Making Documents Accessible with Screen Readers

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Collabora Online
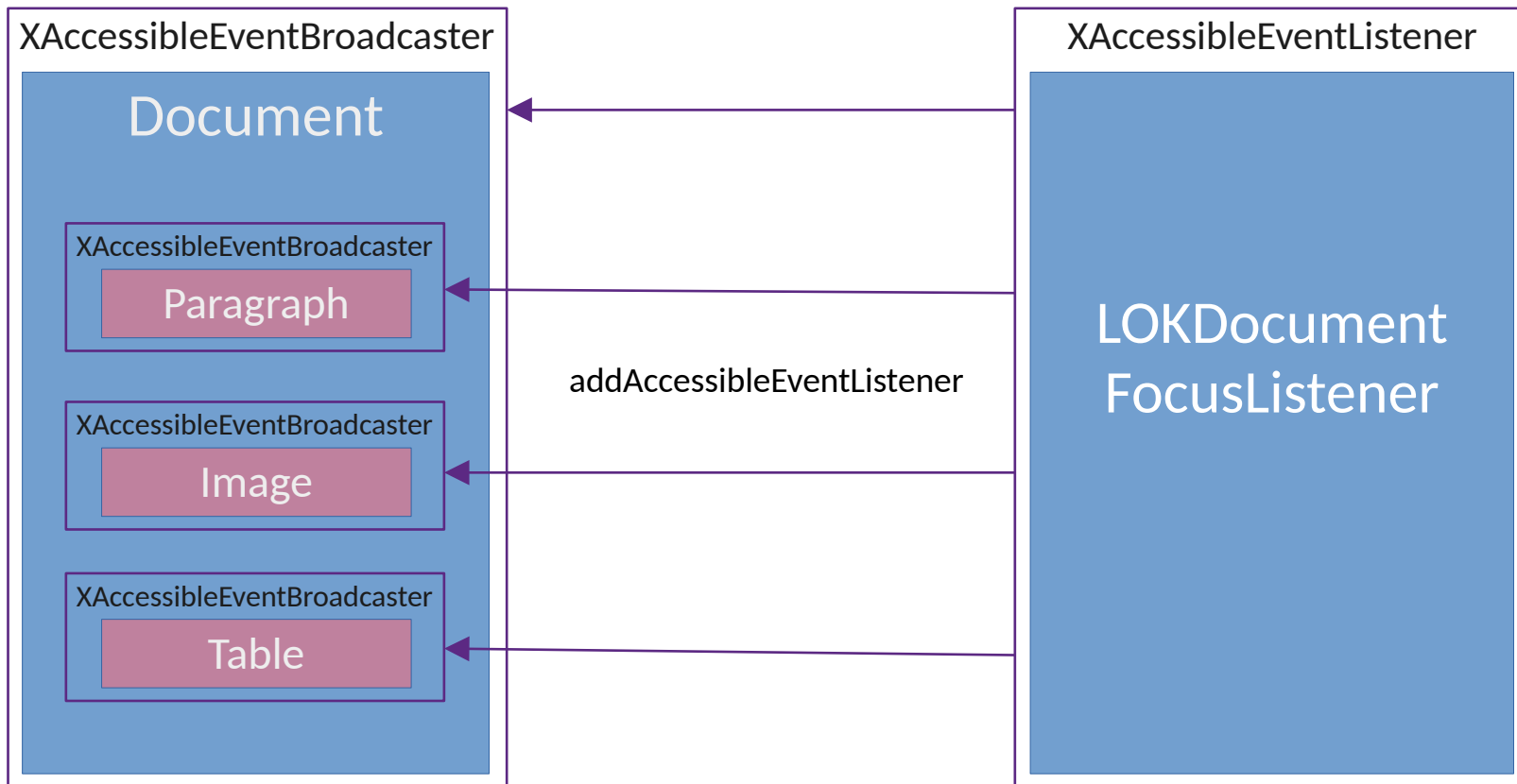
LibreOffice Technology

Technical Day
COOL days

Problem

- A document is just a collection of images

- Browser is not able to generate an accessibility tree of the document content
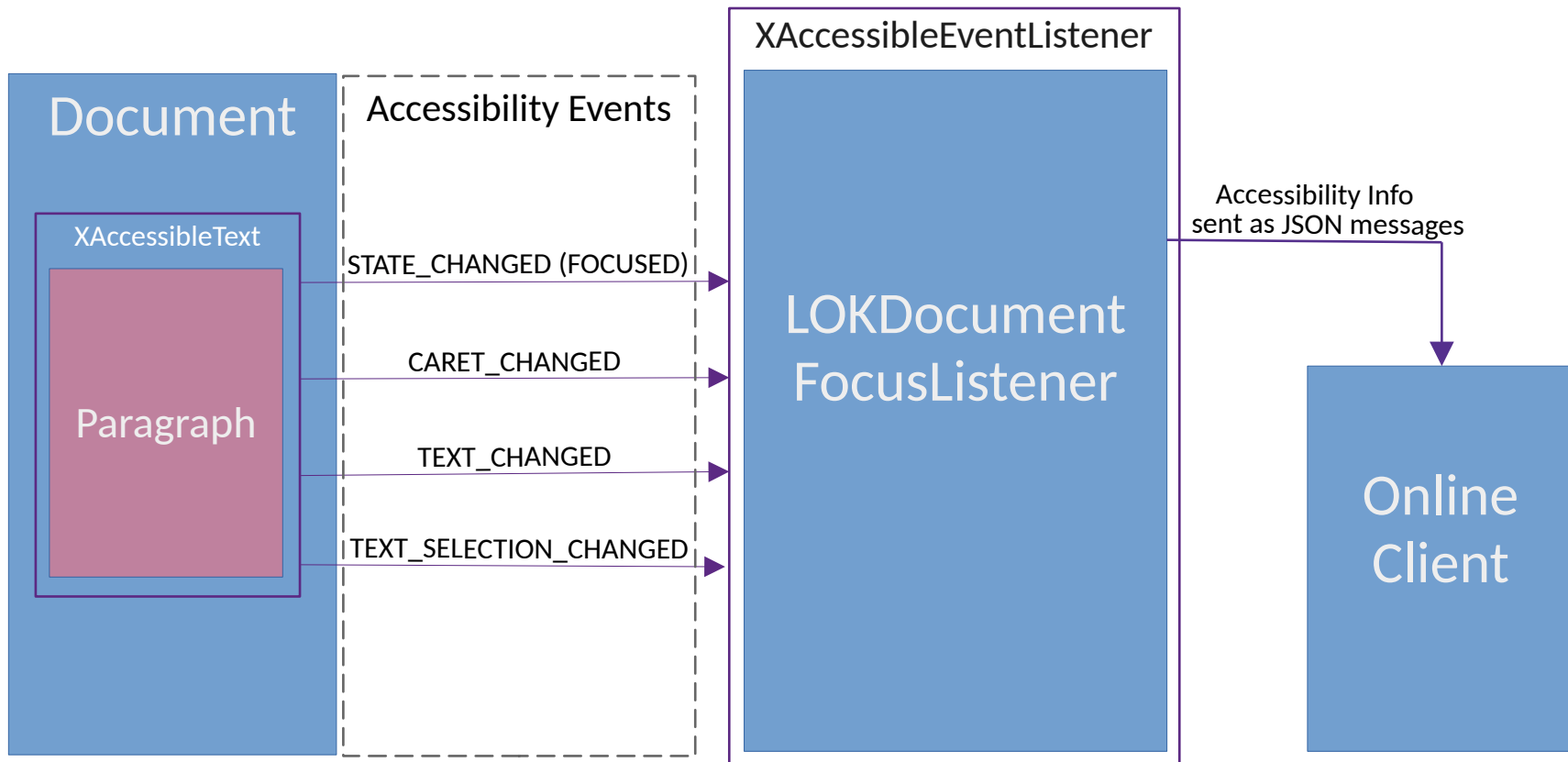
LOKDocumentFocusListener Class

XAccessibleEventBroadcaster

XAccessibleEventListener

Document

XAccessibleEventBroadcaster
Paragraph

XAccessibleEventBroadcaster
Image

XAccessibleEventBroadcaster
Table

addAccessibleEventListener

LOKDocument
FocusListener

Accessibility Events Handling

Document

Accessibility Events

XAccessibleEventListener

XAccessibleText

Paragraph

STATE_CHANGED (FOCUSED)

CARET_CHANGED

TEXT_CHANGED

TEXT_SELECTION_CHANGED

LOKDocument
FocusListener

Accessibility Info
sent as JSON messages

Online
Client

JSON message on focused paragraph
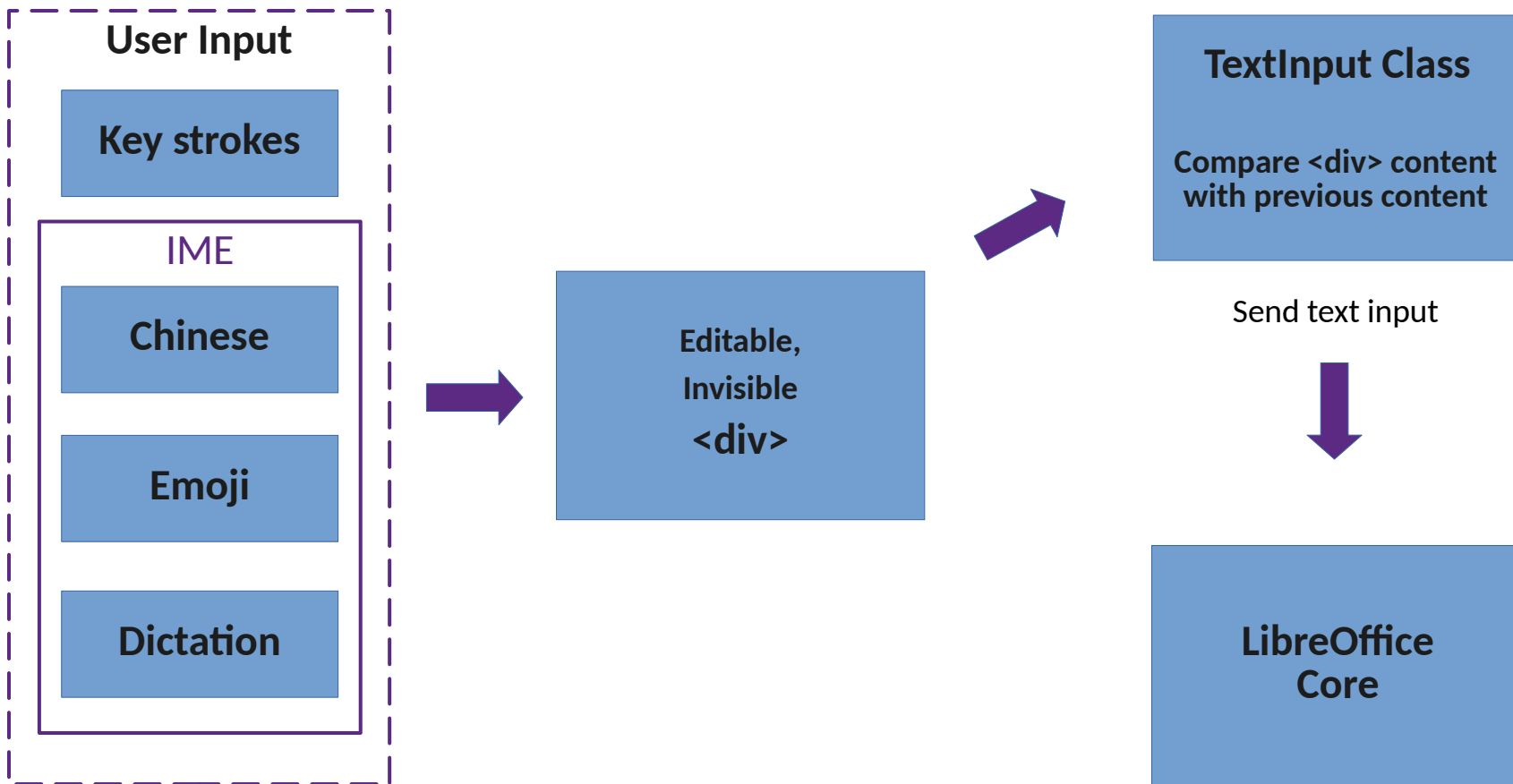
```
{

    content: "<paragraph text>"

    position: N

    start: N1

    end: N2

}
```

- N is the position of the text cursor in the paragraph
- [N1,N2] is the range of the text selection
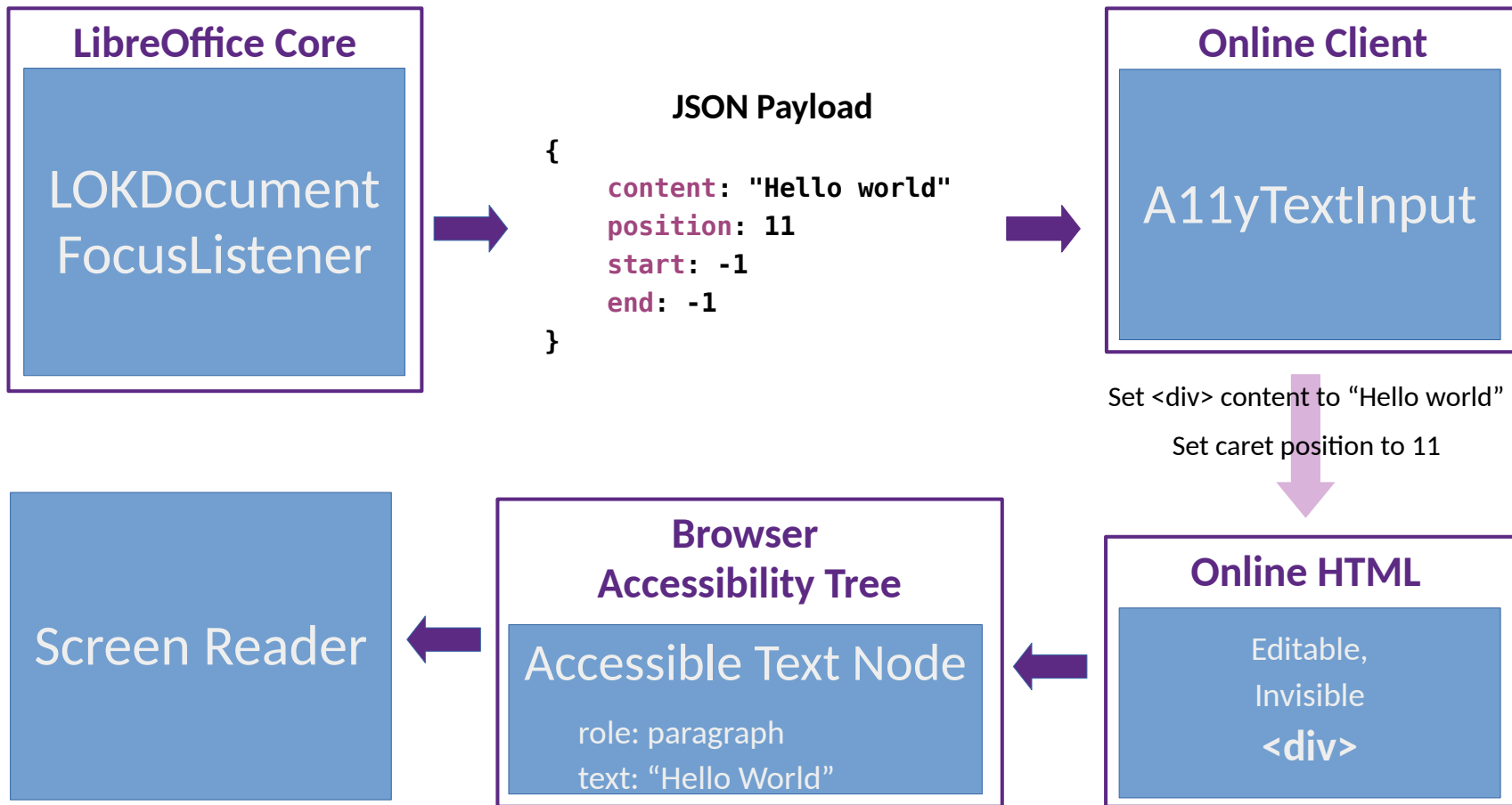
Document Accessibility in Online

User Input Handling

User Input

Key strokes

IME

Chinese

Emoji

Dictation

Editable,
Invisible
<div>

TextInput Class

Compare <div> content
with previous content

Send text input

LibreOffice
Core

Make Focused Paragraph Accessible

Technical Day COOL days

LibreOffice Core

LOKDocument
FocusListener

JSON Payload

```
{
    content: "Hello world"
    position: 11
    start: -1
    end: -1
}
```

Online Client

A11yTextInput

Set <div> content to "Hello world"

Set caret position to 11

Online HTML

Editable,
Invisible
<div>

**Browser
Accessibility Tree**

Accessible Text Node

role: paragraph

text: "Hello World"

Screen Reader

Collabora Online

Editable and Accessible Text

This solution allows a screen reader to report:

- a paragraph content when it gets focused

- typed keys

- character at caret position (when user navigates with arrow keys)
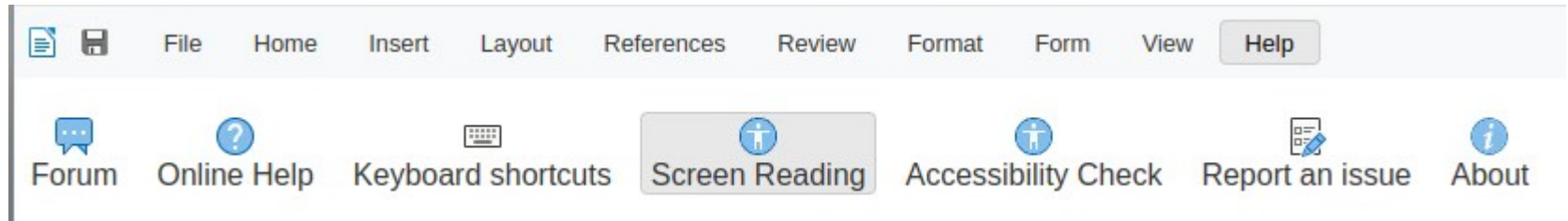
- selected/unselected text

Enable/Disable Screen Reader Support

At server level through the accessibility section in coolwsd.xml

```
<accessibility desc="Accessibility settings">
    <enable type="bool" desc="Controls whether accessibility support should be enabled or not." default="false">true</enable>
</accessibility>
```

Per view, through the apposite toggle button under the Help tab

Video

What's Next

Further accessibility improvements

- Calc: interactive formula editing

- Calc: input bar

- Text Formatting through markups inside the editable <div>

Thank you!

By Marco Cecchetti

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