



Critical Path Analysis

Prioritizing what matters

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Introduction

- Grab was growing really fast!
- Needed something light-weight to force good design

Critical Path Analysis to the rescue

- A subset of services that ensure the main parts of our application are running
- Is it possible? What's our main part?

Critical Path Definition

Any impact on our systems that impacts the ability of a passenger to get a car to get safely from Point A to Point B.

Critical Path Definition Trade-Offs

Any impact on our systems that impacts the ability of a passenger to get a car to get safely from Point A to Point B.

- Fares
- Cashless Payments
- Promotions
- Safety

Validating the Critical Path

- Tests on staging environment
- Very simplistic tests

Validating the Critical Path in Prod

- Confidence can only be obtained by validating in production
- Get executive approval to run these tests
- Communicate in advance to all of the local teams about the tests

Validating the Critical Path in Prod

- Tested 50+ services over 8 hours across 2 nights



Fixing a service that didn't conform

Graceful Degradation

- Involve product teams early on in the decision making
- Use Circuit Breakers to fail fast
 - Golang - <https://github.com/afex/hystrix-go>
 - Ruby - <https://github.com/orgsync/stoplight>

Graceful Degradation - Caching

- Cache for
 - Geofences
 - City Details
 - Country Details
 - Vehicle Type Metadata

Graceful Degradation - Caching

- Frequently/Recently Used POIs
- Active Vehicle Types

Graceful Degradation - Fallbacks

- Multiple Routing Providers
- Falling back to straight line distance

Graceful Degradation -Retries & Queues

- Enqueue the job if it fails
- Retry it when the dependant service is back up

- Commission deductions on booking completion
- Allocation of Reward Points

Graceful Degradation - It's OK to fail

- Rating a driver
- ETA

Additional benefits

- Critical Services weren't the only ones to benefit
- Queues for Deployment Pipelines
- Highlighting Recent Changes
- Architectural changes for critical services

What would we have differently?

- Naming
- Only Two Tiers
- Build the automation earlier
- Keeping track of new services
- Working closely with mobile developers

What can you take away from this?

- 1) Make sure you define your critical path ensuring you are working with your business / product teams.
- 2) Ensure that you test your assumptions on a regular cadence.
- 3) Every 6 months or so re-evaluate your definition to make sure it aligns with your business goals.

Thank You!

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