



# STATE OF UTAH WEB STANDARDS AND GUIDELINES

Department of Technology Services  
Office of the Chief Technology Officer

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## **DTS Technology Standard 4300-0001**

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## CONTENTS

1.0	Introduction .....	4
2.0	Legal and Statutory Authority .....	4
2.1	Implementation .....	4
2.2	Changes and Revisions.....	5
3.0	General Web Page Standards and Guidelines.....	5
3.1	Content Management .....	6
3.1.1	Communication .....	6
3.1.2	Content Approval.....	6
3.2	Content and Presentation .....	6
3.2.1	State of Utah Identifier.....	6
3.2.2	Branding (Headers and Footers) .....	7
3.2.3	Calendars .....	10
3.2.4	Document Formats .....	11
3.2.5	Dynamic Content.....	12
3.2.6	Forms and Workflow.....	12
3.2.7	Color.....	13
3.2.8	Flash.....	13
3.2.9	Images.....	14
3.2.10	Mapping and GIS .....	14
3.2.11	Mashups.....	16
3.2.12	Multimedia .....	17

3.2.13	Page Layout and Navigation .....	17
3.2.14	Site Markup .....	18
3.2.15	Special Purpose Documents .....	19
3.2.16	Style Sheets—CSS and XSL.....	19
3.2.17	Tables and Frames.....	20
3.2.18	Text and Fonts .....	20
3.2.19	Writing Content.....	20
3.3	Development and Site Implementation.....	21
3.3.1	Access Control Services.....	21
3.3.2	Authentication Services .....	21
3.3.3	Database APIs .....	21
3.3.4	E-mail Implementation (HTML).....	21
3.3.5	Online Payment Handling.....	22
3.3.6	RSS Services .....	22
3.3.7	Software as a Service.....	22
3.3.8	State Web Services .....	23
3.3.9	Validation.....	23
3.3.10	Web 2.0 Services Available as Global SOA .....	23
3.3.11	Web Reporting Services.....	24
3.3.12	XML Services .....	25
3.4	Reporting, Monitoring, and Metrics.....	25
3.4.1	Analytic Monitoring Tools .....	25
3.4.2	Alert Monitoring Tools.....	27
3.4.3	Consolidated Feedback and Adoption Rates .....	27
3.5	User Interface .....	28
3.5.1	Browser Access.....	28
3.5.2	Page Formatting.....	28
3.5.3	Page Size .....	28
3.5.4	Plug-ins .....	29
3.5.5	Cookie Requirements.....	29
3.5.6	JavaScript.....	29
3.5.7	HTTP Error Handling.....	29
4.0	Accessibility and Usability Guidelines .....	31
4.1	Standards—Section 508.....	31
4.2	Standards—W3C.....	34
4.3	Accessibility and Document Image Files .....	35
4.4	Screen Readers.....	35
4.5	Multimedia, Audio, and Video Files .....	36
4.5.1	Alternative Forms of Accommodation.....	36
4.5.2	Captions .....	36
4.5.3	Audio Descriptions.....	36
4.6	Non-Standard Extensions.....	36
4.7	Java and JavaScript Accessibility.....	37
4.8	Universal Accessibility Design Guidelines .....	37
4.8.1	Text Based Design .....	38
4.8.2	Graphics and Images .....	38

4.8.3	Multimedia Files .....	38
4.8.4	Wireless Access .....	39
4.9	Usability Tools .....	39
4.10	Other Usability Resources .....	39
4.10.1	Online Training .....	40
4.10.2	Accessibility Questions for Web Site Page Designs .....	40
5.0	Advertising and Acknowledgements .....	42
6.0	Copyright and Attribution on State Web Sites .....	42
7.0	Internet Domain Names .....	42
7.1	Registration for Utah.gov Domains and Sub-domains .....	42
7.2	Use of non Utah.gov Domain Names .....	43
8.0	Linking to Other Internet Sites .....	44
8.1	Link Maintenance and Testing .....	45
8.2	Use of Non State Web Services on State Web Sites .....	45
9.0	Privacy and Security .....	45
9.1	Citizen Access to Personal Information .....	46
9.2	Information Collection Guidelines .....	46
9.3	Privacy on State Web Sites .....	47
9.3.1	Privacy of Individual Health Information .....	47
9.3.2	Privacy Audit Requirements .....	48
9.4	Security Assurances on Utah.gov .....	48
9.4.1	Secure Socket Layer Certificates .....	49
9.4.2	Secure Multipurpose Internet Mail Extensions (S/MIME) .....	49
9.4.3	Payment Card Industry Data Security Standards (PCI DSS) .....	49
10.0	Management of Financial, Electronic, .....	50
10.1	Technologies and Methods .....	50
10.1.1	Encryption .....	50
10.1.2	Secure Socket Layer (SSL) .....	50
10.2	Records Retention .....	51
11.0	Search Functionality on State Web Sites .....	51
11.1	Agency Site Search .....	52
11.2	Utah.gov Search .....	52
11.3	Site Maps .....	52
12.0	Tagging and Use of Meta Tags on State Web Sites .....	53
12.1	Meta Tagging Standards .....	54
12.2	Tagging Guidelines .....	54
13.0	Definitions .....	54
14.0	References and Additional Resources .....	60

## 1.0 INTRODUCTION

This document revises the *State of Utah Web Standards* publication dated January 9, 2001. The standards, recommendations, and guidelines presented here are applicable to all State of Utah Executive Branch agency Web sites that are accessed by the public, with the exception of those agencies exempted in Utah Code 63F-1-102. State of Utah intranet sites may be exempted from some of the accessibility provisions, depending upon the needs of the user audience for the particular site.

The provisions of these standards are designed to make State of Utah Web sites more accessible and to be compliant with generally accepted Web standards on a worldwide basis.

There are tangible benefits to using Web standards. A site that has been built to Web standards generally will be:

- less bandwidth intense;
- future-proof;
- extensible;
- easier to maintain;
- optimized for search engines;
- compatible with newer browsers; and,
- accessible.

Standards are designed to deliver the greatest benefits to the greatest number of Web users while ensuring the long-term viability of any document published on the Web.

## 2.0 LEGAL AND STATUTORY AUTHORITY

The Department of Technology services is charged in *Utah Code 63F-1-104 et seq* with the overall responsibility for defining technology standards. The Chief Information Officer (CIO) has rulemaking and policy making authority for technology standards and practices for the Executive Branch agencies as specified in Utah Code 63F-1-206 et seq, with the exception of those agencies exempted in Utah Code 63F-1-102.

### 2.1 IMPLEMENTATION

Application of these standards, recommendations, and guidelines shall be applied to all new Web site development in the State of Utah commencing July 1, 2007 for items designated as "required." Existing Web sites should be made compliant as the sites are redesigned. Recommended practices and guidelines should be incorporated on a best effort basis.

## 2.2 CHANGES AND REVISIONS

Suggestions for changes, revisions, and additions to this document are encouraged. This standards document will be subject to review and revision six months from the initial date of publication, and every six months thereafter. Suggestions for changes, additions, or revisions may be made on the DTS Web site using the form provided. Alternately, changes and suggestions may be e-mailed to Robert Woolley ([bwoolley@utah.gov](mailto:bwoolley@utah.gov)) or Frank Stehno ([fstehno@utah.gov](mailto:fstehno@utah.gov)) at any time. Change recommendations will follow approved processes for enterprise standards approval and changes.

## 3.0 GENERAL WEB PAGE STANDARDS AND GUIDELINES

This document presents three categories of advisement for developing State Web sites:

- **Required:** These are requirements and standards which are objectively testable. Items designated as required are recognized on a broad basis as best practice standards. Web Content for use with DTS managed infrastructure must comply with these standards to ensure consistency, performance, and interoperability. It is the responsibility of agencies to review their Web sites and pages to ensure they achieve these standards.
- **Recommended:** These are items that would be standards, however, for one or more reasons (breadth of scope or containing a degree of subjectivity), they cannot fairly be expressed as standards. Nonetheless, they are considered of high importance and agencies are *encouraged* to comply with them.
- **Guidelines:** These are examples of best practices from other organizations that have complied successfully with a particular standard or have taken a successful approach to a particular problem.

Links have generally been provided to other Web sites that have information relevant to a particular standard or recommended item. The principal validation sites for the content of this document are the World Wide Web Consortium (W3C) and other specialty sites that focus on accessibility compliance and integration with W3C standards. Web standards recommendations from key private and public sector groups have been reviewed.

### 3.1 CONTENT MANAGEMENT

#### 3.1.1 Communication [ RECOMMENDED ]

When agencies make changes to URL addresses on agency Web sites, other State Web designers and Utah Interactive should be notified. Change notifications are provided to prevent broken links on sites linking to agency pages. Notification can be accomplished by submitting URL changes at <http://www.utah.gov/submitlink.html>.

#### 3.1.2 Content Approval [ RECOMMENDED ]

Agency Web sites should have a formal process in place for content approval by appropriate agency management. Agency directors are ultimately responsible for all Web content presented on the agency site.

#### 3.1.3 Staging [ RECOMMENDED ]

Agencies should use staging sites as a part of the site content management approval process.

### 3.2 CONTENT AND PRESENTATION [ RECOMMENDED ]

From an overall content and presentation perspective, agencies should use W3C technologies according to specification at <http://www.w3.org> and follow accessibility guidelines. Where it is not possible to use a W3C technology, or doing so results in material that does not transform gracefully, provide an alternative version of the content that is accessible. (See *Section 4.0 Accessibility and Usability Guidelines*.)

#### 3.2.1 State of Utah Identifier [ REQUIRED ]

Each page in the Web site must have a State of Utah as well as an agency identifier. Identifiers can be either graphic or text representations.

Examples of commonly used graphic State identifiers include:



Agency specific graphic logos and logotypes are another acceptable method for identifying the Web site as a State of Utah agency site.

Text identifiers commonly include the phrase "State of Utah" and are often followed or preceded by the name of the agency, such as "Governor's Office of Planning and Budget," or "Utah State Library," followed by the department name

“Department of Community and Culture.” Text messages are intended to identify the Web site as a State agency site.

No specific naming standards are required, however, divisional unit and program sites must provide links back to the departmental site.

### **3.2.2 Branding (Headers and Footers) [ REQUIRED ]**

All official State of Utah Web sites must display the standard headers and footers for Utah.gov, as follows:

#### **Header**



#### **Footer**

[Utah.gov Home](#) | [Utah.gov Terms of Use](#) | [Utah.gov Privacy Policy](#) | [Utah.gov Accessibility Policy](#)

Copyright © 2007 State of Utah—All rights reserved.

Utilizing approved headers and footers facilitates navigation to other agency Web sites and provides access to government site-specific search functionality provided by using a customized version of Google site search for government agencies. Links are also provided to the Utah.gov home page, standardized terms of use, and approved privacy and accessibility policies.

#### **3.2.2.1 Home Page Links [ REQUIRED ]**

Each site, including, but not limited to, agency and division sites, must link back to their own home page for consistency in site navigation. The use of “bread crumbs” that provide the user with a path back to the home page is one method that might be employed.

#### **3.2.2.2 State of Utah Home Page Link [ REQUIRED ]**

Each agency Web site must have a link to the State of Utah Home Page at [www.utah.gov](http://www.utah.gov). This link can be a textual reference, such as “State of Utah Web Site,” or a graphic identifier, as illustrated in section 3.2.1, or, as most easily met, by using the standard headers and footers illustrated in section 3.2.2.

#### **3.2.2.3 Contact Information [ REQUIRED ]**

Each agency’s home page must contain contact information, including, but not limited to, e-mail addresses, phone numbers, and a street address for the agency. The use of graphics, forms, or hyperlinks that lead to contact information on a “Contact Us” type page is also acceptable. The use of online

forms in lieu of revealing personal names and e-mail addresses, is also acceptable.

#### **3.2.2.4 Disclaimer** [ REQUIRED ]

Agency Web sites must provide a disclaimer for the site and for each page as deemed necessary by agency management. Some agencies may require specific types of disclaimers based upon site content. The disclaimer approved by the State is included in the Utah.gov footer under Utah.gov Terms of Use and can be linked to at <http://www.utah.gov/disclaimer.html>.

#### **3.2.2.5 Privacy Statement** [ REQUIRED ]

Agency Web sites must provide a privacy statement for the site and for each page as deemed necessary by agency management. The privacy statement approved by the State is included in the Utah.gov footer under Utah.gov Privacy Policy and can be linked to at <http://www.utah.gov/privacypolicy.html>. For additional information, refer to *Utah Code 63D-2-101 et seq Governmental Information Privacy Act, Utah Administrative Code*, and State and agency privacy policies.

#### **3.2.2.6 Accessibility Policy** [ REQUIRED ]

Agency Web sites must provide an accessibility policy for the site. The accessibility policy approved by the State is included in the Utah.gov footer under Utah.gov Accessibility Policy and is linked to at <http://www.utah.gov/accessibility.html>.

#### **3.2.2.7 Meta Tags** [ RECOMMENDED ]

Each page of the Web site should include title, creator, and description meta tags. The Utah State Library metadata list for special applications, such as digital libraries, is based on the Dublin Core metadata schema. (See *Section 12.0 Tagging and Use of Meta Tags on State Web Sites*.)

#### **3.2.2.8 Link Verification** [ RECOMMENDED ]

Links should be checked at least monthly to maintain viability and to avoid user frustration with broken links. Link testers, such as Linklint <http://www.linklint.org>, W3C Link Validator at <http://validator.w3.org/checklink>, and Xenu's Link Sleuth at <http://home.snafu.de/tilman/xenulink.html>, provide a reliable method for finding and repairing broken links.

#### **3.2.2.9 Site Search Capabilities** [ RECOMMENDED ]

Each agency Web site should have a search functionality that provides results specific to the agency site if a user requires it. This function can be provided with an Ajax site search function, with Google Co-op Custom Searches, or with the customized Google site search included in the Utah.gov

header. Other site specific search functions may be utilized based upon agency requirements.

If AJAX functionality is used, accessibility should be considered. See 3.2.5 *Dynamic Content* and the *Roadmap for Accessible Rich Internet Applications* (WAI-ARIA Roadmap) <http://www.w3.org/TR/2006/WD-aria-roadmap-20060926>.

#### **3.2.2.10 Agency Information** [ RECOMMENDED ]

Each agency Web site should have an “about” section that describes the functions of the agency and the services provided.

#### **3.2.2.11 Copyright (Agency Produced Information)** [ REQUIRED ]

Most State produced publications and Web materials are public domain and available for use by others without restriction. Exceptions may include materials produced under outside contracts where the contractor retains copyright. (See also section 6.0 Copyright and Attribution on State Web Sites and R895-3.)

#### **3.2.2.12 Copyright (Fair Use)** [ REQUIRED ]

Agencies are advised to exercise caution in using digital material downloaded from the Internet when producing a Web site because there is a mix of copyright protected and public domain work on the Internet. All agencies will abide by national and international copyright laws. (See also section 6.0 Copyright and Attribution on State Web Sites.)

#### **3.2.2.13 Writing Guidelines** [ RECOMMENDED ]

- Be aware that writing will be viewed on a screen, not on paper, and adjust accordingly for direction (landscape or portrait) and density of text.
- Sentences and paragraphs should be concise.
- Sentences should use plain language with minimal use of jargon, abbreviations, and acronyms. Word selection should be based upon the intended audience.
- Check spelling and grammar manually. Do not rely solely on computer spell checkers.

#### **3.2.2.14 Expectations of Web Site Content** [ RECOMMENDED ]

Web site content should be:

- trustworthy and free from error;
- timely and frequently updated;
- easy to understand by the intended audience;
- well written;

- clear, concise, and complete;
- authoritative; and,
- easy to view on the computer screen.

### **3.2.2.15 Site Content** [ RECOMMENDED ]

Agencies are the sole arbiters of the content and information that appears on Web sites owned by the agency. Any publicly available reports that the agency is required to produce by statute may be presented on the agency Web site, along with agency press releases, event calendars, and other content as appropriate.

### **3.2.3 Calendars** [ RECOMMENDED ]

A calendar is a collection of events, tasks, journal entries, etc., such as a person's, group's, or organization's schedule, resource availability, and event listings. Electronic calendar software for use in enterprises is impacted by a number of different standards:

- CalDAV is a standard protocol to allow calendaring and scheduling via extensions to the WebDAV protocol. This standard specifies a calendar access protocol that allows Calendar User Agents to access and manage calendar data in a calendar store accessible via a calendar service. The specification also defines how Calendar User Agents perform scheduling operations via a calendar service.
- iCalendar is the Internet Calendaring and Scheduling Core Object Specification and is an IETF standard for a text representation of calendar data.
- vCalendar is a text representation of calendar and scheduling data created by the Versit consortium. The iCalendar specification is based on the work of vCalendar.

There are many other related standards, such as RSS, and iMIP (iCalendar Message-Based Interoperability Protocol), but these three represent the major standards components of open source and commercial calendar systems. A variety of event calendars are used on agency Web sites. Until such time as a standard event calendar is recommended, agency calendars should be in conformance with and utilize the three major standards components.

#### **3.2.3.1 News Services** [ RECOMMENDED ]

Agencies should post news and press releases on their home pages, and make RSS feeds available that can be used by other interested entities and individuals and utilized on the State home page at [www.utah.gov](http://www.utah.gov).

### **3.2.3.2 Public Notices and Announcements [ REQUIRED ]**

*Utah Code 63F-1-701* was modified by the 2007 General Legislative session to require the creation of a Utah Public Notice Website. As stated in the legislation, the Web site shall provide a means to assist the public in finding posted public notices from any public body of the State and its political subdivisions, as required under Utah Code Title 52, Chapter 4, Open and Public Meetings Act, and under any other State statutes or State agency rules. The Web site will:

- allow a public body, or other certified entity, to easily post any public notice information that the public body or other entity is required to post under statute; and,
- allow the public to search the public notices by:
  - public body name;
  - date of posting of the notice;
  - date of any meeting or deadline included as part of the public notice;
  - allow the public to search and view past, archived public notices;
  - allow a person to subscribe to receive updates and notices associated with a public body or a particular type of notice;
  - be easily accessible by the public from the State of Utah home page;
  - have a unique and simplified Web site address;
  - be directly accessible via a link from the main page of the official State Web site; and,
  - include other links, features, or functionality that will assist the public in obtaining and reviewing information in relation to public notices posted on the Web site.

The effective compliance date for the Utah Public Notice Web site is April 1, 2008. All State agencies are required to post notices to the site upon its implementation by the Department of Technology Services and the Division of Archives and Records, the administrator of the site.

### **3.2.4 Document Formats [ RECOMMENDED ]**

State Web sites use a variety of formats for linked documents. The most commonly used document format (as of 2006) is the Adobe Acrobat PDF format, which accounts for about 54% of all documents on State Web sites. Other formats may be used to meet accessibility requirements or specific agency business purposes.

Use of PDF alone for long documents, or documents with specific, complex formatting intended for special audiences, is strongly discouraged. However, if no HTML or Rich Text Format (RTF) version is provided, and PDF is the best solution, then the Acrobat Accessibility Guidelines should be followed (see [http://www.adobe.com/products/acrobat/access\\_booklet.html](http://www.adobe.com/products/acrobat/access_booklet.html)).

### **3.2.5 Dynamic Content** [ REQUIRED ]

Ensure that dynamic content is accessible. Provide an alternative presentation or page upon which the equivalents for dynamic content are updated when the dynamic content changes. (See W3C <http://www.w3.org/TR/WCAG10-TECHS/#alt-page-note>.) See section 4.0 for additional detail.

The *Roadmap for Accessible Rich Internet Applications* (WAI-ARIA Roadmap) <http://www.w3.org/TR/2006/WD-aria-roadmap-20060926> (such as AJAX and other dynamically generated page content) describes an overall approach for ensuring interoperability between rich Internet applications and assistive technologies used by people with disabilities. The approach relies on technologies already developed or under development by W3C, such as the *XHTML Role Attribute Module* <http://www.w3.org/TR/xhtml-role>. The WAI-ARIA Roadmap presents a gap analysis identifying technologies that may still be needed to ensure accessible rich Internet applications. Two companion documents explain how to bridge those gaps: *Roles for Accessible Rich Internet Applications* (WAI-ARIA Roles) <http://www.w3.org/TR/2006/WD-aria-role-20060926> and *States and Properties Module for Accessible Rich Internet Applications* (WAI-ARIA States) <http://www.w3.org/TR/2006/WD-aria-state-20060926>.

#### **3.2.5.1 Blinking and Scrolling Dynamic Text** [ RECOMMENDED ]

Web pages should not contain any blinking or scrolling text nor flashing objects unless the image enhances usability and does not compromise accessibility. For further detail, see the University of Wisconsin site at <http://www.doit.wisc.edu/accessibility/online-course/standards/flicker.htm#explanationj>.

### **3.2.6 Forms and Workflow** [ REQUIRED ]

Screen readers read left to right. Place labels beside form controls, not above them. Examples of form control elements include text entry fields and checkboxes. Labels should be associated with form elements by locating them in close proximity to each other. Labels are the names of form control elements, e.g., "first name" could be the label for a form element which could be a text entry field. In this case, the field name could be visually presented immediately above or to the left of the field. Associating the label with the form control by positioning the two as near as possible is called implicit labeling. Doing this makes it easier for a screen reader to interpret the form, as per Section 508 Standards. (See the Irish National Disability Authority Web site at [http://accessit.nda.ie/guideline\\_1\\_79.html#directions](http://accessit.nda.ie/guideline_1_79.html#directions).)

#### **3.2.6.1 Form Layout** [ RECOMMENDED ]

Create a logical tab order through links, form controls, and objects. Tabbing through form controls is possibly the most common navigation method for Web site users, so it is important to ensure that the tab order follows the

visual placement of controls on a Web page. For additional information and examples, see W3C at <http://www.w3.org/WAI/wcag-curric/sam73-0.htm>.

### **3.2.7 Color** [ REQUIRED ]

Ensure that foreground and background color combinations provide sufficient contrast for navigation, text, and informational elements when viewed by someone with color recognition disabilities, or when viewed on a black and white screen. Do not design content that is entirely dependent on color to be usable.

Ensure that all information conveyed with color is also available without color. This applies principally to navigation labels and error messages. These provisions do not require the underlining of all links. Content should be tested with color blindness testing software, such as the Colorblind Web Page Filter at <http://colorfilter.wickline.org>, to ensure that all content is visible. For additional detail see W3C at <http://www.w3.org/WAI/wcag-curric/gid3-0.htm>.

### **3.2.8 Flash** [ RECOMMENDED ]

Macromedia Flash 8 (or newer) is authorized for use on State Web sites, provided that the functionalities add value to the user experience and do not reduce accessibility. New features integrated into Macromedia Flash Player 8 and the Macromedia Flash 8 applications allow users of assistive technologies to access Flash content. Using Flash 8 (or newer) eliminates the accessibility concerns associated with the earlier versions of Flash.

Some general usability guidelines that will enhance accessibility include:

- assigning text equivalents for visual elements;
- avoiding looping animation elements;
- allowing users to control animation motion;
- using the core set of User Interface (UI) accessibility components provided with Flash;
- avoid non-text Flash intro pages;
- enabling control over reading order;
- ensuring keyboard access to all controls;
- including caption audio content;
- enabling control over audio playback;
- exposing structure;
- exposing the current state of controls;
- using color wisely; and,
- validating accessibility.

Additional details on each of these guidelines are available from [http://www.adobe.com/resources/accessibility/flash8/best\\_practices.html](http://www.adobe.com/resources/accessibility/flash8/best_practices.html) and from the NNG Web site at <http://www.nngroup.com/reports/flash>.

### 3.2.9 Images [ REQUIRED ]

Provide a text equivalent for non-text element (for example “alt,” “longdesc,” or in element content). This includes images, graphical representations of text (including symbols), image map regions, animations (for example, animated GIFs), applets and programmatic objects, ASCII art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracks of video, and video.

#### 3.2.9.1 Image Maps [ RECOMMENDED ]

Client side image maps are preferred over server side image maps. Redundant text links should be provided for each active region of any image map, and links should be located as close as possible to the image map to which they relate. If server-side image maps must be used, then offer a text alternative to the server side map regions, or "hot spots," at an appropriate place on the page, such as the footer. In many situations the use of image maps can be avoided by using CSS2.

#### 3.2.9.2 Image Galleries [ RECOMMENDED ]

Web sites requiring image gallery capability may utilize external services, such as Flickr at <http://www.flickr.com>, provided that the agency maintains a specific gallery site at Flickr over which the agency has control of content. Many other similar image gallery services are available, such as Picasa at <http://picasa.google.com>, and should be used in preference to the development of site specific image gallery functionality. Other commercial applications are available that provide a greater range of cataloging and management capabilities.

### 3.2.10 Mapping and GIS [ RECOMMENDED ]

There are a variety of Web mapping options available for agency use on State Web sites. Major Web mapping categories identified by Wikipedia that may be used on agency Web sites include:

**Static Web Maps**—Static Web pages are viewed with no animation and interactivity. Typical graphics formats for static Web maps are png, jpeg, gif, tiff, drg (for raster files), svg, pdf, or swf (for vector files).

**Dynamically Created Web Maps**—These maps are created on demand each time the user reloads the Web page, often from databases. The Web server generates the map using a Web map server or specialized software.

**Distributed Web Maps**—Distributed maps are created from distributed data sources. The Web Map Services (WMS) protocol offers a standardized method to access maps on other servers. WMS servers can collect these different sources and send them back as an image containing all requested map layers.

**Animated Web Maps**—Animated maps show changes in the map over time by animating one of the graphical or temporal variables. Various data and multimedia formats and technologies allow the display of animated Web maps (SVG, Adobe Flash, Java, QuickTime, etc.), with varying degrees of interaction. Examples include weather maps, water current maps, wind patterns, traffic flow, trade flow, communication patterns, etc.

**Real-time Web Maps**—Real-time maps show results close to real-time with minimal delay. Data is collected by sensors and the maps are generated or updated at regular intervals or on demand. Examples include weather maps, traffic maps, or vehicle monitoring systems.

**Personalized Web Maps**—Personalized Web maps allow the map user to apply their own data filtering, selective content, and the application of personal styling and map symbolization. The Open Geospatial Consortium (OGC) provides the Styled Layer Description (SLD) standard that may be sent to a WMS server for the application of individual styles.

**Open, Reusable Web Maps**—Web maps in this category are usually more complex Web mapping systems that offer Application Programming Interfaces (APIs) for reuse in agency Web pages and products. An example of such a system is Google Maps, with the Google Maps API. Yahoo and Microsoft provide similarly reusable services.

**Interactive Web Maps**—Interactivity is one of the major advantages of screen based and Web maps, helping to compensate for their disadvantages. Interactivity helps to explore maps, change map parameters, navigate and interact with the map, reveal additional information, link to other resources, and much more. Technically, it is achieved through the combination of events, scripting, and Document Object Model (DOM) manipulations.

**Analytic Web Maps**—These Web maps offer GIS analysis, either with geo-data provided, or with geo-data uploaded by the map user.

Agencies may use any of these mapping types on agency Web sites as methods for communicating geographic information, often associated with other agency data, to enhance customer use and interpretation.

#### **3.2.10.1 Google Maps [ RECOMMENDED ]**

The Google Maps API, a free service, was created by Google to facilitate developers integrating Google Maps into their Web sites, with their own data points. Using the Google Maps API allows the developer to embed full Google Maps on an external Web site. Creating an agency map interface involves adding the Google JavaScript code to an agency Web page, and then uses JavaScript functions to add points to the map. Agencies are encouraged to

use Google Maps for geographic content requirements that require reusable maps.

### **3.2.10.2 Other Mapping Services** [ GUIDELINE ]

There are a number of mapping services that can be utilized on agency Web sites at no charge. Among the services that have potential for State Web site use, other than Google Maps, are:

- Microsoft MapPoint ([mappoint.msn.com](http://mappoint.msn.com)) and Virtual Earth (<http://maps.live.com/>)
- Yahoo Maps (<http://maps.yahoo.com/index.php>)
- MapQuest (<http://maps.yahoo.com/index.php>)
- Multimap (<http://www.multimap.com>)
- Windows Live Local (<http://local.live.com>)
- Map24 (<http://www.us.map24.com>)

### **3.2.10.3 ESRI** [ RECOMMENDED ]

The State has set ESRI mapping services as its standard. ESRI offers ArcWeb Services which provide developers with a set of Web services APIs for integrating mapping functionality and GIS content into browser, desktop, mobile, and server applications. ArcWeb Services offer:

- APIs including SOAP, JavaScript, REST, OpenLS, and J2ME;
- code downloads for platforms including C++.NET, ASP.NET, JavaServer Pages (JSP), and ColdFusion MX; and,
- data from more than 20 commercial mapping data and content providers.

Utilizing ArcWeb Services allows agencies to directly access data in GIS map layers collected and developed by other State agencies. The State of Utah Automated Geographic Reference Center (AGRC) provides services for utilizing ArcWeb capabilities.

### **3.2.11 Mashups** [ RECOMMENDED ]

The use of mashups to add value to site content presentation is encouraged. Agencies that provide mashups using data from multiple sources must provide attribution on the mashup page that specifies the sources of the data included on the page. (See also section 6.0 Copyright and Attribution on State Web Sites.) Mashups that use data from non-state services are provided subject to a disclaimer by the State of Utah which states that use of the service does not serve as an endorsement, nor is the State responsible for any data inaccuracies or omissions provided by the services used by the mashup.

### 3.2.12 Multimedia

#### 3.2.12.1 Video [ RECOMMENDED ]

For any time-based multimedia presentation (e.g., a movie or animation), synchronized equivalent alternatives should be used (e.g., captions or auditory descriptions of the visual track) with the presentation. Provide a text equivalent or alternative, and an audio track to accompany a multimedia presentation, which describes important information presented in the visual track. Ensure that the text and/or audio track is synchronized with the presentation. For further details from the W3C see <http://www.w3.org/WAI/wcag-curric/sam21-0.htm> and <http://www.w3.org/WAI/wcag-curric/sam22-0.htm>.

#### 3.2.12.2 Multimedia Meta Tags

Multimedia materials are indexed on the multimedia portal site on Utah.gov. Basic metadata needed for audio and video content include:

- Title
- Date of Event
- Description of Event
- Agency/entity involved or featured in the event.
- Media type (QuickTime, RealPlayer, Windows Media Player, AVI, MP3, PodCast, etc.)
- Category (Public hearing, speech, meeting, etc.)
- Link to the Transcript
- Keywords/Meta Tags for search purposes
- Link to Where the Media is Streamed or Hosted

The multimedia portal searches by title, description, agency, and keywords. Search results can be sorted by date, agency, category, and media type.

### 3.2.13 Page Layout and Navigation [ REQUIRED ]

Web pages must be able to be printed in their entirety. It must be made clear to the user if any page requires a landscape orientation to achieve this result. A “printer friendly” page option should be established for frequently printed pages. When possible, use CSS for layout and navigation.

#### 3.2.13.1 Navigation [ REQUIRED ]

Clearly identify the target destination of each link. Every available link must be obvious. For additional information see W3C at <http://www.w3.org/WAI/wcag-curric/sam97-0.htm>.

#### 3.2.13.2 Navigation Elements [ REQUIRED ]

Provide navigation bars to highlight and give access to the navigation mechanism. Use CSS or text navigation whenever possible to avoid the use

of hyperlinked images. For additional information see W3C at <http://www.w3.org/WAI/wcag-curric/sam103-0.htm>.

### **3.2.13.3 Navigation to Homepage** [ REQUIRED ]

Every Web page must link to a homepage. If using an agency logo on a Web page, it must link to the homepage and provide alt text of "Go to home page—Agency Name."

### **3.2.14 Site Markup** [ REQUIRED ]

Any Web page or form must follow published formal grammars, such as:

- HTML 4.01 Transitional
- HTML 4.01 Strict
- XHTML 1.0 Strict
- CSS1 and CSS2
- RSS (v0.9, v1.0, and v2.0)

Use the correct Document Type Declaration (DOCTYPE). Current browsers look for a DOCTYPE at the top of each page, and will change the way they behave in response to it. Without the correct DOCTYPE, browsers can take an otherwise standards-compliant page and render it incorrectly.

#### **3.2.14.1 Heading Elements** [ REQUIRED ]

Use heading elements to convey page structure and use them according to specification. The meaning of the page title must be clear when used out of context. An agency must clarify heading tags for page or document titles. This not only assists with the consistent identification of documents on an agency Web site, but ensures that users of external search engines are presented with more appropriate results. For additional detail see W3C at <http://www.w3.org/WAI/wcag-curric/sam33-0.htm>. Additional considerations include:

- Titles should contain meaningful information within the first 60 characters, but should preferably be restricted to 30 characters. Given the way in which titles are displayed in search results it is important that they be able to succinctly convey what is on the page.
- Page titles must consistently use the same syntax throughout the site.

#### **3.2.14.2 Lists** [ REQUIRED ]

Mark lists and list items properly. Use HTML elements appropriately for formatting effects such as indentation. For additional guidance see W3C at W3C <http://www.w3.org/WAI/wcag-curric/sam35-0.htm> and "how-to" tips for lists at <http://www.w3.org/TR/WCAG10-HTML-TECHS/#lists>.

### **3.2.14.3 Deprecated Features** [ REQUIRED ]

Avoid deprecated (discontinued) features of W3C technologies. Using deprecated features, e.g., deprecated HTML elements or attributes, will not stop the HTML from validating against transitional DOCTYPEs. However, it will stop HTML from validating against future DOCTYPEs in which the phasing out is complete. Transitional elements may be used in support of cross browser functionality, but should be eliminated when they are no longer required. For additional information see W3C at <http://www.w3.org/WAI/wcag-curric/sam87-0.htm> and <http://www.w3.org/WAI/wcag-curric/sam88-0.htm>.

### **3.2.14.4 Header Labels** [ REQUIRED ]

Provide abbreviations for header labels. Use the "abbr" (or abbreviation) attribute of the HTML <TH> element. For additional information see W3C at <http://www.w3.org/WAI/wcag-curric/sam51-0.htm>.

### **3.2.15 Special Purpose Documents** [ REQUIRED ]

Links to documents, such as PDF, word processor, or spreadsheet generated documents, must indicate the document size and type. This must either be included in the link itself and/or in the TITLE tag. Publish the documents in the most accessible format possible. Accessible formats include:

- Rich Text Format (RTF) for text based documents;
- Comma Separated Values (CSV) for spreadsheets; and,
- Portable Document Format (PDF) for a variety of types (see *Section 3.2.4 Document Formats* for details).

Spreadsheet documents can be published in the native format provided that they are for a specialized audience, and the audience expects the features in the spreadsheet that prevent it from being provided in a CSV format. As a general rule, agencies should be cautious about posting proprietary document formats on Web sites. (See Document Formats in section 3.2.4.)

### **3.2.16 Style Sheets—CSS and XSL** [ RECOMMENDED ]

Use style sheets to control layout and presentation of the page and its elements. (See W3C at <http://www.w3.org/WAI/wcag-curric/sam30-0.htm>.) The ultimate aim for a Web site is to separate presentation (colors, fonts, layout, positioning) from content. This is achieved using CSS. Style sheets describe how Web pages are presented on screens and in some other media formats, such as print. There are two complementary style sheet standards from W3C: Cascading Style Sheets (CSS), and Extensible Style Sheet Language (XSL). XSL does not work with HTML, but it does provide the capability to transform XML data into HTML/CSS pages on the Web server. Agencies should use CSS whenever possible and XSL only when needed.

### **3.2.17 Tables and Frames** [ REQUIRED ]

Do not use tables or frames for layout, unless the table makes sense when the table is put or projected in linear form. Use style sheets instead. As more browsers include consistent support for the W3C Cascading Style Sheet Recommendations CSS 1 and CSS 2, it will become increasingly proper to do all positioning of text and images on a page using style sheet markup. Tables should only be used for the proper markup of data that needs to be presented in tabular form. (See W3C <http://www.w3.org/WAI/wcag-curric/sam48-0.htm>.) iframes may be utilized, but cascading style sheets are recommended where possible. (See also section 3.2.16 Style Sheets—CSS and XSL.)

### **3.2.18 Text and Fonts** [ RECOMMENDED ]

Font size must be expressed in such a way that users can change it to meet their needs. Browser functionality for changing font sizes alone is not sufficient accommodation, since it requires prerequisite user knowledge of font size capabilities which are not standardized between browsers. Use relative (% or em) rather than absolute (pt, px, etc.) units in markup language attribute values and style sheet property values. Font size, color, and other characteristics should be specified and manipulated with CSS instead of <font> Tags.

### **3.2.19 Writing Content**

#### **3.2.19.1 Language** [ RECOMMENDED ]

Identify the primary natural language of a document. For additional detail, see W3C at <http://www.w3.org/WAI/wcag-curric/sam42-0.htm>.

#### **3.2.19.2 Semantic Information** [ REQUIRED ]

Provide metadata (such as page title and description) to add semantic information to pages and sites. For additional information see W3C at <http://www.w3.org/TR/WCAG10-HTML-TECHS/#document-meta>.

#### **3.2.19.3 Abbreviations** [ REQUIRED ]

Specify the expansion of each abbreviation or acronym in a document where it first occurs. For additional information, see W3C at <http://www.w3.org/WAI/wcag-curric/sam41-0.htm> and <http://www.w3.org/TR/WCAG10-HTML-TECHS/#text-abbr>.

#### **3.2.19.4 Underlining** [ REQUIRED ]

Do not use underlining for emphasis within any part of a Web page, including text and headings. Underlining must be reserved as an indicator of a hyperlink.

### 3.3 DEVELOPMENT AND SITE IMPLEMENTATION

Components in this section deal primarily with site layout, infrastructure components, and specific deployment technologies.

#### **3.3.1 Access Control Services** [ RECOMMENDED ]

The State provides access control services for Web sites using SiteMinder from Netegrity. Agencies requiring access restrictions to an entire site, or any component of a Web site, are encouraged to use SiteMinder functionality.

#### **3.3.2 Authentication Services** [ RECOMMENDED ]

Directory requirements should be met using the Utah master Directory (UMD) whenever possible. However, when working with Utah Interactive it is best to use their authentication Web services when requiring a login. Development and maintenance of separate Web site directory resources is discouraged. The State provides directory services (UMD) that can be utilized for any State Web site. The UMD includes all State employees (excluding higher education) and the directory has specific containers for citizens, business partners, and other non-State government agencies. Web services are available, as are code modules that will support J2EE and .Net environments, as well as a number of other custom environments.

#### **3.3.3 Database APIs** [ RECOMMENDED ]

MySQL is a preferred database environment for Web site hosted data. Specific APIs are available for a wide range of database connections, including Oracle, Sybase, DB2, etc. APIs are also available for a variety of other State applications and databases. Desktop databases, such as Microsoft Access or InfoPath, should not be used on agency Web sites.

#### **3.3.4 E-mail Implementation (HTML)** [ RECOMMENDED ]

E-mail is commonly used by many agency Web sites for routine contacts, or, in many cases, as a subscription to specific site information. Users do not always accept HTML e-mail, so some attention is necessary to ensure that messages are readable when they are delivered. General guidelines for HTML e-mail sent to external users include:

- Never use images for important content like headlines, links, and any calls to action.
- Use “alt attributes” text for all images and always add the height and width to the image to ensure that the blank placeholder image does not have an undesirable design impact.
- Add a text-based link to a Web version of the design at the top of the e-mail.
- Ensure that the most compelling content is at the top (and preferably to the left).

- Test e-mail layout designs in a preview pane, at full screen, and with images turned on and off before it is sent.

### **3.3.5 Online Payment Handling** [ REQUIRED ]

Utah GovPay is the approved online payment handling environment for any State Web site that collects payment for services or products. Utah GovPay:

- enables existing applications to accept payments;
- accepts credit cards and/or electronic checks;
- provides a secure environment for accepting payments;
- does not require users to leave the Utah.Gov Web site; and,
- supports reconciliation with the State accounting system by tracking FINET codes per transaction.

Implementation details for using Utah GovPay on agency sites is provided in the *UGP Customer Workbook* and in the *UGP Technical Manual*. Both documents are available at the Utah Interactive Partner site at <https://secure.utah.gov/utahinteractive/solutions-gov-pay.html>.

### **3.3.6 RSS Services** [ RECOMMENDED ]

RSS is a Web content syndication format that is a dialect of XML. All RSS files must conform to the XML 1.0 specification, as published on the World Wide Web Consortium (W3C) Web site. Agencies are encouraged to provide RSS functionality on their Web sites both by incorporating relevant RSS feeds into their sites and by providing the ability for Web site users to subscribe to agency RSS feeds. Additional information on implementing, using, and validating RSS feeds is available from the W3C at <http://validator.w3.org/feed/docs/rss2.html>.

RSS feed availability on Web sites should use the industry standard RSS logotype as follows:



The orange square with waves indicates that an RSS feed is present on a Web page. This icon was introduced by Mozilla Firefox and by mutual agreement the same icon has also been adopted by Microsoft Internet Explorer and Opera.

### **3.3.7 Software as a Service** [ RECOMMENDED ]

Software as a Service (SaaS) is subscription based and centrally hosted and administered. Agencies are encouraged to provide Web delivered applications to their customers that are centrally managed and maintained without the need to deliver specialized clients or other types of stand alone software. Agencies may also consume external SaaS applications, such as mapping services, shared spreadsheets and databases, etc., as functional components of Internet and intranet Web sites. SaaS applications are generally access controlled, and consideration must be given to password and account management for SaaS

services that are external to the State infrastructure. Internally hosted SaaS applications should use existing authentication and directory infrastructure such as the UMD.

### **3.3.8 State Web Services** [ RECOMMENDED ]

There are a variety of Web services available that have been prepared by agencies for specific kinds of application requirements. Enterprise Web services are available for authentication and access control, and are under development for a wide range of other application requirements. Agencies are encouraged to develop Web services that are consistent with published guidelines and standards for SOAP, WSDL, and related technologies. For additional information see W3C at <http://www.w3.org/TR/2002/WD-ws-arch-20021114>.

#### **3.3.8.1 Enterprise Service Bus**

Implementation of an Enterprise Service Bus (ESB) environment is in progress and details will be provided in a subsequent revision to this document.

#### **3.3.8.2 Web Services Registry**

Implementation of a Web Services Registry is in progress and details will be provided in a subsequent revision to this document.

### **3.3.9 Validation** [ REQUIRED ]

Validation tools check the syntax of HTML and CSS to make sure it is correct, and let the developer know about any errors or ambiguities. Validation ensures that the code works correctly and complies with appropriate standards. CSS and HTML pages may be designed to support cross browser functionality even though the pages do not pass validation checking. For additional information see W3C, including tips for validation, at <http://www.w3.org/WAI/wcag-curric/sam29-0.htm>. The W3C validation tool is available at <http://validator.w3.org>. A CSS validation tool is available at <http://jigsaw.w3.org/css-validator>.

Use of application framework validation tools, such as those provided in Struts, which are standardized and consistent, allow for less work, more stability, and less long-term maintenance.

### **3.3.10 Web 2.0 Services Available as Global SOA** [ RECOMMENDED ]

Web 2.0 services focus on autonomous, distributed services and recombination, and are fraught with ownership, boundary, and control issues. Service Oriented Architecture (SOA) also has the same issues within the State enterprise. Nonetheless, there are now hundreds of APIs available on a worldwide basis that can be consumed and used by Web developers where they do not have to support the environment or maintain the code. This constitutes an emerging form of a Global SOA. Agencies should continue to implement services that require tight controls and State hosting. There is no reason why agencies should not use global services as an integral part of their Web design implementations. Services

with functional dependencies should be identified prior to use. Services like Flickr (<http://www.flickr.com/services/api>), RSS, and Google Maps are examples of Global SOA. A useful list of similar services is available on the Programmable Web site located at (<http://www.programmableweb.com/apis>.) Many of these services may be suitable for use on State Web sites. Such services are provided subject to a disclaimer by the State of Utah which states that use of the service does not serve as an endorsement, nor is the State responsible for any data inaccuracies or omissions provided by the service.

### 3.3.11 Web Reporting Services [ RECOMMENDED ]

The State currently supports all of the following Web reporting environments:

**Actuate**—Actuate is an enterprise Web reporting environment that is available for agency use on a rate basis as published in the State Rate Schedule for Technology Services. User access to reports does not require fees or licensing.

**Cognos**—Cognos Reports is available on a license basis for agencies that prepare reports and on an open access basis for report users.

**Crystal Reports**—Owned by Business Objects, Crystal Reports is available as an embedded reporting tool in many Web based applications and as a licensed standalone report server in a number of agencies. User access to reports does not require fees or licensing.

**iText**—This is an open source reporting tool that can be used to generate reports for specific Web based applications. There are no licensing or user fees associated with use of the product.

**Pentaho**—Pentaho is an open source business intelligence and reporting tool that supports a number of reporting environments as snap-ins, such as JReports.

**JasperReports**—JasperReports is a leading open source Java reporting tool that has the ability to deliver rich content onto the screen, to the printer, or into PDF, HTML, XLS, CSV, and XML files. It can be used in a variety of Java enabled applications, including J2EE or Web applications, to generate dynamic content.

### **3.3.12 XML Services** [ RECOMMENDED ]

Agencies should comply with published XML services standards listed at W3C, Oasis, and XML.org. Basic XML services that should be standards compliant include XML Messaging, meta data, Web services, SOAP, XML-RPC, RDF, UDDI, and WSDL. Each of these areas, with their associated standards and implementation methods, are detailed at [http://www.xml.org/xml/resources\\_focus\\_topics.shtml](http://www.xml.org/xml/resources_focus_topics.shtml), with additional links to Oasis and W3C documentation. It is recommended that agencies adhere closely to published standards and methods so that these services can be easily shared and reused.

## 3.4 REPORTING, MONITORING, AND METRICS

Web performance monitoring is critical to ensuring the uptime and performance of non-transactional Web sites. Monitoring tools and services continually tests Web page availability and measures load times from outside the firewall, providing independent validation of a Web site's performance from an end-user perspective. Web performance monitoring does not require client-side software. The State monitors Web sites and will provide alerts to customers when site or server performance has degraded below established service levels.

Other analytic and reporting tools, such as Web Trends, Google Analytics, Alexa, Compete, etc., are available for measuring user behavior at agency sites.

### **3.4.1 Analytic Monitoring Tools**

#### **3.4.1.1 Google Analytics** [ RECOMMENDED ]

Google Analytics is a free service offered by Google that generates detailed statistics about the visitors to a Web site, including how they interact with pages on the site. Measurement categories especially relevant to agency Web sites include:

##### Marketing Optimization

- Unique Visitor Tracking
- Visitor Segment Performance
- Search Engine Marketing

##### Content Optimization

- Content Performance
- Navigational Analysis
- Web Design Parameters

Agency Web designers may sign up for the service for agency Web sites. Google Analytics uses a small JavaScript on each page the user wishes to track. This JavaScript loads files from the Google Web server and then sets variables with the user's account number. The reports interface will check for the presence of this script on a tracked site's homepage. Agencies are encouraged to use Google Analytics to gather information on site performance and utilization. Agencies may register sites for Google Analytics at <http://www.google.com/analytics/index.html>.

Google Analytics enables Web designers to gain insight into Web traffic to their sites and how site visitors found and interact with the site. Google Analytics is free at the entry level, and modestly priced at the enterprise level.

Additional training and support is available through a network of Google Analytics support partners. For details visit:

- <http://www.google.com/analytics>
- [http://www.google.com/analytics/media/report\\_tour/feature\\_tour.html](http://www.google.com/analytics/media/report_tour/feature_tour.html)
- [http://www.google.com/analytics/support\\_partner\\_provided.html](http://www.google.com/analytics/support_partner_provided.html)

It is possible for agency Web designers to create their own Google Analytics accounts and profiles; however, from an enterprise perspective, it is far more useful to manage Web traffic analysis across diverse State Web assets from a central location. Detailed set up procedures are available from Utah Interactive.

#### **3.4.1.2 Alexa [ RECOMMENDED ]**

Alexa is a subsidiary company of Amazon.com that offers a Web site ([www.alexa.com](http://www.alexa.com)) that provides information on the Web traffic to other Web sites. Alexa collects information from users who have installed an "Alexa Toolbar," allowing them to provide statistics on Web site traffic, as well as lists of related links. Alexa provides data on the international use of a specified Web site, and the gathered information is generally considered to be representative of actual site use. Agencies may use the services at no cost. Other similar types of services are available from Compete, ComScore, Hitwise, Nielsen//NetRatings, and Netcraft. All of these services provide information on reach, ranking, site comparisons, and related measurements for user specified sites.

#### **3.4.1.3 Compete** [ RECOMMENDED ]

Compete has developed a unique methodology created by experts in the fields of mathematics, statistics, and data sciences to aggregate, transform, enhance, and normalize data in order to estimate U.S. Internet traffic. Data is based on a standardized sample of users, and is specific to United States Internet use. Agencies can check sites by registering at <http://www.compete.com>.

#### **3.4.2 Alert Monitoring Tools** [ RECOMMENDED ]

DTS provides a number of monitoring and alerting services for hosted Web sites. There are also a number of open source and proprietary alert and monitoring solutions available. Agencies should ensure that they are monitoring site performance on a level granular enough to detect site failures, or below expected service level responses. Specific alerting and monitoring salutations may be implemented with DTS Web Hosting. Utah Interactive provides monitoring services using Nagios at <http://nagios.org>.

#### **3.4.3 Consolidated Feedback and Adoption Rates**

##### **3.4.3.1 Adoption Rates** [ RECOMMENDED ]

Utah Interactive provides an Adoption Rate Wizard which allows agencies and Utah Interactive to get a simple view of the adoption rate of specific applications. The numbers are entered at the end of each month. Reporting is available on a monthly and annual basis. This functionality has not been formally released, but is expected in 2007.

##### **3.4.3.2 Consolidated Feedback** [ RECOMMENDED ]

The Consolidated Feedback Form and Database provides an online survey tool for customer feedback. Information is stored in a database that can be queried periodically for useful reports. The purposes of this tool are:

- to get feedback from users about their experience with Utah.gov online services and focus on improving that experience in needed areas;
- to have statistical backing of the service's value, and to statistically identify opportunities for improvement;
- to identify pages or services that need improvement, and those that may not; and,
- to gather comments from users for marketing and communication of services.

This functionality has not been formally released, but is expected in 2007.

## 3.5 USER INTERFACE

### 3.5.1 Browser Access [ REQUIRED ]

Multiple browsers must be supported to make an agency's Web site accessible to approximately 96% of Internet users. A consistent visual experience should be attained on an agency's Web site in the following browser environments:

- Internet Explorer 6.0 and 7.0 (Windows)
- Firefox 1.5+ (Windows, Linux, Mac)
- Safari 1.2+ (Mac)
- Opera (text only)

These browser environments support CSS. Agencies should avoid browser and/or browser version specific dependencies.

### 3.5.2 Page Formatting [ RECOMMENDED ]

Agency Web pages should be viewable without horizontal scrolling on a 1024 x 768 pixel screen display for fixed page layouts, unless the page is specifically designed for horizontal scrolling, such as panoramic images, maps, and other large format documents. Agencies may also choose to use fluid size layouts for pages so they automatically adjust to varying monitor resolutions. Common resolutions should be tested before the page is made available. Current resolution data for Utah.gov users in 2006 indicates that approximately 88.9% of all users have screen resolution capability greater than 800 x 600.

Web page layout can be completed in two different ways:

- **Fixed Width Layouts**—These are layouts where the width of the entire page is set with a specific numerical value, such as 650 pixels.
- **Liquid Layouts**—These are layouts where the width of the entire page is flexible depending upon the width of the viewer's browser.

Both design methodologies are acceptable for State Web sites. The decision as to which will be used is dependent upon the type of content to be displayed on the site and the preferences of the agency. Use CSS for layout whenever possible.

### 3.5.3 Page Size [ RECOMMENDED ]

Page sizes should be scaled to provide less than eight second page downloads when tested against the most prevalent access environment of the target audience for the specific Web site. As of 2006, approximately 89.9% of Utah.gov users connected at broadband speeds.

### **3.5.4 Plug-ins [ RECOMMENDED ]**

Agency Web sites that require browser plug-ins, such as Real Video™, Adobe Acrobat Viewer™, Java JDK, etc., should identify the plug-in required on their Web site and provide a link to a location where the user can download the plug-in.

### **3.5.5 Cookie Requirements [ RECOMMENDED ]**

Agency Web sites with public audiences that do not require authentication should generally avoid using cookies. Sites for agency use, and public Web sites requiring user authentication and tracking, should use non-persistent cookies. Agency personnel using the State environment must have cookies enabled in their browser configurations.

### **3.5.6 JavaScript [ REQUIRED ]**

Many State Web applications use JavaScript and/or Java applets on the Web site. All browser versions in use by State agencies must be Java enabled to utilize either JavaScript or Java element features on the Web site. This function must not be disabled on agency employee browser configurations.

### **3.5.7 HTTP Error Handling [ RECOMMENDED ]**

As a general recommendation, assure that any error that could possibly occur in a Web application or on a site is handled on the most appropriate level. Error handling should always take place within the Web site and should not be redirected to external locations outside of State control. Error messages, such as 404 Errors, can be hijacked by external parties to leverage State Web traffic and can then be redirected to other sites that may not be acceptable or appropriate. See the W3C site (<http://www.w3.org/TR/webarch/#error-handling>) for more details.

Most applications and Web sites use some sort of error trapping to handle both expected and unexpected errors. Error handling in Web applications occurs on four different levels, each of which generally traps different types of errors.

#### **Code-block Level**

Error handling done within a page in try-catch-finally blocks routine. Both JSP and ASP.NET support this structure.

#### **Page Level**

Errors that occur on a JSP or ASP.NET page (for example, compilation errors) are generally processed by specialized error pages. Redirection to error pages is accomplished through page directives.

### Application Level

These errors apply to entire Web applications, and are generally handled and controlled by settings within configuration files, such as deployment descriptors in JSP applications or the Web.config file in ASP.NET.

### Server Level

This applies to all applications running on a server, and is generally configurable in the settings for the particular server. Error handling of this nature is vendor-specific.

When an error occurs, it moves through these levels in a process called error bubbling. If an error can't be handled at the code block level, it bubbles up to the page level. If it can't be handled at the page level, it bubbles up to the application level, and finally to the server level. At each level, a different set of errors can be trapped and handled. If an error bubbles up through all four levels without being trapped, an explicit error message will generally be displayed to the user. This error message could contain non secure information, such as SQL scripts or hidden code, and could be otherwise difficult to understand without some site based and understandable error handling.

Error #	Error Code
400	Bad Request
401	Unauthorized
403	Forbidden
404	Page Not Found
408	Request Timeout
500	Internal Server Error
501	Not Implemented
503	Server Unavailable

Applying the above precautions does not mean an error page will always work. Even if a site has a custom error page it may still be redirected to the default Microsoft 404 page if it is under 512 bytes. Error pages of less than 512 bytes are ignored by the IE5+ browser and replaced by the Microsoft MSN search page. Be sure to create error pages larger than 512 bytes in order to keep Web traffic on the intended site.

Also, when renaming page or moving pages them into a different directory, consider the consequences. If a search engine has previously visited the site the

links that the search engine provides will no longer work, producing a 404 error page instead. Take appropriate steps to redirect traffic that may be coming from earlier search engine visits.

## 4.0 ACCESSIBILITY AND USABILITY GUIDELINES

The Web poses challenges and obstacles for users with disabilities. To ensure equal access to electronic information, the State of Utah has established standards and guidelines to guarantee accessibility to users with visual, physical, or developmental disabilities. A Web site that is accessible and usable improves the chances that Utah citizens can locate the information they are looking for when they need it. A Forrester Research report entitled *The Wide Range of Abilities and Its Impact on Computer Technology* revealed that 57% of working-age adults in the United States are likely to benefit from the use of accessible technology. A useful testing site for accessibility using Section 508 and WCAG is available at <http://checkwebsite.erigami.com/accessibility.html>.

### 4.1 STANDARDS—SECTION 508 [ RECOMMENDED ]

In 1998 Congress modified the Rehabilitation Act to include *Section 508, Electronic and Information Technology Accessibility Standards*. Section 508 eliminates barriers in information technology and makes new opportunities for people with disabilities. The standards cover:

- Software Applications and Operating Systems
- Web-based Information or Applications
- Telecommunications Products
- Video and Multimedia Products
- Self Contained, Closed Products
- Desktop and Portable Computers

The Federal Access Board standards are available at <http://www.access-board.gov/508.htm>. The following is an extract from Section 508 of the Rehabilitation Act: § 1194.22 *Web-based Intranet and Internet Information and Applications*.

- (a) A text equivalent for every non-text element shall be provided (e.g., via "alt," "longdesc," or in element content).
- (b) Equivalent alternatives for any multimedia presentation should be synchronized with the presentation.
- (c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.

- (d) Pages shall be organized so they are readable without requiring an associated style sheet.
- (e) Redundant text links shall be provided for each active region of a server-side image map.
- (f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
- (g) Row and column headers shall be identified for data tables.
- (h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.
- (i) Frames shall be titled with text that facilitates frame identification and navigation.
- (j) Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.
- (k) A text-only page (which can be provided by CSS), with equivalent information or functionality, shall be provided to make a Web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.
- (l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.
- (m) When a Web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a compliant plug-in or applet.
- (n) When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.
- (o) A method shall be provided that permits users to skip repetitive navigation links.
- (p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

The following is an extract from the Section 508 Standards: § 1194.21 *Software Applications and Operating Systems*.

- (a) When software is designed to run on a system that has a keyboard, product functions shall be executable from a keyboard where the function itself or the result of performing a function can be discerned textually.
- (b) Applications shall not disrupt or disable activated features of other products that are identified as accessibility features, where those features are developed and documented according to industry standards. Applications also shall not disrupt or disable activated features of any operating system that are identified as accessibility features where the application programming interface for those accessibility features has been documented by the manufacturer of the operating system and is available to the product developer.
- (c) A well-defined on-screen indication of the current focus shall be provided that moves among interactive interface elements as the input focus changes. The focus shall be programmatically exposed so that assistive technology can track focus and focus changes.
- (d) Sufficient information about a user interface element including the identity, operation and state of the element shall be available to assistive technology. When an image represents a program element, the information conveyed by the image must also be available in text.
- (e) When bitmap images are used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images shall be consistent throughout an application's performance.
- (f) Textual information shall be provided through operating system functions for displaying text. The minimum information that shall be made available is text content, text input caret location, and text attributes.
- (g) Applications shall not override user selected contrast and color selections and other individual display attributes.
- (h) When animation is displayed, the information shall be displayable in at least one non-animated presentation mode at the option of the user.
- (i) Color coding shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

- (j) When a product permits a user to adjust color and contrast settings, a variety of color selections capable of producing a range of contrast levels shall be provided.
- (k) Software shall not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.
- (l) When electronic forms are used, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.

The Section 508 standards were effective June 21, 2001. The Center for Information Technology Accommodation (CITA), in the U.S. General Services Administration's Office of Government-wide Policy, has been charged with the task of educating federal employees and building the infrastructure necessary to support Section 508 implementation. GSA has established a Web site at <http://www.section508.gov> with resources for understanding and implementing the requirements of Section 508.

#### 4.2 STANDARDS—W3C [ REQUIRED ]

The *World Wide Web Consortium (W3C) Web Content Accessibility Guidelines*, at <http://www.w3.org/WAI>, addresses a range of standards for text, audio, and video usage on Web sites. The W3C identifies three types of checkpoints as follows:

**Priority 1**—A Web content developer *must* satisfy this checkpoint. Otherwise, one or more groups will find it impossible to access information on the page. Satisfying this checkpoint is a basic requirement for some groups to be able to use Web documents.

**Priority 2**—A Web content developer *should* satisfy this checkpoint. Otherwise, one or more groups will find it difficult to access information on the page. Satisfying this checkpoint will remove significant barriers to accessing Web documents.

**Priority 3**—A Web content developer *may* address this checkpoint. Otherwise, one or more groups will find it somewhat difficult to access information on the page. Satisfying this checkpoint will improve access to Web documents.

## Conformance Levels

1. Conformance Level "A"—All Priority 1 checkpoints are satisfied.
2. Conformance Level "AA"—All Priority 1 and 2 checkpoints are satisfied.
3. Conformance Level "AAA"—All Priority 1, 2, and 3 checkpoints are satisfied.

The full checklist, including coding tips to improve accessibility, is available at <http://www.w3.org/TR/WAI-WEBCONTENT/full-checklist.html>

### 4.3 ACCESSIBILITY AND DOCUMENT IMAGE FILES [ REQUIRED ]

Information contained in special purpose documents (as discussed in Section 3.2.15) must be accessible. Document image files are copies of electronic files, created with a specific application (e.g., word processor) and then published on the Web in vendor-specific file formats (e.g., portable document format [PDF] files) that create an image of a document. This type of file may limit accessibility for persons with low visual acuity or blindness, hearing impairment, motion impairment, and other disabilities.

The most common form of document files in use by Utah agencies are Adobe PDF files. Adobe has added PDF accessibility information resources at <http://access.adobe.com>.

### 4.4 SCREEN READERS [ RECOMMENDED ]

Use a screen reader to test for accessibility and usability. The following is a partial list of current screen readers:

**JAWS**—The free demo download includes the synthesizer and everything a user needs to install and operate JAWS for a time limited period. The download is available from [http://www.hj.com/fs\\_downloads/jaws\\_form.asp](http://www.hj.com/fs_downloads/jaws_form.asp). A free audio tutorial for using the JAWS demo is available at [http://www.hj.com/fs\\_downloads/jawsdemo\\_audio.asp](http://www.hj.com/fs_downloads/jawsdemo_audio.asp). A Web Designer's Guide to JAWS is available at <http://www.maccessibility.com/archive/000843.php>.

**Connect Outloud**—Connect Outloud, at [https://www.freedomscientific.com/fs\\_products/software\\_connect.asp](https://www.freedomscientific.com/fs_products/software_connect.asp), is a scaled down version of JAWS. Connect Outloud 2.0 is based on JAWS for Windows 4.02. However, Connect Outloud does not have the full power of JAWS, and is not as useful as the full JAWS package for site testing purposes. However, this may meet the needs of Web developers who just want to hear their Web sites.

## 4.5 MULTIMEDIA, AUDIO, AND VIDEO FILES

Web casting, pod casting, and otherwise recording of public meetings and other State events has become commonplace and much of this material is accessible on many State Web sites. Accessibility for these types of media has been addressed in Section 508 and W3C standards and guidelines.

### 4.5.1 Alternative Forms of Accommodation [ RECOMMENDED ]

Under the Section 508 standards the "equivalent alternatives for any multimedia presentation should be captioned (open or closed captions) and synchronized with the presentation." The W3C Web Content Accessibility Guidelines addresses this requirement under the general recommendation to provide alternative forms of access for multimedia content. The alternatives are captions (that include dialog, and also identify who is speaking and notate sound effects and other significant audio) or provide an alternate method of access, including sign language, voice, fax, teletype, and captioning.

### 4.5.2 Captions [ RECOMMENDED ]

The W3C standard Synchronized Multimedia Integration Language (SMIL), viewable at <http://www.w3.org/AudioVideo>, enables organizations to make accessible rich media/multimedia presentations which integrate streaming audio and video with images, text, or any other media type. The National Center for Accessible Media (NCAM) has developed and distributes (for free) the *Media Access Generator (MAGpie)*, at <http://ncam.wgbh.org/webaccess/magpie>, for creating captions and audio descriptions for rich media.

### 4.5.3 Audio Descriptions [ RECOMMENDED ]

Audio description is the addition of text describing the important visual elements of the video that are necessary to understand the full intent of the information being presented. Audio description should be planned into the production of the video rather than added in post-production. National consulting on audio description and closed captioning is available from the WGBH Media Access Group at <http://main.wgbh.org/wgbh/pages/mag/services/description>.

## 4.6 NON-STANDARD EXTENSIONS [ RECOMMENDED ]

State agencies should avoid vendor specific "non-standard" extensions and comply with applicable standards (e.g., [IEFT](#) (if using secure socket layer (SSL) connections), [W3C](#) (if using Cascading Style Sheets ([CSS](#))) and validated using the W3C [CSS Validation Service](#)). One procedure that can help State agencies avoid coding to a vendor specific technology is to test Web page designs with different browsers (e.g., Internet Explorer, Firefox, etc.) and screen readers.

#### 4.7 JAVA AND JAVASCRIPT ACCESSIBILITY [ REQUIRED ]

The World Wide Web Consortium (W3C) Web Content Accessibility Guidelines (version 1) address the use of JAVA under [Guideline 6. Ensure that pages featuring new technologies transform gracefully](#) and state "ensure that links that trigger scripts work when scripts are turned off or not supported (e.g., do not use "javascript" as the link target)." In the current draft of the Web Content Accessibility Guidelines they address the use of JAVA under [Principle 4: Content must be robust enough to work with current and future technologies](#). The success criteria for this is: "Technologies are used according to specification without exception."

#### 4.8 UNIVERSAL ACCESSIBILITY DESIGN GUIDELINES [ RECOMMENDED ]

The purpose of this list is to provide a summary of the types of issues to consider when creating and designing accessible HTML pages:

- Include a [Document Type Declaration](#) (DOCTYPE) on all Web pages. This declares what version of HTML is in use on the page, and assists the browser in rendering the page correctly.
- Avoid the use of HTML tags or extensions which are supported by only one browser.
- Use headings, lists, and consistent structure.
- Avoid the unnecessary use of icons, graphics, and photographs.
- Check Web pages and images at different monitor resolutions, monitor sizes, and color depth settings.
- Use plain backgrounds and simple layouts to improve the readability of text.
- Ensure that foreground and background color combinations provide sufficient contrast when viewed by someone having color deficits or when viewed on a black and white screen.
- Maintain a standard page layout and navigation method throughout the Web site.
- Do not abbreviate dates (for example, use December 1, 2007 rather than 12/1/07).
- Ensure that dynamic content is accessible or provide an alternative presentation or page.
- Until user agents allow users to freeze moving content, avoid movement in pages.
- Test Web pages with a variety of Web technologies, including, but not limited to, graphical browsers with the images turned off, browsers with JavaScript disabled, a text based browser, using only a keyboard, and using assistive technology.

#### **4.8.1 Text Based Design** [ RECOMMENDED ]

- Avoid using side by side presentation of text, for example, columns and tables.
- End all sentences, headers, list items, etc. with a period or other suitable punctuation.
- All online forms must be accessible.
- Avoid/limit the use of bitmap images of text, unless a textual alternative is also provided.
- Consider using numbers instead of bullets to help the user to remember items.
- Provide meaningful and descriptive text for hyperlinks. Do not use short hand (e.g., "click here"). Instead, use something like "Follow this link to our News Page." (Screen readers can search specifically for linked text, "click here" provides no indication of where the link will take them.) If documents are provided in a specialized format (e.g., PDF, etc.) provide the equivalent text in HTML or plain text format.

#### **4.8.2 Graphics and Images** [ RECOMMENDED ]

- Keep the number of colors in Web pages to a minimum.
- Minimize the file size and number of images displayed on any one page.
- Design background images at the lowest color depth and resolution possible.
- Ensure that text can always be clearly read at any location against the background.
- Avoid or limit using image maps.
- Use the "ALT attribute" with image files to provide meaningful text for all images and pictures.

#### **4.8.3 Multimedia Files** [ RECOMMENDED ]

- Provide text transcriptions of all video clips.
- If possible, include captions or text tracts with a description or sounds of the movie.
- Provide descriptive passages about speakers and events being shown through video clips.
- Give a written description of any critical information that is contained in audio files contained on the Web site.
- If there is a link to an audio file, inform the user of the audio file format and file size in kilobytes.

#### 4.8.4 Wireless Access [ RECOMMENDED ]

Agencies should consider planning for providing access to information and services from a Web page using a cellular phone or other hand-held device. Page layouts for mobile devices can be generated with CSS for small screen devices that provide a text display.

#### 4.9 USABILITY TOOLS [ RECOMMENDED ]

Choose automated accessibility testing tools that generate reports in XML and/or EARL (Evaluation and Repair Language) to facilitate comparison of:

- results produced by different tools; or,
- reports produced at different points in time.

Examples of tools that produce reports in XML include Bobby 5.0 (Watchfire), at <http://webxact.watchfire.com>, and LIFT Online (UsableNet), at <http://www.usablenet.com>.

Use multiple automated testing tools if possible and compare the results side-by-side. This will have the effect of emphasizing the more serious accessibility and usability problems with a software application, Web page, or other digital resource. Web sites should also be tested with a screen reader.

Agencies should use the Simple Tool for Error Prioritization (STEP) for Section 508 compliance. The tool uses the output of Section 508 compliance tools (e.g., [Bobby](#), [LIFT](#)) and evaluates the accessibility errors to determine both the severity of the errors and the effort to fix them. The tool is available on the [Section 508 Web site](#).

#### 4.10 OTHER USABILITY RESOURCES

The National Institute of Standards and Technology (NIST) Web Metrics Test has a number of tools that support testing and evaluation of Web site usability. The free tools currently available are:

**WebSAT** (<http://zing.ncsl.nist.gov/WebTools/WebSAT/overview.html>)—Checks the HTML of Web pages against usability guidelines, either its own, or a set of IEEE Standard guidelines.

**WebCAT** (<http://zing.ncsl.nist.gov/WebTools/WebCAT/overview.html>)—Allows the designer/developer to quickly construct and conduct a simple category analysis across the Web.

**WebVIP** (<http://zing.ncsl.nist.gov/WebTools/WebVIP/overview.html>)—Lets the designer/developer rapidly analyze a Web site so as to capture a log of user behavior on the site.

**FLUD** (<http://zing.ncsl.nist.gov/WebTools/FLUD/overview.html>)—A file format and an associated parser for representation of the behavior of Web site users.

**FLUDViz** (<http://zing.ncsl.nist.gov/WebTools/FLUDViz/overview.html>)—Allows the developer/designer to visualize and analyze a single usability session.

**VisVIP** (<http://zing.ncsl.nist.gov/WebTools/VisVIP/overview.html>)—Lets the developer/designer visualize (in 3D graphics) and analyze the navigational paths of Web site users as captured in a FLUD file.

**TreeDec** (<http://zing.ncsl.nist.gov/WebTools/TreeDec/overview.html>)—Supports the representation of a Web site as a single logical tree.

Additional information and download instructions are available at <http://zing.ncsl.nist.gov/WebTools/tech.html>

#### 4.10.1 Online Training

- Section 508—Web Accessibility Course, at <http://www.jimthatcher.com/webcourse1.htm>.
- Access E-Learning (AEL), at <http://www.accesselearning.net>. The ten modules cover:
  1. Accessibility Issues of Disabilities in Distance Education
  2. Planning for Accessibility in Distance Education
  3. Making PowerPoint Slides Accessible
  4. Making Video Accessible
  5. Making Flash Accessible
  6. Making Word Documents Accessible
  7. Making Excel Documents Accessible
  8. Making PDF Documents Accessible
  9. Making HTML Files Accessible
  10. Making Scripts and Java Accessible

#### 4.10.2 Accessibility Questions for Web Site Page Designs

[ RECOMMENDED ]

- Do Web pages have a text equivalent for every non-text element (e.g., via "alt," "longdesc," or in element content)?
- Do multimedia presentations have equivalent alternatives synchronized with the presentation?
- Are Web pages designed so that all information conveyed with color is also available without color?

- Are pages organized so they are readable without requiring an associated style sheet?
- Are redundant text links provided for each active region of a server-side image map?
- Are client-side image maps provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape?
- Are row and column headers identified for data tables?
- Do tables use markup to associate data cells and header cells for data tables that have two or more logical levels of row or column headers?
- If frames are used, are they titled with text that facilitates frame identification and navigation?
- Are Web pages designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz?
- Is a text-only page, with equivalent information or functionality, provided to make a Web site accessible, when compliance cannot be accomplished in any other way? Is the content of the text-only page updated whenever the primary page changes?
- If Web pages utilize scripting languages to display content, or to create interface elements, is the information provided by the script identified with functional text that can be read by assistive technology?
- If a Web page requires that an applet, plug-in, or other application be present on the client system to interpret page content, does the page provide a link to the plug-in or applet?
- If electronic forms are designed to be completed online, does the form allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues?
- Is a method provided that permits users to skip repetitive navigation links?
- If a timed response is required, is the user alerted and given sufficient time to indicate that more time is required?
- Are Web pages designed to work on older versions of browsers?

## 5.0 ADVERTISING AND ACKNOWLEDGEMENTS ON STATE WEB SITES [ RECOMMENDED ]

Advertising of specific products and services is generally prohibited on State Web sites. The State does not endorse specific products or services. An acknowledgement of specific vendor products is appropriate if used in a non-intrusive manner, and if it adds credibility to site services. For example, an agency using Google Maps may use the Google logo on the map reference. In general, agencies should only provide acknowledgements for products and services when it is appropriate to do so in fairness to the vendor. Acknowledged services are utilized subject to a disclaimer by the State of Utah which states that use of the service does not serve as an endorsement, nor is the State responsible for any data inaccuracies or omissions provided by the service.

## 6.0 COPYRIGHT AND ATTRIBUTION ON STATE WEB SITES [ REQUIRED ]

Information created by a government agency is largely considered to be in the public domain. Graphics, audio, or outside information from other sources should not be used without proper permission as required by owners of the material. Correctly attribute all information used on a site. Copyright laws must be observed. Information about copyrights can be found on the U.S. Copyright Office site at <http://www.copyright.gov>.

## 7.0 INTERNET DOMAIN NAMES FOR UTAH GOVERNMENT ENTITIES [ REQUIRED ]

State agencies connected to the Internet or using Internet protocols (TCP/IP) must use the Internet Domain Naming System (DNS) to associate computer names with IP addresses. State agencies are encouraged to use utah.gov for all official agency Web sites. The state.ut.us domain is used principally by the Legislature.

### 7.1 REGISTRATION FOR UTAH.GOV DOMAINS AND SUB-DOMAINS [ REQUIRED ]

*Utah Administrative Rule R895-4. Sub-Domain Naming Conventions for Executive Branch Agencies* explains the value of using "utah.gov." The "utah.gov" identifier is intended to provide the following features to the State of Utah and its agencies:

- The ".gov" sub-domain identifier is controlled by the Federal .gov domain registrar, thereby protecting State interests.

- The State of Utah, Chief Information Officer's (CIO) office is responsible for issuance of all "utah.gov" sub-domains, further protecting the integrity of the identifier.
- The "utah.gov" identifier offers immediate recognition to constituents for developing credibility and confidence through a consistent interface.
- The "utah.gov" sub-domain simplifies constituent access to State agency services.

The Department of Technology Services approves and activates registration for the utah.gov and state.ut.us domains. A State agency designee may apply for a sub-domain name to the registrar by making a request through the registrar Web site at <http://registrar.utah.gov>. Detailed procedures and Frequently Asked Questions (FAQ) are available on the site. Once the registrar has approved the sub-domain name, it is automatically forwarded to the technical contact that will then activate the sub-domain.

The following conventions will be followed in creating sub-domains:

- Domain names and sub-domains should be kept as simple as possible.
- Sub-domains of utah.gov will be no more than four levels deep, including utah.gov domain with www excluded. For example, <http://news.innerweb.utah.gov> would be permitted but <http://good.news.innerweb.utah.gov> would not.
- A sub-domain level should be as short as possible, but long enough that the user will likely be able to identify the site from its name.

Agencies within the Legislative, Executive, or Judicial branches of government may submit a registration request for a sub-domain name to the registrar. This process is also open to local governments. Quasi-public, non-public, private, commercial, or private-not-for profits may not use the utah.gov domain nor obtain a sub-domain and are encouraged to use an appropriate name within the .org TLD.

If any entity acts as an agent or contractor on behalf of a governmental agency, then the registrar may approve acquisition of a utah.gov sub-domain for that entity for the sole purpose of acting on behalf of the State. However, the State retains ownership of all utah.gov sub-domains and the agency must supply the contact information to the registrar site.

## 7.2 USE OF NON UTAH.GOV DOMAIN NAMES [ REQUIRED ]

*Utah Administrative Rule R895-4. Sub-Domain Naming Conventions for Executive Branch Agencies* specifies the requirements and exceptions for using domain names with State agencies. Specific Rule provisions that apply to the use of non Utah.gov Top Level Domain (TLD) names are:

- Any State Executive Branch agency that develops, hosts, or funds a Web site shall only register a sub-domain using the "utah.gov" naming convention.
- No State Executive Branch agency may publicize a sub-domain in a TLD such as .org, .net, .com or any other available TLD not conforming to this rule.
- Non-conforming TLDs may be obtained or retained solely for the purpose of re-direction to an approved "utah.gov" TLD, or to retain ownership of the TLD for avoiding identifier misuse, provided that the non-conforming TLD is not publicized.

Exceptions to using the "utah.gov" naming convention are specified in the rule as follows:

- The requirements of this rule do not apply to funds that are "passed-through" or contracted to a private non-profit or for-profit entity and subsequently used by that entity for its own Web site or for the purchase of a URL.
- The CIO may provide a waiver for an "extraordinary environment" for which it is demonstrated that use of the "utah.gov" identifier would cause demonstrable harm to citizens or business. Requests for a waiver must be submitted with justification to the CIO by the requesting agency's Executive Director.
- Non-conforming TLDs may be obtained or retained solely for the purpose of re-direction to an approved "utah.gov" TLD, or to retain ownership of the TLD for avoiding identifier misuse, provided the non-conforming TLD is not publicized.

Agencies must consider the issues associated with registering under different domain names (e.g., .com), and the associated risk. Domain names open to the general public (.com, .us, etc.) that are not renewed are often obtained by pornographic or other questionable sites seeking to capitalize on an existing flow of traffic to the site. If an agency does not renew the special domain name, then there is a high likelihood that someone else will take the name with potential negative results to the agency. Additional information from the Rule is available at <http://www.rules.utah.gov/publicat/code/r895/r895-004.htm>.

## 8.0 LINKING TO OTHER INTERNET SITES [ RECOMMENDED ]

State agencies that maintain a generally accessible Internet site should cooperate to facilitate useful electronic links between the sites. This means creating and maintaining easily followed links to other sites and pages containing relevant related information that may be of interest or value to their visitors. Search engine access, site maps, and meta tagging should be considered as methods to improve access and links to State Web sites.

### 8.1 LINK MAINTENANCE AND TESTING [ RECOMMENDED ]

Agency sites that provide external links to other State and non State Web sites should establish a process to verify links as described in Section 3.2.2.8. Links should be checked regularly to maintain accuracy, viability, and to avoid user frustration with broken links.

### 8.2 USE OF NON STATE WEB SERVICES ON STATE WEB SITES [ RECOMMENDED ]

Agencies may utilize non State Web services from federal and other governmental partners as components of agency Web sites and applications. Agencies may also use Web services that are available ubiquitously from stable and reliable Internet vendors and sites. Before using external Web services, agencies should confirm the availability of service documentation, the rights to use the service, as well as the technical contacts, should the service not perform adequately.

## 9.0 PRIVACY AND SECURITY [ RECOMMENDED ]

Key privacy and security policy areas include:

**Notice**—A Privacy and Security Policy should be published on every government Web site, even if the site does not collect any information that results in creating a record. The Utah.gov header and footer provide links to approved statewide statements.

**Choice**—Specific Web-based forms that require personal information from a visitor should post privacy and security policies, or a link to those policies, on the page or form, indicating how the information will be used, and under what conditions the information may be shared or released to another party. The form should include a notice that the information may be a public record and therefore subject to release as an open record under the Government Records Access and Management Act (GRAMA). Web pages designed for children must comply with all applicable federal and State laws intended to protect minors.

**Access**—Citizens should be able to view and contest the accuracy and completeness of data collected about them.

**Security**—Agencies that collect data must take reasonable steps to ensure that information collected from citizens is accurate and secure from unauthorized use.

## 9.1 CITIZEN ACCESS TO PERSONAL INFORMATION [ RECOMMENDED ]

Citizens are entitled to access personal information that may be collected or used on State Web sites. Sites should provide a process statement that explains how a user can review and correct their personal information. Such information is not required to be delivered online, and may use manual contact processes.

- With few exceptions, the individual is entitled, on request, to be informed about the information that the State agency collects about the individual.
- The individual is entitled to receive and review their personal information.
- The individual is entitled to have the State agency correct information about the individual that is incorrect.
- State agencies should not charge an individual to correct information about the individual.

## 9.2 INFORMATION COLLECTION GUIDELINES [ REQUIRED ]

Agencies that collect personally identifiable information via a Web form or other means should use an SSL session or equivalent technology to encrypt the data. All personal information collected must be in compliance with *Utah Code 63D-2-103 Collection of Personally Identifiable Information*. The provisions of the code establish the following requirements:

- A governmental entity may not collect personally identifiable information related to a user of the Web site unless reasonable steps have been taken to ensure that on the day on which the information is collected the Web site complies with the next point.
- A governmental Web site shall contain a privacy policy statement that discloses:
  - the identity of the governmental Web site operator and how the Web site operator may be contacted by telephone or electronically;
  - the personally identifiable information collected by the governmental entity;
  - a summary of how the personally identifiable information is used by the governmental entity;
  - the practices of the governmental entity or the Web site operator related to disclosure of any personally identifiable information collected;
  - the procedures, if any, by which a user may request access to the user's personally identifiable information and to correct the user's personally identifiable information; and,
  - without compromising the integrity of the security measures, a general description of the security measures that are in place to protect a user's personally identifiable information from unintended disclosure.

- Personally identifiable information is not a classification of records under Title 63, Chapter 2, *Government Records Access and Management Act*. Access to government records is governed by Title 63, Chapter 2, *Government Records Access and Management Act*.

*Utah Administrative Code R895-8. State Privacy Policy and Agency Privacy Policies* establish requirements for the use of any personal information collected by agencies. Any personally identifiable information that an individual provides to a State Web site shall be used solely by the State, its entities, and third party agents with whom it has contracted to perform a State function on its behalf, unless this rule is superseded by a federal statute, federal regulation, or State statute in which case the personally identifiable information shall be used by other parties only to the extent required by the superseding federal statute, federal regulation, or State Statute, or, the information is designated as public record by an individual State agency as authorized under Title 63, Chapter 2 of the *Utah Code, Government Records Access and Management Act*.

Included among the federal and State statutes that may supersede portions of this rule are the *Driver's Privacy Protection Act of 1994, Title 18, Section 2721, United States Code*; and Sections 41-1a-116, 53-1-104, 53-1- 109, and 59-1-403, of the *Utah Code Annotated*.

For additional information, refer to *Utah Code 63D-2-101 et seq Governmental Information Privacy Act*, and *Rule R895-8. State Privacy Policy and Agency Privacy Policies*.

### 9.3 PRIVACY ON STATE WEB SITES

As described in Section 3.2.2.5, all State Web sites must have a privacy statement on the site to ensure that site users understand the privacy guarantees associated with using State government Web sites. Specific privacy disclaimers and an explanation may be needed for sites that collect personal and financial information. For additional information see *Utah Code 63D-2-101 et seq Governmental Information Privacy Act*, and *Rule R895-8. State Privacy Policy and Agency Privacy Policies*.

#### **9.3.1 Privacy of Individual Health Information [ REQUIRED ]**

State agencies are required to protect the privacy of medical records. The U.S. Department of Health and Human Services has developed "*Standards for Privacy of Individually Identifiable Health Information*." State agencies that handle health care information need to ensure that they are in compliance and are implementing required security and privacy standards. For additional information, refer to *Utah Code 63D-2-101 et seq Governmental Information Privacy Act*, *Utah Administrative Code R895-8. State Privacy Policy and Agency Privacy*

*Policies, and Utah Administrative Code R380-250, HIPAA Privacy Rule Implementation.*

### 9.3.2 Privacy Audit Requirements [ REQUIRED ]

Agencies that collect extensive data about an individual, or sensitive data (e.g., medical), must have documented policies and practices that can be audited.

### 9.4 SECURITY ASSURANCES ON UTAH.GOV [ RECOMMENDED ]

The State of Utah uses the following security branding for personal information provided to Utah.gov:



Utah.gov makes the following assurances to users regarding specific security functionalities on Utah.gov sites:

**Secure Socket Layer Encryption (SSL)**—This enables the encryption of sensitive information during an online transaction with the State.

**Firewall Protection**—Hardware and software protection that controls data entering and leaving the Utah.gov network.

**Secure Internal Networks**—All data transferred between databases is done via secure FTP or Virtual Private Networks (VPN) to ensure that only authorized users can access the network and no one can intercept data.

**Data Storage Policies**—Unless necessary, Utah.gov does not permanently store financial information, so it cannot be retrieved and compromised.

**Secure Policies and Procedures**—Password and network activity audits are performed quarterly.

**Physical Location Security**—All physical locations where hardware and software are located are physically secured and only accessible by individuals with proper credentials.

**Application Security**—A software tool is employed to scan for individual application vulnerabilities.

**Payment Card Industry Data Security Standards (PCI DSS) Compliant**—Adherence to performance measurements outlined in the annual self evaluation as well as submission to regular scans from Security Metrics to search for network vulnerabilities.

#### **9.4.1 Secure Socket Layer Certificates [ RECOMMENDED ]**

The most common form of securing data transmission is to use the Secure Sockets Layer (SSL) 3.0 session. The SSL protocol includes provisions for server authentication (verifying the server's identity to the client), and allows server to server authentication.

Although there are two levels of security available for the transmission of information (40 and 128 bit), Web servers must support 128 bit encryption keys. Depending on the application, agencies should use 128 bit encryption and/or provide a warning to the user if they elect to provide information using only 40 bit encryption. Agencies taking online payment must use 128 bit encryption. Additional information on SSL can be found at the following:

- W3C site at <http://www.w3.org/Security/fag/wwwsf3.html>
- RSA site at [http://www.rsa.com/standards/protocols/ssl\\_tls.html](http://www.rsa.com/standards/protocols/ssl_tls.html)

Securing files and other forms of information (e.g., certificates used for signing or encrypting) should use stronger (longer) encryption keys. Triple DES uses 168 bit keys and the general recommendation for certificates is 1024 bit keys.

#### **9.4.2 Secure Multipurpose Internet Mail Extensions (S/MIME)**

[ RECOMMENDED ]

S/MIME is an Internet suite of standards for the secure exchange of electronic messages and provides privacy and authenticity. S/MIME uses public-key encryption technology to protect messages from unauthorized interception and forgery. While SSL secures a transaction between a user and a Web site over the Internet, S/MIME is used to secure messages between users, applications, and computers. GroupWise supports secure encrypted e-mail protocols.

#### **9.4.3 Payment Card Industry Data Security Standards (PCI DSS)**

[ REQUIRED ]

In order to collect funds electronically the State is required to adhere to PCI audit requirements. All agency collections of funds must be PCI compliant. The State is audited at periodic intervals to ensure compliance. For additional information and details see the PCI site at [https://www.pcisecuritystandards.org/tech/supporting\\_documents.htm](https://www.pcisecuritystandards.org/tech/supporting_documents.htm).

## 10.0 MANAGEMENT OF FINANCIAL, ELECTRONIC, AND SIGNED RECORDS

Agency records management and retention requirements are governed by the Government Records Access and Management Act (GRAMA). Agencies are required to follow GRAMA provisions pertaining to electronic records. The Act is available in *Utah Code Title 63 Chapter 02—Government Records Access and Management Act*.

### 10.1 TECHNOLOGIES AND METHODS

#### 10.1.1 Encryption

The most common methodology for protecting information on the Internet is encryption. The type of encryption used will depend on what and how the information is being exchanged. Filing in a form on a Web site may not require security, however, if the form requests any personal information, or the user is accessing a specific application that requires a user ID and password, then the session (transmission) should be encrypted.

A key issue in using encryption is the key length used in the specific application and how it is used. Security has two primary concerns: security of information maintained on a system, and information being transmitted (exchanged) between two locations. The exchange of information and the level of protection depends upon the type of information being transmitted.

#### 10.1.2 Secure Socket Layer (SSL) [ RECOMMENDED ]

The most common form of securing transmissions is to use the Secure Sockets Layer (SSL) session. The SSL protocol includes provisions for server authentication (verifying the server's identity to the client), and server to server authentication. Currently two levels of security are available for the transmission of information using 40 or 128 bit encryption keys. Agencies should plan on using 128 bit encryption and/or provide a warning to the user if they elect to provide information using only 40 bit encryption. Additional information on SSL can be found at the W3C site at <http://www.w3.org/Security/faq/wwwsf3.html>

Securing files and other forms of information (e.g., certificates used for signing or encrypting) should use stronger (longer) encryption keys. Triple DES uses 168 bit keys and the general recommendation for certificates is 1024 bit keys.

## 10.2 RECORDS RETENTION

In addition to agency practical considerations, records retention requirements are determined by the Utah Division of Archives and Records. Agencies are expected to be compliant with guidelines from the Division for electronic records.

By law, all State agencies are required to furnish copies of their publications to the Utah State Library for long term public access and for making the publications available to the public through the State depository system. The form for submitting publications can be found at [http://library.utah.gov/government\\_information/state\\_publications/reporting\\_state\\_publications.htm](http://library.utah.gov/government_information/state_publications/reporting_state_publications.htm). Agencies should send a digital copy of each publication using this form, and supply the Web address if there is one. This form can also be used to submit digital publications that are removed from the Web.

## 11.0 SEARCH FUNCTIONALITY ON STATE WEB SITES

[ RECOMMENDED ]

State Web sites should provide site specific search functionality using the existing Utah site search capabilities provided in the Utah.gov header, or other customized site search features. The Utah.gov search is a State specific Google application available to all agencies. Making a site searchable by search engines requires attention to the following areas:

### **Design and Content Guidelines**

- Make sure that the agency site has a clear hierarchy and text links. Every page should be reachable from at least one static text link.
- Provide a site map to users with links that point to the important parts of the site.
- Write pages meta tags that clearly and accurately describe the site content.
- Use words in the meta tags that users would type to find pages, and make sure that the site actually includes those words within it.
- Use text instead of images to display important names, content, or links. Search engine crawlers do not recognize text contained in images.
- Be sure that TITLE and ALT tags are descriptive and accurate.
- Check for broken links and correct HTML.
- Search engines do not always crawl dynamic pages, so keep page parameters short and limited in number.
- Keep the links on a given page to fewer than 100.

## Technical Guidelines

- Use a text browser, such as Lynx, to examine the site, because most search engine spiders see the site much as Lynx would. If fancy features such as JavaScript, cookies, session IDs, frames, DHTML, or Flash do not allow all of the site to be viewed in a text browser, then search engine spiders may have trouble crawling the site.
- Allow search bots to crawl sites without session IDs or arguments that track their path through the site. Using these techniques may result in incomplete indexing of the site, as bots may not be able to eliminate URLs that look different but actually point to the same page.
- Make sure that the Web server supports the If-Modified-Since HTTP header. This feature allows the Web server to tell Google and other search engines whether content has changed since the site was last crawled. Supporting this feature saves bandwidth and overhead.
- Make use of the robots.txt file on your Web server. This file tells crawlers which directories can or cannot be crawled. Make sure that it is current for your site so that you don't accidentally block the Googlebot crawler. For additional information and details on how to instruct robots when they visit a site, see <http://www.robotstxt.org/wc/faq.html>.

The goal is to make site information more available to users and to enhance external search engines capabilities at effectively searching and indexing site content.

### 11.1 AGENCY SITE SEARCH [ RECOMMENDED ]

Agencies may also utilize a Google customized site search. Free customized Google Site Search may be set up at <http://www.google.com/services/free.html>. Site search specific features with Google may also be enabled by utilizing JavaScript code on agency Web sites such as JavaScript Kit at [http://www.javascriptkit.com/script/script2/google\\_site\\_search.shtml](http://www.javascriptkit.com/script/script2/google_site_search.shtml).

### 11.2 UTAH.GOV SEARCH [ RECOMMENDED ]

Utah.gov domain search is available in the Utah.gov header. This search is restricted to Utah government sites on Utah.gov and other related domains such as state.ut.us. Agencies should ensure that this search functionality is available on published sites.

### 11.3 SITE MAPS [ RECOMMENDED ]

The State is currently engaged in a site mapping project with Google. All agencies are encouraged to participate. Site maps enable Google and other

search engines to do a better job of crawling content and understanding context on agency Web sites.

A sitemap is an XML file that can be made available on a Web site and acts as a marker for search engines to crawl certain pages. It is an easy way for agency Webmasters to make their sites more search engine friendly. It does this by conveniently allowing Webmasters to list all of their URLs along with optional metadata, such as the last time the page changed, to improve how search engines crawl and index their Web sites.

Sitemaps enhance the current model of Web crawling by allowing Webmasters to list all their Web pages to improve comprehensiveness, notify search engines of changes or new pages to help freshness, and identify unchanged pages to prevent unnecessary crawling and save bandwidth. Webmasters can submit their content in a uniform manner that is universally understood. Any Webmaster can submit their sitemap to any search engine which has adopted the protocol. For details on the site mapping protocol and required implementation code for Web sites see <http://www.sitemaps.org/protocol.html>.

## 12.0 TAGGING AND USE OF META TAGS ON STATE WEB SITES

[ RECOMMENDED ]

Section 3.2.2.7 indicates that Web pages should have minimum tag requirements of creator, title, and description meta tags. The Utah State Library is implementing a tagging methodology for digital libraries that utilizes the Utah Taxonomy, available at:

[http://library.utah.gov/government\\_information/state\\_publications/utah\\_taxonomy.htm](http://library.utah.gov/government_information/state_publications/utah_taxonomy.htm).

The Utah Taxonomy is a collection of independent controlled vocabulary terms that can be used with optional Dublin Core meta tags on agency sites. The State Library's *State of Utah Metadata Best Practices Guide* provides detailed descriptions and specifications for these meta tags. Agencies may use these in special applications, such as digital libraries, to enhance access. The *Guide* is available at

[http://library.utah.gov/government\\_information/state\\_publications/matadataguide.pdf](http://library.utah.gov/government_information/state_publications/matadataguide.pdf).

## 12.1 META TAGGING STANDARDS [ RECOMMENDED ]

Meta tagging standards identified in the *State of Utah Metadata Best Practices Guide* include the following simple Dublin Core elements:

- Audience
- Contributor
- Creator
- Date
- Description
- Format
- Identifier
- Language
- Publisher
- Rights
- Subject
- Title
- Type

Each of these elements has detailed descriptions and specifications in the *State of Utah Metadata Best Practices Guide*. Agencies may utilize these and other desired tag types with certain Web applications, such as digital libraries, to enhance access to resources.

## 12.2 TAGGING GUIDELINES [ RECOMMENDED ]

Apply meta tags to all new pages using minimal tagging requirements as specified in section 3.2.2.7, and optional tags as specified in section 12.1.

## 13.0 DEFINITIONS

### **Agency Web Site**

An agency server location that contains Web pages and other files which is available on the Internet usually on a 24 x 7 basis. Agency Web sites are the responsibility of the hosting agency in cooperation with DTS.

### **AJAX**

Asynchronous JavaScript and XML is an enhancement in JavaScript that allows Web pages to be more interactive and behave like local applications, which are also known as "rich client" applications. AJAX allows the Web page to retrieve small amounts of data from the server without reloading the entire page.

### **Alt Tag**

An Alternate Text Tag (ALT attribute) allows the Web site developer to specify alternate text to display in place of the image when image-display is disabled or not available in the Web browser. Some Web browsers also display the alternate text while the image is loading.

### **Application Programming Interface**

API is a language and message format used by an application program to communicate with an operating system or some other control program or communications protocol.

### **Cookie**

Data created by a Web server that is stored on a user's computer is a persistent cookie. A non-persistent cookie stores data in memory and disappears after a pre-set time limit or when the browser is closed. Cookies provide a way for the Web site to keep track of a user's patterns and preferences and, with the cooperation of the Web browser, to store them on the users own hard disk.

### **CSS**

A Cascading Style Sheet is a style sheet format for HTML documents endorsed by the World Wide Web Consortium.

### **Encryption**

Encryption is the reversible transformation of data from the original (the plain text) to a difficult-to-interpret format (the cipher text) as a mechanism for protecting its confidentiality, integrity, and sometimes its authenticity.

### **ESB**

An Enterprise Service Bus is a message broker that supports Web services.

### **Fixed Width Layouts**

Fixed layouts are layouts that start with a specific size, determined by the Web designer. They remain that width, regardless of the size of the browser window viewing the page. Fixed width layouts allow a designer more direct control over how the page will look in most situations.

### **Global SOA**

The Web provides the universal fabric upon which Global SOA rests and includes the standards, the users, and the data. Global SOA views the Web, and related Web 2.0 technologies, as the convergence of software services into a global service-oriented architecture.

### **Home Page**

The first page retrieved when accessing a Web site. It serves as a table of contents to the rest of the pages on the site or to other Web sites.

## **HTML**

HyperText Markup Language is the document format used on the World Wide Web. Web pages are built with HTML tags, or codes, embedded in the text. HTML defines the page layout, fonts, and graphic elements as well as the hypertext links to other documents on the Web.

## **HTTP**

HyperText Transfer Protocol is the communications protocol used to connect to servers on the Web. Its primary function is to establish a connection with a Web server and transmit HTML pages to the client browser or any other files required by an HTTP application.

## **Image Map**

An image map is a single picture image that is logically separated into areas, each of which is used to select a different option or display a different message when clicked. It is widely used on the Web to provide a navigation bar to link to other topics (pages) on the site.

## **Intranet Site**

An intranet site is an internal agency or statewide internal Web site that serves the employees of the enterprise. Although intranet pages may link to the Internet, an intranet is not a site accessed by the general public.

## **Java**

Java is a programming language for writing client and server applications for the Web. Java programs can be called from within HTML documents or launched stand-alone. When a Java program runs from a Web page, it is called a "Java applet." When a Java program is run on the Web server, it is called a "servlet."

## **JavaScript**

JavaScript is a popular scripting language that is widely supported in Web browsers and other Web tools. It deals mainly with the elements on the Web page. On the client, JavaScript is maintained as source code embedded into an HTML document. On the server, it is compiled into byte code (intermediate language), similar to Java programs.

## **Link**

A link is a hypertext link to a URL address on the same or any remote server which provides access to another Web page or document.

## **Liquid Layouts**

Liquid layouts are layouts that are based on percentages of the current browser window's size. They flex with the size of the window, even if the current viewer changes their browser size as they're viewing the site. Liquid width layouts allow a very efficient use of the space provided by any given Web browser window or screen resolution.

### **Mashup**

A mashup is a mixture of content or elements. An application that was built from routines obtained from multiple sources, or a Web site that combines content and/or scripts from multiple sources, is a mashup.

### **Meta Tag**

A meta tag is an HTML tag that identifies the contents of a Web page. Using a `<meta name=" " content=" ">` format, meta tags contain such things as a general description of the page, and keywords for search engines.

### **PCI**

Payment Card Industry standards were established for handling online financial transactions.

### **PKI**

Public Key Infrastructure is a system for publishing the public key values used in public key cryptography. Also a system used in verifying, enrolling, and certifying users of a security application. All PKIs involve issuing public key certificates to individuals, organizations, and other entities and verifying that these certificates are indeed valid.

### **Platform for Privacy Preferences**

P3P is a technical specification, developed by the World Wide Web Consortium, that enables Web sites to identify their privacy practices in a manner that can be understood by commercially-available Web browsers.

### **PDF**

Portable Document Format is the de facto standard for document publishing from Adobe.

### **RSS**

Really Simple Syndication is a syndication format that was developed by Netscape in 1999 and is used widely for aggregating many different kinds of news feeds and other types of information such as updates.

### **SaaS**

Software as a Service is subscription based, and all upgrades are provided during the term of the subscription. The software is hosted and updated on a central location, and does not reside on client computers.

### **Semantic Web**

The Semantic Web provides a common framework that allows data to be shared and reused across application, enterprise, and other types of organizational boundaries.

### **Site Map**

A site map is an hierarchical diagram of the pages on a Web site, starting with the home page at the top. A site map facilitates site navigation and it is an important component that can be used by search engines.

### **SiteMinder**

SiteMinder is a software product that enables management of user access to Web sites.

### **SSL**

Secure Sockets Layer is the leading security protocol on the Internet. SSL is widely used to validate the identity of a Web site and to create an encrypted connection for sending credit card and other personal data.

### **Service Oriented Architecture (SOA)**

SOA is a way of thinking about IT assets as service components. When functions in a large application are made into stand-alone services that can be accessed separately, they are beneficial to several parties.

### **SOAP**

Simple Object Access Protocol is a message-based protocol based on XML for accessing services on the Web.

### **TLS**

Transport Layer Security is a protocol that ensures privacy between communicating applications and their users on the Internet. When a server and client communicate, TLS ensures that no third party may eavesdrop or tamper with any message. TLS is the successor to the Secure Sockets Layer (SSL).

### **UDDI**

Universal Description, Discovery, and Integration is a Web services registry designed to enable software to automatically discover and integrate with services on the Web.

### **URL**

Uniform Resource Locator is the address that defines the route to a file on the Web or any other Internet facility.

### **W3C**

World Wide Web Consortium, [www.w3.org](http://www.w3.org), is an international industry consortium founded in 1994 to develop common standards for the World Wide Web.

### **Web 2.0**

Web 2.0 is not a specific technology; rather, it implies the implementation and availability of user-generated content, and thin client computing. Web 2.0 offers

core functionality as open services to be composited or mashed up into new services and sites, placing the Web at the center of the software experience and as the location for both data and software applications.

### **Web Services**

Web services provide an interface for a service oriented architecture (SOA), in which Web-based applications dynamically interact with other Web applications using open standards that include XML running over HTTP, UDDI, and SOAP.

### **XML**

**Extensible Markup Language** is an open standard for describing data from the W3C. It is used for defining data elements on a Web page and business-to-business documents. It uses a similar tag structure as HTML; however, whereas HTML defines how elements are displayed, XML defines what those elements contain.

### **XSL**

The Extensible Style Sheet Language is a standard from the W3C for describing a style sheet for XML documents. It is the XML counterpart to CSS in HTML and is compatible with CSS2, the current CSS standard.

## 14.0 REFERENCES AND ADDITIONAL RESOURCES

Accessibility & Microsoft <http://microsoft.com/enabl>

Accessible Web Authoring Resources and Education AWARE  
<http://aware.hwq.org>

Accessibility Primer Page <http://www.icdri.org/accprim.htm>

Adaptive Technology Resource Center HTML Commandments  
<http://www.utoronto.ca/atrc/rd/html/commandments.html>

Curriculum for Web Content Accessibility Guidelines 1.0  
<http://www.starlingweb.com/wai/wcag>

Dion Hinchcliffe's Web 2.0 Blog *Is Web 2.0 the Global SOA* at  
[http://web2.wsj2.com/is\\_web\\_20\\_the\\_global\\_soa.htm](http://web2.wsj2.com/is_web_20_the_global_soa.htm)

IBM Accessibility Center Guidelines  
<http://www.austin.ibm.com/sns/guidelines.htm>

International Center for Disability Resources on the Internet  
<http://www.icdri.org/index.html>

Internet Engineering Task Force <http://www.ietf.org>

National Center for Accessible Media (NCAM)  
<http://www.wgbh.org/wgbh/pages/ncam/webaccess/index.html>

National Institute of Standards and Technology (NIST) Web Tools  
<http://zing.ncsl.nist.gov/WebTools/tech.html>

OASIS <http://www.oasis-open.org/specs/index.php>

PCI Security Standards Council  
[https://www.pcisecuritystandards.org/tech/supporting\\_documents.htm](https://www.pcisecuritystandards.org/tech/supporting_documents.htm)

Policies Relating to Web Accessibility  
<http://www.w3.org/WAI/References/Policy>

Programmable Web <http://www.programmableweb.com>

Site Maps.org <http://www.sitemaps.org/index.html>

The [HTML Writers Guild](#)

Approved 5.17.2007

The Web Standards Project <http://www.webstandards.org>

United States Copyright Office <http://www.copyright.gov>

Usability.Gov [www.usability.gov](http://www.usability.gov)

Usability.gov and Research-Based Usability Guidelines Book  
<http://www.usability.gov/pdfs/guidelines.html>

*Utah Administrative Code R895-4. Sub-Domain Naming Conventions for Executive Branch Agencies at*  
<http://www.rules.utah.gov/publicat/code/r895/r895-004.htm>

*Utah Code Title 63 Chapter 02 "Government Records Access and Management Act."*

*Utah Taxonomy,*  
[http://library.utah.gov/government\\_information/state\\_publications/utah\\_taxonomy.htm](http://library.utah.gov/government_information/state_publications/utah_taxonomy.htm)

W3C CSS resources: W3C CSS Validator: <http://jigsaw.w3.org/css-validator/>

W3C Style Sheets home page <http://www.w3.org/Style/>

WebContent.gov <http://www.usa.gov/webcontent>

Web Manager University  
<http://www.usa.gov/webcontent/resources/training/university.shtml>

XML.org <http://www.xml.org>

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## COMMENTS

Please direct comments and suggestions on this document to Robert Woolley via e-mail at [bwoolley@utah.gov](mailto:bwoolley@utah.gov) or by phone at (801) 538-1072.