Workshop: TLA$^+$ in Action

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TLA+ Workshop material

The workshop material can be found at the following locations:

- https://git.io/JZxUh
- https://aka.ms/tlaewd998
- https://github.com/lemmy/ewd998
- => Please consider “starring” the Github repository

TLA+ Workshop

- Interactive & Hands-on
  - "Write" a TLA+ spec and meet the tools
  - Zoom *meeting*
  - Git repository (each commit represents a concept)
    - If you miss a beat, skip to the next commit
    - Weeks of debugging save hours of TLA+
- 4x 1.25h over 2 days totaling 5h
  - Not exhaustive (breadths over depths)
  - "Specifying Systems" or "TLA+ in Practice and Theory" for depth

http://etc.ch/ziM6

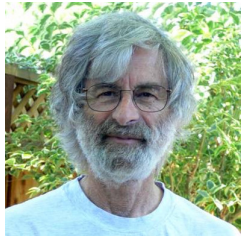
My Background

- Not a mathematician (logician), but software engineer
- Learned TLA+ by working on its tools (~decade)
- Wrote many TLA+ specs related to the tools, examples, ...

http://etc.ch/ziM6

TLA$^+$ 30.000ft above

TLA$^+$ is a specification language to design, document, and verify reactive systems.



Leslie Lamport

Specify Large Systems in TLA+

- DynamoDB: scalable high-performance "no SQL" data store with cross datacenter replication and strong consistency guarantees
- First informal proofs and excessive (fault-injecting) testing

Specify Large Systems in TLA+

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- TLC found very subtle bug: shortest error trace 35 steps
- "Using TLA+ in place of traditional proof writing would thus likely have improved time to market, in addition to achieving greater confidence in the system's correctness." [Newcombe, 2014, Newcombe et al., 2015]

Your background

- https://directpoll.com/r?XDbzPBd3ixYqg8AIK7KI7E0zwD6RtEdWCc3UvSu

Bibliography

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Chris Newcombe, Tim Rath, Fan Zhang, Bogdan Munteanu, Marc Brooker, and Michael Deardeuff. How Amazon Web Services Uses Formal Methods. Communications of the ACM, 58(4):66–73, March 2015. ISSN 00010782. doi: 10.1145/2699417. URL http://dl.acm.org/citation.cfm?doid=2749359.2699417.