Hardening WebKit2

Thiago Marcos P. Santos
Intel Corporation

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2013
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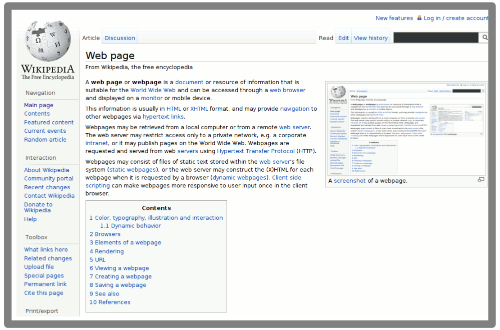
example.com



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A screenshot of a webpage.

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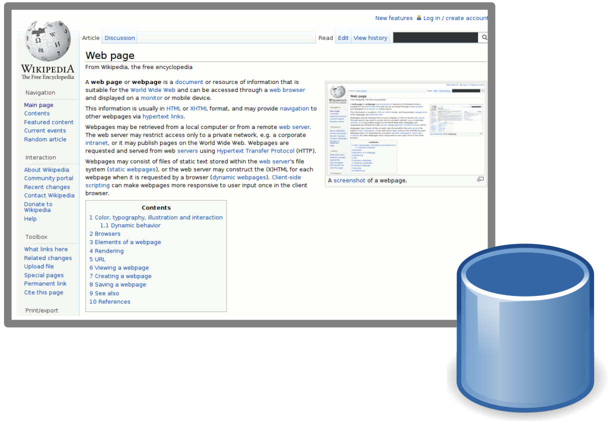

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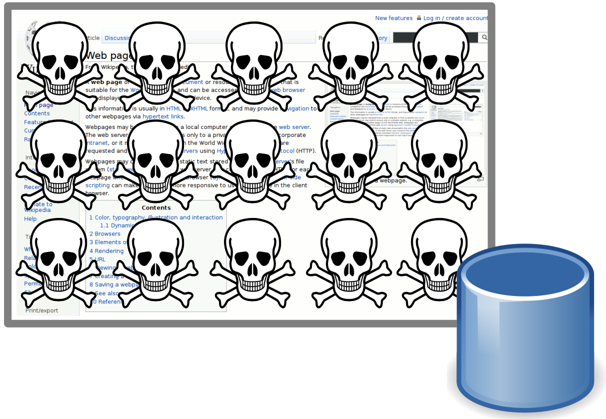

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WebKit2

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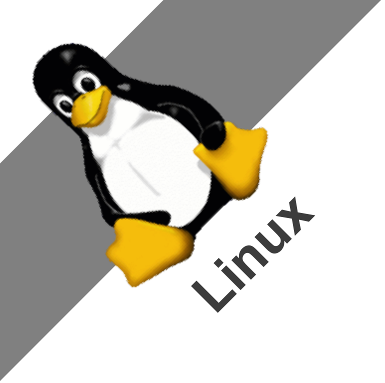

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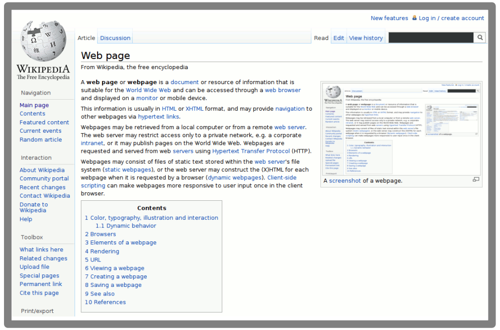

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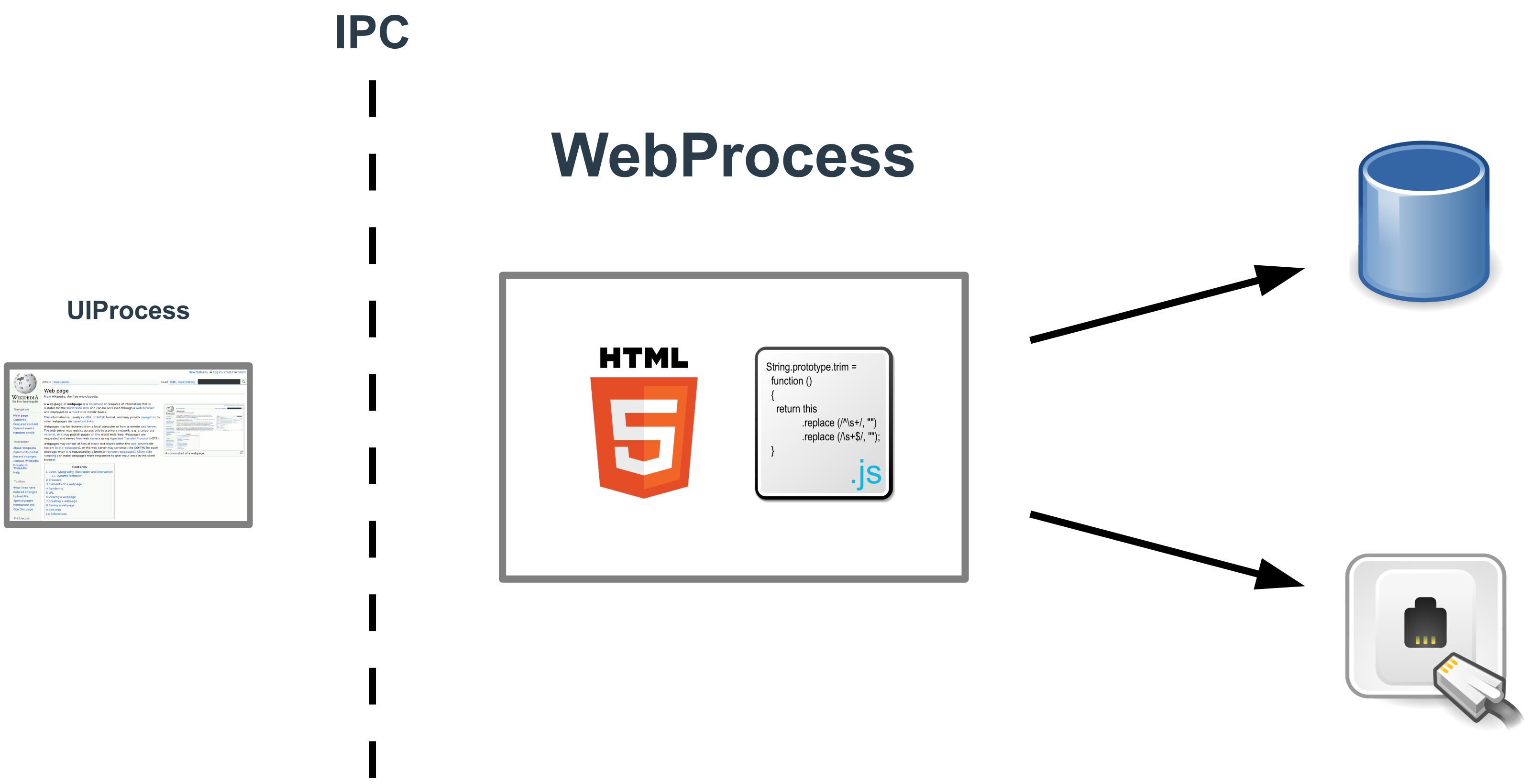

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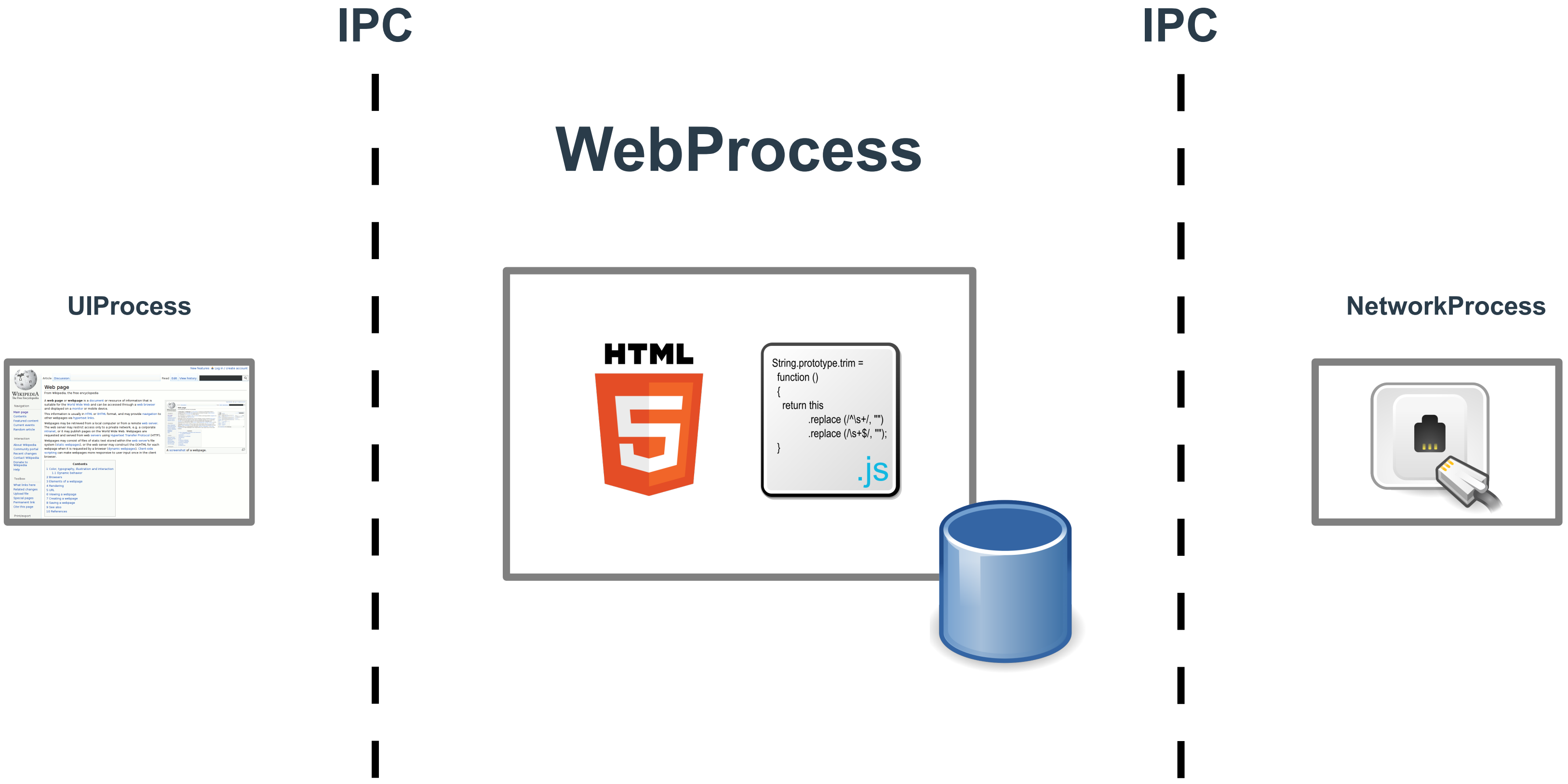

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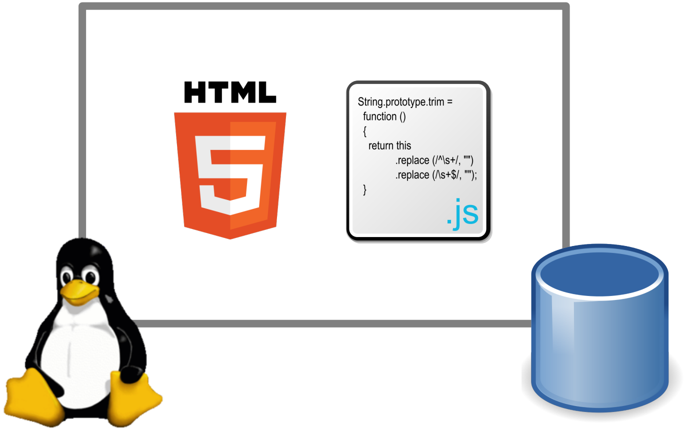

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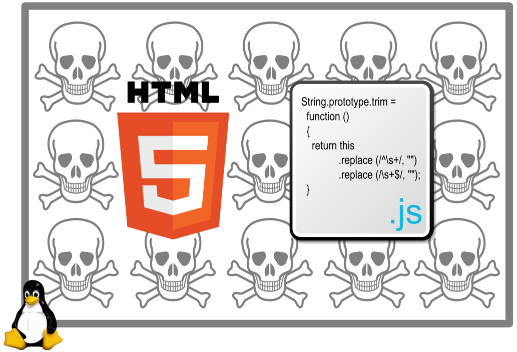

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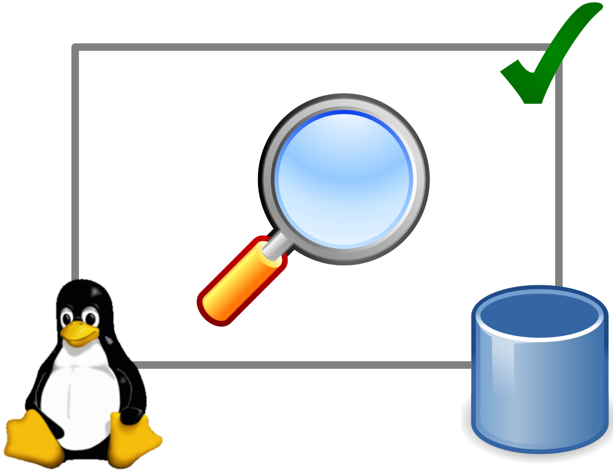
BrokerProcess



```
$HOME/.browser/example.com/*  (rw)
$HOME/.browser/defaults.conf  (r)
/usr/share/fonts/* (r)
/* (not allowed)
```

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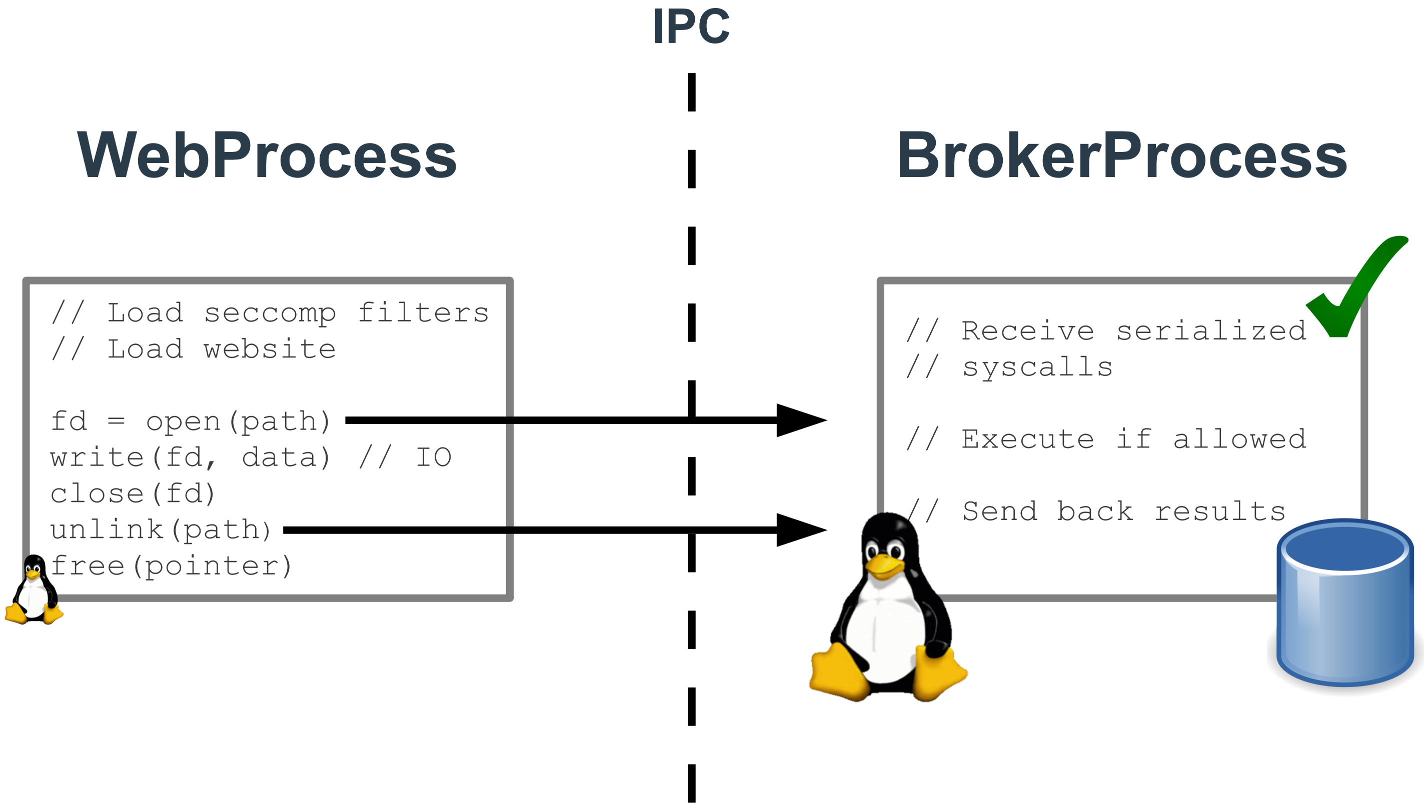
Seccomp Filters

- Linux Kernel 3.5
- Ubuntu 12.04
- Whitelist syscalls
- Blacklist syscalls
- Trap syscalls and inspect its parameters
- Make it possible to emulate a syscall
- ~370 syscalls: libseccomp for the rescue



```
// Load seccomp filters
// Load website

fd = open(path)
write(fd, data) // IO
close(fd)
unlink(path)
free(pointer)
```

```
// Receive serialized
// syscalls

// Execute if allowed

// Send back results
```

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Additional information

- **Performance implications**
  - open() ~28x slower
  - 15.000 open()'s in ~590ms

- **Source code**

```
# ls Source/WebKit2/Shared/linux/SeccompFilters/*
```

- **How to build**

```
# ./Tools/Scripts/build-webkit --efl -2 --seccomp-filters
```

- **Documentation**

  http://tinyurl.com/seccompwk2

Questions?

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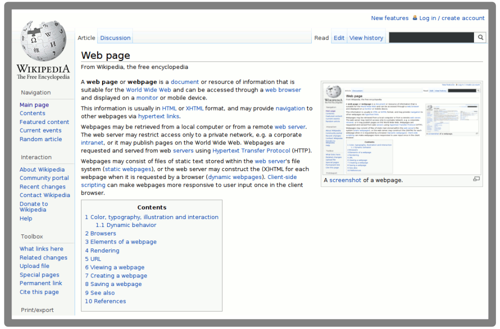

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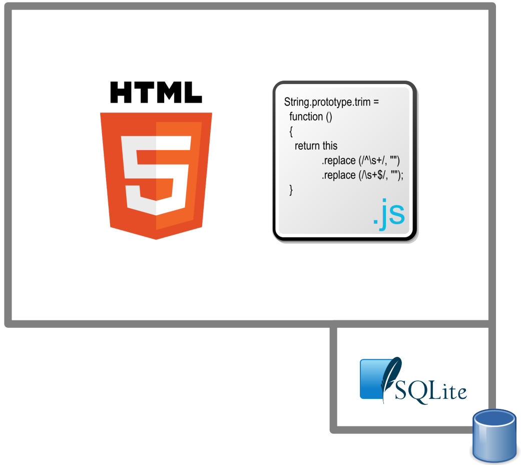

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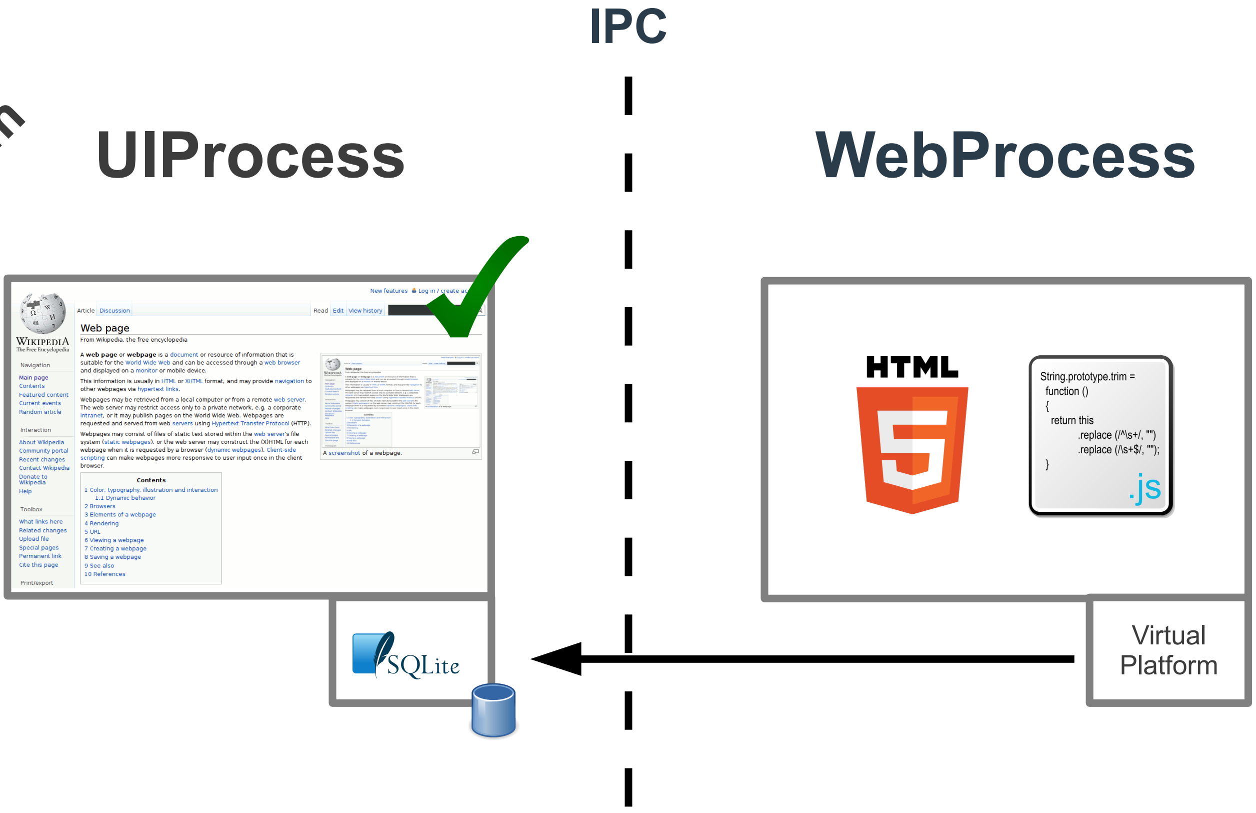

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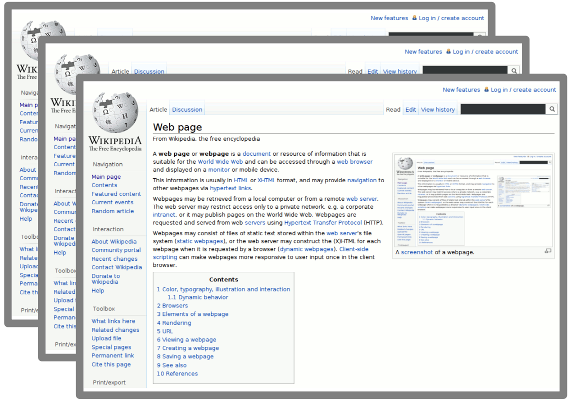

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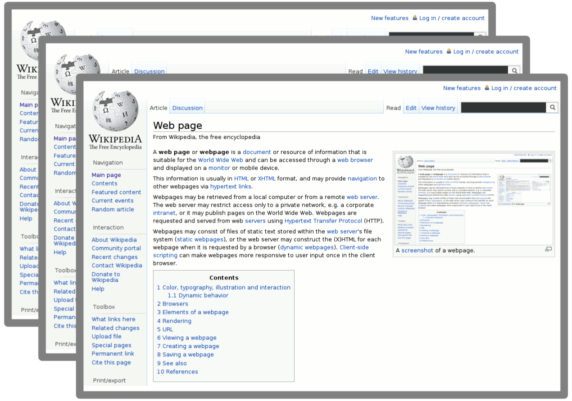

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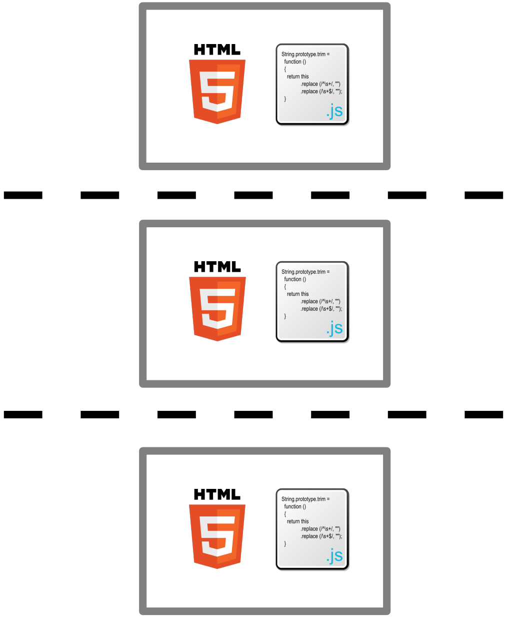

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