Story of
Test Contribution to W3C

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Audience

If you are QA or write test code, and would like

- to make your tests be standard of industry
- to build reputation and leadership in industry standard organization

Please read this story …

Agenda

- What are W3C and W3C tests?
- Why we made test contribution to W3C?
- How we grow leadership?
- What to do next?

W3C

- World Wide Web Consortium (W3C).
- An international community where Member organizations, a full-time staff, and the public work together to develop Web standards. Led by Web inventor Tim Berners-Lee and CEO Jeffrey Jaffe.
- W3C Groups
  - Working Groups (WG), 48
  - Interest Groups (IG), 15
  - Coordination Groups, 3
  - Community and Business Groups (CG BG) -> WG

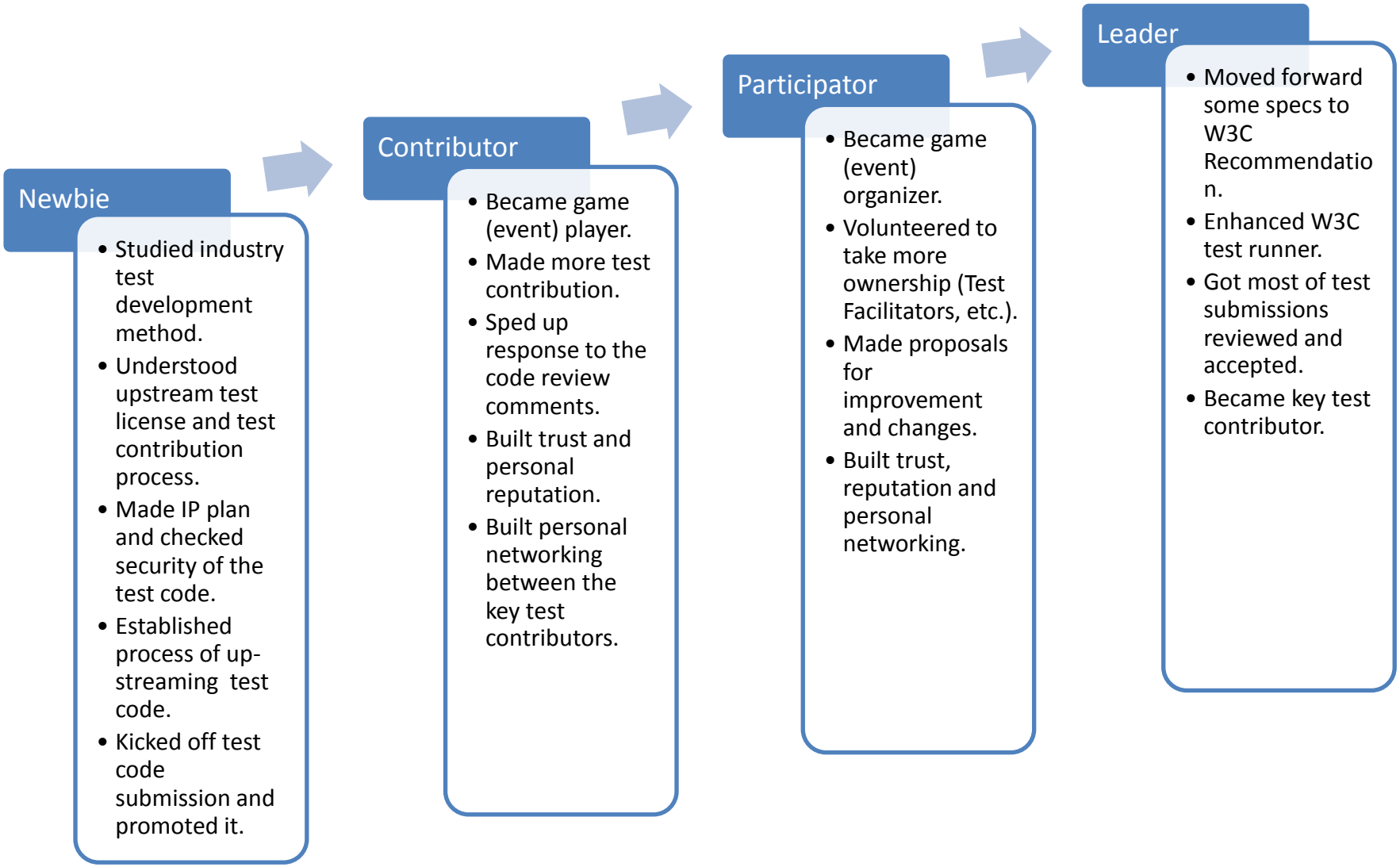
W3C Tests

- Purpose of W3C testing:
  - To promote wide interoperability across devices, platforms, and classes of user agents (such as browsers and content authoring tools).
  - To demonstrate two interoperable implementations of each feature of a technical report in the transition from Candidate Recommendation to Proposed Recommendation.
    - Conformance testing
    - Interoperability testing
- Type of W3C Spec-based Tests:
  - idlharness.js tests - for testing anything in a Web IDL block.
  - testharness.js tests - for any test that can be written using script alone.
  - Reftests - for most tests of rendering.
  - Web Driver tests - for testing the web driver protocol itself or (in the future) for certain tests that require access to privileged APIs.
  - Manual tests - as a last resort for anything that can't be tested using one of the above techniques.

Why Contribute Tests to W3C?

- Intel web projects (Crosswalk, Tizen, etc.) support many W3C features and web QA has used/developed a large amount of W3C tests.
- Ensure Intel web test development including test methodology align with the Web industry.
- Ensure Intel test suites high quality, standardized and applicable to the Open Web Platforms.
- Ensure Intel web projects and products high quality and interoperable across devices, platforms and classes of user agents.
- Support Intel's strategy of becoming an industry leader and trusted advisor for HTML5.

How We Grow Leadership?



Newbie

- Challenges:
  - Intel had no one ever contributed tests to W3C.
  - Intel web projects support different versions of W3C features other than the latest versions that W3C test suites require.
  - Intel web projects may have *-webkit* or *-xwalk* prefixes in implementation while W3C tests require no vendor prefix.
  - Intel test cases may be buggy or hard-coded for the web projects.
- What we did:
  - Integrated W3C tests into our test suites.
  - Studied W3C test development methodology (FAQ, CSS, SVG, WebApps, TestTWF).
  - Reinforced test development guideline/templates and updated existing tests to ensure our tests are standardized and fulfill W3C guideline naturally.
  - Created tests to fill gaps of W3C test coverage.

Newbie

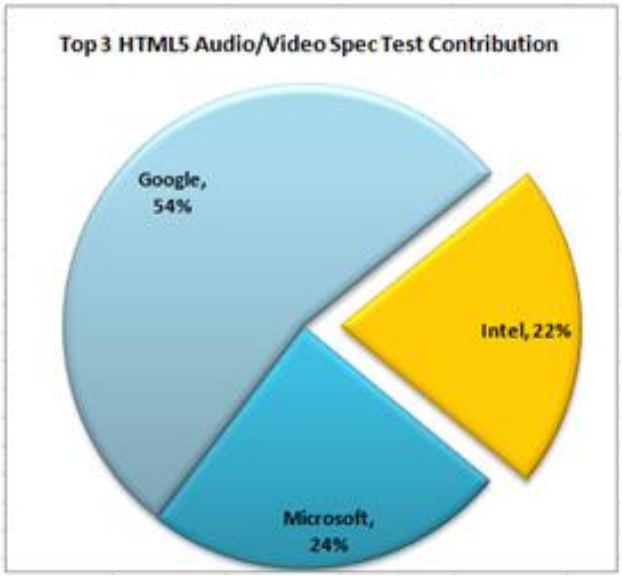
- What we did:
  - Made IP Plan for the test code to be submitted to W3C, and checked the test code security.
  - As the first team of Intel, initiated whole process for making test contribution to W3C (CSS, HTML, WebApps WGs) co-working with Intel W3C coordinator (Advisory Committee Representative) and representatives.
  - Attended W3C *Test the Web Forward* (TestTWF) event and made test contribution.

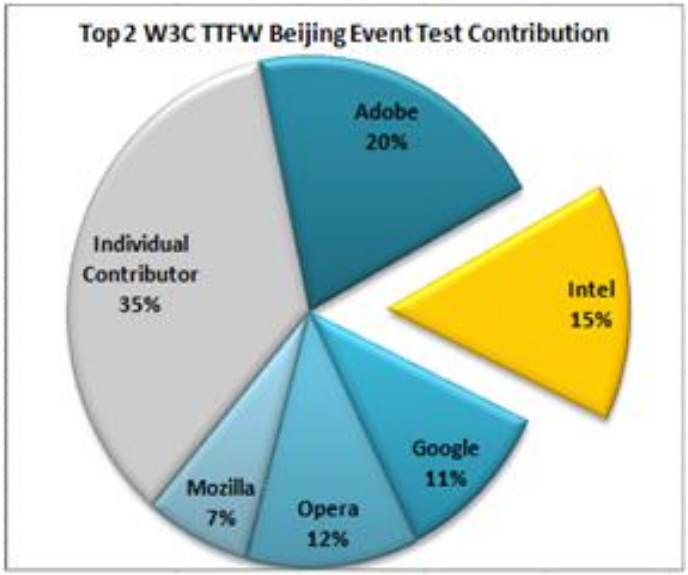
How to Write Spec-based Tests?

- Look for *conformance requirements* in the spec, e.g. *MUST*, *MUST NOT*.
- Some statements are unambiguously requirements.
- Some statements are *candidate* requirements.
- Requirements are often stated within algorithms.
- A single requirement usually requires multiple test.
- A single test case may test a combination of requirements.
- In short, it's complicated. See testing-how-to.

Contributor

- Challenges:
  - Deliver high quality and standardized tests independent to implementation.
  - Little reputation or recognition in W3C test community.
- What we did:
  - Submitted 400+ tests to HTML WG, 100+ tests to CSS WG.
  - Acted as presenter and reviewer in W3C *TestTWF* events.
  - Took Test Facilitator role of Server-Sent Events (SSE), WebApps WG.
  - Participated in W3C initiative *Testing the Open Web Platform* project.





How to Get Tests Approved/Accepted?

- Create tests following W3C test development methodology.
- Submit the tests following Intel process.
- Call for public review.
- Address review comments **timely** and continue to improve the tests.

contributors/intel/submitted/css3-background/background-size-029.html

2012-11-22	Updated background-size-025, 027~031 with http://www.gtalbot.org /BrowserBugsSection/review/support/100x100-blue-and-orange.png	file | diff | annotate
2012-11-21	Updated background-size-025, 028, 029 and 031 per Gérard's review, updated background-size-027 tiny different from Gérard's review, and added reftest to background-size-026	file | diff | annotate
2012-11-15	I have improved background-size-013, 015, 016, 018, 019 and 020	file | diff | annotate
2012-11-09	Update background-size-021~031 pass conditions	file | diff | annotate
2012-11-08	Improve tests background-size-025~034	file | diff | annotate
2012-10-15	Update background tests style to reflect test case template for HTML5	file | diff | annotate
2012-10-15	Update background tests title to reflect title-element format	file | diff | annotate
2012-10-13	Improve assert description for background tests	file | diff | annotate
2012-10-13	Update test links to tracked specification sections	file | diff | annotate
2012-10-13	Submit the tests for css3 background-clip/-origin/-size	file | diff | annotate |

Participator

- Challenges:
  - Intel process for making test contribution to W3C became a bottleneck for us because we had to ask representatives help submit the tests.
  - Our test submissions got slow review and approval.
- What we did:
  - Jointed W3C Web Testing IG (now closed)
    - http://lists.w3.org/Archives/Public/public-test-infra/ still active
    - https://github.com/w3c/web-platform-tests
  - Simplified Intel process for making test contribution.
  - Recognized as test reviewer for the W3C test repositories.
  - Co-chaired of W3C HTMl5 Chinese IG.
    - http://www.w3.org/html/ig/zh/
    - http://lists.w3.org/Archives/Public/public-html-ig-zh/
    - https://github.com/w3c-html-ig-zh/
  - Got 436 tests approved among 1529 submitted by the end of 2013; 1735/2826 tests approved/submitted by the end of 2014 Q1.

Participator

- What we did:
  - Demonstrated leadership at *TestTWF* Shanghai event
    - Presenter and reviewer.
    - Top 1 test submitter: 522 tests out of total 1003.
    - Top 1 bug reporter: 10 bugs out of total 35.
    - 7 attendees out of total 150+.
    - 4 awards of Excellent/Outstanding Contribution, Test Case Talent and Best Bug Reporter.


Participator

- What we did:
  - Co-sponsored *TestTWF* Shenzhen event.

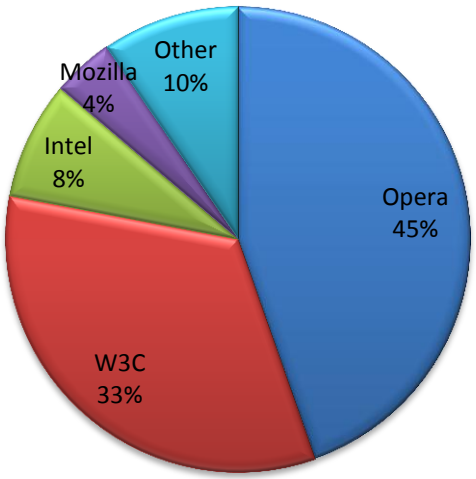
How to Review Test Cases?

- Make sure the test follows the format and style guidelines.
- Checklist for all tests:
  - The test follows the format and style guidelines.
  - The test passes when it's supposed to pass.
  - The test fails when it's supposed to fail.
  - The test is testing what it thinks it's testing.
  - The spec backs up the expected behavior in the test.
  - The test is automatable as either reftest or a script test.
- Checklist for reftests only:
  - The test has a self-describing statement.
  - The self-describing statement is accurate, precise, simple, and self-explanatory.
  - The reference file is accurate and will render pixel-perfect identically to the test on all platforms.
  - The reference file uses a different technique that won't fail in the same way as the test.
  - The title is descriptive but not too wordy.
  - The test is as cross-platform as reasonably possible.
- See how-to-review-W3C-tests.

Leader

- Challenges:
  - How to drive Web QA team deliver high-quality test cases applicable to W3C, especial for new staff?
  - How to move forward the W3C specifications that Intel cares about?
  - How to influence the W3C testing community?
- What we did:
  - Coached and encouraged each engineers/CWs who worked on webapi test development diving into the test contributions to W3C.
  - In 2014, among the 13 specifications in Candidate Recommendation, only the 3 specifications (*Indexed DB*, *Server-Sent Events*, *Vibration*) that Intel takes the Test Facilitator role were moved forward to Proposed Recommendation and Recommendation.
  - In 2014, had 2305 tests accepted and 900 tests submitted.
  - Had 10+ pull requests accepted to enhance W3C test runner.

Top 3 of Test Contributor for HTML5 Spec in 2014



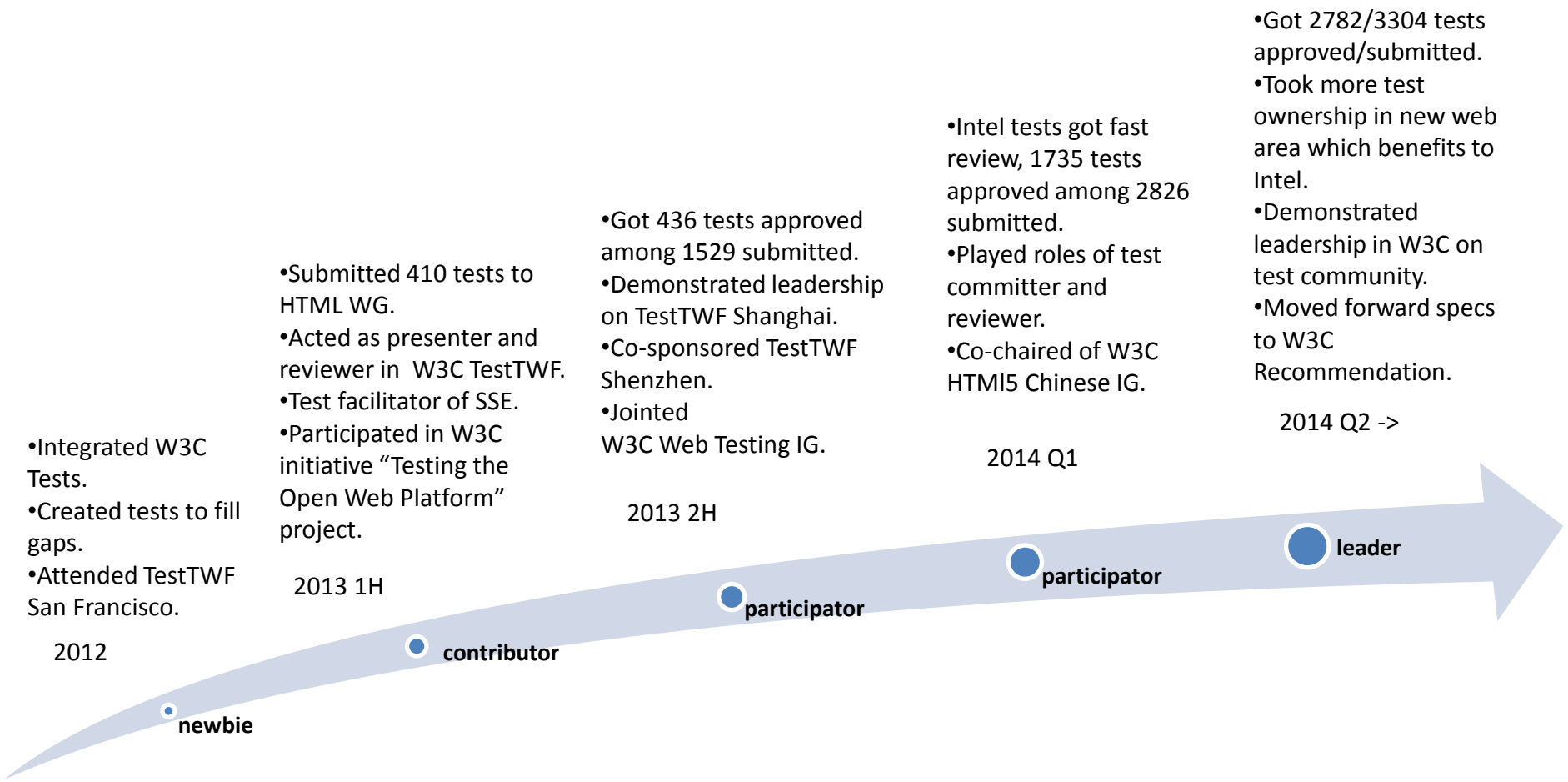
Top 1 Test Contribution to 6 Specifications

Specification	Intel	Other
Vibration	11	0
HTML Media Capture	6	0
Web Notifications	16	0
Indexed DB	60	129
Typed Arrays	58	0
Battery Status	3	1

How to Determine a Test Suite Complete?

- A test suite for a spec shall cover all normative sections as:
  - IDL item or CSS properties.
  - RFC 2119 key words, MUST and MUST NOT; may be SHOULD.
  - Algorithm steps, “ol li”.
- Generate implementation reports at https://github.com/w3c/test-results.

Achievement Summary



Recognition

- Intel was thanked by W3C CEO as one of few companies for making significant contributions to Intel's testing efforts; and by Jon Lee, Chair Web Notification WG.
- Zhiqiang was thanked by Arthur Barstow, Chair W3C WebApps WG; by Frederick Hirsch, Chair W3C Device APIs WG; Philippe Le Hegaret, Lead of W3C Interaction Domain.

What to Do Next?

- Contribute and lead more testing efforts on the new technique areas aligning with Intel interests.
  - *File API*, *Web IDL*, *Web Messaging*, *Web Notifications*, *Web Sockets*, *Web Workers*, etc. invited by W3C.
  - *Battery Status*, *HTML Media Capture* as Test Facilitator.
  - *Manifest* related, *Media Capture* related, *NFC*, *Presentation APIs*, *Service Workers*, *Web Bluetooth*, *Web RTC* that Intel cares.
- Continue to grow our test leadership.
  - Investigate new test method.
  - Automate more manual tests to Reftests, etc.
  - Promote our tests and test method, tools, etc.

Acknowledgments

- Thanks to Ling Yu and OTC management for supporting the test contributions to W3C.
- Thanks to the whole Web QA team for being awesome.
- Thanks to Wayne Carr, Intel W3C coordinator, for making and improving the Intel process of submitting tests to W3C.
- Thanks to Thiago Santos, Pan Deng and Anssi Kostiainen for helping the test contributions.

Thanks

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