

What is the Accessibility Tools Framework (ACTF)?

Kentarou Fukuda, IBM

Michael Squillace, IBM

- New Technologies, New Standards, and Lack of Tools

ACTF targets to provide building blocks for new technologies and standards.

<i>Evolution of runtime technologies</i>	<i>Current and coming accessibility standards and APIs</i>	<i>Existing accessibility check or repair tools</i>
Traditional HTML	Section 508 , WCAG 1.0& 2.0 , ISO/IEC Guide 71, ISO/DIS 9241-151, etc.	Bobby, WebKing, etc.
Web 2.0 (DHTML / AJAX)	Section 508, WCAG 2.0, WAI-ARIA , ISO/IEC Guide 71, ISO/DIS 9241-151, MSAA (IAccessible2)	?
Flash	Section 508 , ISO/IEC Guide 71, MSAA	LIFT, AccRepair for Flash
Eclipse RCP (SWT)	Section 508 , ISO/IEC Guide 71, SWT Accessibility, MSAA (IAccessible2)	?
OpenDocument Format (ODF)	Section 508 , ISO/IEC Guide 71, ODF 1.1 spec, ODF 1.2 spec.	?
• • •	• • •	????

Runtime technology innovation goes on.

Standards and APIs in **blue bold face** will be standardized or updated in 2008 to 2009.

Lack of tools

Accelerate adoption of new accessibility standards, and accelerate research and development activities for next generation accessibility tools.

- Provide an extensible and comprehensive framework for accessibility tools.
- Allow developers to build various types of accessibility tools on top of ACTF.
 - ◆ Alternative interfaces for Persons with Disabilities (PwD)
 - ◆ Assistive technology simulation tools
 - ◆ Compliance validation and usability visualization tools
 - ◆ Accessibility check plugins for IDEs
 - ◆ ...
- Contribute to other Eclipse projects
 - ◆ Cooperate with other Eclipse projects as closely as possible.
 - ◆ Help accessibility enhancement of other Eclipse projects.
 - ◆ Work towards making all development and authoring tools on Eclipse generate accessible artifacts.

- Project leads
 - ◆ Chieko Asakawa, IBM
 - ◆ Mike Paciello, The Paciello Group
- Mentors
 - ◆ Naci Dai (WTP PMC, etermination a.s.)
 - ◆ Ed Merks (Modeling PMC, IBM Corporation)
- Community
 - ◆ 7 Companies
 - ◆ 6 Non-profit organizations
 - ◆ 7 Academia
 - ◆ 2 Open source communities
 - ◆ 2 International consortiums
- Committers
 - ◆ 21 committers from 9 organizations

•Company (7)

- ◆ Actuate Corporation, US
- ◆ Adobe Systems Incorporated, US
- ★ IBM Corporation, US
- ◆ SAP AG, Germany
- ◆ SAS Institute Inc., US
- ◆ Technosite (ONCE Foundation), Spain
- ★ The Paciello Group, US

•Non-profit Organization (6)

- ◆ BrailleNet, France
- ◆ Japan Braille Library, Japan
- ◆ National Center for Accessible Media (NCAM), Media Access Group at WGBH, US
- ◆ Royal National Institute of Blind People (RNIB), UK
- ◆ The Carroll Center for the Blind, US
- ◆ Vision Australia, Australia

•Academia (7)

- ★ Center for Mathematics and Computer Science, Netherlands
- ◆ SIG-Universal Access to the Internet (UAI), Internet Technology Research Committee (ITRC), Japan
- ★ State University of New York at Stony Brook, US
- ◆ Tokyo Institute of Technology, Japan
- ★ University of Manchester, UK
- ★ University of Toronto, Canada
- ★ University of Washington, US

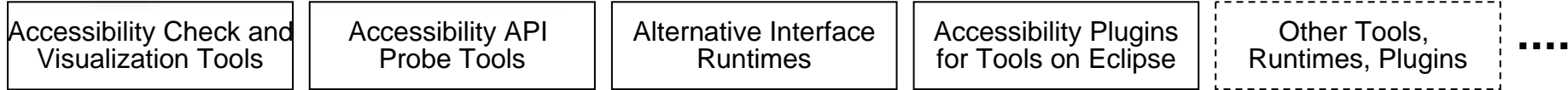
•Open Source Community (2)

- ◆ BIRT Project, Eclipse Foundation
- ◆ Mozilla foundation, US

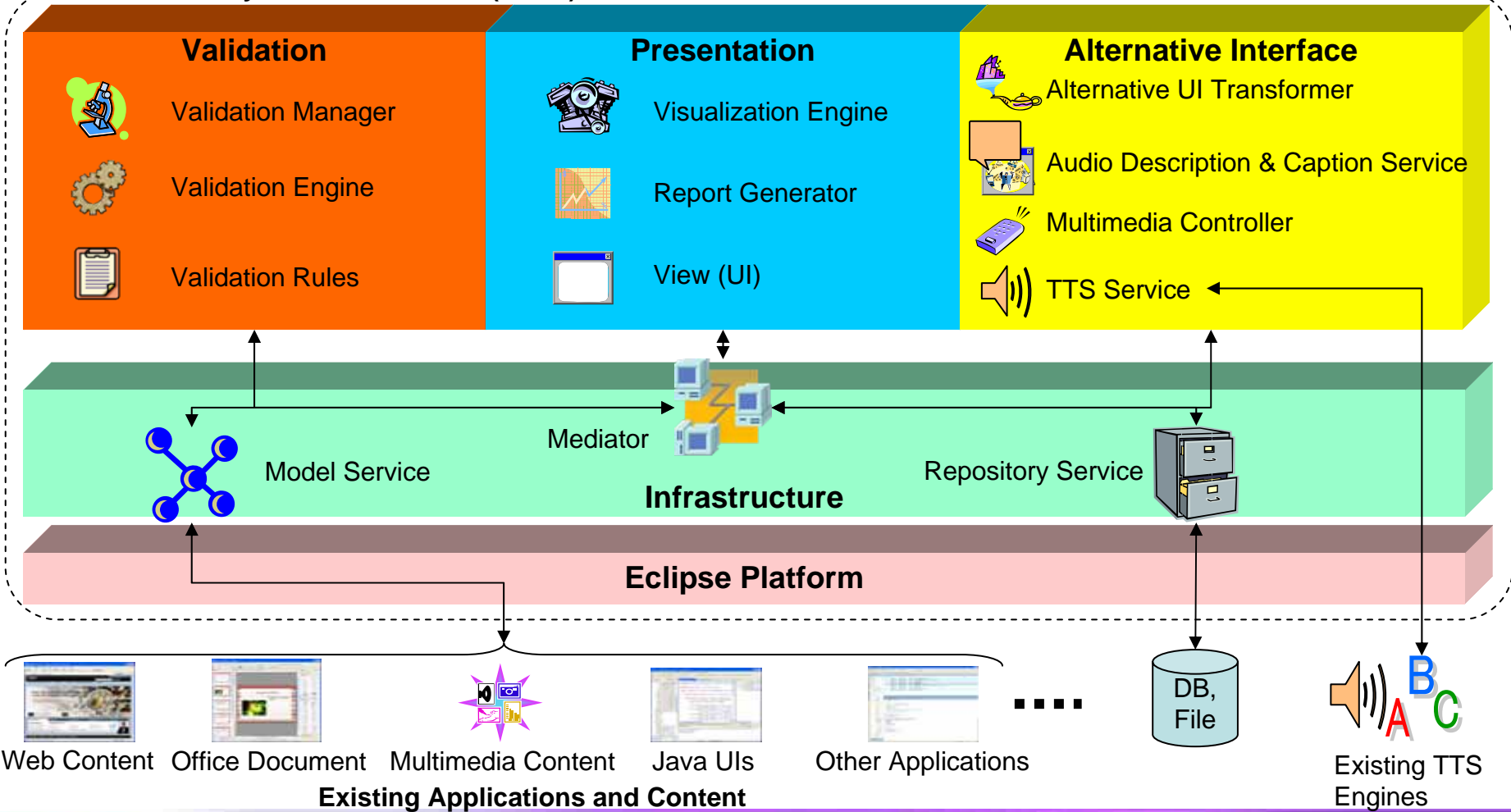
•International Consortium (2)

- ★ International Webmasters Association/HTML Writers Guild (IWA/HWG)
- ★ Web Accessibility Tools Consortium (WAT-C)

Tools and Runtimes on top of ACTF



Accessibility Tools Framework (ACTF)



- Provide extensible accessibility validation features with initial support for:
 - ◆ Accessibility APIs such as Microsoft Active Accessibility (MSAA) and IAccessible2.
 - ◆ Eclipse SWT
 - ◆ Flash
 - ◆ HTML
 - ◆ Java Swing
 - ◆ OpenDocument Format (ODF)
- Developers can customize validation rules by using XML configuration files or through Java APIs.

Join the long talk!

The Accessibility Tools Framework Validation Engine

Thursday, 14:30, Room 207

- Eclipse Rich-Client Product (RCP) application
 - ◆ Requires only a Java Runtime Environment (JRE) (5.0 or later)
 - ◆ Combines inspection, exploration, and event-monitoring functionality
 - ◆ Is fully accessible:
 - passes IBM's own internal guidelines for accessible products and services
 - Designed and used by a totally blind developer
- Built upon components of the ACTF as the result of a requirement for testing by IBM's own Software Group
 - ◆ Supports evaluation of both MSAA- and IAccessible2-enabled applications
 - ◆ Plan to support evaluation of Java Accessibility API and AT-SPI on Linux

- Three views
 - ◆ Explorer View – for navigating among the hierarchy of accessible objects
 - ◆ Properties View - for viewing properties (both simple and nested) of accessible objects and invoking methods on these objects
 - ◆ Event Monitor - for monitoring the events fired by accessible objects
- Inspecting/monitoring an application
 - ◆ On startup, Explorer View is populated with all top-level windows (except AccProbe)
 - ◆ Navigate through objects by using the view as a standard tree or via tracking
 - ◆ Properties View is automatically updated
 - ◆ Window being monitored is the top-level window that is “selected” in Explorer
 - ◆ Properties and events displayed depend upon accessibility architecture of underlying accessible object

- Provide a visual representation of the PwD users' usability of content or applications.
 - ◆ Blind usability visualization engine
 - ◆ Image simulation engine
 - Low vision simulation
 - Presentation simulation
- Objective
 - ◆ Provide a tool to **learn** about real accessibility issues
 - Encourage authors/designers to check accessibility whenever they are authoring content.
 - ◆ Provide a tool to effectively **demonstrate** accessibility issues
 - Encourage website owners to renovate their pages to be accessible.

Join the long talk!

ACTF Visualization Engines and Components for Alternative Interfaces
Thursday, 11:10, Room 207

Large Difference between Sighted and the Blind

Sighted



Eye-movement-based exploration with visual cues

Blind

[IBM.]
 [Skip to main content.]United States
 (Start of form 1.)
 [Text.]
 [Search: Image Button.]
 (End of form 1.)
 Home | Products & services | Support & downloads | My account
 Select country / region
 (Start of form 2.)
 (Start of select menu with 10 items.)
 Select one[Selected.]
 Canada[Off.]
 China[Off.]
 France[Off.]
 Germany[Off.]
 Italy[Off.]
 Japan[Off.]
 United Kingdom[Off.]
 United States[Off.]
 Full country list[Off.]

Keyboard-based exploration without visual cues

- Functions

- ◆ **Visualization of blind usability**

- Reaching time and reading text visualization
- Integration with a voice browser engine

- ◆ **Simulation of low vision**

- Weak eyesight, color vision deficiencies, cataracts.
- Detect color combination problems.

- ◆ **Presentation simulation**

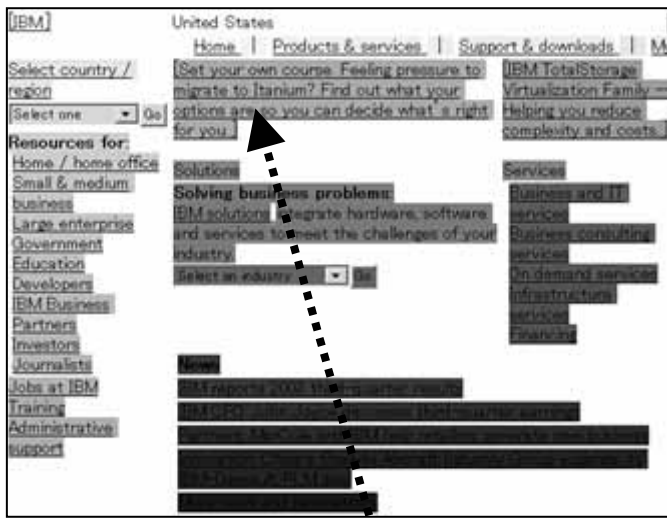
- Check visibility of presentation slides in large conference rooms.

- ◆ **Checking compliance items from the usability point of view**

- Appropriateness of ALT texts and skip-navigation links, etc.
- WCAG, Section 508, IBM CI162, JIS, etc.

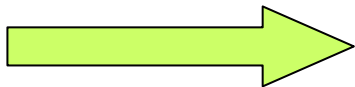


- Objective: “Visualize the non-visible blind usability”
- Approach
 - ◆ Reaching time visualization
 - Simulate voice browser and users’ behavior to calculate reaching time to each element in a page
 - Present the reaching times to each part of a page by using background colors.
 - ◆ Reading text presentation
 - Presenting the text information extracted or generated by standard voice browsers, while retaining the fundamental visual layouts.

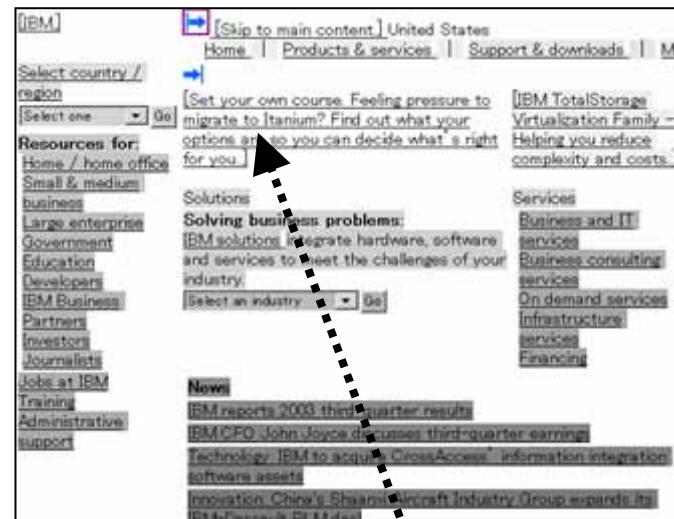
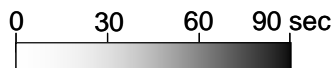


More than **45 seconds** to get to the main content.

Insert “Skip-to-main” link



Reaching time color:



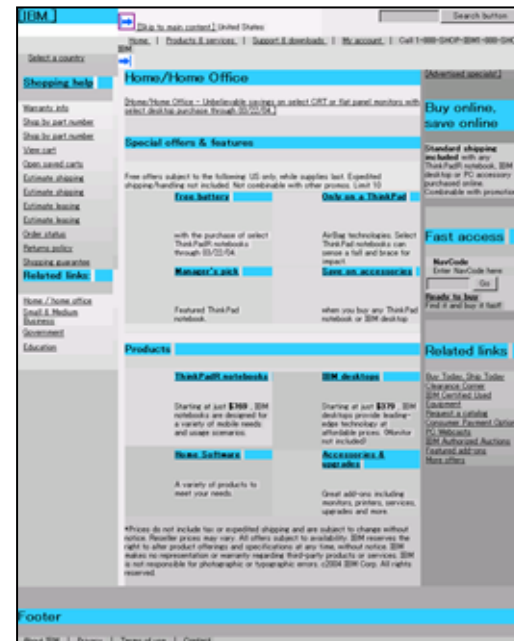
Only **3 seconds** to get to the main content.

eclipseCON™ 2008 Blind Usability Visualization Example

Original



With heading Tags



Inaccessible



With skip-link



Easy to find main contents

- Headers can use as TOC
- Easy to navigate through the page



Simulating the experience of users who have low vision

The original Web page which people without low vision view.

Summary Report

Some parts of this page use color combinations that might be difficult to distinguish from each other.

Too small and fixed size font: 2

Low vision simulation. In this example, Color Vision Deficiency (Deutan) and cataract are simulated.

Problem map that indicates the positions of problems.

Setting panel (Eyesight, color vision deficiencies, crystalline lens transparency)

Preferences - Low Vision

Eyesight: 35/200, 30/40, 20/20

Color Vision Deficiency: Deutan

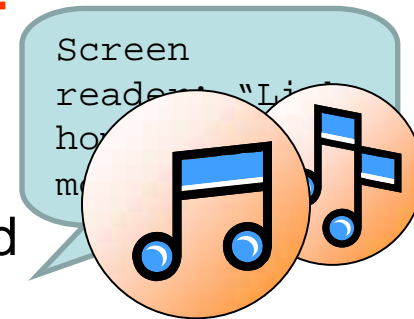
Original and After simulation color calibration charts.

- Provide middleware components for developing accessible alternative user interfaces.
 - ◆ **Multimedia controller**
 - Make multimedia content controllable with unified shortcut keys even if the content does not support keyboard operations.
 - Allow independent adjustment of each sound source.
 - ◆ **Audio description & caption service**
 - Provide audio descriptions and captions to multimedia content by using text metadata.
 - ◆ **Text-to-Speech service**
 - Provide interface to use TTS from the framework. (Currently, we support SAPI.)
 - ◆ **Alternative UI transformer**
 - Support improving the navigating and operating environments by using external metadata without changing the existing applications or content.

- The emergence of multimedia content
 - ◆ Entertainment, News, Education, E-government, ...
 - ◆ **Most of these content are inaccessible for the blind...**

- Major issues

1. Audio of a streaming video **interferes** with a synthesized assistive voice.
2. Streaming videos do not provide **audio descriptions** for non-visual users.
3. **Dynamically changing visual interfaces** can't be perceived non-visually. (E.g. mouse only operation)
4. The **work** to make multimedia content accessible for screen readers is too expensive.



1. Direct audio control

- ◆ Allow users to increase or lower the volume, stop or play, and control audio speed by using simple keyboard commands.

2. User interface simplification

- ◆ Structurally simplify interfaces by converting dynamic visual interfaces into static text-based interfaces

3. Video descriptions with text

- ◆ Infrastructure to provide video descriptions at low cost

4. Workload reduction

- ◆ Drastically reduce costs to make existing Flash and AJAX content accessible based on new metadata mechanisms.

“The first multimedia browser for the blind”



- Exemplary tools are downloadable now!
 - ◆ AccProbe (Accessibility testing and debugging tool for applications.)
 - ◆ aDesigner (Accessibility check and usability visualization tool.)
 - ◆ aiBrowser (Alternative accessible interface for multimedia browsing.)
- Release 0.1 will be downloadable in 2Q 2008

Check it out and get involved!!

<http://www.eclipse.org/actf>

Thank you!

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The Accessibility Tools Framework Validation Engine

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Backup



- Release plan
 - ◆ 2Q, 2008: Build 0.1 release
 - ◆ 3Q, 2008: Milestone build 0.1 M1 release
 - ◆ 4Q, 2008: Build 0.2 release
 - ◆ 1H, 2009: Projected first release
- Enhancements currently under consideration include:
 - ◆ Refinement of APIs
 - ◆ Documentation
 - ◆ Support new accessibility guidelines (e.g., WCAG 2.0, WAI-ARIA, etc.)

Visualize the experience of blind users

The screenshot shows the aDesigner interface with a 'Blind' visualization of the IBM website. The interface includes a 'Visualize' button, a 'Blind' status indicator, and a 'Summary report' section. A table at the bottom lists accessibility errors.

All Errors (184)	H	C	LI	N	WCAG	Sect.	JS	Line	Problem Description
Error (1)					P3: 13.6	e	5.2(a)	337	Consider providing more intra-page links or
User Check (89)					P3: 10.5		5.3(g)	226	Include non-link, printable characters betwe
Information (94)					P3: 10.5		5.3(g)	285	Include non-link, printable characters betwe
					P3: 10.5		5.3(g)	297	Include non-link, printable characters betwe
					P2: 33		5.2(b)	66	Use style sheets to control layout and pres
					P2: 33		5.2(a)	70	Use style sheets to control layout and pres

Text content that will be read out by a voice browser is visualized in this area.

Lighter background color indicates that it takes less time to reach there by using voice browsers.

The balloon message shows the exact time to reach the element on which the mouse cursor is placed.

Darker background color indicates that it takes more time to reach there by using voice browsers.

The overall page rating is calculated from:

- 1: Compliance to accessibility guidelines
- 2: Navigability (ease of navigation within the page)
- 3: Listenability (ease of listening)

The original Web page which sighted people view.

Summary Report

Detailed Report

The problems of the selected category are listed.



eclipseCON™ 2008 aDesigner - Presentation Simulation

Check visibility of presentation slides in large conference rooms

The screenshot shows the aDesigner software interface with two presentation windows. The left window is titled 'Small Meeting Room' and the right window is titled 'Large Meeting Room'. Both windows display a slide titled 'Pie Chart Example' with a pie chart and a list of items: 'Large font (32)', 'Medium font (24)', and 'Small font (16)'. A red dashed box highlights the 'Presentation' tab and the room selection buttons: 'Small Meeting Room', 'Large Meeting Room', and 'Auditorium'. A red arrow points from the 'Auditorium' button to the 'Auditorium' window below. The 'Auditorium' window shows the same slide but with a much smaller font size, illustrating the impact of room size on readability. The interface also includes a menu bar (File, Visualization, Favorites, Window, Help), a toolbar, and a status bar.

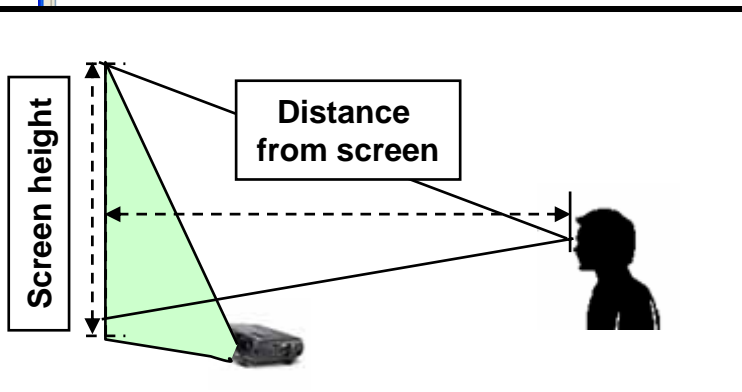
Small Meeting Room



Large Meeting Room



Auditorium



eclipseCON™ 2008 aDesigner - Visual Synchronization

The screenshot shows the aDesigner interface with a web browser window displaying the IBM Business services page. A yellow callout box points to a specific error in the 'Summary report' table, which is highlighted in blue. A blue dashed oval highlights the corresponding error position on the web page, which is also highlighted in red. A tooltip indicates the error is '23 seconds from top' and describes the problem as 'No alternative text for an image button.' The error list table is as follows:

C...	Li...	N...	WCAG	Secti...	JIS	IBM...	Line	Problem Description
			P1: 6.3	I	5.4(e)	6		This page has more than ten links wh
C	L	-5						
C	L	-2						
C	L	-2	P1: 1.1	a, n	5.4(a), ...	7	107	No alternative text for an image butto
C	L	-2	P1: 1.1	a, n	5.4(a), ...	7	135	No alternative text for an image butto
C	L	-2	P1: 1.1	a, n	5.4(a), ...	7	154	No alternative text for an image butto
C			P2: 12.3		5.3(b)	7	85	Consider grouping long lists of select
C			P2: 12.3		5.3(b)	7	116	Consider grouping long lists of select

When a user selects an error in the problem list, the corresponding error position is highlighted.



- A tool that enables multimedia content to be enjoyed by people with visual impairments -

1. Enable users to adjust volume of an individual source
-to identify assistive voice
-to listen to different sound sources

IBM TV
IT Solutions



Synthesized assistive voice of screen reader



Behind the speaker, a picture of Jazz ...

3. Enables users to control multimedia by using pre-defined shortcut keys.

- Play: Ctrl+P
- Stop: Ctrl+S
- Volume up: Ctrl+J
- Volume down: Ctrl+K
- ...

29 button
31 button

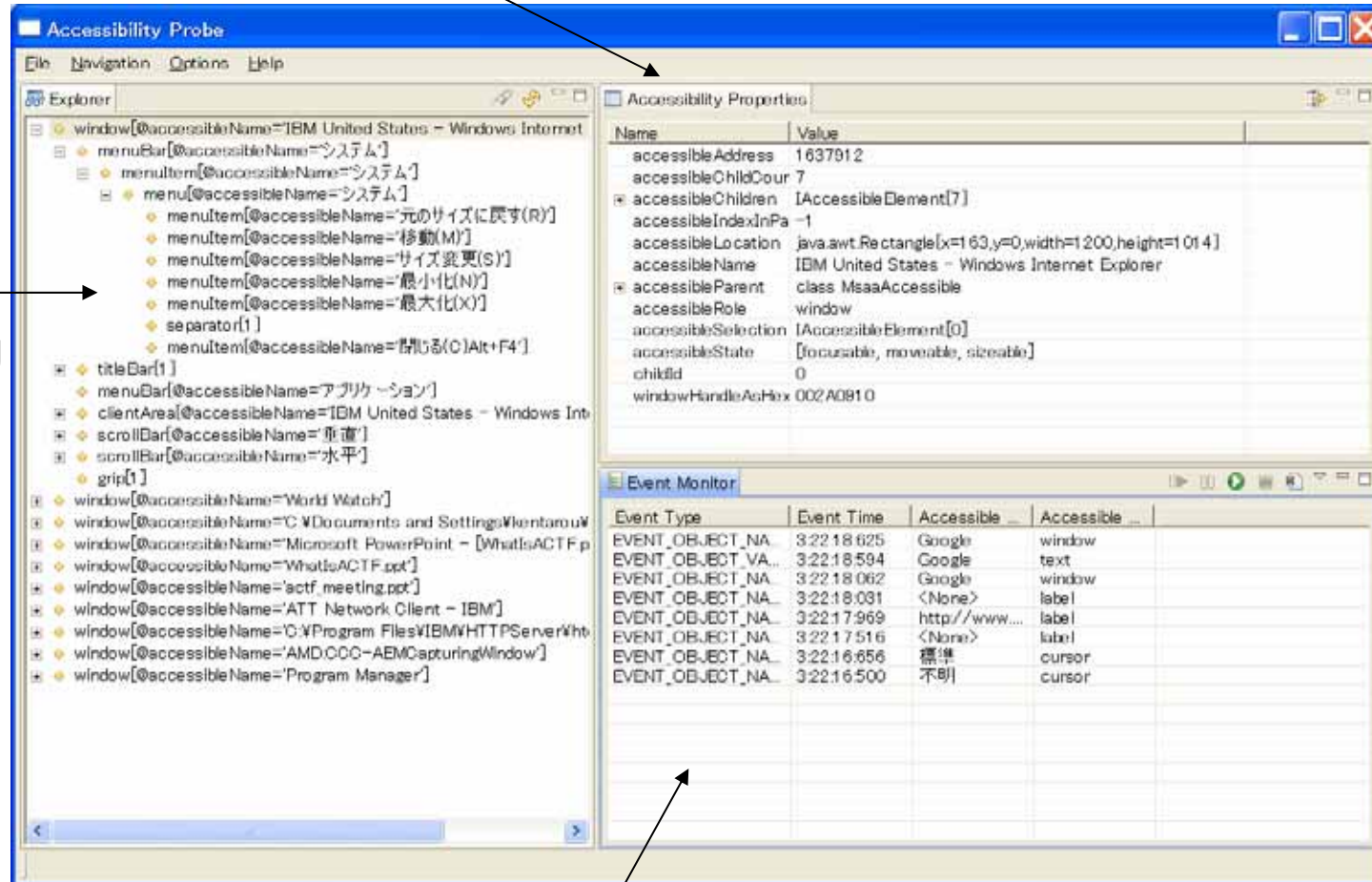


Go to next chapter
Play previous movie

2. Provide audio caption by using text metadata & TTS

4. Provide alternative text information by using external metadata.

Properties View - for viewing properties (both simple and nested) of accessible objects and invoking methods on these objects



Explorer View - for navigating among the hierarchy of accessible objects

Event Monitor - for monitoring the events fired by accessible objects