

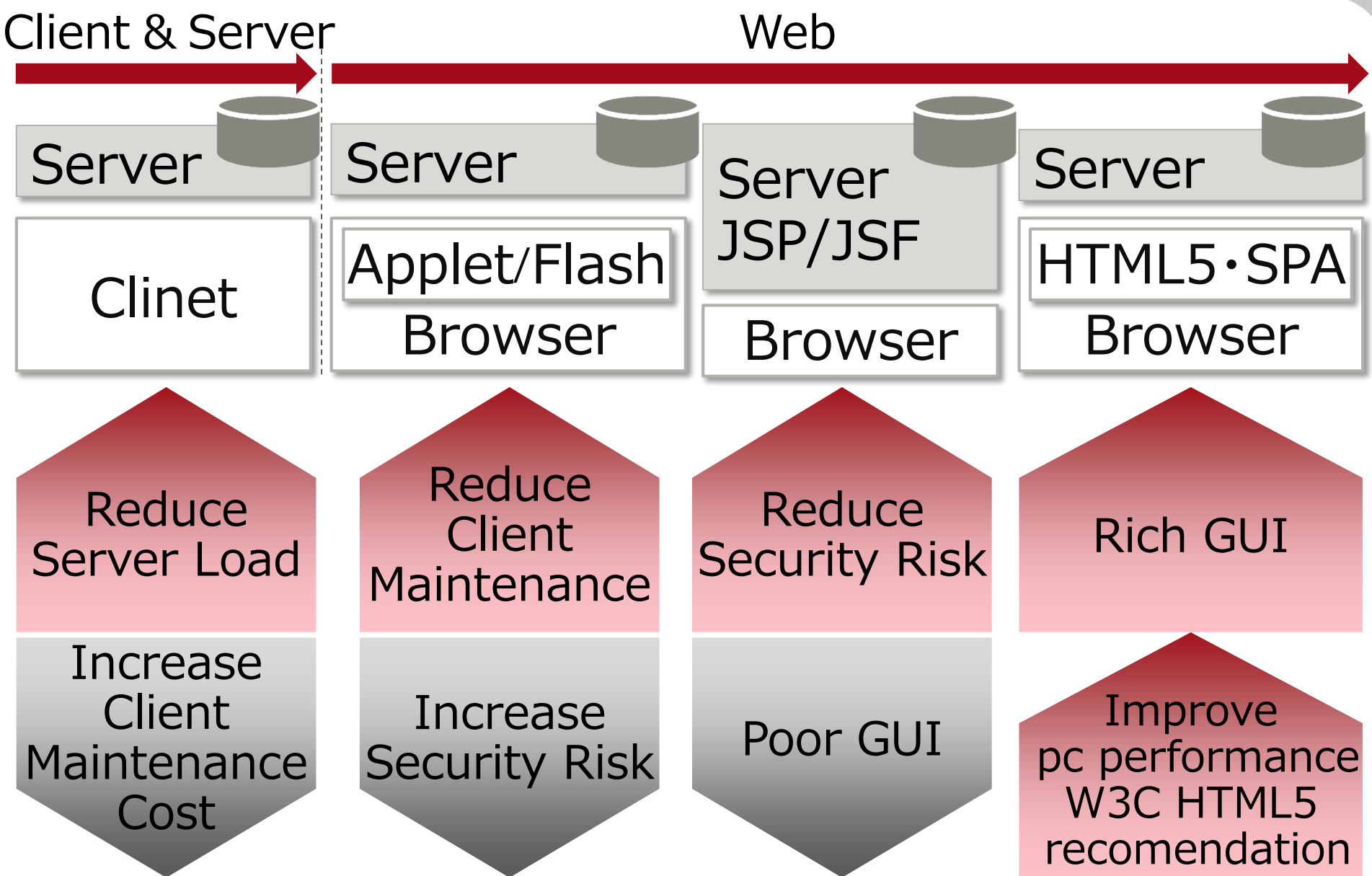
2019.5.15
Kenji Kazumura

- One of the oldest Java related products vendor
 - Including Java for mainframe

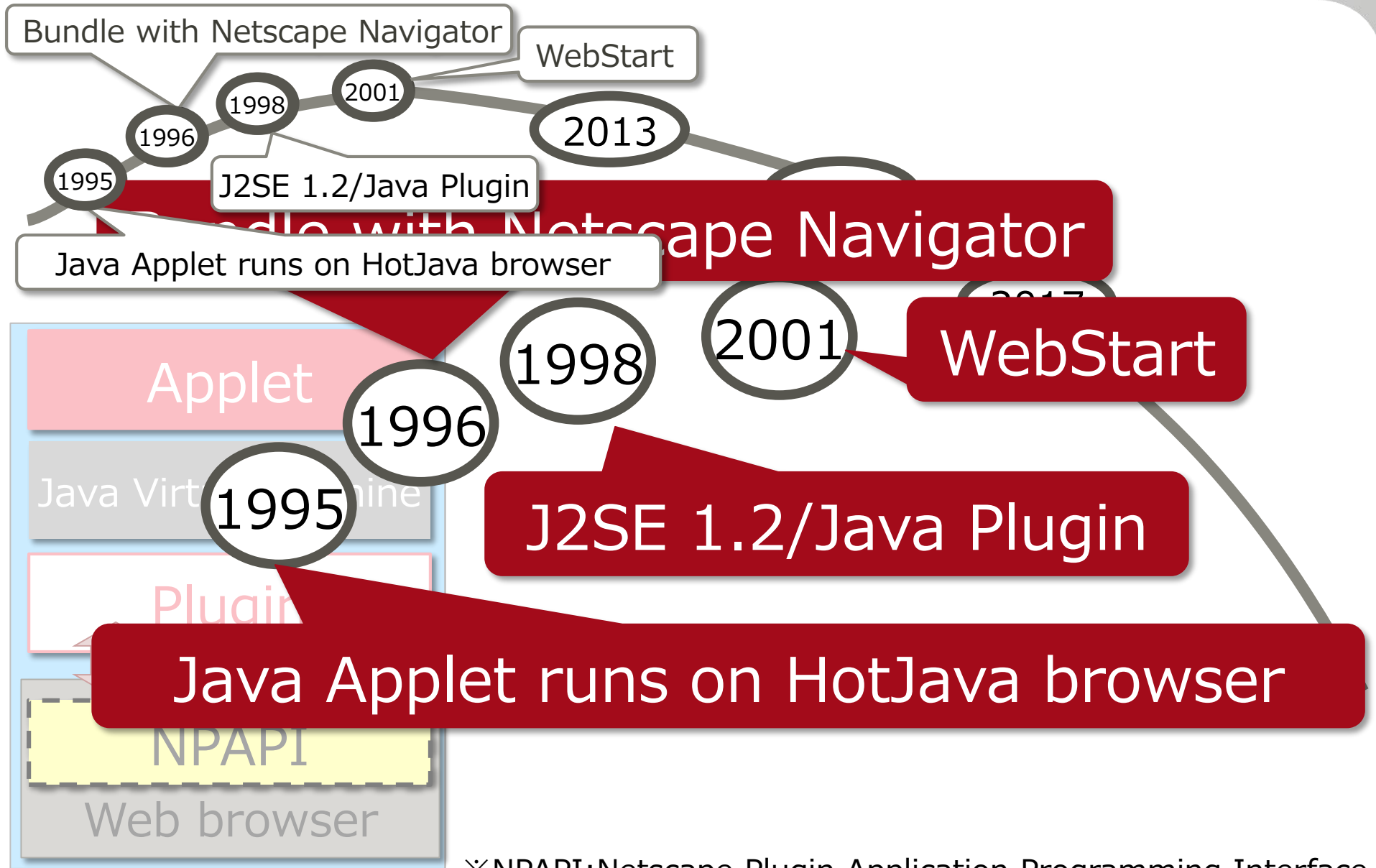
- Interstage Application Server since 1998
 - Java EE certified GlassFish base application server

- Interstage Studio
 - Eclipse base
 - classic GUI library for client desktop

History of Client Java

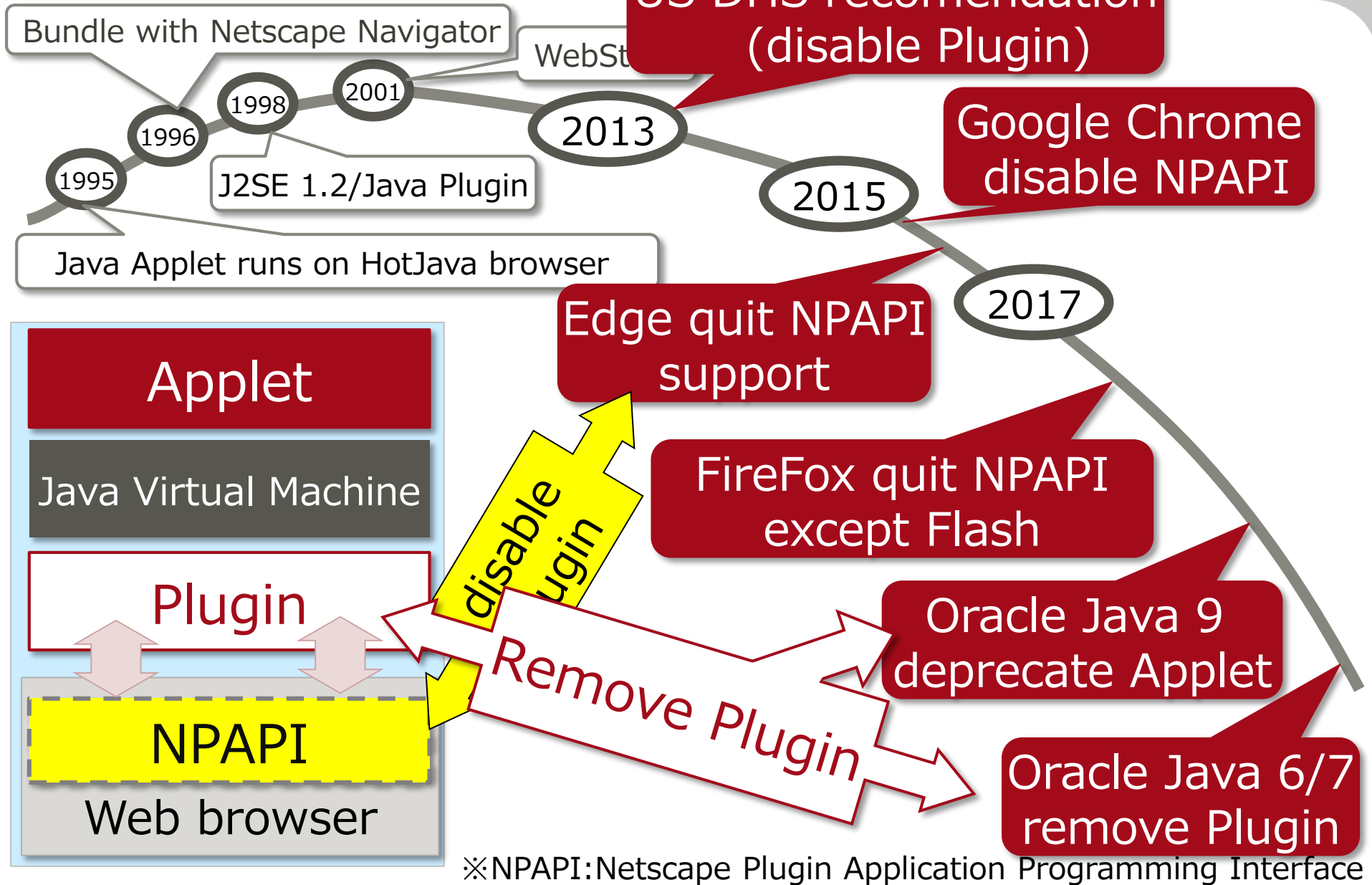


Applet Technology



※NPAPI:Netscape Plugin Application Programming Interface

Applet Technology



How much are there Applet ?

Fujitsu Customers		# of client pc
 A Company		90,000
 B Company		70,000
 C Company		54,000
 D Company		21,000
 E Company		5,000
 F Company		3,500
 G Company		3,000
 H Company		3,000
Total		249,500

Migration Plans

1 Use Applet

until end of IE11



2 Use JSP/JSF



JavaServer Faces

Not so much used ?

3 use HTML5/JavaScript

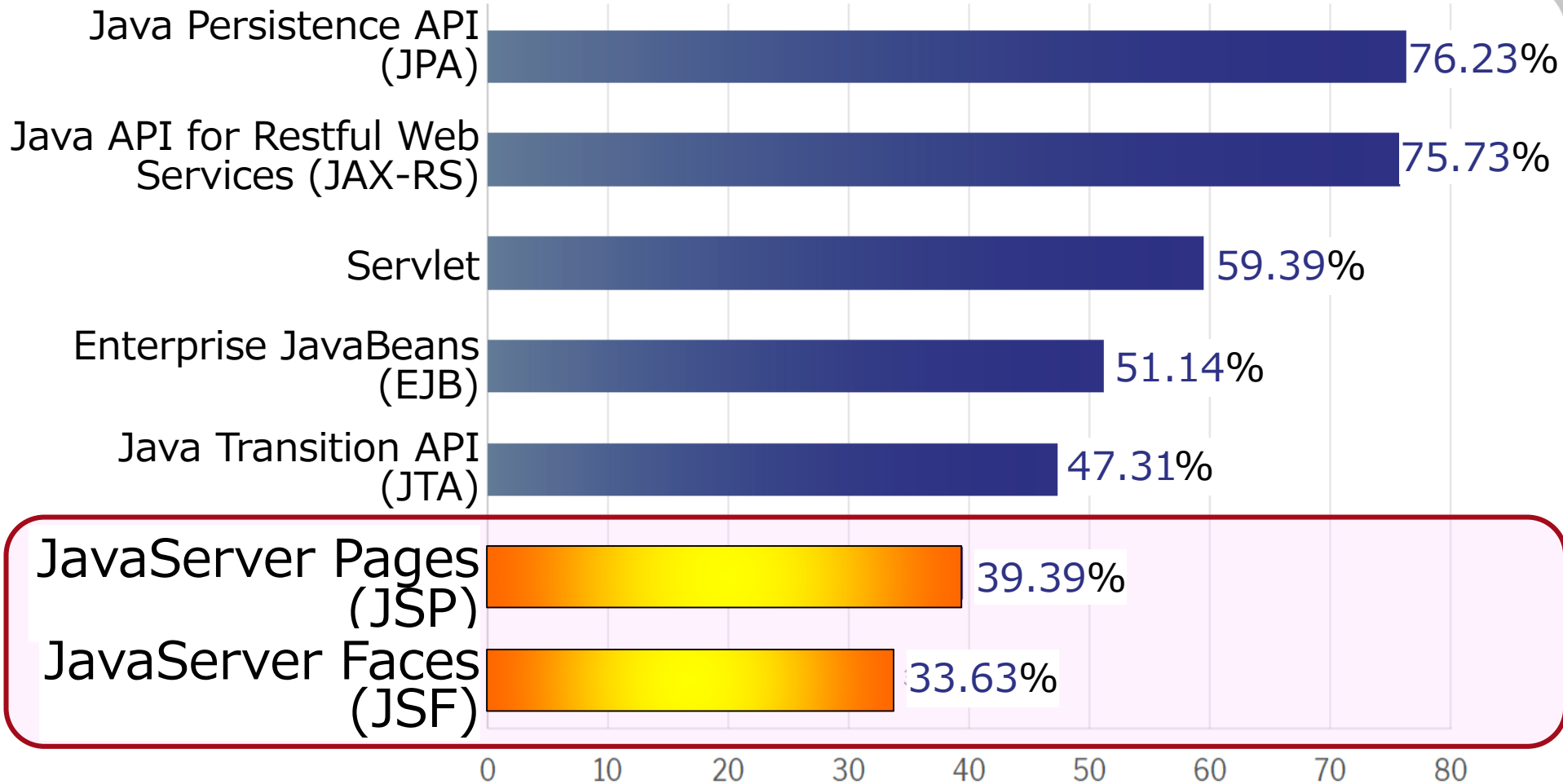
favorite!?



ANGULARJS
by Google



Jakarta EE survey (used API)



※<https://jakarta.ee/news/2018/04/24/jakarta-ee-community-survey/>

JSP/JSF are not used so much

DukeScript

Java app runs on browser without Plugin
<https://dukescript.com/>



jpro

JavaFX app runs on browser
<https://www.jpro.io>



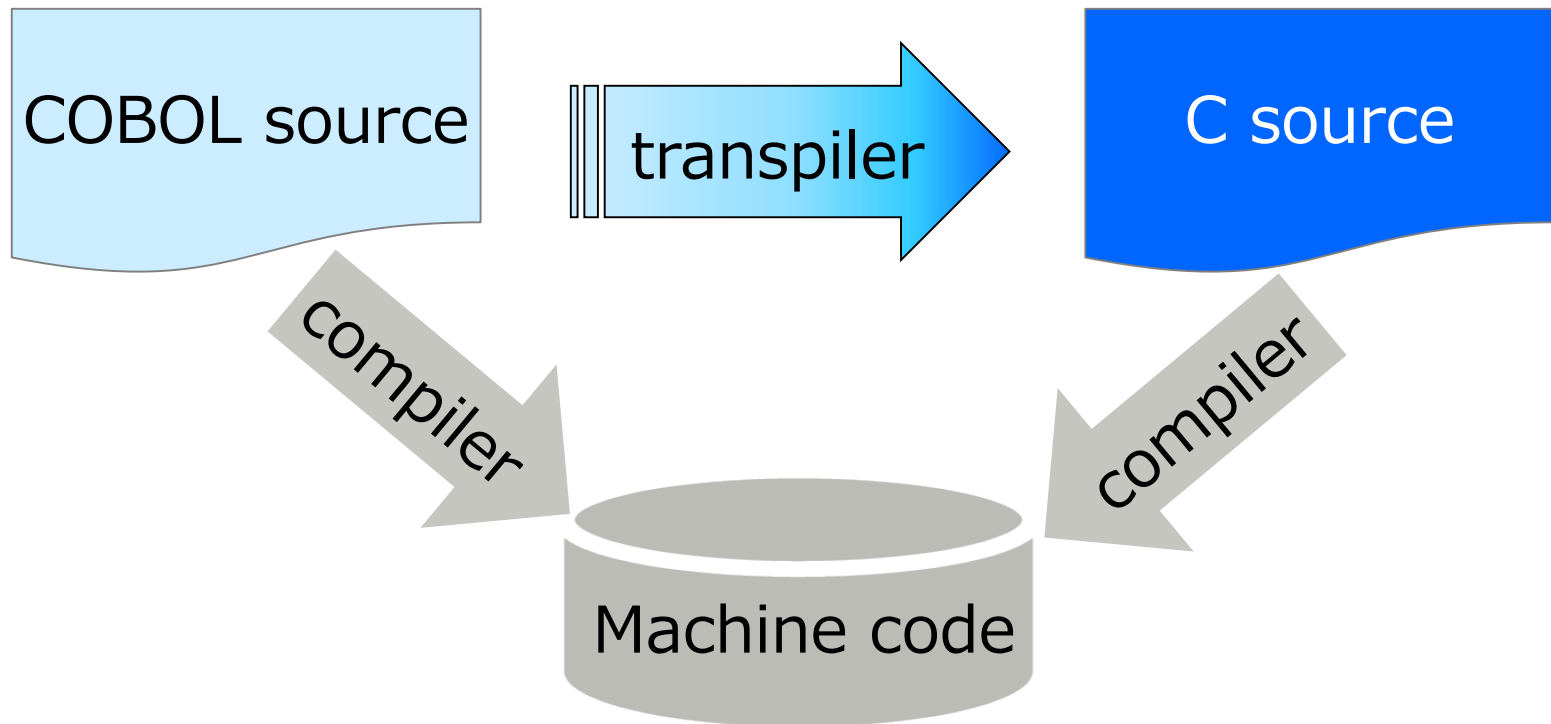
JSweet

Transpiler from Java to JavaScript
<http://www.jsweet.org/>



Change source code in a language to same code in a different language

Difference between transpiler and compiler



Examples of transpiler

◆ Legacy language

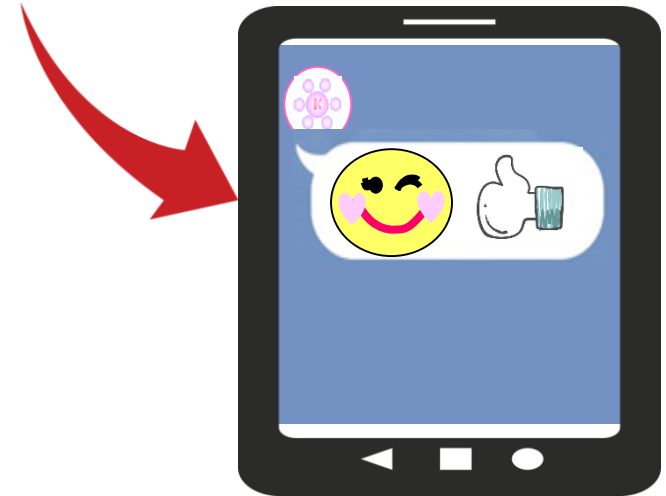
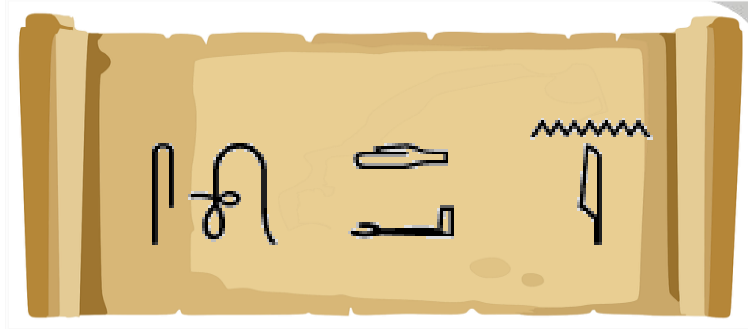
- Fortran $\rightarrow$ C (f2c)
- C++ $\rightarrow$ C (cfront)

◆ JavaScript (altJS)

- TypeScript $\rightarrow$ JavaScript
- CoffeeScript $\rightarrow$ JavaScript

◆ Legacy to JavaScript

- Java $\rightarrow$ JavaScript (GWT, JSweet)
- Haskell $\rightarrow$ JavaScript (GHCJS)

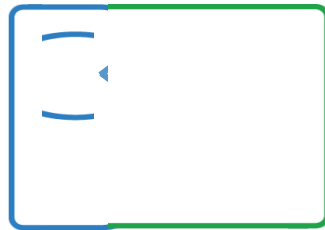
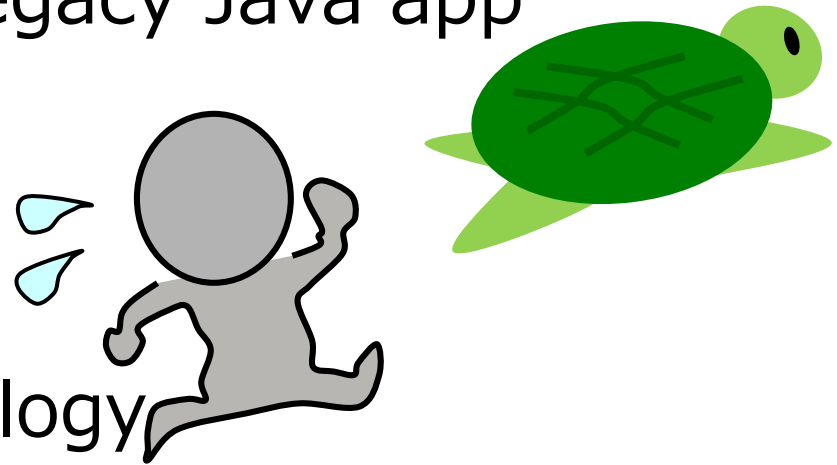


◆ pros

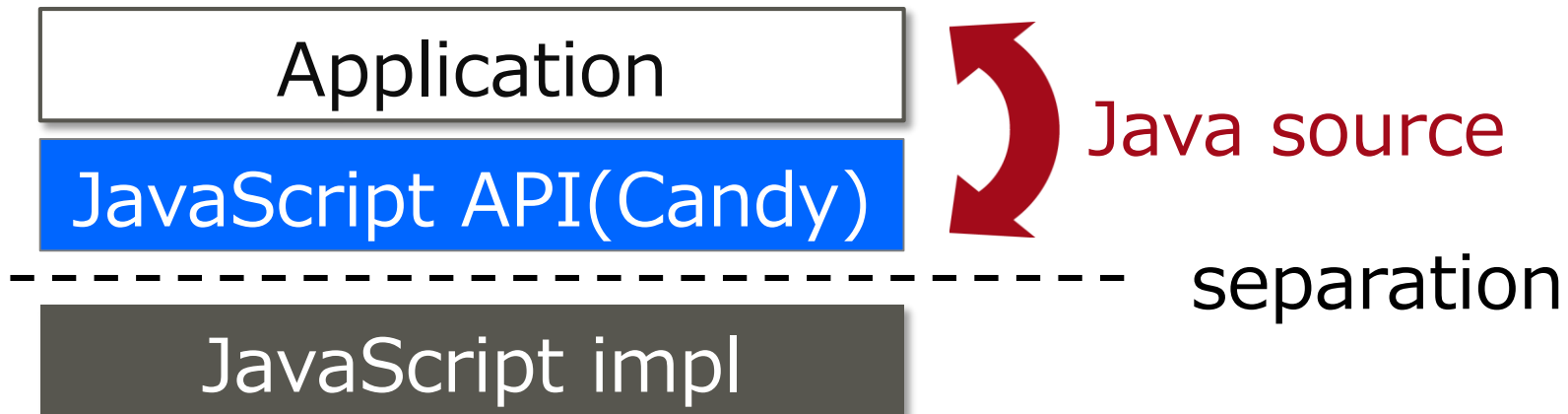
- Need not know JavaScript
- Easy to migration of legacy Java app
- IDE support

◆ cons

- Rapid frontend technology
- API mismatch



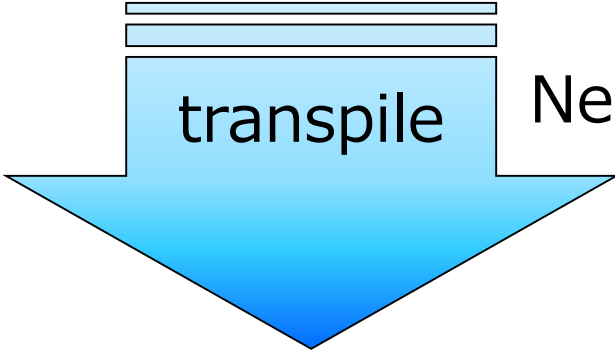
- ◆ Java → TypeScript(JavaScript) transpiler
 - <http://jsweet.org>
- ◆ Syntax Mapper
 - Only Syntax conversion
 - Use JavaScript API in Java code
- ◆ Resolve existing problems of transpiler



Existing transpiler (API conversion)

Input Java source

```
Button button = new Button();  
button.setLabel("click me");
```



transpile

Need not modify Java source

Output JavaScript

```
var button = document.createElement("button");  
button.innerText = "click me";
```

JSweet transpiler (Syntax Mapper)

Input Java source

```
Button button = new Button();  
button.setLabel("click me");
```

Modify Java
source

API conversion

Modified Java source

```
HTMLButtonElement button =  
    document.createElement(StringTypes.button);  
button.innerText = "click me";
```

transpile

Syntax Mapper

Output TypeScript

```
let button : HTMLButtonElement=  
    document.createElement("button")  
button.innerText = "click me";
```

New problem

Need source modification before transpilation

Resolve by
Candy

No modification

Application

Modified code

Common Library(Candy)

JavaScript API(Candy)

Java
source

JavaScript impl

separation

Good for systems using common
library/framework

JSweet (practical way)

Input Java source

```
Button button = new Button();  
button.setLabel("click me");
```

```
public class Button extends JButton {  
    public void setLabel(String label) {  
        this.label = label;  
    }  
}
```

No
modification
for app

Modify only
library
(API conversion)

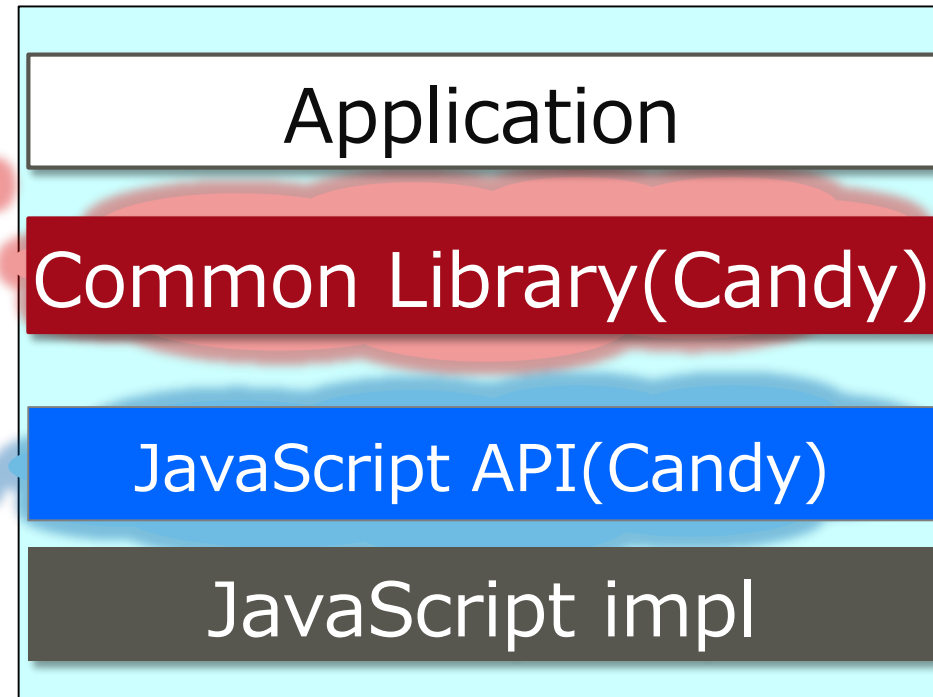
```
Button button = new Button();  
button.setLabel("click me");
```

```
public class Button {  
    public Button {  
        button =  
            document.createElement(StringTypes.button);  
    }  
    public void setLable(String label);  
        button.innerText = label;  
    }  
}
```

transpile

Syntax Mapper

- ◆ Bridge between Java and JavaScript
 - There are 1744 Candy registered (as of 2018/5)
<http://www.jsweet.org/candies-releases/>
 - Can create your own
- ◆ Candy types
 - Java Candy:
common Java library can be used by JSweet
 - JavaScript Candy:
bridge to existing JavaScript



System of Company A

Summary of system

- ◆ 22K LoC Applet
- ◆ Created more than 10years ago
- ◆ Use Fujitsu GUI product

Requirements

- ◆ Migrate to JavaScript with less cost and time
- ◆ Must be same as before for Looks and operation

DEMO PRIV Diving Log Book SUMMER 2018

終了 出力 入力 検索 クリア 前頁 次頁 ヘルプ

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ライセンス - - ガイド 日付 YYYY MM DD

ON 国コード JPN 県名 OKNW 場所 ILAND - KERAM - 00 会員番号 - -

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日付 2002/08/01 - / /

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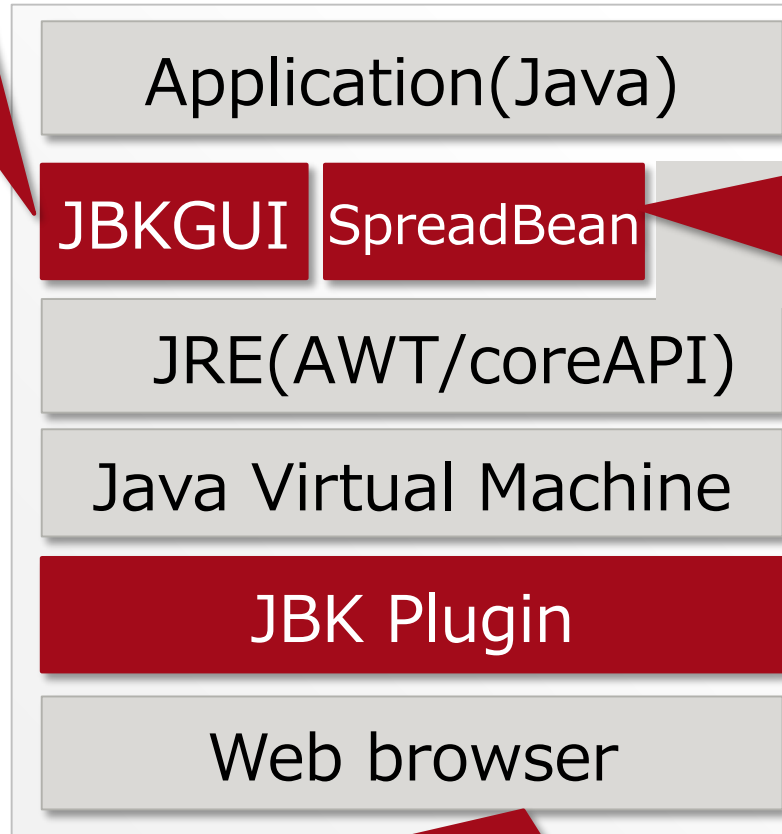
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平均深度に誤りがあります

Fujitsu product for Client

provide button,label,frame and dialog
for Java GUI application



Spread functions
similar to Excel
for Java application

Run applet on Web browser

*JBK: J Business Kit

Applet transformation

before

Applet(Java)

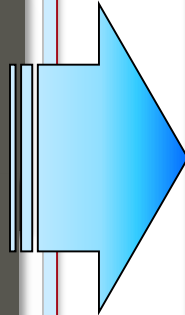
JBKGUI SpreadBean

JRE(AWT/coreAPI)

JBK Plugin

Java Virtual Machine

Web browser



after

Application(JavaScript)

JBKGUI (JavaScript) Spread (JavaScript)

JavaScript framework

AWT

spread library

Java base core API

JavaScript engine

jQuery
AngularJS
...

Web browser

SlickGrid
Wijmo
...

Demo

POC

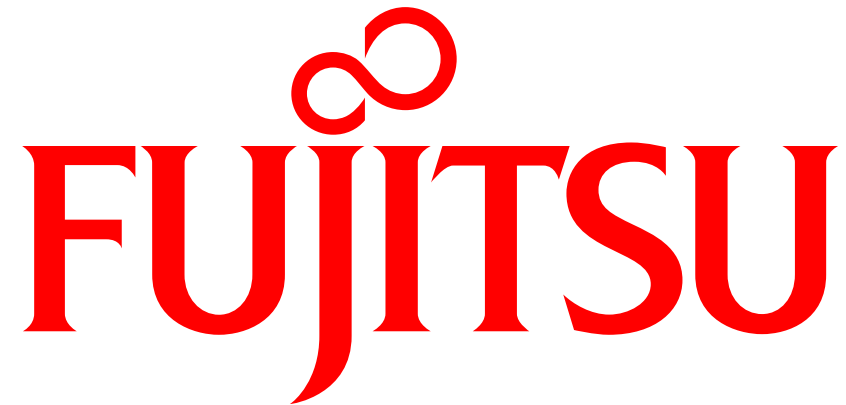


LoC of two windows

	LoC			%auto
	total	manual	auto	
A window	6,102	63	6,039	99.0%
B window	4,764	44	4,720	99.1%
common	11,789	849	10,940	92.8%
total	22,655	956	21,699	95.8%

manual: need to modify for transpiler

High auto transformation
by Candy of Fujitsu product



shaping tomorrow with you