What is the Accessibility Tools Framework (ACTF)?

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Background

- New Technologies, New Standards, and Lack of Tools

Evolution of runtime technologies	***Current and coming accessibility standards and APIs***	***Existing accessibility check or repair tools***
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.	?
⋮	⋮	????

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

Runtime technology innovation goes on.

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

Lack of tools

Project Goal

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.

ACTF Organization

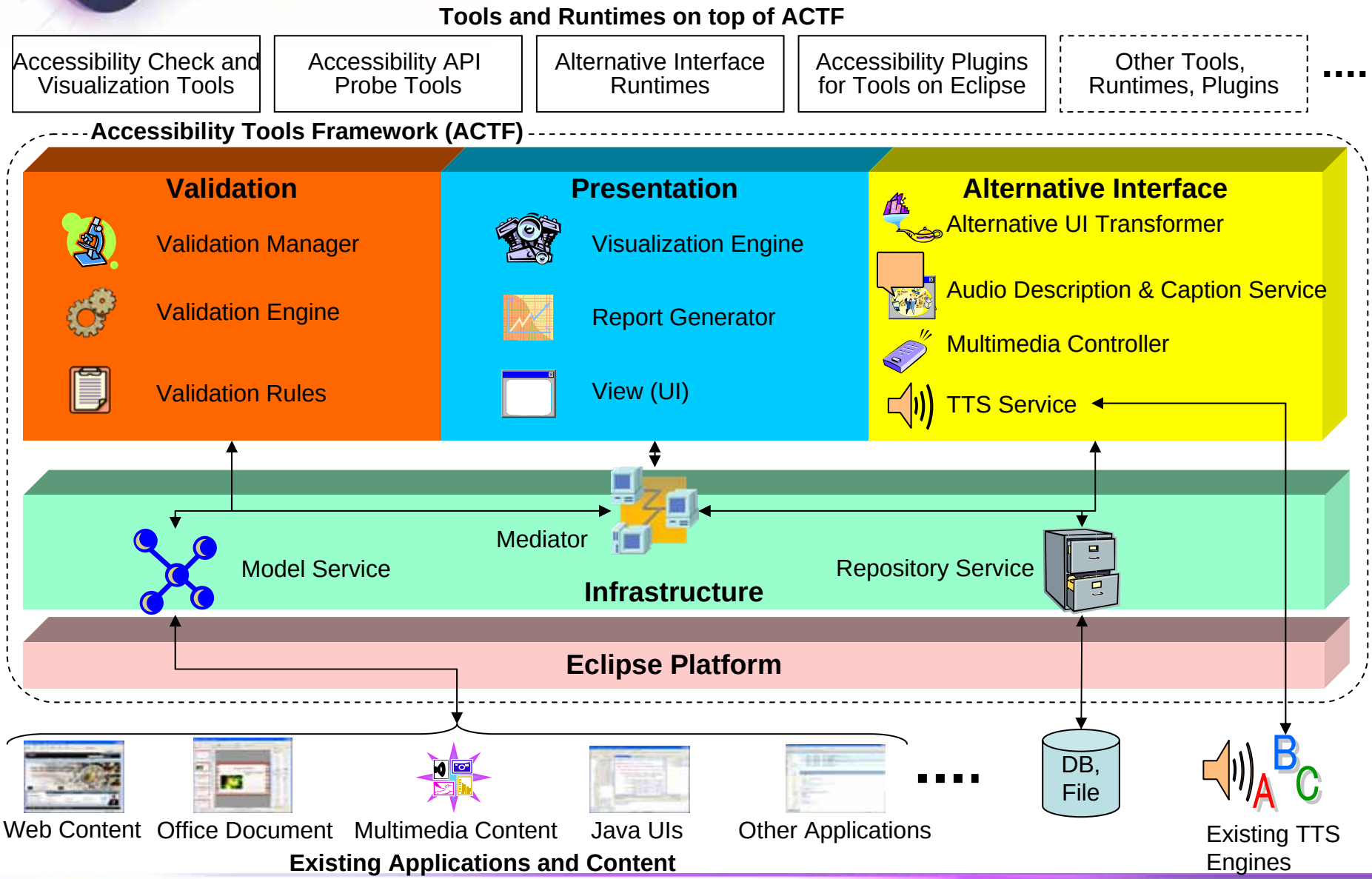
- Project leads
  - Chieko Asakawa, IBM
  - Mike Paciello, The Paciello Group
- Mentors
  - Naci Dai (WTP PMC, eteration a.s.)
  - Ed Merks (Modeling PMC, IBM Corporation)
- Community
  - 7 Companies
  - 6 Non-profit organizations
  - 7 Academia
  - 2 Open source communities
  - 2 International consortiums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

eclipseCON 2008 ACTF Community

★ Committers

- **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)

Architecture



ACTF Validation Engine

- 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

Accessibility Probe (AccProbe)

- 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 IAcccessible2-enabled applications
  - Plan to support evaluation of Java Accessibility API and AT-SPI on Linux

AccProbe Overview

- 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

ACTF Visualization Engines

- 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

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.]

Eye-movement-based exploration with visual cues

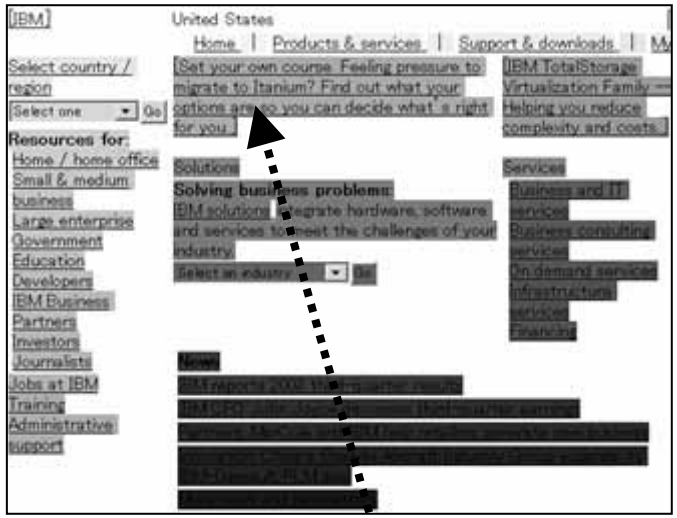
Keyboard-based exploration without visual cues

ACTF aDesigner (Accessibility Designer)

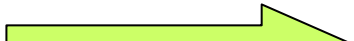
- Functions
  - **Visualization of blind usability**
    - Reaching time and reading text visualization
    - Integration with a voice browser engine
  - **Simulation of low vision**
    - Weak eyesight, color vision deficiencies, cataracts.
    - Detect color combination problems.
  - **Presentation 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.

Blind Usability Visualization

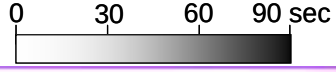
- Objective: "Visualize the non-visible blind usability"
- Approach
  - Reaching time visualization
    - Simulate voice browser and users' behavior to calculate reaching time to each element in a page
    - Present the reaching times to each part of a page by using background colors.
  - Reading text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

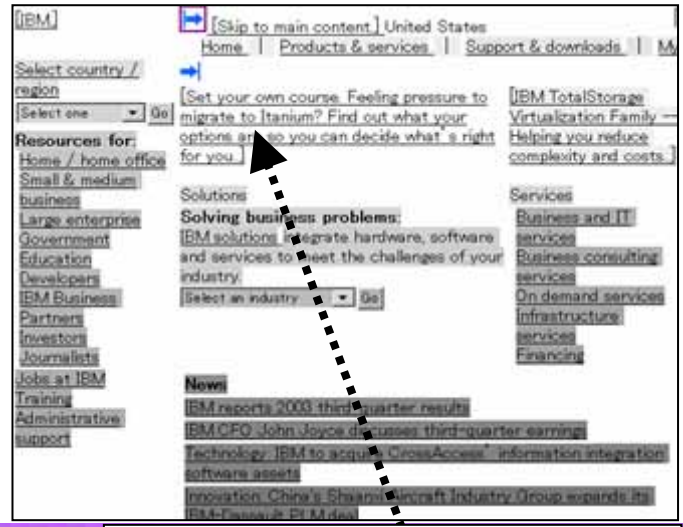


Insert "Skip-to-main" link



Reaching time color:





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

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

Blind Usability Visualization Example

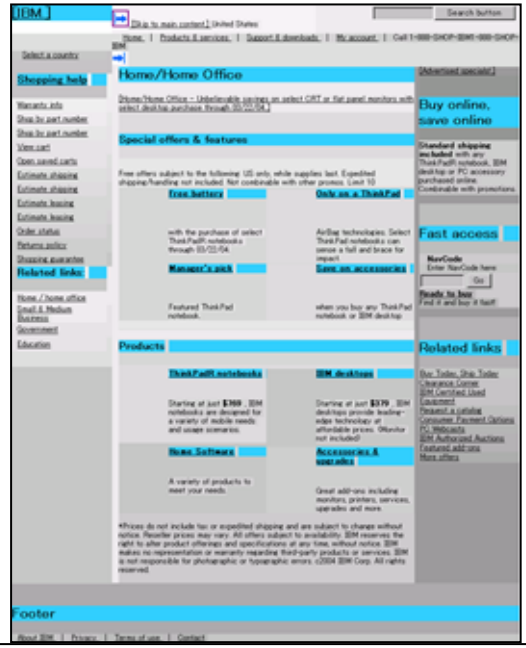
Original

Inaccessible

With skip-link

Easy to find main contents

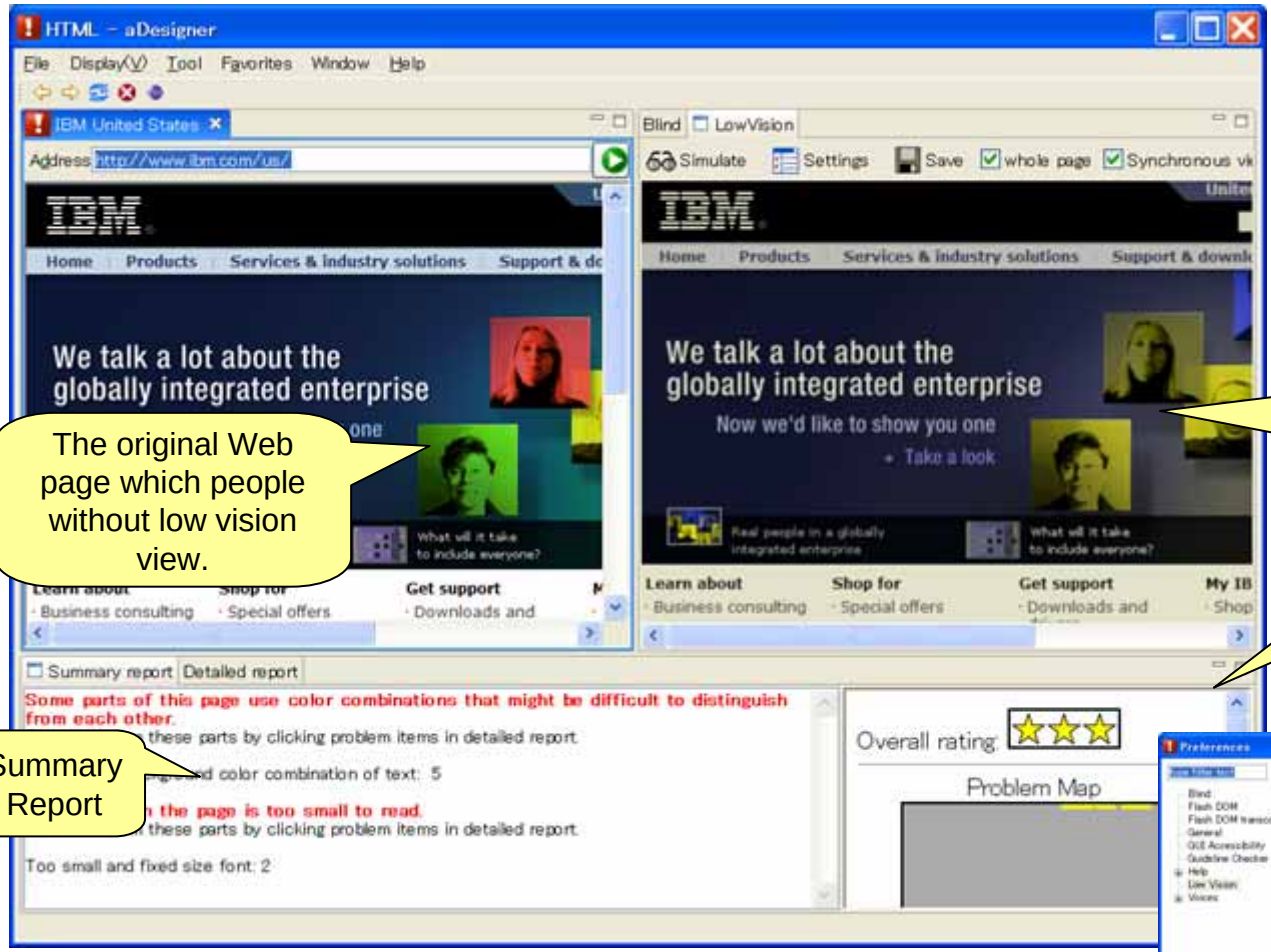
With heading Tags



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

Low Vision Simulation

Simulating the experience of users who have low vision



The original Web page which people without low vision view.

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

Problem map that indicates the positions of problems.

Summary Report

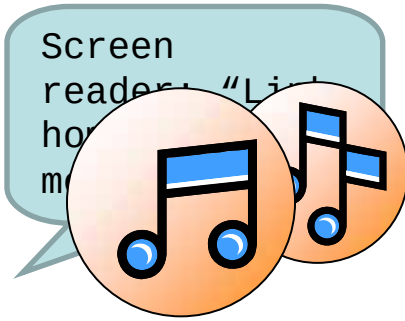
Setting panel
(Eyesight, color vision deficiencies, crystalline lens transparency)

ACTF Alternative Interface Part

- 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.

Accessibility Issues of Multimedia 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.

ACTF aiBrowser

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"

ACTF is available

- 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

Q&A

Thank you!

Join the long talks!

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Thursday, 11:10, Room 207

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Backup

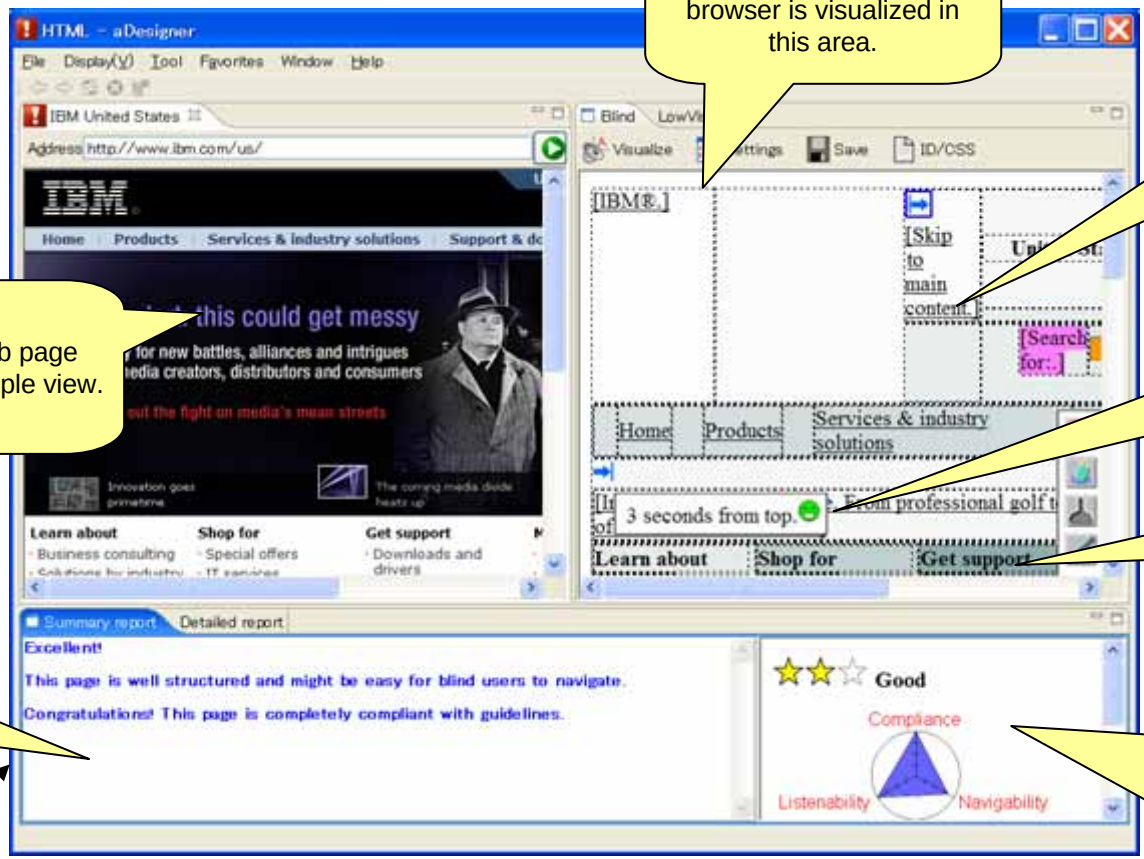
Schedule

- 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.)

aDesigner - Blind Visualization

Visualize the experience of blind users



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 original Web page which sighted people view.

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.

Summary Report

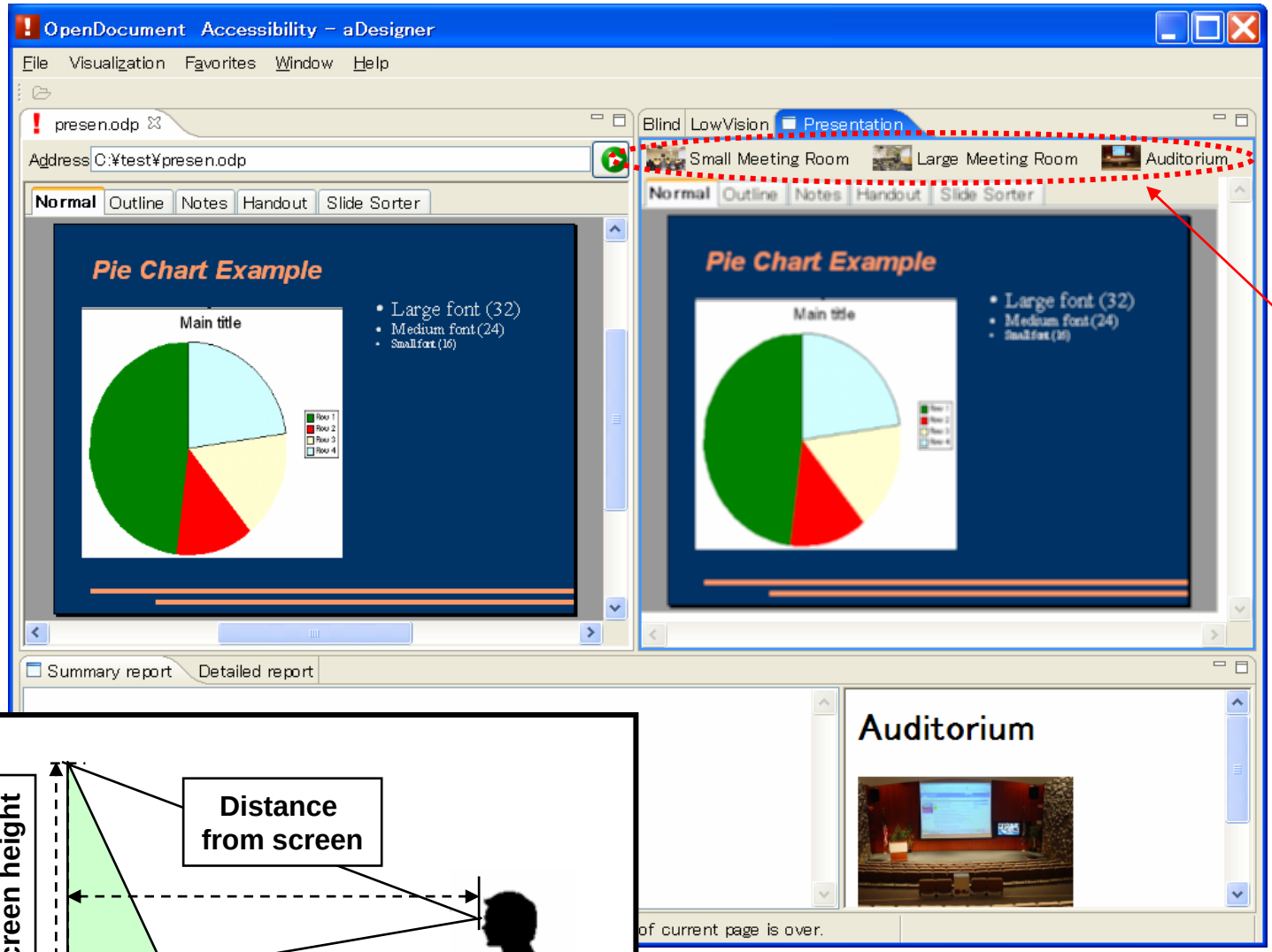
The overall page rating is calculated from:
1: Compliance to accessibility guidelines
2: Navigability (ease of navigation within the page)
3: Listenability (ease of listening)

Detailed Report

The problems of the selected category are listed.

aDesigner - Presentation Simulation

Check visibility of presentation slides in large conference rooms

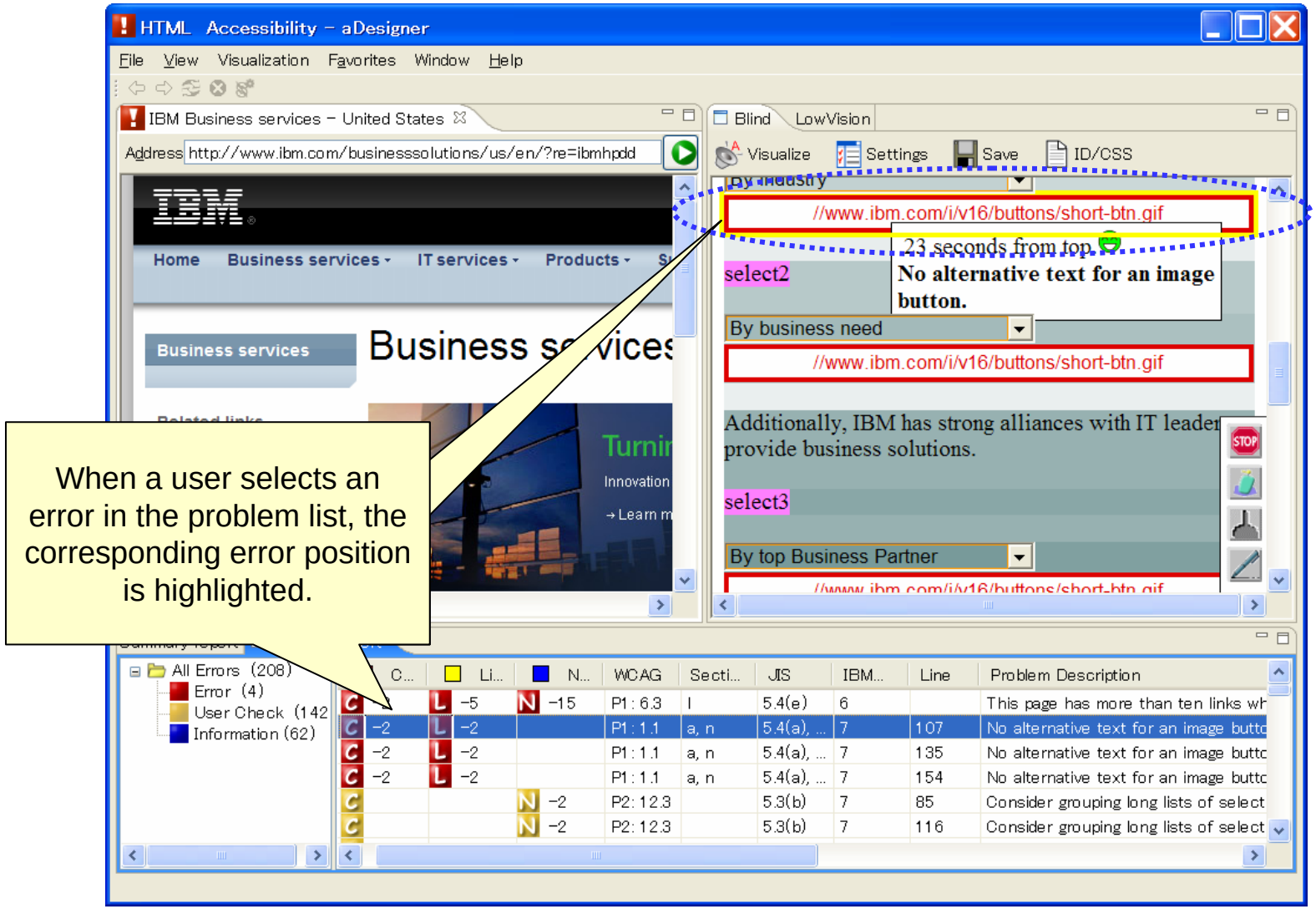


Small Meeting Room

Large Meeting Room

Auditorium

aDesigner - Visual Synchronization



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

aiBrowser

- 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
...
This figure shows...

Synthesized assistive voice of screen reader

2. Provide audio caption by using text metadata & TTS

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

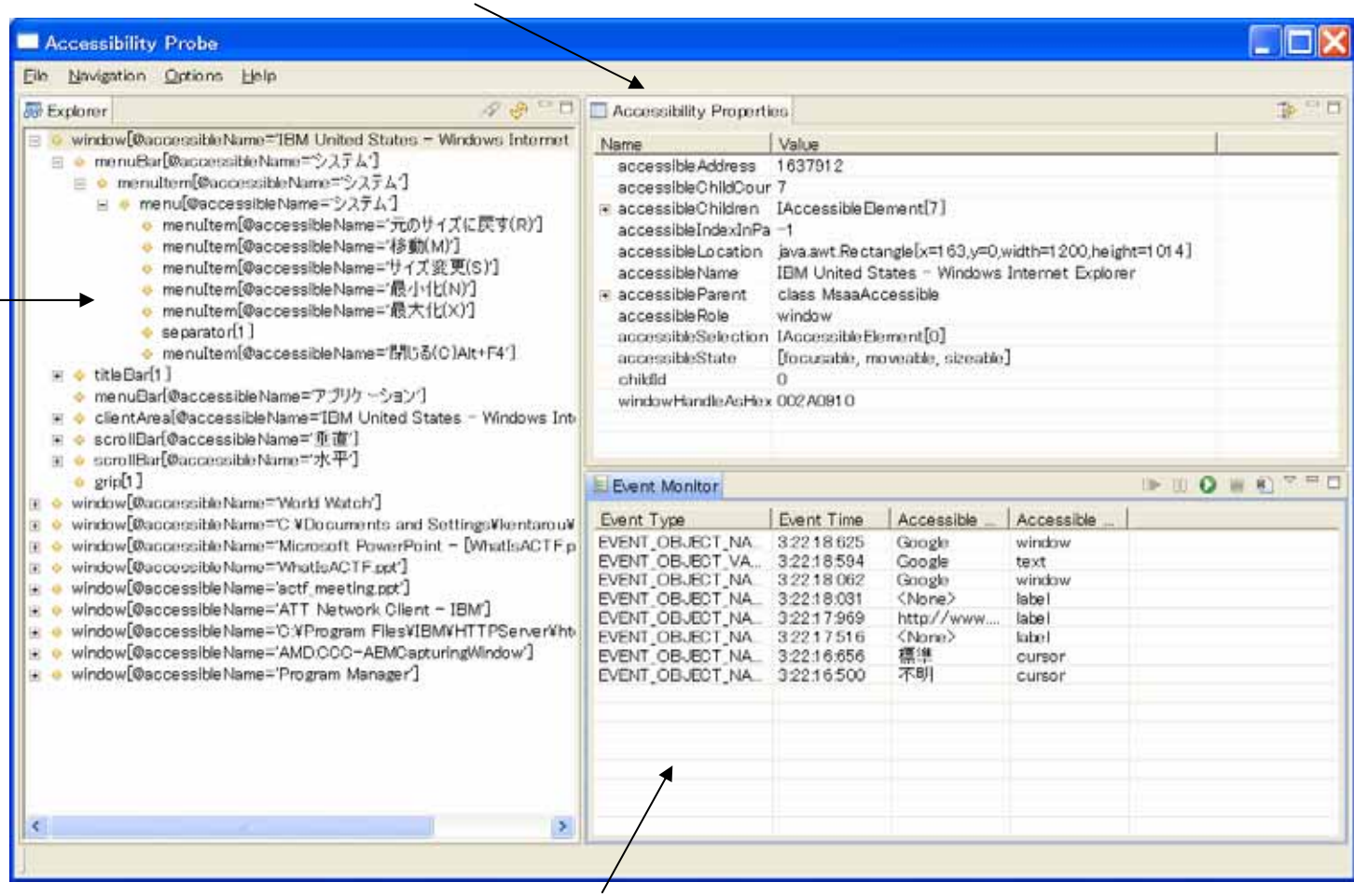
Play:	Ctrl+P
Stop：	Ctrl+S
Volume up：	Ctrl+J
Volume down：	Ctrl+K
...	

4. Provide alternative text information by using external metadata.

AccProbe

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

