Remote High Performance Computing ("HPC") Cluster Management

Introduction

Dell is pleased to provide Remote High Performance Computing ("HPC") Cluster Management (the "Service(s)") in accordance with this Service Description ("Service Description"). Your quote, order form or other mutually-agreed upon form of invoice or order acknowledgment (as applicable, the "Order Form") will include the name of the service(s) and available service options that you purchased. For additional assistance or to request a copy of your service contract(s), contact Dell Technical Support or your sales representative.

The Scope of This Service

This Service provides remote administration and management of Dell HPC clusters. The Service is available for newly installed clusters or certified clusters. A ‘certified’ cluster is one that has been evaluated and deemed ready for this Service through a separately purchased Dell HPC service.

This Service includes:

- Secure remote cluster monitoring, management, and support
- Seasoned HPC support team for day-to-day HPC administration tasks
- Remote initial setup of cluster management solution
- Proactive management and reporting process
- Resolution of issues including working with various vendors
- Upgrades to supported applications and to compute node images
- Queue customization
- Cluster application support
- Documentation
- Quarterly reporting
- Application support
- Various cluster management solutions are supported

The Key Service Components

The key components of the Services include:

I. Setup of Remote Cluster Management Service:
1. The Service setup by Dell is done remotely one time for initial setup of cluster and any subsequent add-on cluster purchases, as specified in the Service Configuration Document ("SCD") provided by Dell at project kickoff, and includes configuration of:
   a. Monitoring and alerting
   b. Secure connection for management and monitoring (see Security Compliance section for more details)
   c. Site Documentation (including user guide and points of contact ("POC(s)") guide)
   d. Training of POCs

II. User Level Documentation and Knowledge Transfer:
   1. Training for Customer POC on queue management, addition of users, and job submission on supported applications.
   2. Documentation for POC that includes:
      a. How to request support from Dell.
      b. How to add users and groups, manage queues/user jobs.
      c. How to shut down the cluster, if needed in an emergency. Tools will be provided by Dell to assist in this operation.
   3. Documentation for users that includes:
      a. How to request/add accounts, service from POC.
      b. How to submit and manage own jobs (batch, message passing interface ("MPI"), and interactive).

III. Pro-active Monitoring and Management of the Cluster:
   1. Automated node monitoring of utilization and errors on server or compute hardware for:
      a. Central processing unit ("CPU"), memory, disk and network.
      b. Hardware alerts such as fans, temperature, if supported by manufacturer, and Operating System ("OS").
      c. NOTE: For utilization warnings such as disk space, the Customer is responsible for cleanup.
   2. Scheduler availability.

IV. Pro-active Reporting and Meetings:
   A regular report will be produced and reviewed with the Customer. The report will include:
   2. Utilization history.
   3. Assistance summary report.
   4. Recommendations for improved operations or service.
   5. The reporting interval is as follows:
      a. In the initial 3 months of Service, more frequent meetings will be held to review issues and progress.
      b. In the first 2 months, there will be at least 2 meetings per month.
      c. In the third month, there will be at least 1 meeting.
6. Following the initial 3 months of service, there will be a meeting every quarter that will also review the performance reports.
   a. For a cluster size greater than 100 compute nodes, these meetings will be monthly instead of quarterly.

V. Priority Response to Alerts or Customer Generated Requests:
   1. Priority response to alerts or Customer generated requests.
      a. Emergency (1 hour response)- Service not available (all users and functions offline)
      b. High (4 hour response) – Some critical services not available (large number of users and functions affected).
      c. Normal (8 hour response) – Limited degradation of service (limited number of users and functions affected, business process can continue).
      d. Requires the end user provided POC is available in a timely manner for onsite hands support, if needed.

VI. Remote Vendor Management of Issues:
   1. This assumes that all hardware and software is fully supported (Dell is not responsible for the providing hardware and software support unless it is purchased separately).
   2. Engage software and hardware vendors to resolve issues with the cluster.
   3. Follow up and close issues with vendors.

VII. Cluster Application Support:
   1. This Service includes support for the agreed to applications that are specified in the SCD.
   2. To receive support, application must have a valid vendor service contract or Dell has agreed to provide support on a best-effort basis.
   3. Compilers and MPI implementations not included in the base Cluster Management Software (CMS) are considered separate applications
   4. Different versions of the application count as a separate application. The only exception is if an application is being upgraded. After parallel testing is complete for an upgrade, the Customer has up to 1 month to move users to the new application version.
   5. Additional applications can be added at any time during the service contract for an additional fee.
   6. The cluster may run other applications supported by the POC
      a. These are not considered ‘supported’ and the POCs have to support these applications internally. Any issues or install requests for these applications are outside the scope of this Service.
      b. These applications must be installed in a shared network area and cannot require any components be installed in the image
      c. Normal ticket process can be used to help POC place unsupported applications in share or to have Dell place applications in share using the Extended Service Time block hours, as described below.

VIII. Parallel Filesystem Support:
   1. For parallel filesystems, Dell will provide:
a. Automated node monitoring as specified in the ‘Proactive Monitoring and Management of the Cluster’ section for storage, metadata and control/management servers  
b. Resolution of hardware, OS and filesystem issues including patches as needed  
c. Space usage and availability monitoring & reporting  
d. Storage area network ("SAN")/controller storage health monitoring per storage server  
e. Investigation of performance issues  

2. Supported filesystems are: Dell Storage Intel Enterprise Edition for Lustre  

IX. Queue Customization:  
1. Up to 4 standard queue customizations are available during initial setup  
2. An additional 4 standard queue customizations per year are included with no carryovers  
   a. For clusters size greater than 100 compute nodes, an additional 8 queue customizations per year are included with no carryovers  
   b. Standard queue customizations imply queue modification that uses the built-in features of the scheduler. Any customizations that extend the functionality are considered non-standard and will be done using Extended Service Time as described below  

X. Upgrades to Supported Applications and to Compute Node Images:  
1. Includes one upgrade per supported application on the cluster every year  
2. Includes one cluster management software and one scheduler upgrade every 3 years. This can be used anytime during an upfront 3 year contract or only during the 3rd year of a 1 year contract renewed consecutively. Note that this does not include Operating System (OS) upgrades.  

XI. Extended Service Time (EST):  
1. Can be used for any work performed by Dell outside the Services listed in this Service Description, but the work has to be directly associated with the Remote HPC Cluster Management service and the specific scope of Service for the EST will be further listed in the SCD.  
2. Time purchased in units for projects and out of scope support requests (1 Unit = 20 support hours)  
3. To be used during normal business hours (8:00 am to 5:00 pm) in Customer’s local time zone. Any after-hours support will be charged at the rate of 1.5 times the clock hours.  
4. Expires when the associated Remote HPC Cluster Management service expires. Any unused support hours are forfeited and will not be refunded.  

XII. Security Compliance Requirements:  
Dell approaches security with extreme awareness of its criticality to Customer’s operations. As such several policies and procedures are put in place to meet or exceed Customer’s needs.  
1. Only authorized staff authenticate and access Customer systems  
2. Customer confidential and protected data is not accessed unless authorized by Customer  
3. For reporting and monitoring purposes, only data such as system performance and job/scheduler operational data is collected. No other user or application data stored on the system is gathered.  
4. Dell has systems and processes in place to comply with industry best practices
5. Dell will work with Customer security team to ensure compliance with Customer requirements including Customer specific procedures that may need to be put in place

Assumptions

1. To receive support, application must have a valid service contract
2. This Service includes support for applications specified in the SCD
3. Compilers and MPI implementations not included in the base cluster management system are considered separate applications
4. Additional nodes and applications can be added at any time during the service contract for an additional fee as defined by associated SKU’s
5. The cluster may run other applications supported by the POC
   a. These are not considered ‘supported’ and the POCs have to support these applications internally. Any issues or install requests for these applications are outside the scope of this Service.
   b. These applications must be installed in a shared network area and cannot require any components be installed in the image
   c. Extended Service Time can be used to help POC place unsupported applications in a shared directory
6. Different versions of the application count as a separate application. The only exception is if an application is being upgraded. After parallel testing is complete for an upgrade, the Customer has up to 1 month to move users to the new application version.
7. The definition of 1 “node” is, either 1 computer addressed as a compute node within the cluster or up to 4 general-purpose graphics processing unit (“GPGPU”) devices
8. Limited ‘superuser/administrator’ access is allowed
   a. Customer will be given controlled administrator access for commands they need to run to support the users, jobs or backups etc. For all other functions, access must be coordinated with Dell
   b. The Customer, including the Customer’s local point of contact, is not allowed to access the management systems as the ‘superuser/administrator’. They will be given privileges to do their day-to-day responsibilities and Dell will perform tasks that need to be done as ‘superuser/administrator’.

A Dell representative will contact Customer to schedule this Service, allowing for at least a ten business day lead time prior to the start of the Service, based upon Customer resources, both people and clusters, being available for implementation.

Exclusions

For the avoidance of doubt, the following activities are not included in the scope of this Service Description:

- Any services, tasks or activities other than those specifically noted in this Service Description.
- The development of any intellectual property created solely and specifically for the Customer.
- Major version upgrades, benchmarking and optimization
- Providing auto-update and antivirus tools on the HPC systems
Auto-updates for patches must be turned off on the systems to provide stability. Vendor approved HPC patches and service packs will be applied on an as needed manual basis, if they affect application functionality or security but only if they have been approved to work with the whole HPC stack.

Anti-virus software causes significant denial of service as nodes are trying to run jobs and accessing cluster network services. Any effort to support issues caused by using live anti-virus tools or anti-virus scanning will be applied to Extended Service Time hours.

This Service Description does not confer on Customer any warranties which are in addition to the warranties provided under the terms of your master services agreement or Agreement, as applicable.

Offer-Specific Customer Responsibilities

The Customer is responsible for:

1. Providing vendor support information and permission to contact vendors on Customer’s behalf
2. Providing assigned primary and secondary local point of contact (“POC”) for Dell to:
   a. Be trained on how to resolve most common user requests and how to get support from Dell
   b. Provide timely hands-on assistance for hardware support - cable swapping, physical node resets, etc.
   c. Escalate cluster issues and other requests for support to Dell following agreed to and documented procedures. This includes originating tickets for all service requests.
   d. Make physical changes to cluster node to facilitate remote troubleshooting
   e. Be the local POC for vendor access to cluster and associated facilities
   f. Field all end user questions and act as liaison to accessing Dell support team
   g. Act as first level support for managing scheduler queues
   h. Manage User Accounts, which includes changes, adds and deletions
3. **NOTE:** A backup POC can also be trained at the same time. They must be trained by the primary POC if they cannot be present for the original training. A ‘POC Training’ fee at regular hourly rates will be charged for training additional POCs.
4. Providing support contracts and warranties for hardware and software
5. Any hardware or software not covered under vendor support or warranty, related issues may not be resolved in a timely manner. Any effort for resolution will require the use of EST hours outside of the priority response guidelines outlined above.
6. Backing up any and all data they wish to preserve. Dell will have no liability for loss or recovery of data or programs or loss of use of systems arising out of the Services or support or any act or omission, by Dell or a third-party service provider. Dell will identify key cluster management files for backup.
7. Providing an environment maintained to environmental standards of hardware vendor specifications.
   a. Proper uninterruptable power supply and cooling must be available 24x7 for the cluster. Remediation efforts caused by unstable environment will be considered out of scope for the fixed price Service.
General Customer Responsibilities

Authority to Grant Access. Customer represents and warrants that it has obtained permission for both Customer and Dell to access and use, whether remotely or in-person, Customer-owned or licensed software, hardware, systems, the data located thereon and all hardware and software components included therein, for the purpose of providing these Services. If Customer does not already have that permission, it is Customer's responsibility to obtain it, at Customer's expense, before Customer asks Dell to perform these Services.

Non-solicitation. Customer will not, without Dell’s prior written consent, for a period of two years from the date listed on your Order Form, directly or indirectly solicit for employment any Dell employee with whom you have come in contact in connection with Dell’s performance of the Service; provided, however, that general advertisements and other similarly broad forms of solicitation will not constitute direct or indirect solicitation hereunder and you are permitted to solicit for employment any employee that has been terminated or has resigned his or her employment with Dell prior to the commencement of employment discussions with you.

Customer Cooperation. Customer understands that without prompt and adequate cooperation, Dell will not be able to perform the Service or, if performed, the Service may be materially altered or delayed. Accordingly, Customer will promptly and reasonably provide Dell with all cooperation necessary for Dell to perform the Service. If Customer does not provide reasonably adequate cooperation in accordance with the foregoing, Dell will not be responsible for any failure to perform the Service and Customer will not be entitled to a refund.

On-site Obligations. Where Services require on-site performance, Customer will provide (at no cost to Dell) free, safe and sufficient access to Customer's facilities and environment, including ample working space, electricity, safety equipment (if applicable) and a local telephone line. A monitor or display, a mouse (or pointing device), and a keyboard must also be provided (at no cost to Dell), if the system does not already include these items.

Data Backup. Customer will complete a backup of all existing data, software and programs on all affected systems prior to and during the delivery of this Service. Customer should make regular backup copies of the data stored on all affected systems as a precaution against possible failures, alterations, or loss of data. DELL WILL HAVE NO LIABILITY FOR:

- ANY OF YOUR CONFIDENTIAL, PROPRIETARY OR PERSONAL INFORMATION;
- LOST OR CORRUPTED DATA, PROGRAMS OR SOFTWARE;
- DAMAGED OR LOST REMOVABLE MEDIA;
- THE LOSS OF USE OF A SYSTEM OR NETWORK; AND/OR
- FOR ANY ACTS OR OMISSIONS, INCLUDING NEGLIGENCE, BY DELL OR A THIRD-PARTY SERVICE PROVIDER.

Dell will not be responsible for the restoration or reinstallation of any programs or data.

Third Party Warranties. These Services may require Dell to access hardware or software that is not manufactured by Dell. Some manufacturers’ warranties may become void if Dell or anyone else other than the manufacturer works on the hardware or software. Customer will ensure that Dell's performance of Services will not affect such warranties or, if it does, that the effect will be acceptable to Customer. Dell does not take responsibility for third party warranties or for any effect that the Services may have on those warranties.

Service Hours. Subject to local law relating to weekly work hours, this Service will be performed Monday through Friday during normal Dell business hours, which unless otherwise listed below is from 8:00 AM to 6:00 PM Customer local time:
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Country | Normal Dell Business Hours
St. Kitts, St. Lucia, St. Vincent, Trinidad, Virgin Islands, Rest of English speaking Caribbean | 7:00 AM to 4:00 PM
Barbados, Bahamas, Belize, Costa Rica, El Salvador, Grand Cayman, Guatemala, Honduras, Jamaica, Panama, Puerto Rico, Rep. Dominicana, Suriname, Turks and Caicos | 8:00 AM to 5:00 PM
Australia, Bermuda, China, Haiti, Hong Kong, Japan, Korea, Malaysia, Netherland Antilles, New Zealand, Singapore, Taiwan, Thailand | 9:00 AM to 5:00 PM
Argentina, India, Paraguay, Uruguay, France | 9:00 AM to 6:00 PM
Bolivia, Chile | 9:00 AM to 7:00 PM

No Service activities will take place during local holidays unless other arrangements have been made in advance in writing.

Dell Services Terms & Conditions

This Service Description is entered between you, the customer (“you” or “Customer”), and the Dell entity identified on your invoice for the purchase of this Service. This Service is provided subject to and governed by Customer’s separate signed master services agreement with Dell that explicitly authorizes the sale of this Service. In the absence of such agreement, depending on Customer’s location, this Service is provided subject to and governed by either Dell’s Commercial Terms of Sale or Dell’s standard Customer Master Services Agreement (as applicable, the “Agreement”). Please see the table below which lists the URL applicable to your Customer location where your Agreement can be located. The parties acknowledge having read and agree to be bound by such online terms.

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<tr>
<th>Customer Location</th>
<th>Terms &amp; Conditions Applicable to Your Purchase of Dell Services</th>
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<tr>
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<td>Customers Purchasing Dell Services Directly From Dell</td>
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<tr>
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<td>Customers Purchasing Dell Services Through an Authorized Dell Reseller</td>
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<td>Canada</td>
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Service Descriptions and other Dell service documents which you may receive from your seller shall not constitute an agreement between you and Dell but shall serve only to describe the content of Service you are purchasing from your seller, your obligations as a recipient of the Service and the boundaries and limitations of such Service. As a consequence hereof any reference to “Customer” in this Service Description and in any other Dell service document shall in this context be understood as a reference to you whereas any reference to Dell shall only be understood as a reference to Dell as a service provider providing the Service on behalf of your seller. You will not have a direct contractual relationship with Dell with regards to the Service described herein. For the avoidance of doubt any payment terms or other contractual terms which are by their nature solely relevant between a buyer and a seller directly shall not be applicable to you and will be as agreed between you and your seller.
In addition, customers located in France, Germany and the UK can select the applicable URL below:

France: [Dell.fr/ConditionsGeneralesdeVente](#)
Germany: [Dell.de/Geschaeftsbedingungen](#)
UK: [Dell.co.uk/terms](#)

Service Descriptions and other Dell service documents which you may receive from your seller shall not constitute an agreement between you and Dell but shall serve only to describe the content of Service you are purchasing from your seller, your obligations as a recipient of the Service and the boundaries and limitations of such Service. As a consequence hereof any reference to “Customer” in this Service Description and in any other Dell service document shall in this context be understood as a reference to you whereas any reference to Dell shall only be understood as a reference to Dell as a service provider providing the Service on behalf of your seller. You will not have a direct contractual relationship with Dell with regards to the Service described herein. For the avoidance of doubt any payment terms or other contractual terms which are by their nature solely relevant between a buyer and a seller directly shall not be applicable to you and will be as agreed between you and your seller.

* Customers may access their local Dell.com website by simply accessing Dell.com from a computer connected to the Internet within their locality or by choosing among the options at Dell’s “Choose a Region/Country” website available at Dell.com/content/public/choosecountry.aspx?c=us&l=en&s=gen.

Customer further agrees that by renewing, modifying, extending or continuing to utilize the Service beyond the initial term, the Service will be subject to the then-current Service Description available for review at Dell.com/servicedescriptions/global.

To the extent that any terms of this Service Description conflict with any terms of the Agreement, the terms of this Service Description will prevail, but only to the extent of the specific conflict, and will not be read or deemed to replace any other terms in the Agreement which are not specifically contradicted by this Service Description.

By placing your order for the Services, receiving delivery of the Services, utilizing the Services or associated software or by clicking/checking the “I Agree” button or box or similar on the Dell.com website in connection with your purchase or within a Dell software or Internet interface, you agree to be bound by this Service Description and the agreements incorporated by reference herein. If you are entering this Service Description on behalf of a company or other legal entity, you represent that you have authority to bind such entity to this Service Description, in which case “you” or “Customer” shall refer to such entity. In addition to receiving this Service Description, Customers in certain countries may also be required to execute a signed Order Form.
Supplemental Terms & Conditions Applicable to Consulting & Managed Services

1. **Term of Service.** This Service Description commences on the date listed on your Order Form and continues through the term ("Term") indicated on the Order Form. As applicable, the number of systems, licenses, installations, deployments, managed end points or end-users for which Customer has purchased any one or more Services, the rate or price, and the applicable Term for each Service is indicated on Customer’s Order Form. Unless otherwise agreed in writing between Dell and Customer, purchases of Services under this Service Description must be solely for Customer’s own internal use and not for resale or service bureau purposes.

2. **Important Additional Information**
   
   A. **Rescheduling.** Once this Service has been scheduled, any changes to the schedule must occur at least 8 calendar days prior to the scheduled date. If Customer reschedules this service within 7 days or less prior to the scheduled date, there will be a rescheduling fee not to exceed 25% of the price for the Services. Any rescheduling of the Service will be confirmed by Customer at least 8 days prior to commencement of the Service.
   
   B. **Payment for Hardware Purchased With Services.** Unless otherwise agreed to in writing, payment for hardware shall in no case be contingent upon performance or delivery of consulting or managed services purchased with such hardware.
   
   C. **CommerciaLly Reasonable Limits to Scope of Service.** Dell may refuse to provide Service if, in its opinion, providing the Service creates an unreasonable risk to Dell or Dell’s Service providers or if any requested service is beyond the scope of Service. Dell is not liable for any failure or delay in performance due to any cause beyond its control, including Customer’s failure to comply with its obligations under this Service Description.
   
   D. **Optional Services.** Optional services (including point-of-need support, installation, consulting, managed, professional, support or training services) may be available for purchase from Dell and will vary by Customer location. Optional services may require a separate agreement with Dell. In the absence of such agreement, optional services are provided pursuant to this Service Description.
   
   E. **Assignment.** Dell may assign this Service and/or Service Description to qualified third party service providers.
   
   F. **Cancellation.** Dell may cancel this Service at any time during the Term for any of the following reasons:
      
      - Customer fails to pay the total price for this Service in accordance with the invoice terms;
      - Customer is abusive, threatening, or refuses to cooperate with the assisting analyst or on-site technician; or
      - Customer fails to abide by all of the terms and conditions set forth in this Service Description.

   If Dell cancels this Service, Dell will send Customer written notice of cancellation at the address indicated on Customer’s invoice. The notice will include the reason for cancellation and the effective date of cancellation, which will be not less than ten (10) days from the date Dell sends notice of cancellation to Customer, unless local law requires other cancellation provisions that may not by varied by agreement. If Dell cancels this Service pursuant to this paragraph, Customer shall not be entitled to any refund of fees paid or due to Dell.

   G. **Geographic Limitations and Relocation.** This Service is not available at all locations. Service options, including service levels, technical support hours, and on-site response times will vary by geography and certain options may not be available for purchase in Customer’s location, so please contact your sales representative for these details.
H. **Fixed Scope.** This Service is available by ordering standard Dell SKUs with defined parameters and is thus, fixed in scope. If the desired scope of service is determined to be larger than the pre-defined scope herein, additional service(s) can be requested by Customer. Scenarios outside this standard Service may include, but are not limited to: exceeding the number of devices or applications in scope, Customer-request to extend timeframe, specific testing outside scope, multiple sites, or country locations beyond standard delivery capabilities. Talk to your Dell sales professional for more details.

I. **Service Expires 1 Year After Purchase.** Except to the extent applicable law requires otherwise, you may use this service one time during the 1 year period following the date of original purchase ("Expiration Date"). The original purchase date is defined as the earlier of the date of the invoice for the service or order confirmation from Dell. Dell's delivery of the Service will be deemed satisfied after the expiration date event if you do not use the Service.