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Integrating SharePoint with HPC08

Using SharePoint as a front-end to
Windows HPC Server 2008

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We Take a Business Approach to IT

- ✕ What is HPC?
- ✕ Why use SharePoint with HPC08?
- ✕ Integrating SharePoint with HPC08
 - Required components
 - Configuration changes
 - Adding web parts to pages
- ✕ Demonstration

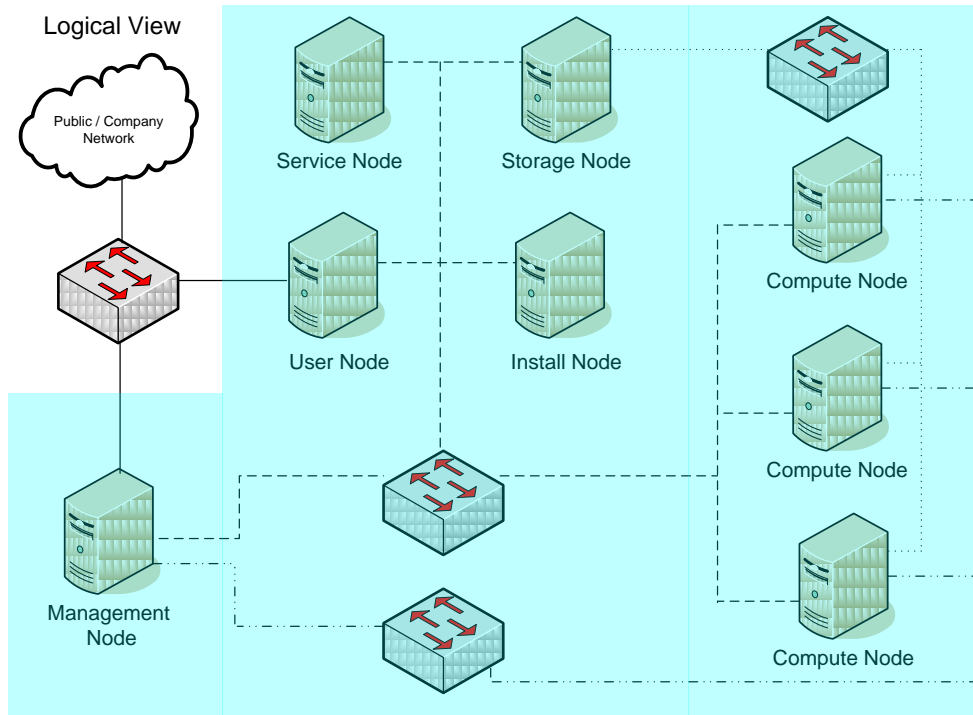
X High Performance Computing

- Clusters of computers that work together to crunch numbers
- Jobs are submitted to solve specific problems
- Typically comprised of management nodes and compute nodes.

X Common uses of HPC Clusters

- Reservoir modeling
- Weather modeling
- Bio-Informatics (genetic sequencing, etc.)
- Financial modeling & analysis

- ✧ Ways to interact with the cluster
 - Command line
 - Client-side GUI
 - Specialized application (e.g. MATLab)
- ✧ Microsoft Windows HPC Server 2008
 - Leverages Microsoft technologies (AD, Server 2008, .NET)
 - Supports batch jobs as well as SOA!



- Node Groups
 - Compute
 - Support
 - Cluster manager
- Network Groups
 - Public
 - Cluster
 - Management
 - Inter-Process Communication (IPC)

Why Use SharePoint with HPC08?



- ✕ Eliminate installing client-side software for all users
- ✕ Drive more users to your SharePoint site
- ✕ Allows for robust workflows involving job submissions and state changes
- ✕ Allow for business partner use through extranet access
- ✕ Leverage existing integration with legacy or other back-end applications
- ✕ Easy to use!

- ✕ Follow proper dev/test/deploy procedures for your organization
- ✕ Changes to web.config will require restarting IIS
- ✕ Obtain the HPC Pack 2008 SharePoint Integration Sample from Microsoft

- ✕ Step 1 – Extend the web.config file
 - Enables AJAX support for HPC Web Parts
 - Multiple changes, back-up your original!
- ✕ Step 2 – Deploy the HPC SharePoint solution
- ✕ Step 3 – Specify the HPC Cluster to use

- ✕ Add section groups to support new entries in web.config
- ✕ Add controls declaration
- ✕ Add assembly declaration
- ✕ Add verb handlers
- ✕ Add script module handlers
- ✕ Add safe controls entry
- ✕ Add scripting web service handlers

Step 2 – Deploy the HPC SharePoint Solution

- ✘ HPC Pack 2008 SharePoint Integration Sample from Microsoft contains
 - HPC Web Part solution file (HPCWebPart.wsp)
 - setup script (setup.bat)
 - Sample web.config file
 - Text file with XML entries to add to your web.config
 - Visual Studio Solution and source files
- ✘ Open “HPCWebPart” folder and run setup.bat
 - Defaults to port 80
 - Install to alternate port from CLI:
 - `setup.bat /install /weburl http://yourServer:yourPortNumber`
 - Change SPLocation in setup.bat to ...\\14 (vs 12) for SP2010

Step 3 – Specify HPC Cluster to use



- ✕ Edit HPCconfig.xml in ...\\12\TEMPLATE\LAYOUTS
 - Edit values for domain name and head node hostname

```
<Hpc>
  <DomainName>HPCdomain</DomainName>
  <HeadNode>HeadNodeName</HeadNode>
</Hpc>
```

For example:

```
<?xml version="1.0" encoding="utf-8" ?>
<Config>
  <Hpc>
    <DomainName>x-iss.com</DomainName>
    <HeadNode>HPC08-HN</HeadNode>
  </Hpc>
</Config>
```

- ✕ Create the site (e.g. HPC Jobs)
- ✕ Add site permissions (site visitors must be cluster users or administrators)
- ✕ Add the HPC Job List web part
- ✕ Create a document library called “Shared Documents”
 - Create a new web part page called “JobSubmitPage”
 - Add the HPC Job Submit web part
 - Create a new web part page called “JobDetailPage”
 - Add the HPC Job Details web part

- ✕ Enable Single Sign-On!
- ✕ If using setup.bat with SP2010, edit it for the proper path
- ✕ Job Submit and Job Detail web parts live in pages within the document library
- ✕ Web parts are hard-coded for page and library names!

Screen Shots



JobSubmitPage

SharePoint Integration with HPC08 demonstration

HPC Job Submit

Job Details | Task List | Resource Selection | Licenses

Job Details

Job Name: Job template:

Project Name: Priority:

Job run options

Do not run this job for more than: Days Hours Minutes

Run job until cancelled or run time expires

Fail the job if task in the job fails

Job resources

Resource Type:

Minimum Resource : Auto-calculate

Maximum Resource : Auto-calculate

Use assigned resources exclusively for this job.

Run As User:

Password:

Remember me for this session

Submit

Cancel

HPC Job Submit Web Part – Task List



Job Details	Task List	Resource Selection	Licenses
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Task List

◀ ▶

Task Properties

Task and Standard I/O

Task Name:

Command Line:

Working Directory:

Standard Input:

Standard Output:

Standard Error:

Parameter Sweep:

Sweep start index: Sweep end index: Sweep increment index:

Minimum Resource:

Maximum Resource:

Exclusive: True False

Rerunnable: True False

Do not run this task for more than: Days Hours Minutes

Environment variables:

Variable Name:

Variable Value:



JobSubmitPage

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HPC Job Submit

Job Details

Task List

Resource Selection

Licenses

Resource Selection

Run this job only on nodes that are members of the following groups:

Add >>

<< Remove

Run this job only on nodes of the following list:

Node Name	Cores	Memory	State
<input type="checkbox"/> HPC08-CN01	2	2047	Online
<input type="checkbox"/> HPC08-CN02	2	2047	Online
<input type="checkbox"/> HPC08-CN03	2	2047	Online

Run As User:

Password:

Remember me for this session

Submit

Cancel

JobSubmitPage

SharePoint Integration with HPC08 demonstration

HPC Job Submit

- Job Details
- Task List
- Resource Selection
- Licenses

License

Name:

Number:

Add License

Cancel

Run As User:

Password:

Remember me for this session

Submit

Cancel

HPC Job List Interactions

X-ISS - Intranet > Demos > HPC Demo

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HPC Job List

Create new job

JobId	JobName	State
250	Frame Render 1	Finished
	Test	Finished
	Frame Render	Finished

- View Job
- Modify Job
- Copy Job
- Cancel Job
- Requeue Job

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