Data Sheet
FUJITSU Software HPC Cluster Suite V3.3

Enabling easy operation and management of your Fujitsu PRIMEFLEX for HPC cluster.
Ready to use in your environment, helping to deliver innovation for your business.

Highlights

- A **fully integrated** and **complete** HPC solution stack designed to deliver **application results in a shorter time**
- **Simplified cluster deployment** and **management** enables users to reach **production readiness in the shortest possible timeframe**
- **Intuitive web based "desktop"** guides users through their daily tasks **eliminating the complexity** of using HPC resources leading to improved user productivity
- **Comprehensive software stack** gives **choice** for the leading software packages related to resource management, MPI and development environments
- **Security model** ensures absolute confidence for web based actions
- **Application workflows** can be developed to increase ease of use for complex processes (advanced edition)

Simplicity and Expertise

The FUJITSU Software HPC Cluster Suite (HCS) is a purpose built HPC software stack which has been designed to eliminate the complexity of deploying, managing and using a HPC cluster.
The HCS includes a set of fully validated HPC software components incorporating the best-of-breed HPC Open Source Software components combined with a set of proprietary software products and tools that ensure optimal usage of the Fujitsu PRIMERGY x86 hardware platforms.

Leading ISV software availability

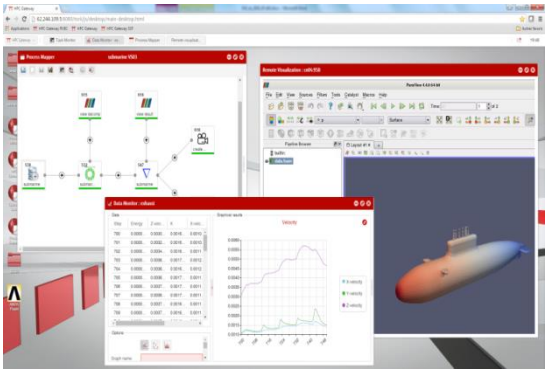
The HCS offering is complemented with a selection of market leading and popular ISV software products specifically focused on HPC usage. Whether you belong to a Small Medium Enterprise looking for a ready to use out of the box solution or a large organization requiring a scalable flexible clustering solution, the HPC Cluster Suite has the features and capabilities to meet your needs.

Innovative web based Desktop

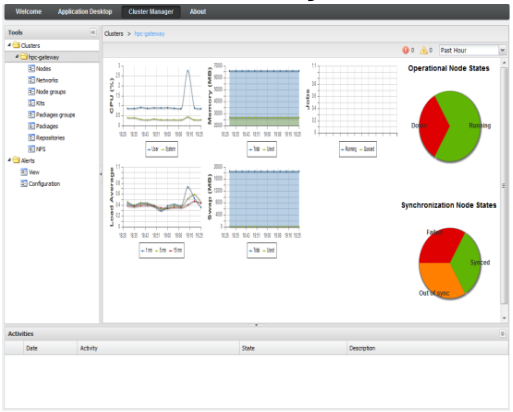
HCS includes an intuitive and innovative web based end-user interface customized for HPC usage. The web "desktop" of the HPC Gateway component brings a familiar and comfortable user environment to the HPC platform.

Reliable HPC servers

Application Desktop



Cluster Manager



Green IT

intel XEON inside

Intel Cluster Ready

Altair

Features and benefits

Main features	Benefits
Cluster Deployment Manager (CDM) - Easy-to-use cluster management	
■ A powerful cluster deployment tool that automates not only the deployment of the operating system but also of each software component and related configuration environment. ■ A graphical user interface is integrated within the HPC Gateway. ■ Scalable installation from deskside servers to the largest clusters.	■ Improves the productivity of HPC administrators by reducing the cluster management TCO. ■ Single point of administration through web based interface. ■ Potential to install extremely large cluster through tiered sub-installer nodes.
Variety of workload managers	
■ PBS Professional from Altair Engineering is one of the most powerful and widely implemented workload managers in the HPC market today and is included in the HCS Advanced Edition. ■ The HCS Open and Basic Editions include the cost effective Open Source Software based OpenPBS or SLURM workload manager.	■ Choice allows users to pick the workload that best meets their processing needs and budget. ■ Existing customers can remove migration headaches by continuing to use the same workload manager on the PRIMEFLEX for HPC cluster. ■ Simplified deployment on the cluster through the CDM component.
HPC Gateway Application Desktop – End-user web-based HPC workplace	
■ Use HPC servers through a web browser with a familiar desktop environment to manage multiple application workloads. ■ Support for visual monitoring of application result data. ■ Ease project organization and workload traceability. ■ On-board your own scripts to add new web application interface panels. ■ Encode internal best-practice and expertise in comprehensive interface.	■ Simplified and intuitive user experience of HPC, lowering entry barriers and increasing productivity. ■ Easily customize the web desktop to provide a standard and robust interface for all users to run any application. ■ Propagate effective and proven methods across the wider team, including users new to HPC, and leverage the increased throughput and quality to use HPC on more projects and innovative designs.
Web-based Cluster Management interface	
■ View the status of nodes in the cluster ■ Review generated alerts for pending or on-going problems ■ Deploy, remove, nodes or update the software environment used by nodes ■ Check the content of the repository, add or remove new packages or kits as needed ■ Manage and control NFS mounts and network definitions used by nodes	■ No need to learn cumbersome line commands. ■ Alerting can be used to warn of impeding problems or load issues. ■ Intuitive single point of administration for the entire cluster reduces complexity and improves productivity of administrators.

Topics

HCS Components and Editions

Open Edition

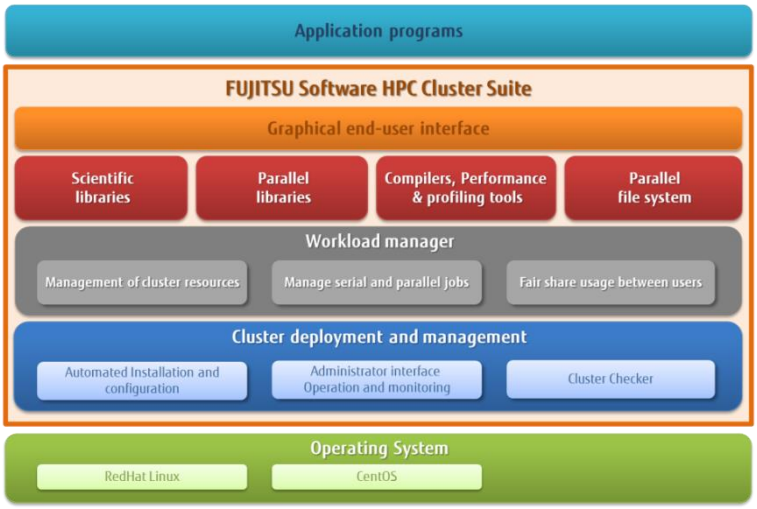
The Open Edition comprises Open Source Software components which are fully validated[1] on FUJITSU Server PRIMERGY systems. This edition provides an economical solution for users that do not require a supported offering. A demonstration version of the HPC Gateway is included.

Basic Edition

The Basic Edition uses the same software stack as the Open Edition but includes support and maintenance for CDM and the HPC Gateway. Installation support is provided for the Open Source Software and optional ISV products.

Advanced Edition

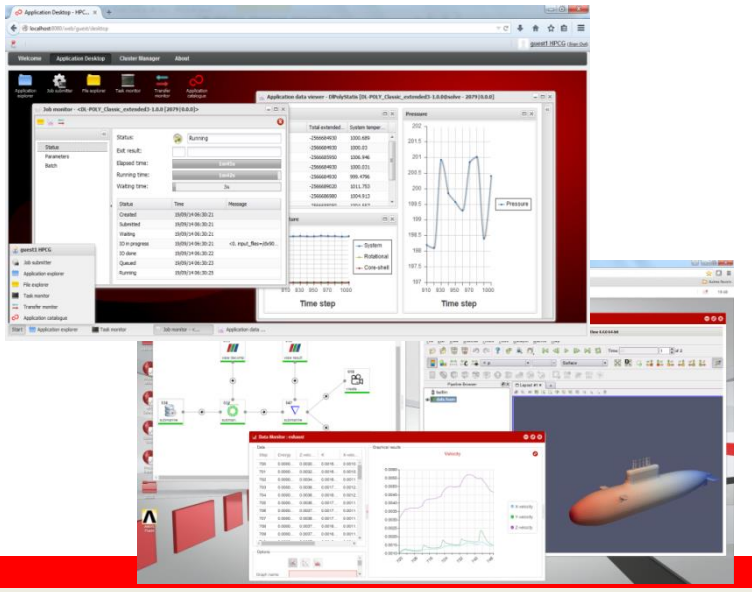
Includes extended features, such as large cluster support and HA, as well as including the leading HPC workload manager, Altair's PBS Professional. Support and maintenance of CDM, HPC Gateway and PBS Professional is included along with installation support for Open Source Software and optional ISV products.



HPC Gateway – Application Desktop

The HPC Gateway simplifies all aspects of HPC work management with integrated functions for file management, application execution and result monitoring. The Application Desktop web interface utilizes a recognizable desktop layout and, ensuring the user experience is both comfortable and intuitive.

New and occasional users as well as practiced HPC users will find the interface for preparing, launching and monitoring their work highly effective. The HPC Gateway functionalities can be easily extended using the powerful add-on mechanism. Visit our web site for more information.



Main Gateway functions

Application Management	Organization and security of application methods; import pre-built methods; create, save and submit individual job parameter profiles; store multiple job execution profiles.
Job Submitter	Run own scripts directly, edit and manage script files.
File Explorer	Navigate cluster file systems, upload/download files, edit text files, cut/paste.
Task Monitor	Monitor jobs and workflows tasks, track and visualize key application results.
Application Editor	Integrate application methods and user variable interface; define prolog/execute/epilog phases; define dynamic data monitor.
VNC viewer	Open remote graphical interfaces in the web desktop with no local client installation and no specific port to be opened. Allow end-user to view remote data for exemple.
Administration Dashboard	Separate desktop tool to customize and manage the HPC Gateway environment.

[1] The Open Source Software and ISV products have been verified for installation with the HPC Cluster Suite but not for their functional capabilities. They are provided as is.

Topics

HCS Installer

The HCS installer is a utility designed to make the setup of a cluster based on Fujitsu HPC Cluster Suite (HCS) a simple and straight forward task. By automating the many steps normally associated with the initial setup of a HPC cluster, the HCS installer is an invaluable tool in bringing a cluster to operational readiness with the least possible effort and in a minimal period of time.

Simplified management with CDM (Cluster Deployment Manager)

The CDM component provides a comprehensive HPC cluster management solution that not only simplifies the cluster deployment process but also ensures the on-going management of the cluster is minimized. All cluster management functions can be achieved through the head node via a command line interface or using the advanced web desktop cluster manager component. Checking the status of the nodes, alerts caused by failures or faults, the state of installed software components, cluster based NFS exports and mounts as well as networks and any custom software components can all be achieved through the convenience of the web desktop environment.

Ready to use with no DIY pain

The HPC Cluster Suite is an essential component of our "Ready-to-Use" philosophy that encompasses all PRIMEFLEX for HPC solutions from Fujitsu. Clusters built according to these processes benefit from optimal application configuration, immediate system readiness and faster deployment. The integrated HPC Cluster Suite simplifies HPC usage and management for both current and potential users of HPC.

PRIMEFLEX for HPC systems, being delivered with standards-based Intel® Cluster Ready, can dramatically reduce cluster purchasing complexity, accelerate your cluster deployment timeline and simplify your cluster management through the use of the Intel® Cluster Checker diagnostic tool. Intel® Cluster Ready becomes the "quality assurance" standard for your cluster purchase.

Components choice meets a diverse set of needs

The HCS incorporates many popular and frequently used open sources HPC software components as well as leading ISV and proprietary packages enabling the solution to be applied to a diverse set of processing needs. The choice of highly used resource managers, MPI libraries, scientific libraries and development environments means that customers are not constrained to use proprietary only based packages for key components but can choice those components that best meet their needs.

Simplicity, Expertise, Agility

HPC systems and applications are complex to use and operate, with a proliferation of variants in processors, interconnects, storage and networks. Maximizing the value of HPC depends on enabling access beyond the most expert engineers or scientists out to the whole enterprise. Fujitsu's HPC Gateway is a dedicated application platform that fulfils this purpose. With a single login to its unique web desktop the end-user can access compute and data resources wherever they are located – on- or off-premise. This complete workplace allows anyone to work easily and effectively, even without low-level IT infrastructure skills.

Organisations thrive by the expertise that they acquire, enhance and innovate. The more they can capture and embed that expertise, the greater the value across business processes and the wider workforce. Fujitsu HPC Gateway stores encapsulated application methods within its global database, enabling publication of these standardised processed across the distributed organisation or just within the local team.

Every business today is looking for more flexible and adaptable compute and data infrastructures. At the same time they must retain their unique and best-practice processes that can use system resources wherever they are ultimately located. Fujitsu's HPC gateway is architected for agility. It is built around database technology that includes global replication and load balancing; the basis for a platform to optimise activity across multiple sites within the organisation, or even to extend to private off-premise resources. For a hybrid infrastructure the internal database can be extended offsite, or with its cloud connector a remote HPC Gateway database can extend the complete pool of authorised resources.

Technical Specifications

HPC Cluster Suite (HCS) Features	HCS Open Edition	HCS Basic Edition	HCS Advanced Edition
Easy-to-use and scalable cluster deployment & management	HCS Installer and CDM	HCS Installer and CDM	HCS Installer and CDM
Flexible workload manager	OpenPBS, SLURM	OpenPBS, SLURM	PBS Professional
Parallel file system	None	None (only for HCS 3.2)	None (only for HCS 3.2)
General HPC Open Source Software components: scientific libraries, parallel libraries, compilers	Yes	Yes	Yes
HPC Gateway	Yes	Yes	Yes
Graphical administrator interface Operation and monitoring	Ganglia	Ganglia	Ganglia
Intel® Cluster Ready	Yes	Yes	Yes
High Availability (HA)	No	No	Yes
Support and maintenance	No	Yes[2]	Yes[2]
Recommended cluster size	Up to 128 nodes	Up to 128 nodes	Up to 1024 nodes[3]
- Notes	[1] includes additional features shown in table below. [2] only installation support is provided for Open Source Software No further SW upgrade will be provided. [3] support for larger clusters available on request.		

HPC Gateway features for Application Desktop	HCS Open Edition	HCS Basic Edition	HCS Advanced Edition
Application Management	Yes	Yes	Yes
Job Submitter	Yes	Yes	Yes
Task Monitor	Yes	Yes	Yes
Application Editor	Yes	Yes	Yes
User Management (Team/Project security model)	Yes	Yes	Yes
Cluster Watch[4]	Yes	Yes	Yes
VNC Viewer[4]	Yes	Yes	Yes

[4] Provided within the Gateway Add-On suite of functions. Other add-on functions may also be purchased separately.

Cluster platform	Supported version
Head node	PRIMERGY RX2530 M1, RX2530 M2, RX2540 M1, RX2540 M2, PRIMERGY RX200 S8, RX300 S8, RX350 S8, PRIMERGY BX2560 M1, BX2560 M2, BX924 S4, CX1640 M1
Compute node	PRIMERGY CX2550 M1, CX2550 M2, CX2570 M1, CX2570 M2, CX1640 M1 PRIMERGY CX250 S2, CX270 S2 PRIMERGY RX2530 M1, RX2530 M2, RX2540 M1, RX2540 M2, PRIMERGY RX200 S8, RX300 S8, RX350 S8, PRIMERGY BX2560 M1, BX2560 M2, BX924 S4 GPGPU NVIDIA Tesla K20 / K20X / K40 / K80 are released for CX2570 M2 / CX2570 M1 / CX270 S2 / RX350 S8 Interconnect Intel® Omni-Path or Mellanox Infiniband FDR / EDR
Operating system	
Head node	Red Hat Enterprise Linux 7.2
Compute node	Red Hat Enterprise Linux 7.2 Red Hat Enterprise Linux HPC Compute Node 7.2 CentOS 7.2
Client device (for HPC Gateway)	
JAVA	Version 1.8 or higher, needed for developing workflows (HCS Advanced Edition)
Web browser	Firefox 15 and above, Chrome, IE 10

More information

Fujitsu platform solutions

In addition to HPC Cluster Suite (HCS), Fujitsu provides a range of platform solutions. They combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships.

Fujitsu Portfolio
Build on industry standards, Fujitsu offers a full portfolio of IT hardware and software products, services, solutions and cloud offering, ranging from clients to data center solutions and includes the broad stack of Business Solutions, as well as the full stack of Cloud offering. This allows customers to leverage from alternative sourcing and delivery models to increase their business agility and to improve their IT operation's reliability.

Computing products
www.fujitsu.com/global/products/computing/

Software
www.fujitsu.com/software/

More information

Learn more about the FUJITSU Software HPC Cluster Suite (HCS), please contact your Fujitsu sales representative, Fujitsu business partner, or visit our website.
www.fujitsu.com/hpc

Fujitsu green policy innovation

Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment.
Using our global know-how, we aim to contribute to the creation of a sustainable environment for future generations through IT.
Please find further information at
www.fujitsu.com/global/about/environment/

Copyright

Disclaimer

Technical data are subject to modification and delivery subject to availability. Any liability that the data and illustrations are complete, actual or correct is excluded. Designations may be trademarks and/or copyrights of the respective manufacturer, the use of which by third parties for their own purposes may infringe the rights of such owner.

Contact
FUJITSU LIMITED

Website: www.fujitsu.com
2017-06-06 CE-EN