



DRUPAL DEVELOPER DAYS
LISBON 2018

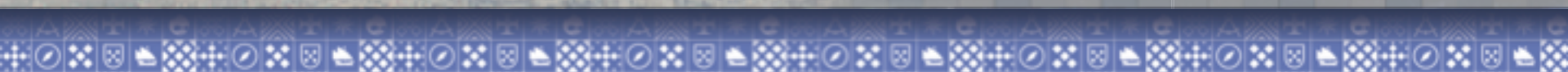
WebAssembly (WASM)

A game changer for the Web

Mladen Todorović

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Drupal Dev Days Lisbon



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About ME

Face =>

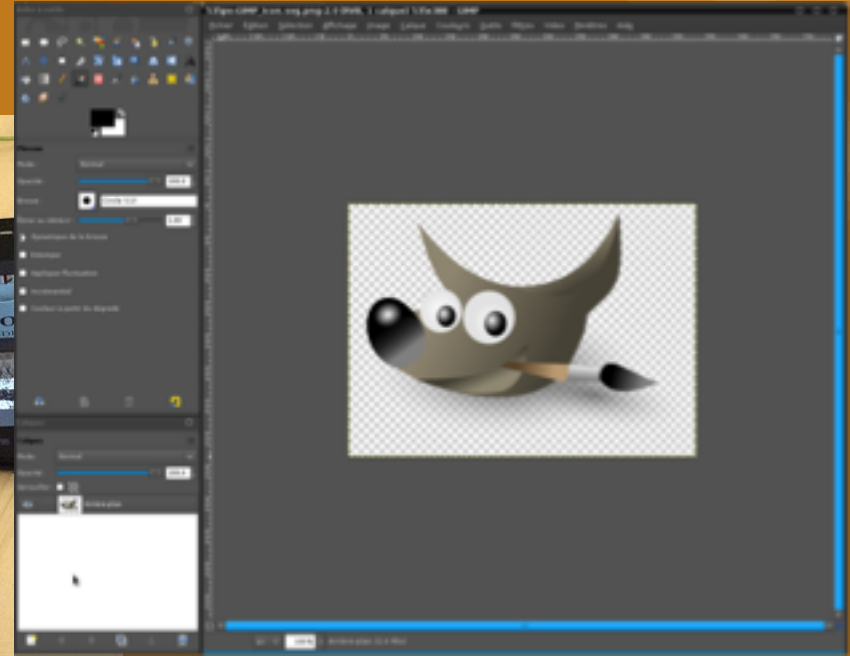
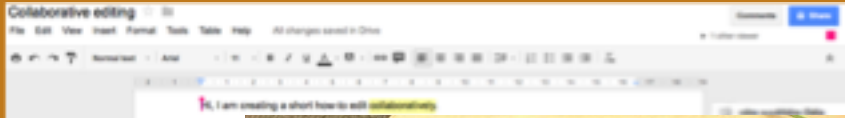


Name: Mladen Todorović

mtodor@everywhere (drupal.org, twitter, gmail, github, etc.)

- **some experience in software development (around 19 years)**
- **front-end developer for several years (mainly ExtJS framework)**
- **“full stack” developer, dev-ops, mother and father of RTB system**
- **currently part of Thunder Core team (for already 2 years)**

Applications, applications!



Native applications

- **[+] good performance**
- **[+] variety of languages**
- **[-] distributing application (different platforms, etc.)**
- **[-] security**

Web applications

- **[+] one platform (any browser)**
- **[+] good security**
- **[-] performance is not so perfect**
- **[-] limited to one programming language**



WASM gets good parts

It combines good parts from native and web applications.

We have:

- fast applications
- use many languages (in theory) – it supports compiling from LLVM
- runs on one platform widely available



What is WASM?

- web standard that defines a binary format that can be run in web browser
- compilation target for languages such as C/C++ or Rust
- near-native performance
- alongside JavaScript

About WASM



- first announced on 17.06.2015
- the team includes people from Mozilla, Microsoft, Google and Apple.
- MVP in March 2017
- around 74% global web browser support for WebAssembly

WebAssembly - OTHER

WebAssembly or "wasm" is a new portable, size- and load-time-efficient format suitable for compilation to the web.

Usage % of all users 
 Portugal 87.8%
 Global 74.12%

Current aligned Usage relative Date relative [Show all](#)

IE	Edge [*]	Firefox	Chrome	Safari	Opera	iOS Safari [*]	Chrome for Android	UC Browser for Android	Samsung Internet
			49						
			65			10.3			
	16	59	66	11	52	11.2			6.2
11	17	60	67	11.1	53	11.3	67	11.8	7.2
	18	61	68	12					
		62	69	TP					
			70						

How can we benefit?

- make better applications (we have more computational power)
- offload computation to clients
- security out of box (browsers are providing good sandboxing)
- no need for specialized developers in Web development
- reuse of existing libraries/algorithms/projects

Software branches that will benefit most from WASM

- Gaming
- Crypto
- Software graphics and animation
- Computer vision
- Emulation cores
- Compression
- Audio processing
- In-memory databases



Current problems

complicated interface with JavaScript in order to
manipulate DOM



executing a WASM function from JS is slow

Current problems (no. 2)

slow loading time and it's already addressed
in Firefox (currently only develop and nightly)



Development tools

- again Firefox is doing good things regarding that
- and also compiler is getting easier to use
- libraries are adding webassembly as compile target
- etc.

But, it's getting better!

- Automatic convert of asm.js to WebAssembly import
- Worker based Threads (in development)
- SIMD support
- Fast exceptions
- Faster loading time for WASM modules
- Faster function calls between JS and WebAssembly
- DOM API in WebAssembly

Demo Time! Yay!



- Skeletal animation
- Video editing
- and Drupal module

Windows

A fatal exception 0E has occurred at 0028:C0011E36 in VXD UMM(01) + 00010E36. The current application will be terminated.

- * Press any key to terminate the current application.
- * Press CTRL+ALT+DEL again to restart your computer. You will lose any unsaved information in all applications.

Press any key to continue _

Where to start!?

- Official site - webassembly.org
- Mozilla docs - developer.mozilla.org/docs/WebAssembly
- A cartoon intro to WebAssembly (by Lin Clark) - hacks.mozilla.org/2017/02/a-cartoon-intro-to-webassembly
- WebAssembly Rocks - www.wasmrocks.com
- WebAssembly Weekly - wasmweekly.news
- WebAssemblyCode - webassemblycode.com

Existing Tools

- Emscripten - kripken.github.io/emscripten-site/index.html
- Binaryen - github.com/WebAssembly/binaryen
- AssemblyScript - github.com/AssemblyScript/assemblyscript
- WebAssembly Studio - webassembly.studio
- Firefox Developer/Nightly Edition

Thank you!

Any questions?

