System Specifications for HydroServers

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The purpose of this document is to define the prerequisite hardware and software specifications for HydroServers. In this document we describe the system specifications that will support full implementation of the CUAHSI HIS HydroServer cyberinfrastructure and suggest reasonable upgrades that will enhance performance and longevity of a server.

Hardware

Processor

Dual-core Intel Processor at 2 GHz.

It is recommended that servers have at least one quad-core processor, and dual quad core processors would provide the most robust system performance.

RAM

4 GB of RAM.

It is recommended that servers be upgraded to at least 8 GB of RAM or more.

Notes:

4 GB of ram is the maximum for a 32-bit operating system. Upgrading to 8 GB of RAM will require the server to be running a 64-bit operating system. Refer to the section on commercial software specifications for details.

Hard Drive

500 GB of hard drive space.

It is recommended that servers be upgraded to at least 1 TB of hard drive space at 7,200 RPM and that hard drives be configured in a redundant RAID array (either Raid Level 1 or Raid Level 5).

Network Adapter

Gigabit network adapter.

Peripherals

DVD drive.

Commercial Software

The following is a list of commercial software components that will support the full implementation of HydroServer.

For some of these software packages, we suggest joining the Microsoft Academic Alliance. An Academic Alliance membership covers an entire academic department (must be a Science, Engineering, Technology, or Mathematics department) and includes many of Microsoft's software packages. Notes are included below for products that can be obtained from the Academic Alliance.

Operating System

Microsoft Windows Server 2008 R2, Standard Edition

Notes:

The 32-bit Microsoft operating systems support a maximum of 4 GB of RAM. The 64-bit Windows operating systems will enable you to upgrade your server to 8 GB of RAM or more. You can use Microsoft Windows Server 2003 for a HydroServer implementation, but Windows Server 2008 is highly recommended.

Microsoft operating systems are included in the Academic Alliance. You can save some money by purchasing a server without an operating system and then installing it yourself using an Academic Alliance version. However, it is recommended that you purchase your operating system preinstalled on your server to ensure that it is installed and configured correctly. Most manufacturers have an academic discount on software so choose accordingly when ordering your server.

Web Server

HydroServers use Microsoft Internet Information Services (IIS) as the web server. IIS is an integral part of the Microsoft operating systems and is preinstalled as part of the Microsoft Server operating systems (i.e., no additional purchase is necessary). The version of IIS will depend upon the version of Windows installed on the server.

Database Server

Microsoft SQL Server 2008 Standard Edition (see important notes below).

It is recommended that ICEWATER data node servers be upgraded to Microsoft SQL Server 2008 R2 Standard or Enterprise edition (see important notes below).

Notes:

HydroServer can use Microsoft SQL Server 2005, but SQL Server 2008 is recommended.

We *do not* recommend that you purchase a SQL Server license with your server. Instead, we recommend using the Microsoft Academic Alliance to obtain a license for your server. The cost of joining the Academic Alliance is much less than the cost of purchasing a separate license for SQL Server.

The free versions of Microsoft SQL Server (i.e., SQL Server 2005 or 2008 Express) can be used in the event that the recommended SQL Server license cannot be obtained. These free versions can be downloaded from Microsoft's website. Although the free versions will work, they are subject to database size restrictions, single processor support, limited RAM support, limited native data import/export tools, and they do not have most of the enterprise features.

Frameworks

Microsoft .Net Framework Version 3.5.

The .Net Framework is a Microsoft product that is required to enable computers to run applications developed using Microsoft Visual Studio. Version 3.5 of the .Net Framework is free and can be downloaded from Microsoft's website.

Development Environment

HydroServers do not require installation of Microsoft Visual Studio.

We recommend that data managers have a license for Microsoft Visual Studio 2008 available for installation on a separate development machine (or the HydroServer if a separate machine is unavailable) to assist in debugging any problems that may occur. We recommend having a development machine, which can be a separate modest laptop or desktop machine, that has many or all of the commercial and HIS components installed to provide data managers with an environment that is separate from the production server for working, testing, and debugging. Access to Visual Studio 2008 Professional edition is included in the Microsoft Academic Alliance membership.

Internet Map Server Software

ArcGIS Server 9.3.1 and ArcGIS Desktop 9.3.1

To enable publishing spatial datasets and for running the HydroServer map server application, HydroServers require a license for ArcGIS Server 9.3.1. Data managers should also have a license for ArcGIS Desktop 9.3.1 for installation either on a development machine or on the data node server.

Notes:

ArcGIS server is only required for hosting spatial data services (i.e., serving GIS datasets). It is not required for publishing observational data using ODM and the WaterOneFlow web services. If a license for ArcGIS is not available at a data node, point observational data can still be published.