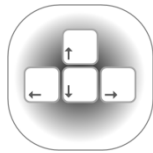




**Homeland
Security**



Trusted Tester Test Environment Installation and Configuration Guide

June 2017 | Version 4.0

Contents

About this guide.....	3
Who should use this guide?.....	3
Testing Tools discussed in this guide.....	3
Where to get help.....	3
Test Environment.....	4
Personal equipment.....	4
Government Furnished Equipment (GFE).....	4
Virtual or remote test environments.....	4
Minimum and Recommended System Requirements.....	5
Hardware requirements.....	5
Optimum work environment.....	5
Software requirements.....	6
Upgrading tools from prior versions.....	7
Software Installation and Configuration.....	8
Inspect.....	8
Java Ferret.....	12
Web Accessibility Toolbar.....	16
ARIA Markup Favelet.....	18
Frames Favelet.....	19
Web Accessibility Favelets (WAF).....	20
Colour Contrast Analyzer.....	22
Version History.....	23

About this guide

This document provides guidance on how to install the required testing software that will be used by Trusted Testers following the **Trusted Tester Section 508 Compliance Test Process for Applications, version 4.0**. The following topics are covered:

1. Minimum and recommended system requirements.
2. Recommendations for optimum work environment for testing.
3. Test environments (Personal, Government Furnished Equipment, Virtual)
4. Software installation and configuration

Who should use this guide?

The steps outlined in this guide are for students taking the Trusted Tester Training course and Trusted Testers. This guide may also be useful to IT Support Personnel if administrator rights to install software or make changes to the PC are required, or if group policies must be modified to permit the use of the test tools.

Testing Tools discussed in this guide

This guide addresses the installation and configuration of the software tools used in the Trusted Tester test process. Below is the list of tools and their purpose:

1. **Object Inspector 32 (a.k.a. Inspect) (including Windows 8.1 and Windows 10 versions):** Reveals the Name, Role, State and Value of software elements.
2. **Java Ferret (used with Java Access Bridge):** Reveals the Name, Role, State and Value of Java software elements.
3. **Web Accessibility Toolbar (WAT), j versions 2012 and 2015:** Adds a toolbar to Internet Explorer to aid manual inspection of accessibility related elements on web pages.
4. **ARIA Markup Favelet:** Adds a JavaScript function that highlights all ARIA code on the page.
5. **Frames Favelet:** Adds a JavaScript function that marks up frames and iframes on the page with name/title; used in IE to supplement WAT.
6. **Web Accessibility Favelets (WAF):** Alternative to WAT that can be installed in IE11, Firefox and Chrome.

Where to get help

If additional guidance is needed, the following is the recommended:

1. Consult with your organizations internal IT Support.
2. Contact the DHS Accessibility Helpdesk at accessibility@hq.dhs.gov or 202-447-0440.

Test Environment

The Trusted Tester test environment typically consists of one or more of the following configurations: Personal Equipment, Government Furnished Equipment, or Virtual Installations. This section of the document provides information to consider when testing in each of these environments.

Personal equipment

Some software will **require administrator rights** during installation. For installation on a personal computer, this guide assumes that the installer has administrator rights.

Government Furnished Equipment (GFE)

If the installer does not have administrator rights, agency IT Support personnel or someone with administrator rights will need to perform the installation. There may be restrictions on the type of software that is allowed to be installed on GFE due to security concerns and policies within an agency. Some agencies require that the software be tested and approved prior to installation.

Security restrictions within your agency may also preclude the required settings for Internet Explorer (see *Requirements* section of this document). Consult your IT Support personnel to verify that these settings can be achieved prior to starting the installation.

Additionally, consider other restrictions that may impact testing such as whether videos can be streamed for testing as some agencies prohibit streaming of videos to their GFE. For example, testing may require videos to be shown in the Internet Explorer window which will require further configuration or permissions. If these changes are prohibited, alternative test arrangements may be required.

Virtual or remote test environments

The testing tools must be installed in a virtual machine if it is being used to run an application or website. The testing tools **MUST** be installed at the remote server end of a test environment if remote access is used to access the test environment.

Minimum and Recommended System Requirements

The minimum and recommended system requirements for installation and use of the testing tools are as follows.

Hardware requirements

Hardware	Minimum	Recommended
PC Note: The test environment used in the test process is the PC platform. It may be possible to test on a Mac using PC/Windows emulation software, but this has not been validated.	<ul style="list-style-type: none">• 2GB RAM memory• 800 MHz Processor• 16-bit sound card and headphones/speakers	<ul style="list-style-type: none">• 2GB RAM memory• 1.6GHz Processor• 16-bit sound card and headphones / speakers
Monitor	1 monitor set at 1024x768	2 monitors set at 1024x768 or higher. Note: Two monitors enable the test tools to be open on one monitor and the application/software being tested open on the second monitor. More screen “real estate” will make it easier to work.
Keyboard Note: Tablet PCs with on-screen keyboards only are not sufficient for testing.	Laptop keyboard	External physical full-size keyboard
Mouse	Laptop trackpad	Mouse
Printer	As needed	Color printer
Internet Connection	56kps	1.5Mbps

Optimum work environment

The optimum work environment is the recommended hardware environment configuration. Additionally, a regular workstation along with plenty of desk space will help test more efficiently.

Software requirements

Software	Configuration
Microsoft Windows (Windows 7, Windows 8.1, or Windows 10)	Enable Java Access Bridge (see <i>Software Installation and Configuration</i> section below).
Internet Explorer 11 (version 11.0.4 or later), with WAT or WAF	Use the following settings in IE: <ul style="list-style-type: none"> • Pop-up blockers disabled • Cookies enabled at medium-low security level • Tools / Compatibility View Settings: uncheck "Display internet sites in compatibility view" and uncheck "Use Microsoft Compatibility Lists"
Chrome (version 49.0.2623.87 or later), with WAF and Colour Contrast Analyzer (CCA)	To configure Chrome for accessibility mode, <u>either</u> : <ul style="list-style-type: none"> • Navigate to chrome://accessibility and select the following checkboxes: <ul style="list-style-type: none"> ○ Native accessibility API support ○ Web accessibility ○ Text metrics ○ Screen reader support ○ HTML, <u>or</u> • Start Chrome with the <code>--force-renderer-accessibility</code> flag. (See https://www.chromium.org/for-testers/command-line-flags for more information on how to start Chrome with command-line flags.)
Firefox (version 45.0.2 or later), with WAF and CCA	None
Java Runtime Environment (Version 7, update 6 or later)	Available from www.java.com . Note: to check installed version, use Control Panel > Programs > Java > General tab > About button.
Windows Media Player (version 9 and above)	Should be installed by default with Windows.
Adobe Flash Player (version 11 and above)	Available from www.adobe.com . Required if testing Flash content.
Adobe Acrobat Reader (version 10 and above)	Available from www.adobe.com . Optional, but recommended for viewing PDF content.

Upgrading tools from prior versions

Trusted Testers who are certified in prior versions of the test process may already have existing tools installed on their workstations. Please refer to the table below to see which tools may require an update.

	Inspect	WAT	WAF	CCA	Java Ferret	ARIA favelet	Frames favelet
Tool Changed?	Yes	Yes	Yes	Yes	No	No	No

1. Inspect: **update may be required.** There are different versions of Inspect for different versions of Windows.
 - a. If you still have the same operating system and were using the prior test process, no actions are needed.
 - b. **Actions to take:** If you have a new Windows operating system (e.g. from Windows 7 to Windows 8.1), you will need to install the appropriate Windows SDK. Please see the Software Installation section for more information on where to obtain the SDK.
2. WAT Toolbar: **update may be required.** The 2015 version of WAT was approved for use.
 - a. **Actions to take:** If you would like to use WAT 2015, uninstall the 2012 version, then install the 2015 version per the instructions in the *Software Installation* section.
 - b. To uninstall WAT, open Windows' Control Panel, select Programs and Features, select WAT, then select Uninstall.
3. Web Accessibility Favelets: **update required if using Chrome or Firefox for testing.** This is a set of favelets/bookmarklets that replicate the functions of the WAT toolbar used in the test process. It can be installed in IE, Firefox, or Chrome.
 - a. **Actions to take:** Download and install the WAF favelets per the instructions below.
4. Colour Contrast Analyzer: **update required if using Chrome or Firefox for testing.**
 - a. If you have WAT already installed, this tool is already included as part of the WAT toolbar. However, you can still install this as a standalone tool, e.g. to be used with other browsers.
 - b. **Actions to take:** To install the standalone tool, please see the *Software Installation* section below.

Software Installation and Configuration

All of the following software must be installed and verified to be working prior to testing. Each of the software tools below include installation guidance, a screen shot of what the software should look like, and steps on how to verify that the software is working.

Inspect

Official name	Inspect
Also Known As	Object Inspector 32; Inspect Objects
Download from	https://www.dhs.gov/508-tools
Purpose for 508 testing	Reveals the Name, Role, State and Value of software elements.
Developed by / Owned by	Microsoft Corporation
Approved version(s)	<p>Windows 7: Microsoft Windows SDK for Windows 7 and .NET Framework 4, Version 7.1, Inspect v. 7.1.0.0</p> <p>Windows 8.1: Windows Software Development Kit (SDK) for Windows 8.1, Inspect v. 7.2.0.0</p> <p>Windows 10: Windows 10 SDK, Inspect v. 7.2.0.07.2.0.0</p>
Installation guidance	<p>Windows 7: Admin rights are required to install.</p> <ol style="list-style-type: none"> 1. Uninstall any and all instances of Microsoft Visual C++ 2010 (or later) and .NET Framework first. 2. During the installation options phase, select <ol style="list-style-type: none"> a. 'Windows Native Code Development' - 'Tools', b. '.NET Development' - 'Tools' c. 'Redistributable Packages' - 'Microsoft Visual C++ 2010'. <div> <p>The screenshot shows the 'Installation Options' window for the Windows SDK. The left pane has a tree view with the following items checked: 'Tools' under 'Windows Native Code Development', 'Tools' under '.NET Development', and 'Microsoft Visual C++ 2010' under 'Redistributable Packages'. The right pane shows the 'Feature Description Detail' for 'Common Utilities', which includes the Microsoft Help Viewer, Application Verifier, Windows Performance Toolkit, and Debugging Tools for Windows. It also shows 'Disk Space Requirements' for volume C: with 43.0 GB available and 386.0 MB required. The download size is 173.4 MB and the estimated time is 10 minutes.</p> </div> <p>After installation, Inspect may be located in the Start menu program group named 'Microsoft Windows SDK'.</p>

Windows 8.1 and 10:

Admin rights are **required** to install.

1. During the installation options phase, select 'Windows Software Development Kit'. You may uncheck all other boxes.

A screenshot of the Windows Software Development Kit for Windows 8.1 installation options screen. The title bar reads "Windows Software Development Kit for Windows 8.1". Below the title bar, the main heading is "Select the features you want to install". Underneath, there is a sub-heading "Click a feature name for more information." followed by three checkboxes: "Windows Software Development Kit" (checked), "Windows Performance Toolkit" (unchecked), and "Debugging Tools for Windows" (unchecked). A red rectangular box highlights the "Windows Software Development Kit" checkbox and its label.

Windows Software Development Kit for Windows 8.1

Select the features you want to install

Click a feature name for more information.

- Windows Software Development Kit
- Windows Performance Toolkit
- Debugging Tools for Windows

2. After installation, Inspect may be located in the 'Windows Software Development Kit' folder on the Start screen (using the 'Apps' view). Select the appropriate platform depending on your computer's processor type (32-bit (x86), 64-bit (x64), or ARM).

Windows 8.1: Navigate to the relevant folder:

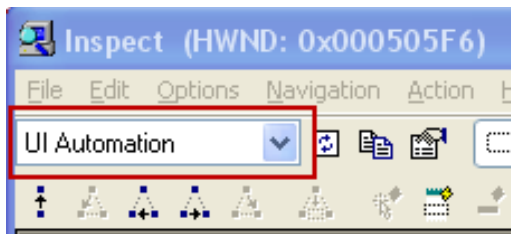
- C:\Program Files (x86)\Windows Kits\8.1\bin\x64\Inspect.exe
- C:\Program Files (x86)\Windows Kits\8.1\bin\x86\Inspect.exe

Windows 10: Navigate to the relevant folder:

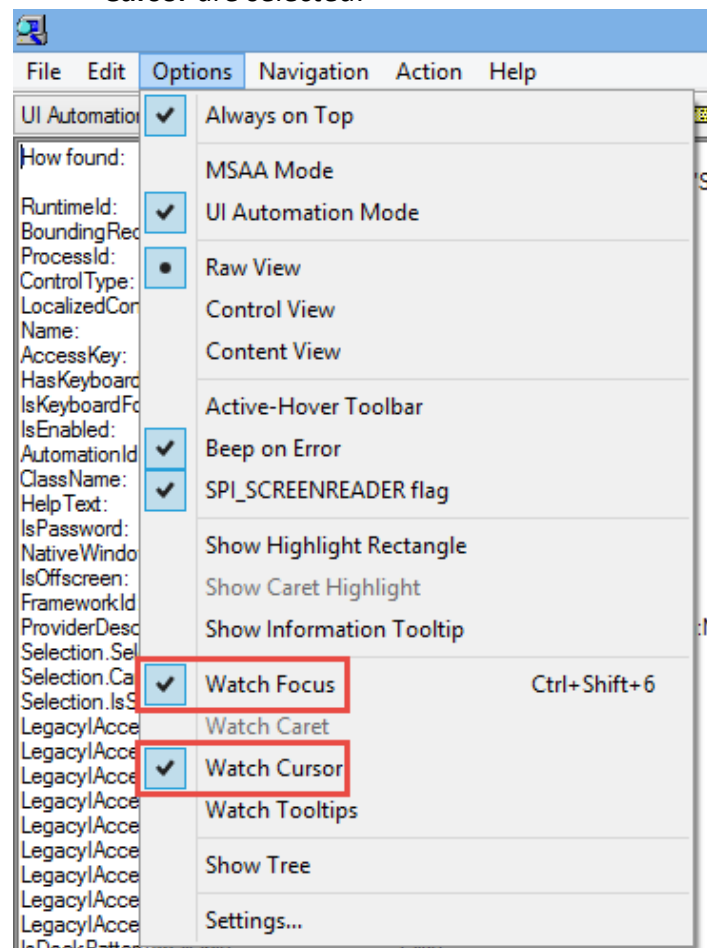
- C:\Program Files (x86)\Windows Kits\10\bin\x64\Inspect.exe
- C:\Program Files (x86)\Windows Kits\10\bin\x86\Inspect.exe

Settings

1. Select **UI Automation** mode:



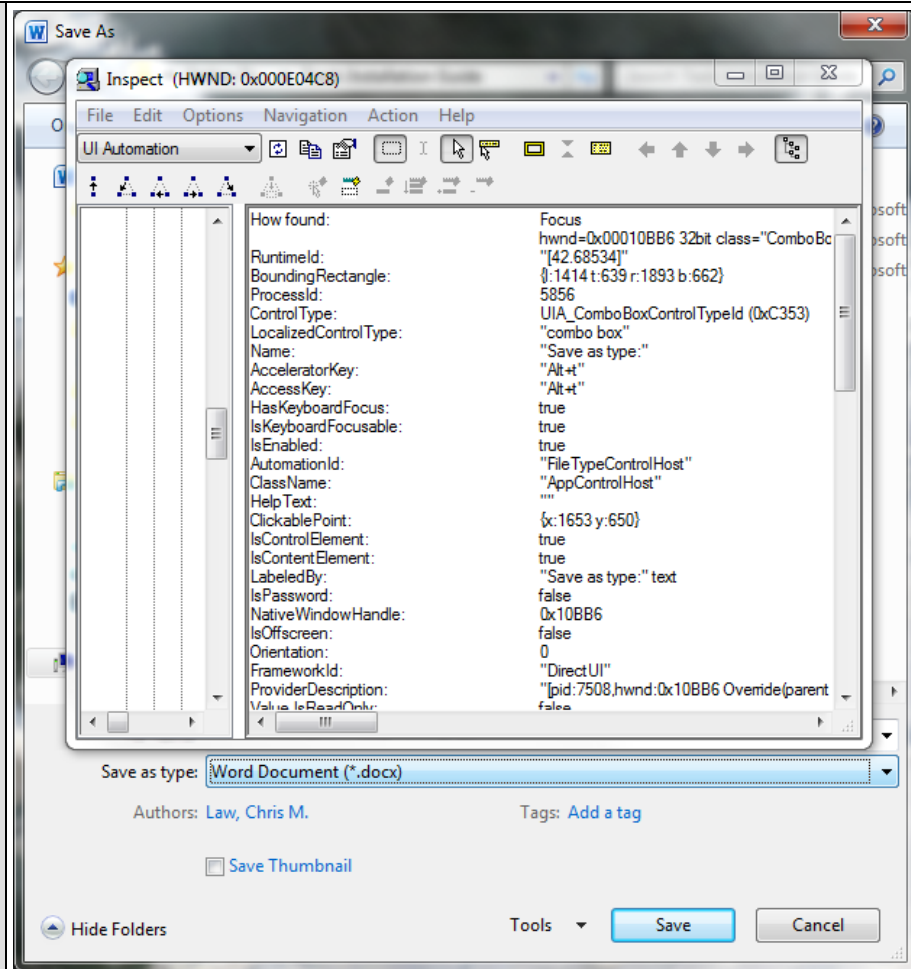
2. Under the Options menu, make sure that **Watch Focus** and **Watch Cursor** are selected:



For ease of use, select these settings each time you open Inspect:

1. Select **Options > Settings**
2. In the **Display in Main list**, select the following:
 - a. LegacyAccessible.Name
 - b. LegacyAccessible.Role
 - c. LegacyAccessible.State
 - d. LegacyAccessible.Value
3. Select OK

What it should look like on your screen



How to verify the software is working

Open Inspect, then open another Windows application (e.g., calculator). Select various items in the Windows application. You should see the list of items in the Inspect window updating each time you select a new item.

Java Ferret

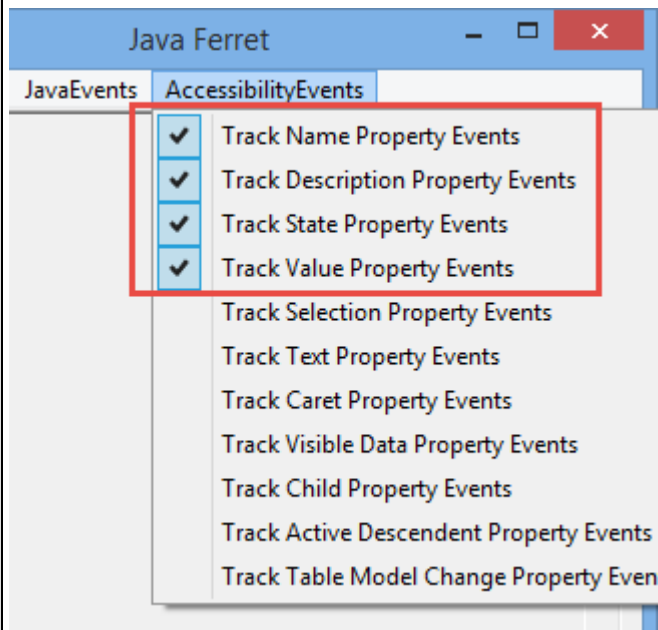
Official name	Java Access Bridge (for the main software) Java Ferret (for the component within the main suite)
Also Known As	Java Access Bridge (note version 2.0.2 is current)
Download from	https://www.dhs.gov/508-tools
Purpose for 508 testing	Reveals the Name, Role, State and Value of Java software elements
Developed by / Owned by	Oracle Corporation
Approved version(s)	Java Access Bridge 2.0.2
Installation guidance	<ul style="list-style-type: none">• Admin rights are required to install Java Runtime Environment (JRE) if necessary. Admin rights are not required to download and run Java Ferret.• If you have Java 7u6 or later installed, the Access Bridge automatically comes with the JRE; you do not need to install the Access Bridge manually. However, you still need to download the Access Bridge from the website (link above) in order to get Java Ferret.• Under Java 7u6 or later, you will need to enable the Java Access Bridge. The steps below will enable the Java Access Bridge for the current user for all versions of JRE 7u6 or later that are installed under your user account only. The steps must be repeated while logged into the account of each user for which it should be enabled if necessary.<ul style="list-style-type: none">○ Activate the Ease of Access Center by pressing Windows+U, or navigate to Start Menu > Control Panel > Ease of Access > Ease of Access Center.○ Select “Use a computer without a display”.○ Check the “Enable Java Access Bridge” check box found in the “Other programs installed” section of the dialog box.• There are 32 and 64 bit versions of Java Ferret. If your workstation is 64-bit, use “JavaFerret-64.exe”. If your workstation is 32-bit, use “JavaFerret.exe”.• If your workstation is 64-bit, your workstation must have both 32-bit and 64-bit instances of JRE installed in order to run JavaFerret-64.exe properly. You can download both instances of JRE from https://java.com/en/download/manual.jsp.• To open Java Ferret (or copy it onto your Desktop), download the Access Bridge 2.0.2 zip file from Oracle’s website (link above). Once downloaded, navigate to the appropriate JavaFerret.exe in accordance to your

workstation's system type (64-bit or 32-bit), copy it onto your Desktop and run it. If a dialog box appears asking whether to run this software due to an unknown publisher, click "Run".

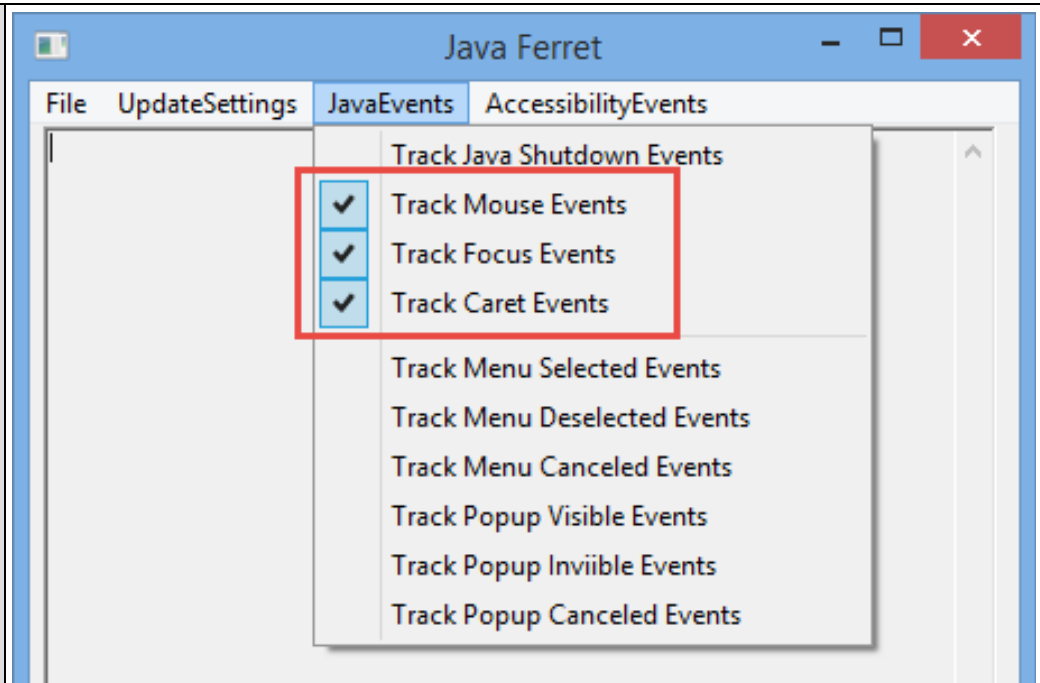
- More Java installation advice can be found at:
 - http://docs.oracle.com/javase/7/docs/technotes/guides/access/enable_and_test.html
 - <http://docs.oracle.com/javase/accessbridge/2.0.2/setup.htm>

Settings

1. Under the Accessibility Events menu, select:
Track Name Property Events, Track Description Property Events, Track State Property Events, Track Value Property Events.



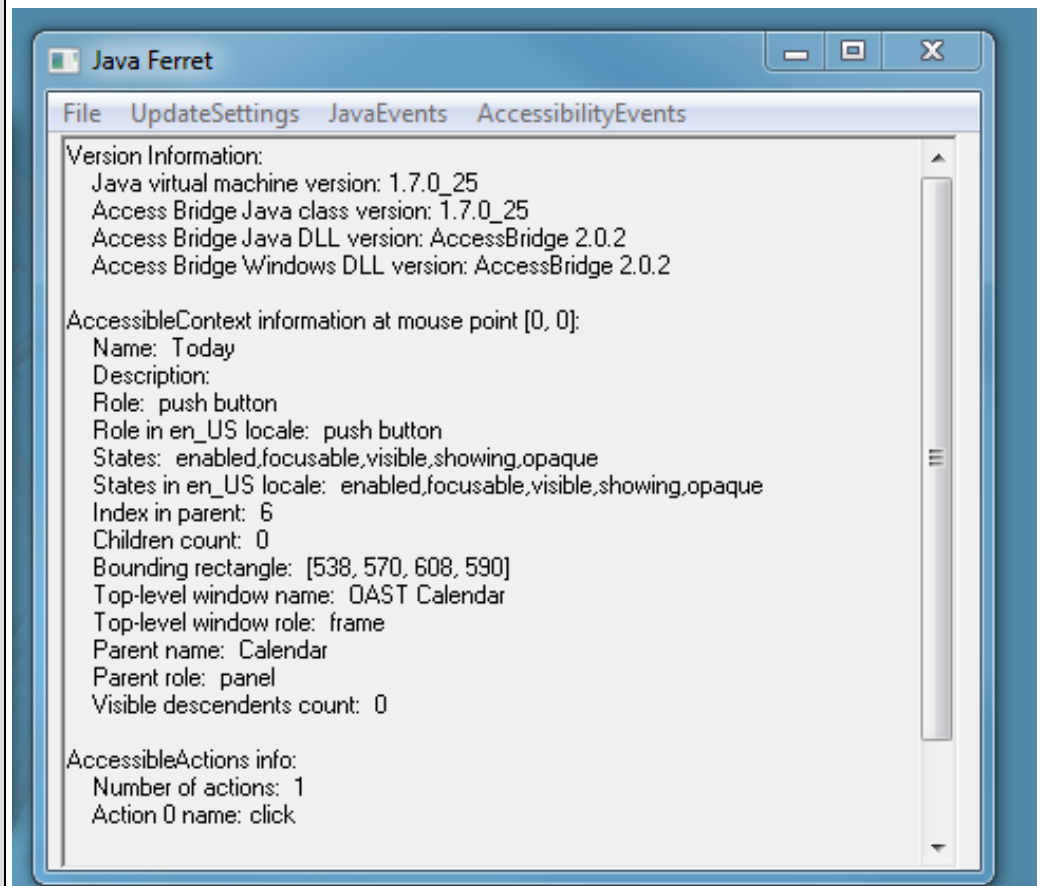
2. Under the Java Events menu, select:
Track Mouse Events, Track Focus Events, Track Caret Events.



Note: the above settings must be checked each time Java Ferret starts. Java Access Bridge must be enabled for Java Ferret to work properly.

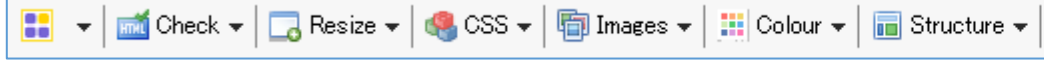
What it should look like on your screen

After hovering over a Java element:



How to verify the software is working	<p>Try these examples (click on these links will download and run the applications after user confirmation):</p> <ol style="list-style-type: none">1. Java example 1: http://docs.oracle.com/javase/tutorial/JWS/samples/uiswing/CelsiusConverterProject/CelsiusConverter.jnlp2. Java example 2: http://docs.oracle.com/javase/tutorial/JWS/samples/uiswing/TapTapTapProject/TapTapTap.jnlp <ul style="list-style-type: none">• Open Java Ferret and make sure you have the correct settings checked (see earlier step).• Open the Java application.• Select various elements in the Java Application. You should see the list of items in the Java Ferret window updating each time you select a new item.
---------------------------------------	--

Web Accessibility Toolbar

Official name	Web Accessibility Toolbar for Internet Explorer
Also Known As	Web Accessibility Toolbar - IE Plug-in WAT Toolbar WAT-C Toolbar
Download from	https://www.dhs.gov/508-tools
Purpose for 508 testing	Adds a toolbar to Internet Explorer to aid manual inspection of accessibility related elements on web pages.
Developed by / Owned by	Web Accessibility Tools Consortium
Approved version(s)	Web Accessibility Toolbar 2015 (5/20/2015) Web Accessibility Toolbar 2012 (9/2012) Note: WAT 2015 is the current version at the release of the <i>Trusted Tester Section 508 Compliance Test Process for Applications, version 4.0.</i>
Installation guidance	<ul style="list-style-type: none"> Admin rights are required to install this tool. An exception to the IT Group Policy restricting IE add-ons may be needed if you are using a government-furnished computer. For more information and to obtain a technical white paper on this, contact the DHS Accessibility Help Desk at accessibility@hq.dhs.gov.
Settings that will be used in the course	<ul style="list-style-type: none"> The toolbar can be enabled/disabled in IE (Tools > Manage Add-ons). If WAT is hidden due to the browser being in full-screen mode, press F11 to exit full-screen mode to reveal WAT. Refresh the page to remove WAT markup (F5 key). Some functions do not work on content within Frames. If so, open the content in its own window before running WAT tool functions. Confirm all WAT popup messages by reviewing WAT markup on the page. Additional favelets (ARIA Markup, Frames) will be needed in addition to WAT.
What it should look like on your screen	<p>This should appear in IE's toolbar area:</p> 

How to verify the software is working

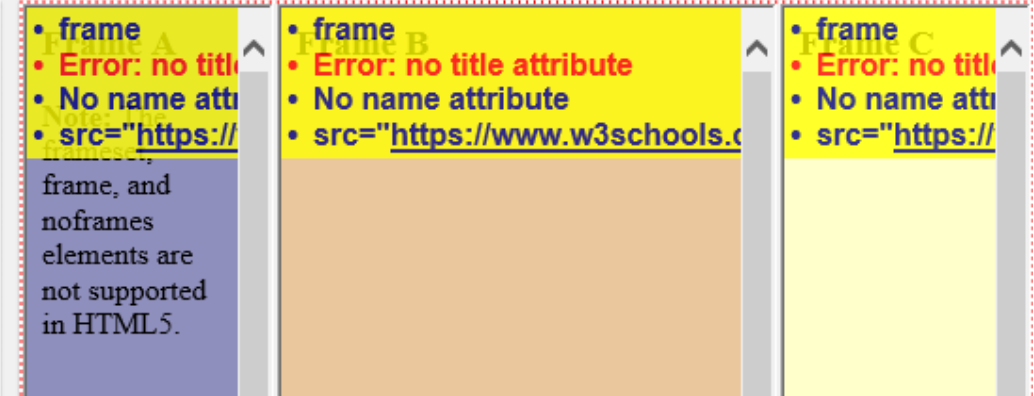
Open www.dhs.gov. In WAT, select Images > Show Images. This should show the alt-text markup for each image.



ARIA Markup Favelet

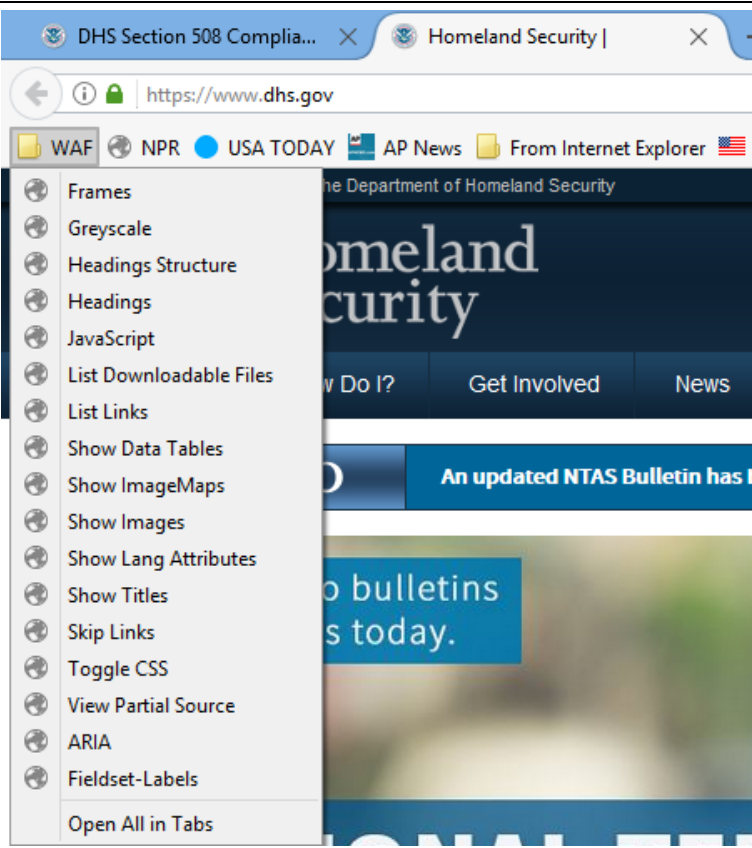
Official name	ARIA Markup
Also Known As	Jim Thatcher's Favelets
Download from	https://www.dhs.gov/508-tools
Purpose for 508 testing	Adds a JavaScript function that highlights all ARIA code on the page. Included in WAF (see below).
Developed by / Owned by	Jim Thatcher
Approved version	N/A
Installation guidance	<ul style="list-style-type: none"> Admin rights are not required to install this tool. This is a supplemental favelet for use with WAT (download separately). It is included with WAF (separate download not necessary). To install the favelet into your IE favorites list, copy and paste the favelet into your Favorites folder at C:\Users\<<your user name>\Favorites
Settings	None
What it should look like on your screen	<p>When run at http://webaim.org/techniques/forms/advanced#labelledby:</p> <p>The screenshot shows a table with three columns: Name, Age, and Weight. The table has three rows of input fields. The 'Name' column has three rows of text input fields, each with a red border and a message 'Found: aria-labelledby="namelabel"'. The 'Age' column has three rows of text input fields, each with a blue border and a message 'Found: aria-labelledby="ageLabel"'. The 'Weight' column has three rows of text input fields, each with a green border and a message 'Found: aria-labelledby="weightLabel"'. A message box titled 'Message from webpage' is overlaid on the bottom of the table, containing a warning icon and the text '24 elements with ARIA were found and are indicated by h6 headings.' The message box has an 'OK' button.</p>

Frames Favelet

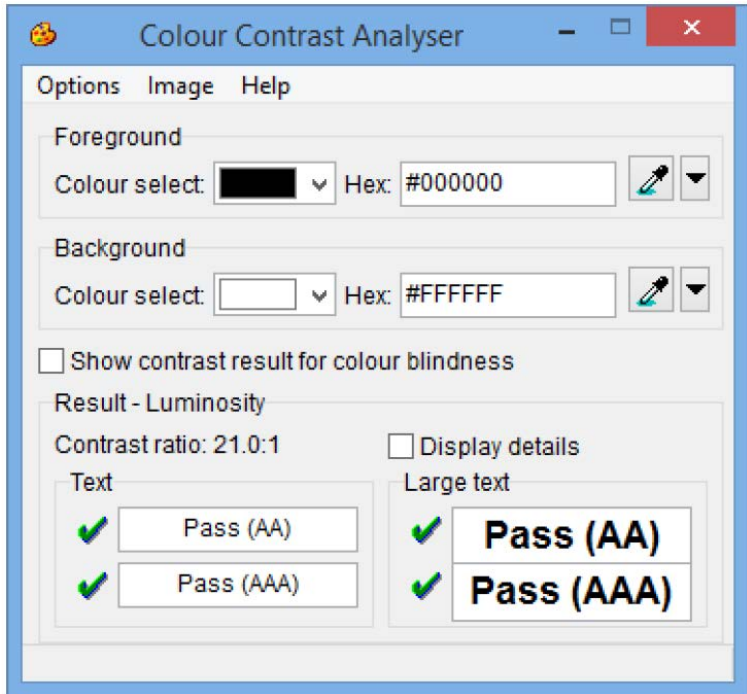
Official name	Frames
Also Known As	Jim Thatcher's Favelets
Download from	https://www.dhs.gov/508-tools
Purpose for 508 testing	Adds a JavaScript function that marks up frames and iframes on the page with name/title
Developed by / Owned by	Jim Thatcher
Approved version	N/A
Installation guidance	<ul style="list-style-type: none"> Admin rights are not required to install this tool. This is a supplemental favelet for use with WAT (download separately). It is included with WAF (separate download not necessary). To install the favelet into your IE favorites list, copy and paste the favelet into your Favorites folder at C:\Users\<<your user name>\Favorites
Settings	None
What it should look like on your screen	<p>When run at https://www.w3schools.com/TAGs/tryit.asp?filename=tryhtml_frame_cols:</p> <p>Result Size: 535 x 662</p>  <p>The screenshot shows three frames side-by-side. Frame A (left) has a blue background and contains the text: "frame, and noframes elements are not supported in HTML5." Frame B (middle) has an orange background and contains error messages: "Error: no title attribute" and "No name attribute". Frame C (right) has a yellow background and contains error messages: "Error: no title attribute" and "No name attribute". Each frame has a yellow header with the frame name and a list of errors.</p>

Web Accessibility Favelets (WAF)

Official name	Web Accessibility Favelets (WAF)
Also Known As	WAF
Download from	https://www.dhs.gov/508-tools
Purpose for 508 testing	An alternative to WAT that can be installed in IE11, Firefox and Chrome. WAF includes the ARIA, Frames, and Skip Link favelets from Jim Thatcher.
Developed by / Owned by	n/a (Open Source)
Approved version	4/8/17
Installation guidance	<p>It is highly recommended to use WAF server-side to receive latest releases. Client-side is available for agencies or organizations in a closed environment with no internet access. If you opt for the client-side version, please check back frequently for future updates. Please read the README.txt for further installation guidance for the client-side WAF.</p> <ul style="list-style-type: none">• Admin rights are not required to install this tool.• To install WAF as a folder in the IE Favorites Bar, download the favelet zip file and unzip the favelets to C:/Users/{your username}/Favorites/Favorites Bar• This folder can then be imported into other browsers by selecting the Import bookmarks option and selecting from IE. <p>Alternatively, users can import the wafbookmarks.html file available as a separate download from the WAF website, directly into Chrome or Firefox:</p> <ul style="list-style-type: none">• In Chrome, at the top right, click Menu, then Bookmarks, Import Bookmarks and Settings. In the "From" drop-down menu, select the wafbookmarks.html file. Select Choose File. Upload the saved wafbookmarks.html. Click Done.• In Firefox, click the Bookmarks button and select Show All Bookmarks to open the Library window. From the toolbar on the Library window, click Import and Backup, then choose Import Bookmarks from HTML. In the Import Bookmarks File window that opens, navigate to the wafbookmarks.html file and select the file. Click the Open button. The Import Bookmarks File window will close. Close the Library window.

	 <p>The screenshot shows a web browser window with two tabs: 'DHS Section 508 Complia...' and 'Homeland Security '. The address bar shows 'https://www.dhs.gov'. The browser's developer menu is open, listing various tools such as 'Frames', 'Greyscale', 'Headings Structure', 'JavaScript', 'List Downloadable Files', 'List Links', 'Show Data Tables', 'Show ImageMaps', 'Show Images', 'Show Lang Attributes', 'Show Titles', 'Skip Links', 'Toggle CSS', 'View Partial Source', 'ARIA', 'Fieldset-Labels', and 'Open All in Tabs'. The background of the browser shows the DHS website with the 'Homeland Security' logo and navigation links like 'How Do I?', 'Get Involved', and 'News'.</p>
Settings	None

Colour Contrast Analyzer

Official name	Colour Contrast Analyzer
Also Known As	CCA
Download from	https://www.dhs.gov/508-tools
Purpose for 508 testing	A standalone version of the Colour Contrast Analyzer included in WAT.
Developed by / Owned by	JUn, Steve Faulkner
Approved version	2.3.0.5
Installation guidance	<ul style="list-style-type: none"> This is a supplemental tool for use with WAF (included in WAF download). Admin rights are not required to install this tool. Unzip the files to desired directory.
Settings	None
What it should look like on your screen	

Version History

June 2, 2017

Initial version for Trusted Tester 4.0