### Table of Contents

**Overview** .................................................................................................................... 2

**Current Infrastructure** ............................................................................................... 2

**Infrastructure Requirements** ..................................................................................... 2
   - Hardware Requirements .......................................................................................... 2
   - Operating System Requirements ........................................................................ 3
   - Application Server Software Requirements ...................................................... 3
   - Database Server Software Requirements ........................................................... 3

**Site Architecture** ........................................................................................................ 4
   - Presentation Layer ............................................................................................... 4
   - Web Services Layer ............................................................................................. 4
   - Entitlement & Security Layer ............................................................................... 5
   - Common Services Layer ....................................................................................... 5

**Functional Modules** .................................................................................................... 5
   - Content Management ......................................................................................... 8
   - Document Management ....................................................................................... 8
   - Global Site Navigation ....................................................................................... 8
   - Polling/Evaluations ............................................................................................. 8
   - Ask an Expert Knowledge Tree .......................................................................... 8
   - Ecommerce .......................................................................................................... 9
   - Event/Calendar Management ............................................................................. 9
   - Conference Call/Calendar Management ........................................................... 9
   - Balloting/General and Board of Directors ......................................................... 9
   - Membership Services ......................................................................................... 9
   - Job Board ........................................................................................................... 10
   - Certified User Search ........................................................................................ 10
   - Site and Document Search .................................................................................. 10
   - Forums ................................................................................................................. 10
   - My HL7 ............................................................................................................... 10
   - Wiki ..................................................................................................................... 11
   - Email Marketing .................................................................................................. 11
   - Administrative Functions ...................................................................................... 11
   - Web Analytics ...................................................................................................... 11
Overview
This document outlines the technical requirements for the HL7.org site implementation. The goal for the new HL7 site is to facilitate community and to build a virtual edifice for an organization whose business is conducted almost entirely in a virtual environment. By providing a consistent, positive user experience for members and non-members alike – we hope to build a web presence that is better representative of the organization and its members, as well as a site that reflects the credibility of the organization.

Current Infrastructure
The HL7.org website currently uses ColdFusion 7.0 as its application server, Internet Information Server as its web server and MS SQL Server 2000 as its database. HL7.org also currently supports several ASP applications. All three servers are hosted on a single Windows server running the Windows 2000 Server operating system. A less robust but functionally identical server is used as a test instance.

Infrastructure Requirements
The new HL7.org website will greatly expand on the functionality of the current site; as these functional requirements grow so do the requirements on the site infrastructure. The goals in upgrading the current infrastructure are:

- Provide hardware and software that will handle the current request load and scale to meet future growth.
- Provide security for all customer data.
- Provide a clear upgrade path and support plan for all 3rd party solutions.

Hardware Requirements
Health Level Seven’s user base numbers in the thousands. While all of these users will not be accessing HL7.org’s services simultaneously this still represents a significant load, it is important to provide a robust platform that can handle heavy traffic without degrading performance. Hardware recommendations:

- Purchase a new server to host the web server and application server.
- Purchase a new server to host the database server, files and backups.
- Purchase a new server to be used as a test environment and failover for production should a server failure take the web server or the application server offline.
- Purchase a firewall and/or routing appliance or software to handle security and failover.

Potential Solutions:
Server: Dell PowerEdge 2950
Firewall: Cisco PIX
       Watchguard Firebox
Operating System Requirements
Health Level Seven’s technical staff has experience supporting the Windows environment. An upgrade to Windows Server 2003 is recommended. This will ensure compatibility with most 3rd party applications and assure vendor support.

Application Server Software Requirements
Currently Health Level Seven uses ColdFusion 7 as its core application server. Health Level Seven’s technical staff has experience supporting ColdFusion and there are several core applications already developed using ColdFusion. The existing production and test ColdFusion licenses will transfer to the new servers. All custom development will be done in ColdFusion.

Additional application servers may be evaluated if needed to host 3rd party applications.

Database Server Software Requirements
Currently Health Level Seven uses SQL Server 2000 for its database server. An upgrade to SQL Server 2005 is recommended. This will ensure compatibility with most 3rd party applications and assure vendor support.
Site Architecture

In order to meet the diverse functional requirements HL7.org must be many things to many users and at the same time unified in look and feel. Some of these functions already exist on the site, some can be added through 3rd party components, and some will require custom development. The way to satisfy these seemingly incompatible requirements is to develop the new site using Service Oriented Architecture (SOA). SOA is not a technology, but a strategic approach to delivering data and services from disparate systems in a structured and secure manner. This requires top level planning that merges business needs with easily accessible and scalable resources. Individual modules are integrated into the site using Web Services. Only the data and services that are needed are delivered without exposing the underlying systems.

Proposed architecture:

Presentation Layer

Web Services Layer

Entitlement & Security Layer

Common Services

Presentation Layer

The presentation contains everything the user will see and interact with. The look and feel of the new HL7.org will be CSS driven and will be Priority One W3C compliant for usability. The presentation code will be standards based in order to render well in all browsers.

Web Services Layer

The web services layer establishes the standard Application Program Interface (API) for the sharing of data between systems. It ensures client goals are met and that components can seamlessly work together to deliver a unified user experience. This is the main point of integration for custom applications and 3rd party modules.
Entitlement & Security Layer
The entitlement and security layer provides centralized authentication services to all components of the site. Authentication for HL7.org will be role based.

Common Services Layer
The common services layer provides services such as site monitoring and web analytics.

Functional Modules
Each of the functional modules will be implemented as either a custom ColdFusion application or a 3rd party solution. All 3rd party solutions will be implemented as a standard install and will integrate with the overall website via web services. This strategy will protect Health Level Seven’s investment in these solutions and provide a clear upgrade path and support plan.

<table>
<thead>
<tr>
<th>Module</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Management</td>
<td>3rd Party Integration</td>
</tr>
<tr>
<td>Document Management</td>
<td>3rd Party Integration</td>
</tr>
<tr>
<td>Global Navigation</td>
<td>3rd Party Integration or New ColdFusion Application</td>
</tr>
<tr>
<td>Polling/Evaluations</td>
<td>3rd Party Integration – Content Management System</td>
</tr>
<tr>
<td>Ask an Expert Knowledge Tree</td>
<td>3rd Party Integration – Content Management System</td>
</tr>
<tr>
<td>Ecommerce</td>
<td>3rd Party Integration</td>
</tr>
<tr>
<td>Module</td>
<td>Recommendation</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Event/Calendar Management</td>
<td>Extend Existing ColdFusion Application – Conference Call Application</td>
</tr>
<tr>
<td>Conference Call/Calendar</td>
<td>Extend Existing ColdFusion Application</td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Membership Services</td>
<td>New ColdFusion Application</td>
</tr>
<tr>
<td>Job Board</td>
<td>New ColdFusion Application</td>
</tr>
<tr>
<td>Certified User Search</td>
<td>New ColdFusion Application</td>
</tr>
<tr>
<td>Site and Document Search</td>
<td>New ColdFusion/Verity Application</td>
</tr>
<tr>
<td>Forums</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Party Integration</td>
</tr>
<tr>
<td>My HL7</td>
<td>New ColdFusion Application</td>
</tr>
<tr>
<td>Wiki</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Party Integration or Hosted Service</td>
</tr>
<tr>
<td>Email Marketing</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Party Integration</td>
</tr>
<tr>
<td>Administrative Functions</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Party Integration – Content Management System New ColdFusion Application</td>
</tr>
<tr>
<td>Module</td>
<td>Recommendation</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Web Analytics</td>
<td>3rd Party Integration</td>
</tr>
</tbody>
</table>
Content Management
A majority of the content on HL7.org will be managed using a Content Management System (CMS). There are many suitable out of the box content management systems which can meet HL7.org’s needs. Building a custom in-house content management system would not be a good use of HL7.org’s budget or resources. The CMS solution selected must run on Window Server 2003 and use SQL Server as its backend database. It must provide an API in order to integrate with the web services layer of HL7.org.

Potential Solutions:
Ektron CMS400.net – Requires .net framework
Hot Banana Web Content Management
Paperthin Commonspot Content Server
Sitecore CMS

Document Management
Most content management systems have at least some document management features. This should be kept in mind when evaluating a CMS. HL7’s document management needs include both public and private documents of various formats like .PDF or .DOC. These documents are available to the user based on their membership level.

Global Site Navigation
The global navigation for the site will need to integrate not only with the content management system but also each of the individual sub-applications. Depending on the content management system chosen this may be developed as an extension of the CMS or it may be developed as a stand alone application.

Polling/Evaluations
Most Content Management Systems have functionality to handle polling, quizzes and form submissions. This should be a factor in evaluating a 3rd party Content Management System.

Ask an Expert Knowledge Tree
This functionality should be able to be implemented within the Content Management System as series of linked pages ending in a content page or targeted document.
Ecommerce
HL7.org will process credit card orders both for products and also for membership fees. Credit cards will be processed through a payment gateway. A 3rd party solution will be used for both store management and payment gateway interface. The chosen solution will need to integrate with the web services layer of HL7.org

Potential Solutions:
Storefront: Application Dynamics Cartweaver
Yahoo Store (Hosted solution - Domain name would be different)
Payment Gateway: Cybersource
Authorizenet

Event/Calendar Management
Health Level Seven requires an online calendar and event application to allow users to see and sign up for events. A custom application written in ColdFusion is currently being used to handle calendar management for conference calls. This application will be extended to handle event management and registration. This application will be required to integrate with the web services layer of HL7.org.

Conference Call/Calendar Management
Health Level Seven currently uses an online conference call application to allow users to keep track of and search for conference calls. This application is written in ColdFusion. This application will be required to integrate with the web services layer of HL7.org.

Balloting/General and Board of Directors
Health Level Seven currently uses an online balloting application which allows users to vote on technical issues. This application is written in ColdFusion. This application will need to be extended to recognize roles for specialized balloting for the Board of Directors. This application will also need to be extended to incorporate the election process and ballot search. This application will be required to integrate with the web services layer of HL7.org.

Membership Services
HL7.org will serve seven different types of users. Each of these role types will have different access rights to various services on the site. All of the roles that require authentication will created using a membership management application. This functionality will be implemented as a new custom ColdFusion application that will interact with the membership database. Authentication and permissions throughout the site’s disparate modules will be handled by entitlement and security layer.
Job Board
HL7.org will host a job board which will enable members and non-members to post jobs on the website for a fee. This application will be written in ColdFusion. Integration with the ecommerce and payment gateway solutions will be required. Integration with the entitlement and security layer will be required to determine the fee level. This application will be required to integrate with the web services layer of HL7.org.

Certified User Search
HL7.org will provide functionality to allow users to search for certified users. Certification will be an attribute of a user’s profile. The ability to remain anonymous will also be an attribute of a user’s profile. This functionality will be implemented as a new custom ColdFusion application. This application will be required to integrate with the web services layer of HL7.org.

Site and Document Search
HL7.org will provide functionality to search both the website and static documents on the website. Users will be able to download certain documents returned in a search for a fee. This functionality will be implemented as a new custom ColdFusion application using the Verity search engine. Metadata about static documents combined with information from the entitlement and security layer will be used to determine if a fee is required for download. If purchase is required to download the document, payment will be handled though integration with the ecommerce and payment gateway services.

Forums
Health Level Seven will use online forums in order facilitate user collaboration. There are many suitable 3rd party forum solutions available. Building a forum system in-house would not be a good use of Health Level Seven’s resources or budget. The forum solution selected needs to run on Windows Server 2003 and use SQL Server as its backend database. This application will be required to integrate with the web services layer of HL7.org.

Potential Solutions:
FuseTalk Standard Edition

My HL7
Health Level Seven will offer their users the ability to personalize their HL7 information in the form of the My HL7 portal. This section of the website will help users manage their tasks within HL7 and provide them with the tools to keep them up to date and in synch with HL7 events and other users. This application will bring together much of the functionality of the rest of the website but tailored to the users needs. This application will be written in ColdFusion with the users preferences stored in database tables integrated with the authentication layer of HL7.org.
Wiki
Health Level Seven will provide their users with a wiki to capture community knowledge in a user friendly and low barrier to entry manner. The wiki will allow the users to record, edit, and comment on information that might not otherwise be captured. Most wiki solutions are hosted with the organization paying a monthly fee to host their private or public wiki on the provider’s servers. This may approach may not work for HL7 as the wiki is required to integrate with the authentication layer of the website.

Potential Solutions:
SocialText (Hosted)
WikiSpaces (Hosted)
Canvas (ColdFusion Application – Open Source)

Email Marketing
HL7.org will be integrated with an email marketing system. The email marketing system may be a locally or remotely hosted service. If the email marketing system is hosted locally it will need to run on Windows Server 2003 and use SQL Server as its backend database. The email marketing system will need to have an API that HL7.org can call based on user actions on the website.

Potential Solutions:
Lyris Listmanager
Lyris Listhosting
Constant Contact

Administrative Functions
Most of HL7.org’s administrative functions will be handled via the user interface within the content management system. Adding content, polls, and forms can all be done through the administration functions of a CMS. Administration functions for all of the custom applications should be gathered into one master administration application. Access to this application like the CMS Admin will be restricted to properly authenticated users only. This functionality will be implemented as a new custom ColdFusion application.

Web Analytics
Health Level Seven currently uses an older version of WebTrends to provide reporting on website usage. An upgrade to a more current web analytics system is recommended. A web analytics strategy must be agreed upon prior to implementation of any of other modules of HL7.org in order to ensure effective coverage across the entire site. The web analytics solutions system may be a locally or remotely hosted service. If the solution is hosted locally it will need to run on Windows Server 2003.
Potential Solutions:
WebTrends 8 Commerce Package
WebTrends On Demands