

On the Web Frontiers with Smalltalk

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ESUG 2011



AIDAweb

Smalltalk Web Application Server

```
self add: self documentTitleElement; add: self documentActionsElement.  
bucketElement := self bucketsElement. "detailed info, references..."  
self add: self infoLineElement. "brief info about document"  
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```



Why frontiers?



- ▶ Microsoft going to HTML5
 - ▶ For desktop apps it plans to replace .NET and WPF/Silverlight with trio HTML5, CSS and JavaScript
- ▶ Web OS-ses: Google ChromeOS, HP WebOS
- ▶ Will all the future applications be based on web technologies?
- ▶ How are we Smalltalkers prepared for this challenge?

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Why? Many key events at once



- ▶ HTML5
- ▶ JavaScript
- ▶ Web browsers
- ▶ Event loop
- ▶ Realtime Web
- ▶ Mobile
- ▶ Cloud

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Web Technology Trio



HTML5

+



CSS3

+



JavaScript

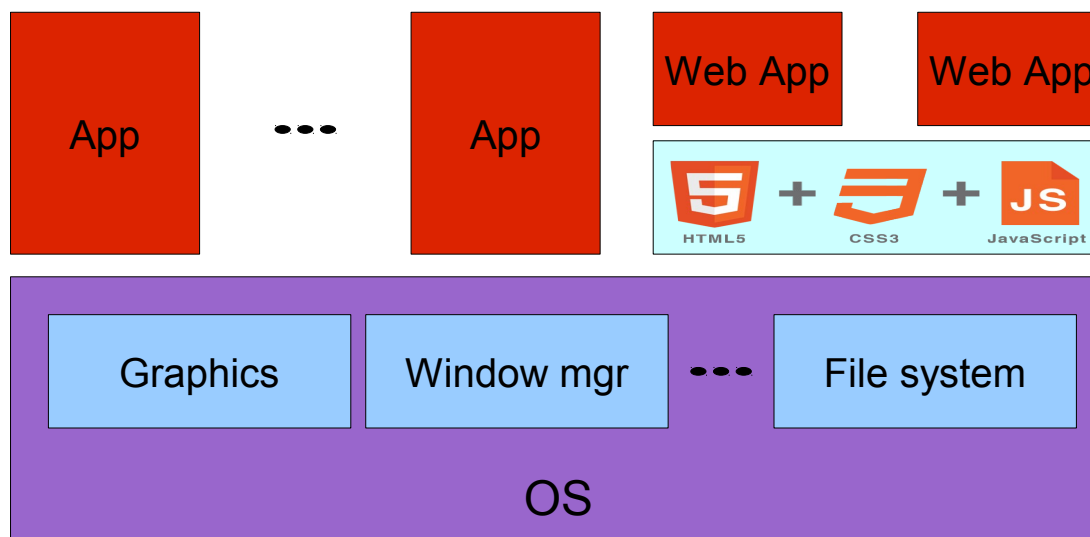
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Web integration into Operating System



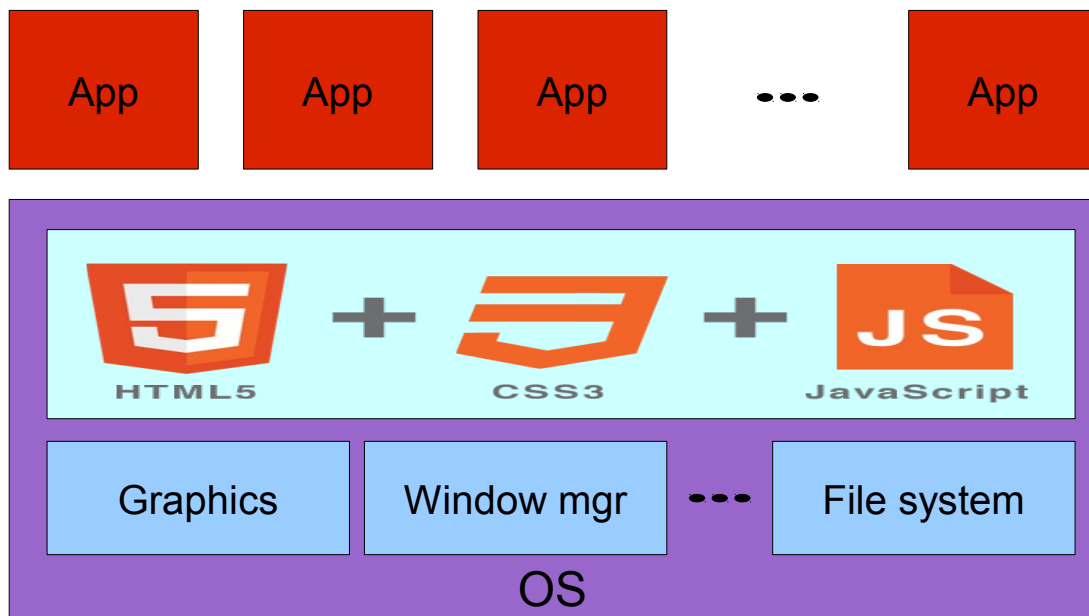
Present: Web trio separated from OS

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Web integration into Operating System



Future: Web trio as part of OS

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HTML5



- ✓ OFFLINE & STORAGE
- ✓ CONNECTIVITY / REALTIME
- ✓ MULTIMEDIA
- ✓ GRAPHICS, 3D & EFFECTS
- ✓ DEVICE ACCESS
- ✓ PERFORMANCE & INTEGRATION
- ✓ SEMANTICS
- ✓ CSS3 / STYLING



www.w3.org/html/logo/

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Javascript



- ▶ Google V8
 - Very performant J S VM (near J ava speed)
 - On server too!
- ▶ Client side „fat“ apps

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Web browsers



- ▶ Another browsers war?
 - **No!** Cooperation + healthy competition
- ▶ Competitive goal: being upfront in conformance with emerging HTML5 standards

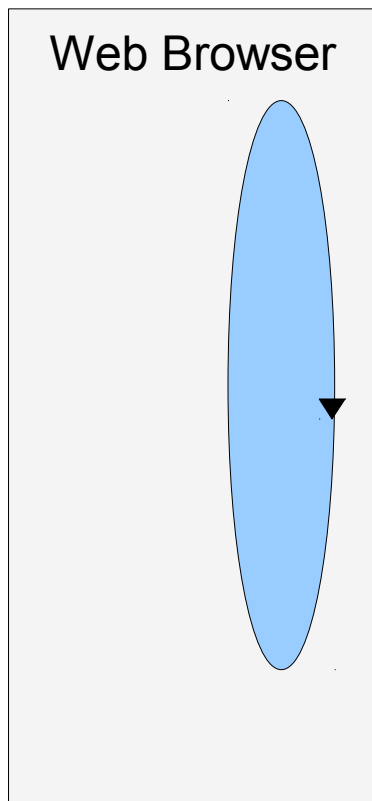
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Event loop in web browser



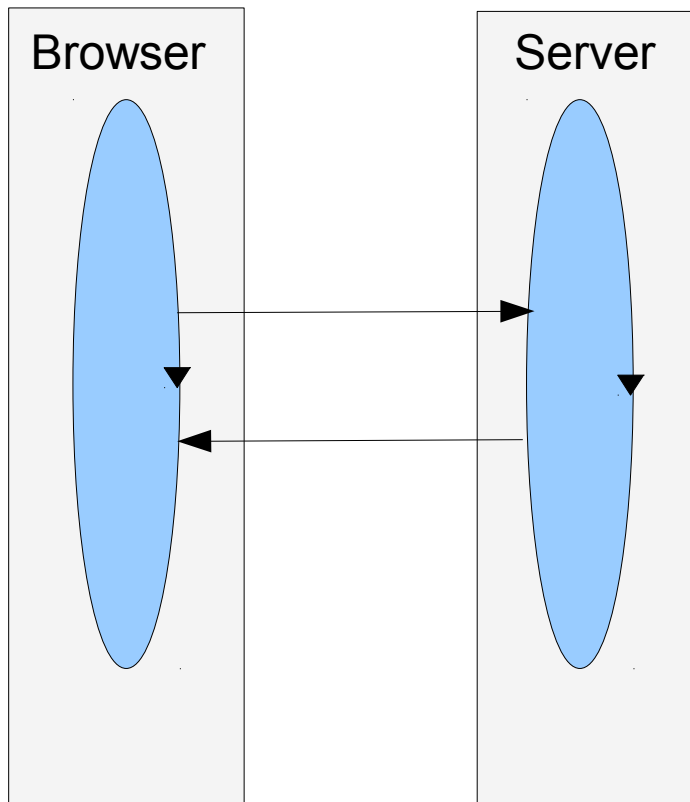
```
ajax = new XMLHttpRequest;  
ajax.onreadystatechange = function() {..};  
ajax.open( 'get', '/ajax-example', true );
```

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Event Loop extended to Server



```
db.query('select...', function(result){..});
```

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Server framework based on Event Loop



nodeJS

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Realtime web



Timeline

@Mentions

Retweets ▾

Searches ▾

Lists ▾

4 new tweets

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Explaining Realtime Web in 100 words



The Real-Time Web is a paradigm based on **pushing information to users as soon as it's available** - instead of requiring that they or their software check a source periodically for updates.

It can be enabled in many different ways and can require a different technical architecture.

It's being implemented in **social networking, search, news** and elsewhere - making those experiences more **like Instant Messaging** and facilitating unpredictable innovations.

Early benefits include **increased user engagement ("flow")** and decreased server loads, but these are early days.

Real-time information delivery **will likely become ubiquitous, a requirement for almost any website or service.**

Source: ReadWriteWeb

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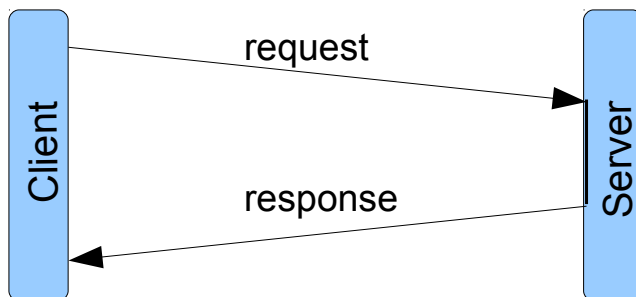
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WebSocket protocol

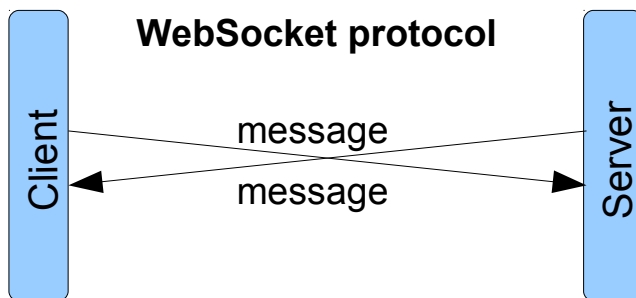


HTTP Protocol



-Unidirectional
-Half-duplex

WebSocket protocol



-Bidirectional
-Full-duplex



Format of WebSocket message

Two Versions:

1. **Hixie-76** (supported in Swazoo)
2. **HyBi-10**





Mobile



- ▶ Native vs. Web vs. Hybrid Apps
 - Hybrid = Web app packed as native one

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Smalltalk is ideal for Web Apps



- We missed the GUI train
- Don't miss the Web too!
- Use Smalltalk spirit!
 - Elegance, Simplicity, Pure OO

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Smalltalk Web Frameworks



seaside 

www.seaside.st



AIDAweb

www.aidaweb.si



iliad

www.iliadproject.org

Jtalk

www.jtalk-projekt.org

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State in Smalltalk: **HTML5**



- ▶ New tags (<section>, <footer>,...) mostly supported
- ▶ APIs like Geolocation, FileSystem, History, LocalStore, Offline, Drag&Drop, Canvas, ... ?

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State in Smalltalk: JavaScript



- ▶ J talk
- ▶ Orca
- ▶ J query and J S as Smalltalk in Seaside
- ▶ J S integrated in Aida and Iliad

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State in Smalltalk: **Realtime Web**



- ▶ In Smalltalk GUI since 80s, 90s
 - MVC, Dependency mechanism
 - In VisualWorks from Parcplace days
 - Observer pattern
- ▶ Immutability flag! (object change detection)

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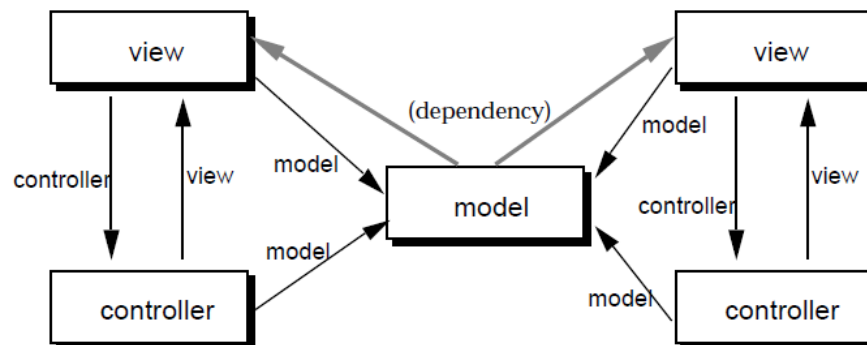
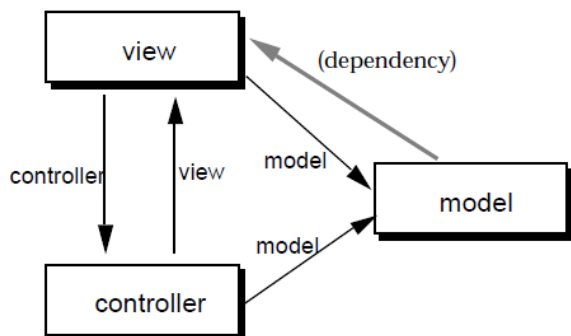




State in Smalltalk: Realtime Web



In Smalltalk from 80's !



Source: Smalltak, an Introduction to Smalltalk Development using VisualWorks, 1995

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State in Smalltalk: Realtime Web



	Seaside	Aida	Iliad
Comet	Hidden IFRAME	Long Polling	Long Polling
WebSocket		Yes	

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State in Smalltalk: Realtime Web



Smalltalk example: Chat

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Example of realtime web

```
chatExample
```

```
  | e lines |
```

```
  e := WebElement newDiv.
```

```
  e addTextH1: 'Multi-user Chat'.
```

```
  lines := self linesElement.
```

```
  e add: le; addBreak.
```

```
  (e addInputFieldAspect: #line for: self) focus.
```

```
  (e addButtonText: 'Send')
```

```
    onSubmitDo:
```

```
      [self observee addLine: self line.
```

```
        self line: "].
```

```
  self observee whenChangedDo: [lines update] on: self.
```

```
  ^e
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State in Smalltalk: **Mobile**



- ▶ Native Apps:
 - Squeak VM on iOS, Android
 - Squeak Apps in Apple App Store
- ▶ Web Apps:
 - Aida: device detection, CSS adaptation, „responsive“ web
- ▶ Hybrid apps ?

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State in Smalltalk: **Cloud**



- ▶ Vmware Cloud Foundry
 - Gemstone actively participating
- ▶ Cloudfork
 - J an van de Sandt
- ▶ SmallHarbour
 - Romain Verducci, Laurent Laffont
- ▶ Google, Facebook, Twitter,..REST API support?

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Conclusion



- ▶ Very vibrant situation in Web technologies field
- ▶ A lot to do but our community is small
- ▶ As browser implementers: let we **cooperate** while we **compete**

Hegelian **Dialectic**: Thesis + Antithesis = Syntesis

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Thanks for your attention!



www.aidaweb.si

@aidaweb

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