



Web2cToGo: Bringing the Web2cToolkit to Mobile Devices

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Outline

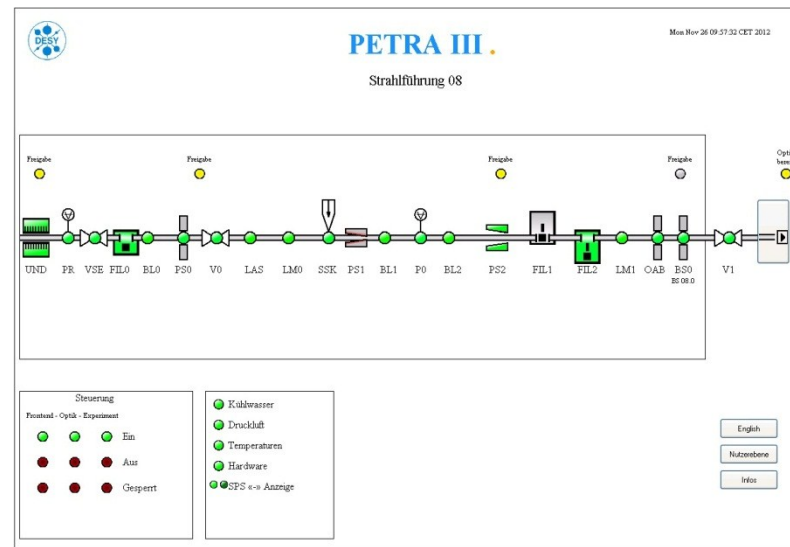
- Introduction to Web2cToolkit
- New: Web2cToGo project
 - Web2cToGo Web-Desktop
 - Web-Desktop navigation and application control by
 - Touch gestures
 - Spoken commands (speech recognition)
 - Project status
 - Outlook

Web2cToolkit

- Framework for **Web-based Rich Client Control System Applications**
- Implemented Web services:
 - **Web2c Synoptic Display Viewer:** Interactive synoptic live display to visualize and control accelerator or beam line equipment
 - **Web2c Archive Viewer:** Web form to request data from a control system archive storage and to display the retrieved data as a chart or table
 - **Web2c Messenger:** Interface to E-Mail, SMS and Twitter
 - **Web2c Logbook:** Electronic logbook with auto-reporting capability
 - **Web2c Manager:** Administrator's interface to configure and manage the toolkit
 - **Web2c Editor:** Graphical editor to generate and configure synoptic displays
 - **Web2c Gateway:** API to all implemented control system interfaces (HTTP-gateway)

Web2cToolkit Services

- **Web2c Synoptic Display Viewer**
- *Web2c Archive Viewer*
- *Web2c Messenger*
- *Web2c Logbook*
- *Web2c Manager*
- *Web2c Editor*
- *Web2c Gateway*

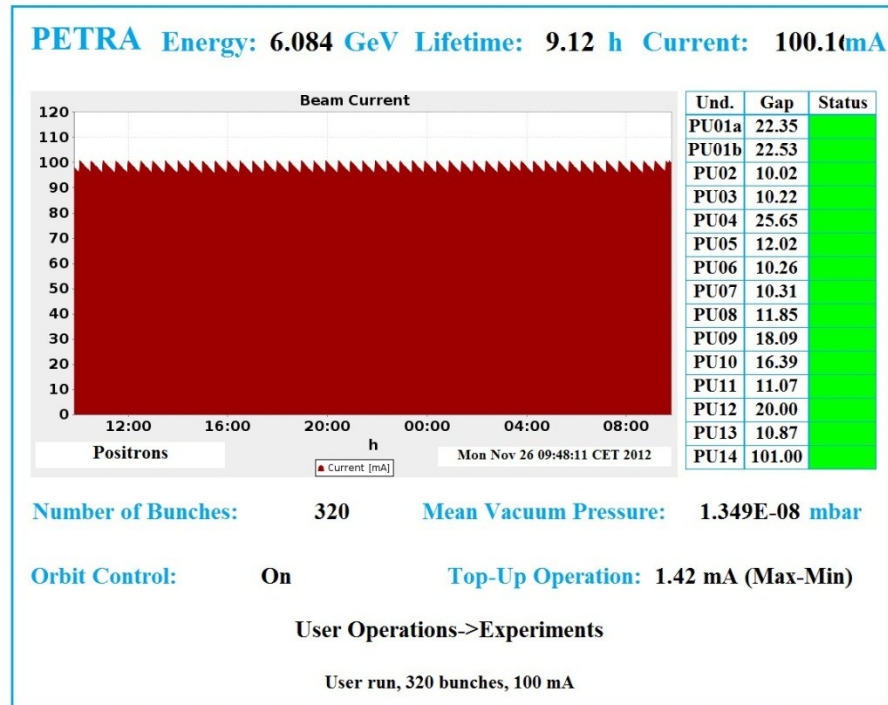


Continuously updated (O(1s))

Animated widgets

Web2cToolkit Services

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Live-data
plots

Web2cToolkit Services

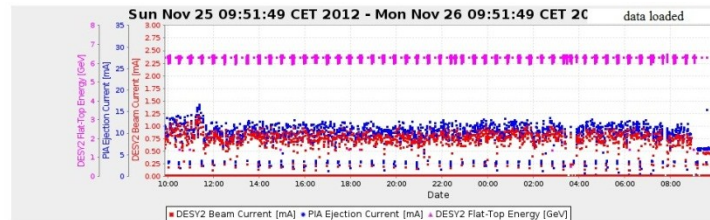
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Zooming option (“optical”)

Web2cToolkit Services

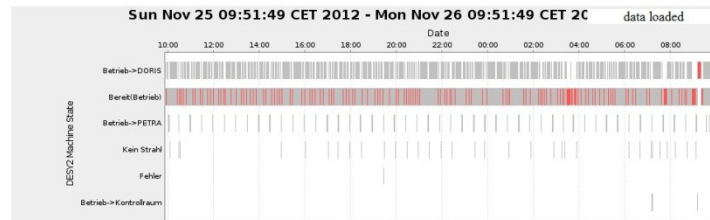
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shift backward (24h)

shift forward (24h)

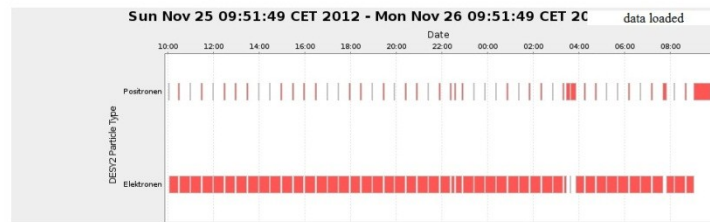
reset zoom / shift



shift backward (24h)

shift forward (24h)

reset zoom / shift



shift backward (24h)

shift forward (24h)

reset zoom / shift

24-h histories with common zooming option

Web2cToolkit Services

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Send Message Page

From:

To:

Subject:

Message:

SMTP (sending e-mail or SMS message on user request)

(automatic status publishing)

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Logbook: Demo

Viewer Reporter

reinhard.bacher@desy.de |< < Refresh Clear > >| New Edit Delete

Title:

Author: Category: Hardware Software Importance: Error Info

Created: Modified:

Send E-Mail

Demo_11_2012

Enter text here ...

Text only

Auto-reporting option

Web2cToolkit Services

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Web2cManagerServlet Page

Toolkit Configuration | Toolkit Diagnostics | Toolkit Performance | Toolkit Debug & Logging | Twitter Service | SMTP Service | Logbook Service

Initialization Files

Type: Name:

web2c
web2cMessengerTwitter
web2cMessengerSMTP
web2cLogbook
web2cUserRegistry

Initialization Parameters

Salutation:

EarlyRegistering:

Web2cSynopticDisplayDemo.xml
Web2cToGoDemo.xml
Web2cAll.xml
common/interlockoverview.xml
common/livestatus.xml
common/overview.xml
common/currentHistoryAll.xml
common/interlockoverviewsmall.xml

User Registry

Registered Users: Name:

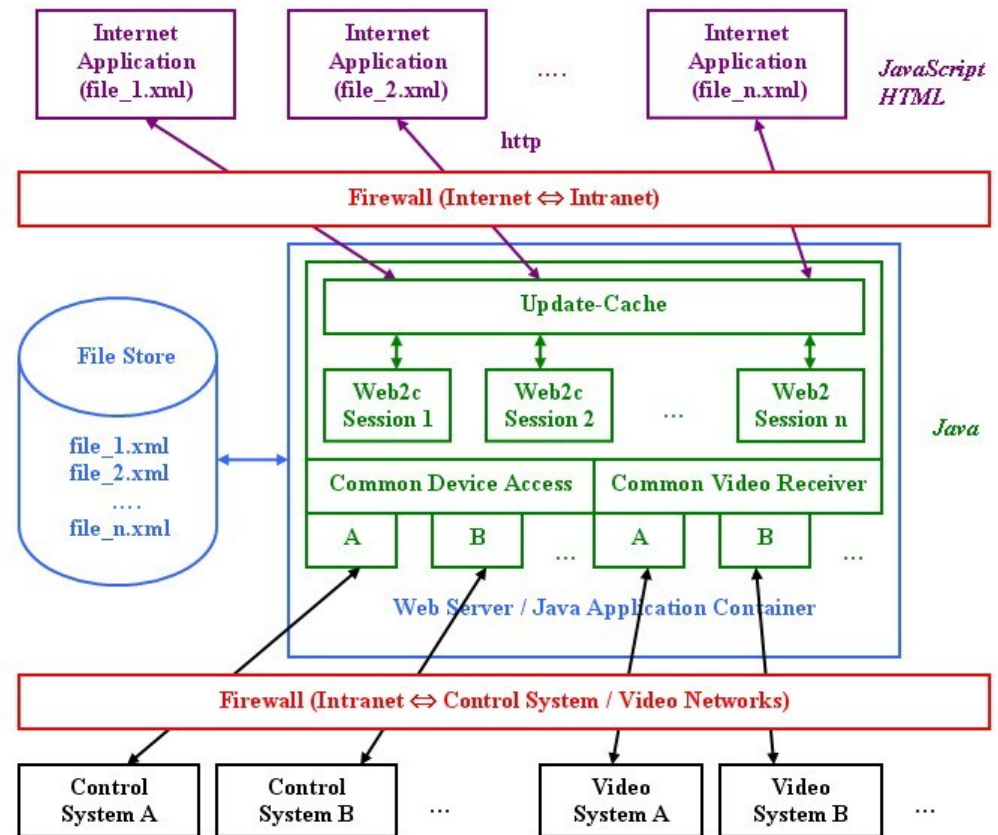
bacher
guest
bkr
exp
HASYVINT

Password:

Web2cToolkit Basics

- **Web-Client:**
 - Runs in Web-browser (compatible with all major implementations including mobile versions)
 - HTML, CSS, AJAX (**A**synchronous **J**avaScript **A**nd **X**ML), Google Web Toolkit
 - No plugins required
 - Multi-language support
- **Web-Server:**
 - Java servlet container
 - Java servlets
 - Session management
 - File store
- **User access:**
 - Guest users / registered users, non-privileged users / privileged users (expert, supervisor)
 - Secure user authentication / authorization
 - Access restriction based on IP address and/or user privilege verification
- **Control systems interfaces (set, monitor, history):**
 - TINE
 - DOOCS (EPICS and TANGO via DOOCS)
- **Video system interfaces:**
 - TINE
 - RTP (JPEG video frames)

Example: Web2c Synoptic Display Viewer



Web2cToGo

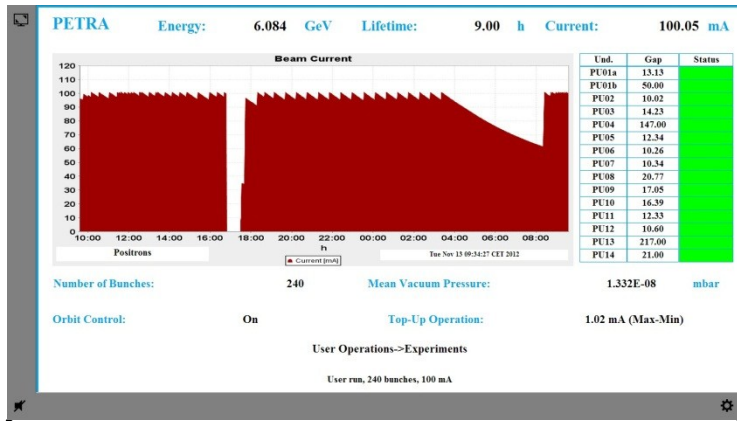
- Novel Web2cToolkit service
- Especially designed for mobile devices (N.B.: with limited features also suitable for desktop computers)
- Platform-dependent app (Android, iOS, ...)
 - embedding instances of all kinds of Web2cToolkit clients (max. 15 instances)
 - providing access to device specific features (local file system, microphone, ...) through PhoneGap API (Cordova ver. 1.9.0)
 - providing navigation and application control by single- or multi-touch gestures and spoken commands
 - capable to handle multi-page Web2cToolkit client applications



Web2cToGo Web-Desktop
client with Application
Explorer window

Web2cToGo Web-Desktop

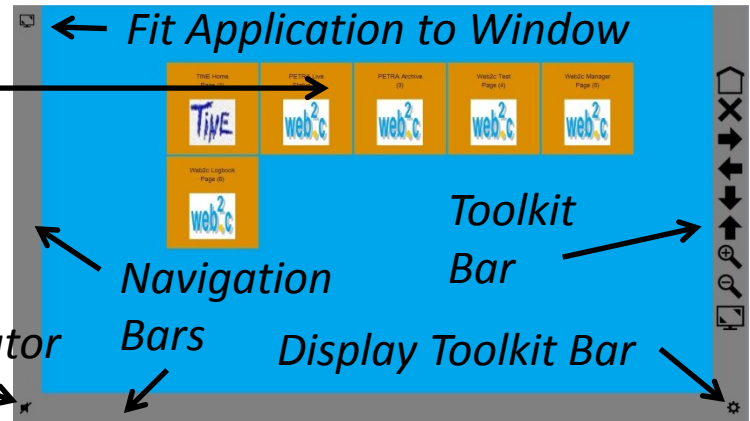
Active Application Window



Select Application

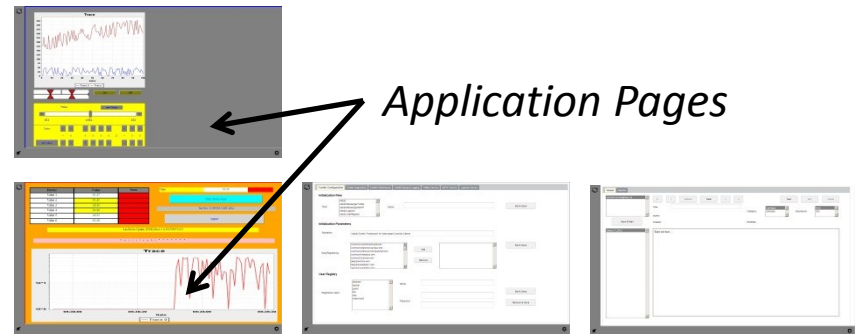
Speech Recognition

Status Indicator



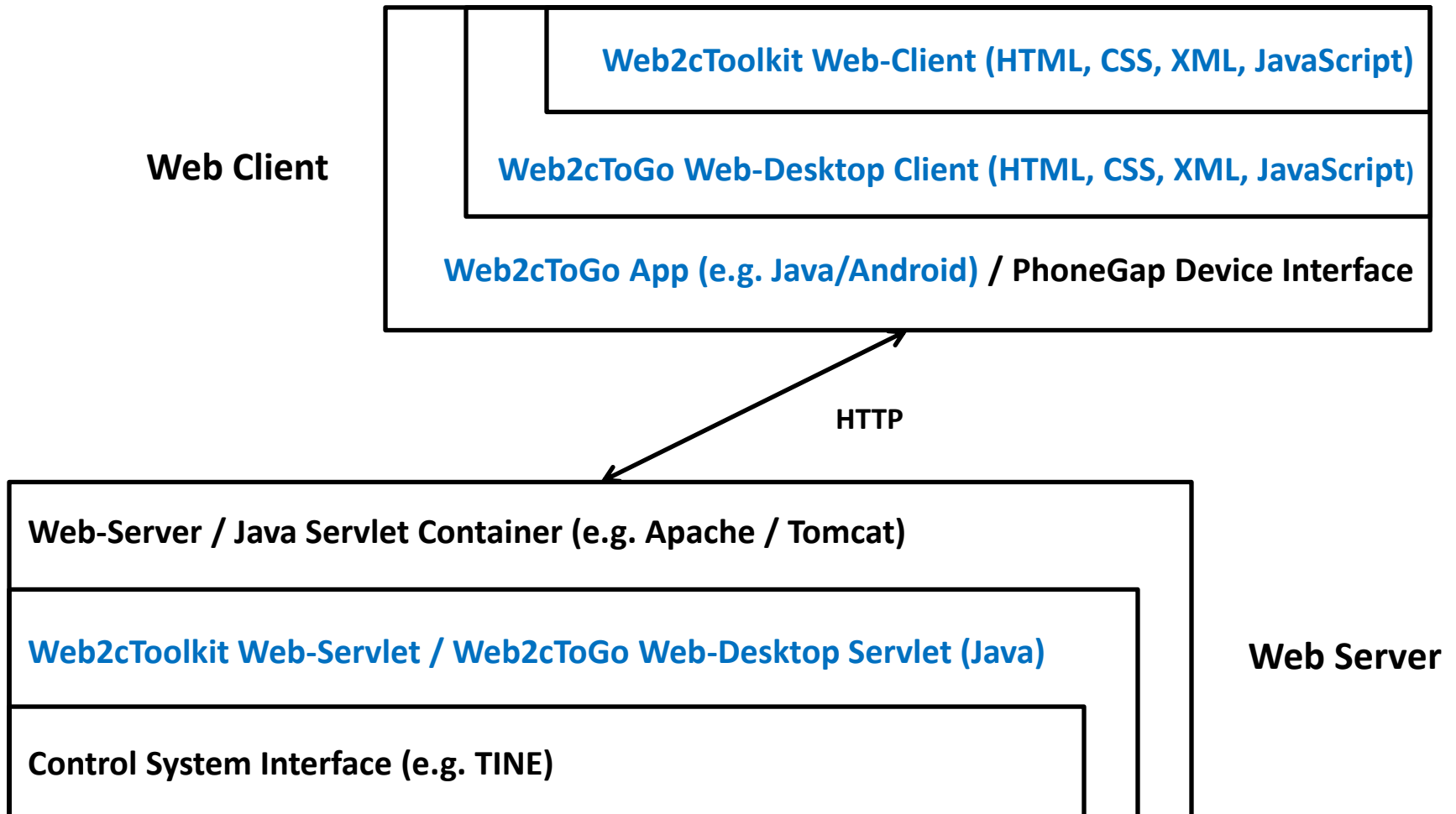
Application Explorer Window

Application Pages

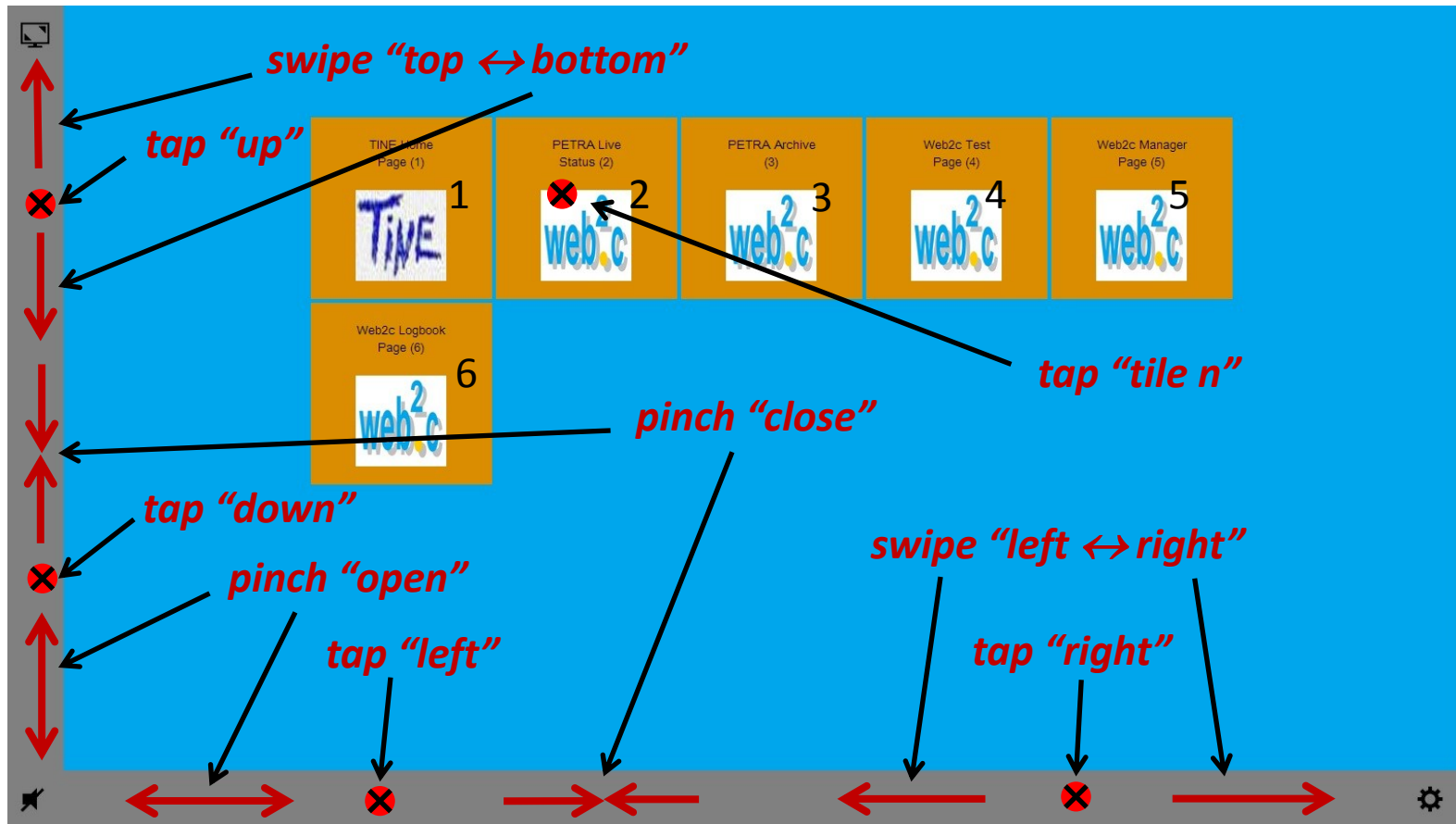


Virtual Application Window Set

Web2cToGo Client-Server Architecture



Web2cToGo Navigation by Touch Gestures



User Action	Touch Gesture	Spoken Command
Display Application Explorer	Pinch “open”	Home
Open (new) application window (with application index n)	Tap “tile n”	Open “n”
Terminate active application	Pinch “close”	Close
Display next (previous) application window	Swipe “right → left” (“left → right”)	Move left (right)
Display next (previous) application page window	Swipe “bottom → top” (“top → bottom”)	Move up (down)
Scroll active application page upwards (downwards, towards left, towards right)	Tap “up” (“down”, “left”, “right”)	Scroll up (down, left, right)
Zoom in (out) active application page	Swipe “left → right” (“right → left”) and Swipe “bottom → top” (“top → bottom”)	Zoom in (out)
Fit active application page to window	Tap “Fit-to-Window” icon	Fit

Web2cToGo Navigation by Spoken Commands

- How does speech recognition work?
 - Speech: is a acoustic sequence of utterances (words, non-linguistic fillers)
 - Utterances: consist of phonemes (e.g. OPEN : OW P AH N)
 - Speech recognition system:
 - Identifies phonemes according to an acoustic model (language-specific, speaker-specific)
 - Browses a dictionary listing words and their corresponding decompositions into phonemes
 - Constrains the search using a task-specific language model (optional)
 - Finds the best match
- Web2cToGo speech recognition workflow:
 1. Record short audio file (5 s) at Web2cToGo Web-Desktop client
 2. Upload recorded audio file to Web2cToGo Servlet
 3. Convert (optional) audio format to WAVE/WAV (Xuggler ver. 5.4 / FFmpeg ver. 1.0)
 4. Analyze audio file (Sphinx-4 ver. 1.0 beta)
 5. Publish recognized commands and execute commands at Web2cToGo Web-Desktop client

Web2cToGo Speech Recognition Test Set-Up

- Acer ICONIA TAB A200:
 - Android (ver. 4.0.3)
 - Available audio output formats (**A**daptive **M**ulti-**R**ate codec, lossy data compression):
 - AMR-NB (narrow-band, mono, 8 kHz sampling frequency, 12.2 kbit/s bit rate)
 - AMR-WB (wide-band, mono, 16 kHz sampling frequency, 6.6 kbit/s bit rate)
- Sphinx-4 speech recognition software:
 - Audio input format: WAVE/WAV (mono, 16 kHz, 256 kbit/s bit rate)
 - After format conversion with Xuggler/FFmpeg media converter:
 - AMR-NB: reduced recognition quality (acoustic model: WSJ_8gau_13dCep_8k_31mel_200Hz_3500Hz)
 - AMR-WB: acceptable recognition quality (acoustic model: WSJ_8gau_13dCep_16k_40mel_130Hz_6800Hz)
- Problem: Poor audio recording quality (humming noise, acoustic artifacts) of A200 tablet

Web2cToGo Project Status and Outlook



- Web2cToGo is an ongoing project
 - Android 4.x.x Web2cToGo app implemented
 - Platform-independent Web2cToGo Web-Desktop client and servlet implemented providing
 - Web-Desktop navigation by touch gestures
 - Web-Desktop navigation by spoken commands
- To-Do
 - Providing Web2cToGo apps for iOS and Windows 8 / RT
 - Providing Web2cToGo application (Java) for desktop computers
 - Improving speech recognition quality
 - Implementing of Web2cToolkit application-specific application control by touch gestures and voice commands

Web2cToolkit Home

<http://web2ctoolkit.desy.de>