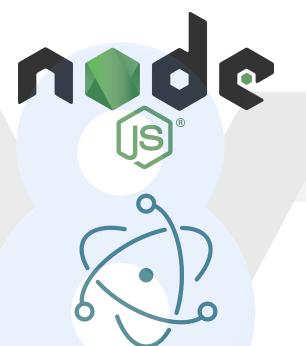


as a Research Platform

Steve Blackburn, Australian National University
Ulan Degenbaev, Google
Hannes Payer, Google
Toon Verwaest, Google
Michael Starzinger, Google

JS















Agenda



14:00 - 14:15:	Introduction and	overview of V8 (10 min) - Hannes Payer
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14:15 - 14:45: Object model, type feedback, parsing and streaming (40 min) - *Toon Verwaest*

14:45 - 15:30: Compilation pipeline, TurboFan overview, JavaScript focused optimizations (40 min)

- Michael Starzinger

15:30 - 16:00: Break

16:00 - 16:20: WebAssembly (20 min) - Michael Starzinger

16:20 - 17:00: Garbage collection and MMTK in V8 (40 min) - Hannes Payer & Steve Blackburn

17:00 - 17:35: Benchmarks, metrics, and tools (35 min) - *Ulan Degenbaev*



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What is V8?

V8 is Google's open source high-performance JavaScript and WebAssembly engine, written in C++. It is used in Chrome and in Node.js, among others. It implements ECMAScript and WebAssembly, and runs on Windows 7 or later, macOS 10.12+, and Linux systems that use x64, IA-32, ARM, or MIPS processors. V8 can run standalone, or can be embedded into any C++ application.

Latest blog posts

- 89. Code caching for WebAssembly developers 17 June 2019 WebAssembly internals
- 88. V8 release v7.5 16 May 2019 release
- 87. Faster and more feature-rich internationalization APIs 25 April 2019 ECMAScript Intl
- 86. A year with Spectre: a V8 perspective 23 April 2019 security
- 85. Blazingly fast parsing, part 2: lazy parsing 15 April 2019 internals parsing
- 84. Code caching for JavaScript developers 08 April 2019 internals
- 83. Blazingly fast parsing, part 1: optimizing the scanner 25 March 2019 internals parsing
- 82. V8 release v7.4 22 March 2019 release
- 81. JIT-less V8 13 March 2019 internals
- 80. V8 release v7.3 07 February 2019 release

More articles can be found in the blog archive.

<u>https://v8.dev</u>

Twitter: @v8js

V8's Git repository is located at: https://v8.dev/git

Official mirror on GitHub:

https://github.com/v8/v8

Technical discussions and design docs: v8-dev@googlegroups.com



SPLASH Conference

@splashcon



Google's V8 wins the ACM SIGPLAN Software Award! Congrats! #splash16

10:06 AM - 3 Nov 2016

Recent Research Papers

Ulan Degenbaev, Michael Lippautz, Hannes Payer:

Garbage collection as a joint venture. Commun. ACM 62(6): 36-41 (2019)

Ulan Degenbaev, Michael Lippautz, Hannes Payer:

Garbage Collection as a Joint Venture. ACM Queue 17(1): 60 (2019)

Ulan Degenbaev, Michael Lippautz, Hannes Payer:

Concurrent marking of shape-changing objects. ISMM 2019: 89-102

Ross McIlroy, Jaroslav Sevcík, Tobias Tebbi, Ben L. Titzer, Toon Verwaest:

Spectre is here to stay: An analysis of side-channels and speculative execution. CoRR abs/1902.05178 (2019)

Ulan Degenbaev, Jochen Eisinger, Kentaro Hara, Marcel Hlopko, Michael Lippautz, Hannes Payer:

Cross-component garbage collection. PACMPL 2(OOPSLA): 151:1-151:24 (2018)

Nadja Peters, Sangyoung Park, Daniel Clifford, S. Kyostila, R. McIlroy, Benedikt Meurer, Hannes Payer, Samarjit Chakraborty:

Phase-Aware Web Browser Power Management on HMP Platforms. ICS 2018: 274-283

Recent Research Papers

Nadja Peters, Sangyoung Park, Daniel Clifford, S. Kyostila, Ross McIlroy, Benedikt Meurer, Hannes Payer, Samarjit Chakraborty: API for power-aware application design on mobile systems. MOBILESoft@ICSE 2018: 90-91

Andreas Rossberg, Ben L. Titzer, Andreas Haas, Derek L. Schuff, Dan Gohman, Luke Wagner, Alon Zakai, J. F. Bastien, Michael Holman:

Bringing the web up to speed with WebAssembly. Commun. ACM 61(12): 107-115 (2018)

Andreas Haas, Andreas Rossberg, Derek L. Schuff, Ben L. Titzer, Michael Holman, Dan Gohman, Luke Wagner, Alon Zakai, J. F. Bastien:

Bringing the web up to speed with WebAssembly. PLDI 2017: 185-200

Ulan Degenbaev, Jochen Eisinger, Manfred Ernst, Ross McIlroy, Hannes Payer: Idle-time garbage-collection scheduling. Commun. ACM 59(10): 34-39 (2016)

Nadja Peters, Sangyoung Park, Samarjit Chakraborty, Benedikt Meurer, Hannes Payer, Daniel Clifford:

Web browser workload characterization for power management on HMP platforms. CODES+ISSS 2016: 26:1-26:10

Ulan Degenbaev, Jochen Eisinger, Manfred Ernst, Ross McIlroy, Hannes Payer: Idle time garbage collection scheduling. PLDI 2016: 570-583

... plus many more from other researchers

For example at this PLDI'19:

Jiho Choi, Thomas Shull, Josep Torrellas:

Reusable inline caching for JavaScript performance. PLDI 2019: 889-901

V8/Google PResearch

Google's 7th Compiler and Programming Language Summit, 9th-11th 2019 December in Munich.

We are always looking for amazing engineers, research visitors, and interns!

Chrome Research Projects, Google PhD Fellowships, Faculty Research Awards, etc.

https://ai.google/research/outreach