

Toph

Toph is where competitive programmers participate in programming contests, solve algorithm and data structure problems and become a part of an awesome community.

The Challenge: Building a Secure and Scalable App

Toph required a secure mechanism for executing and evaluating arbitrary code submitted by the users, and a robust architecture that scales easily on-demand.

The Solution

Our development team had to address a number of challenges:

- Executing arbitrary user submitted code in a secure environment.
- Scaling out to accommodate more users without disrupting experience.
- Delivering a real-time contest experience to both participants and moderators.

Sandbox for User Submitted Code

Our developers leveraged the power of Linux Namespaces and Cgroups to create a lightweight yet secure code sandboxing tool.

Scalable Infrastructure

Our Go developers followed The Twelve-Factor App methodology to build a set of amazing portable apps that can scale up easily and on-demand.

Real-time Contest Experience

Our front-end team built a real-time contest arena using Backbone.js on top of Toph's simple REST APIs and PubSub architecture.

The Results

Toph is now powered by a set of back-end apps that can scale independently based on load and contest needs. It provides a powerful real-time single-page contest arena app that delivers a consistent user experience on any network.

The lightweight sandboxing tool allows Toph to make the most out of its back-end resources and provide verdicts for user submissions quickly.



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Key Results

- Hosted contests with 1000+ participants
- Hosted 300+ contests
- Collaborated with 50+ institutions
- 1k+ problems of varying difficult available for practice
- Handled 500k+ submissions
- Zero sandbox breaches
- Easy-to-use contest moderation dashboard