



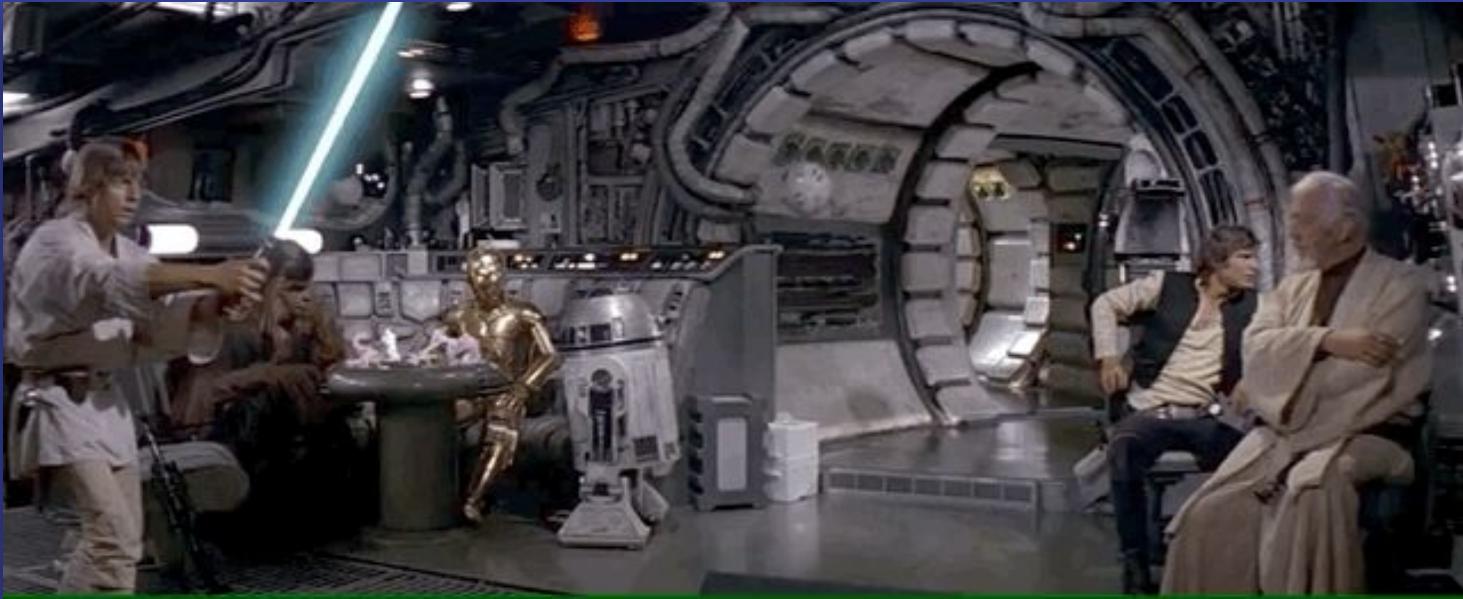
# Observing & Understanding Failures

## Training SRE Apprentices

*Tammy Bryant Butow, SRE @ Gremlin*

*Is it difficult to develop skills to observe and understand failures?*

*Why is training from someone more experienced helpful?*



*Luke before he met Yoda  
Could barely use force*



**Luke after he met Yoda**

*Lifts ship out of swamp after doing a handstand*



## SRE Apprentice

*Padawan*



We created an SRE Apprentice Program to hire and train new SREs. Apprentices come from different backgrounds, for example we hired a Math Teacher who had completed a coding bootcamp (Hackbright Academy).

We matched SRE Apprentices with SRE Teachers.

# SRE Apprentice

*Padawan*



# SRE Teacher

*Jedi*



**SRE Apprentices receive one-on-one instruction in the ways of the SRE.**

# SRE Apprentice

*Padawan*



# SRE Teacher

*Jedi*



**When an Apprentice's training is completed, they must pass the SRE interview-loop to become an SRE. They then continue to develop their skills and one day they will find a Padawan to train.**

# Let's check our assumptions on SRE Apprentices



*Rona*



*Krishelle*

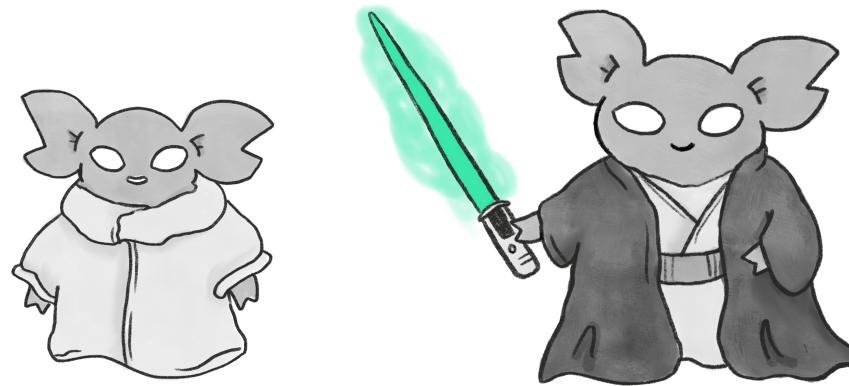


*Thomissa*



*John*

# How do we match SRE Apprentices (Padawans) to SRE Teachers (Jedi)?





# SRE Apprentice

*Padawan - Rona Chong*

The SRE apprenticeship was critical for my career - it was my foot into the door of the tech industry, when it can be hard to break in as a newcomer without the usual credentials. But getting your foot in the door is just the first step. To help set me up for success, Tammy was several things for me: a mentor, a source of emotional support, and an advocate. Find people who are truly dedicated to being there for others! I'm so glad that Tammy and her folks were there for me, checking in, thinking outside the box and pushing for growth and change in our communities

- Rona Chong, Padawan // SRE Apprentice.



## SRE Apprentice

*Padawan - Rona Chong*



*Has a desire to learn everything she can about the force.*



## SRE Teacher

*Jedi - Tammy Bryant Butow*



*Can feel disturbances in the force and use skills effectively to achieve desired results.*

# SRE Teacher

*What makes someone suitable?*

- Set your Apprentice up for success
- Be a mentor
- Be a source of emotional support
- Be an advocate
- Check-in
- Think outside the box
- Push for growth and change in our communities
- 2+ years SRE experience

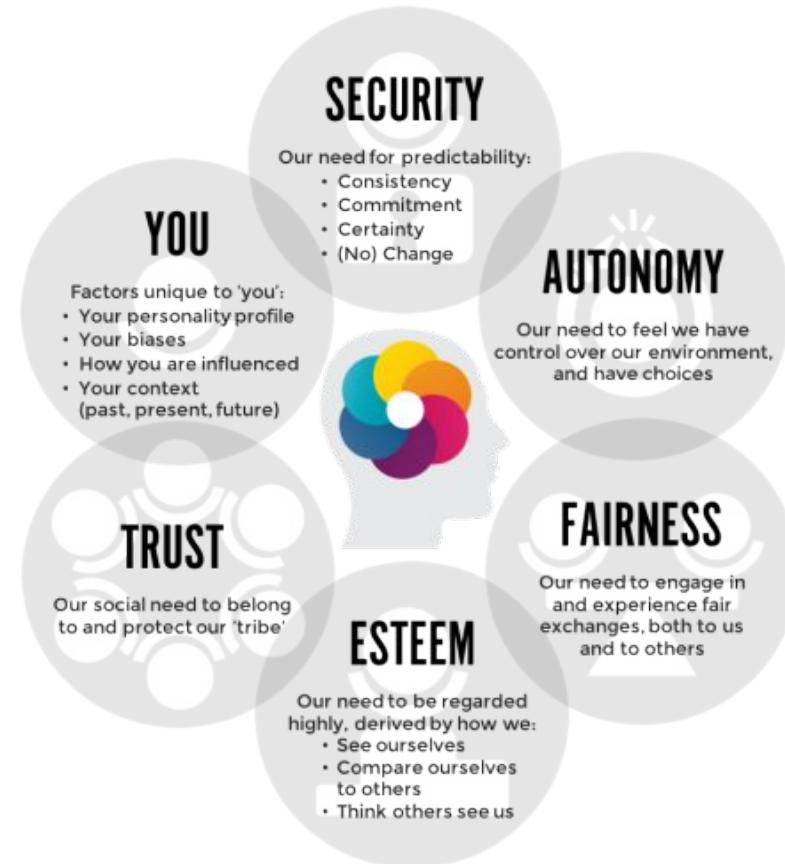


# Psychological Safety

*What is the S.A.F.E.T.Y model and how can it help me teach my apprentice?*

Self Assessment:

<https://academy-bbl.com/safety-assessment/>



# SRE Apprentice

*Padawan*



An approach to learning to observe and understand failures in Production

*Learn by training*



*Learn by shadowing*



*Learn by practice*



*Learn by community*



\* Mandalorian-style apprentice program featuring Grogu aka Baby Yoda and a Jedi trainer

# SRE Apprentice



*Learn by training: start with demo apps & lab environments before production*



burningion/ecommerce-observability

localhost:3000/cart?variant\_id=5

## NoMethodError in Spree::Orders#edit

Showing /spree/sandbox/app/views/spree/layouts/spree\_application.html.erb where line #14 raised:

undefined method `[]' for nil:NilClass

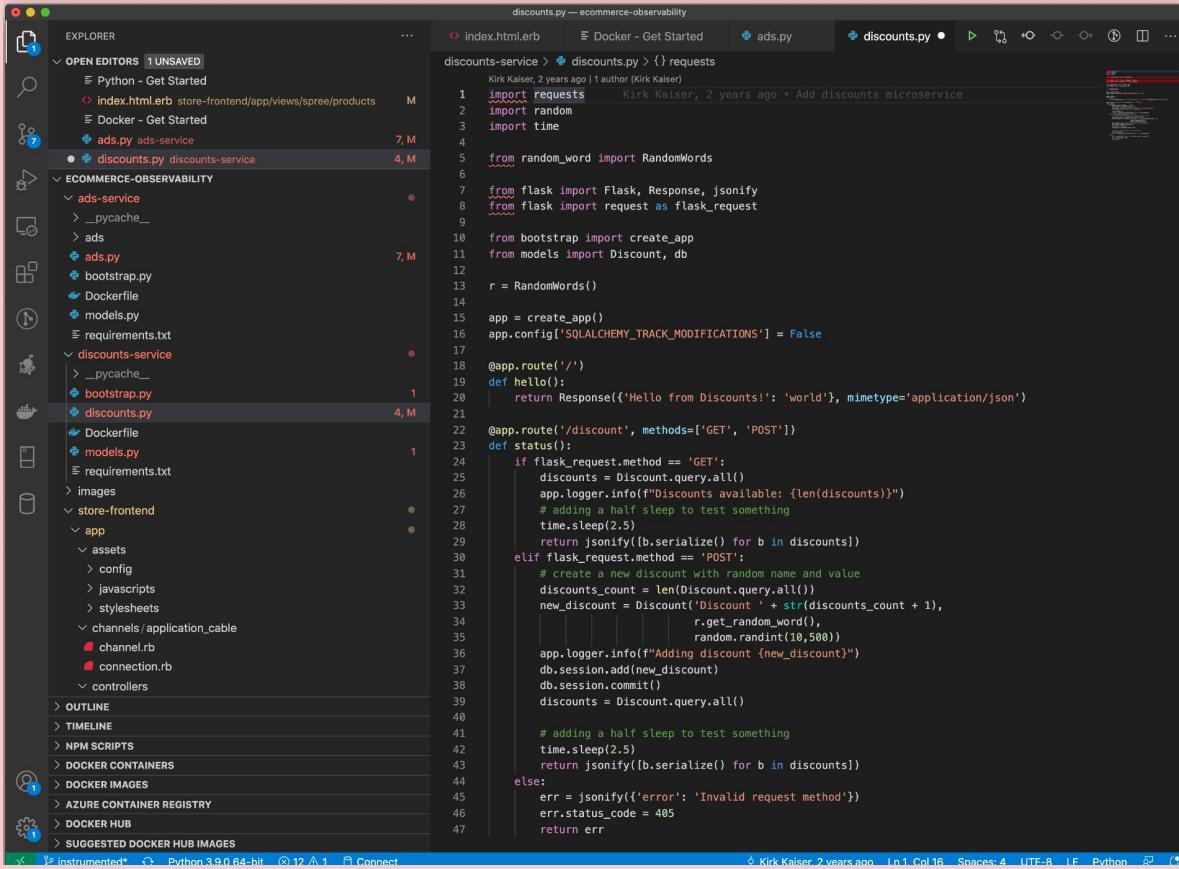
Extracted source (around line #14):

```
12
13     <div class="container">
14         <br /><center><a href="<%= @ads['url'] %>"></a></center>
15     <div class="row" data-hook>
16         <%= spree_breadcrumbs(@taxon) %>
17     </div>
```

Rails.root: /spree/sandbox

ads service  
code is  
throwing  
errors from a  
specific erb  
file

## discounts-service/discounts.py



```
discounts-service > ⌂ discounts.py { requests
Kirk Kaiser, 2 years ago | 1 author (Kirk Kaiser)
1 import requests
2 import os
3 import random
4 import time
5
6 from random_word import RandomWords
7
8 from flask import Flask, Response, jsonify
9 from flask import request as flask_request
10
11 from bootstrap import create_app
12 from models import Discount, db
13
14 r = RandomWords()
15
16 app = create_app()
17 app.config['SQLALCHEMY_TRACK_MODIFICATIONS'] = False
18
19 @app.route('/')
20 def hello():
21     return Response({'Hello from Discounts!': 'world'}, mimetype='application/json')
22
23 @app.route('/discount', methods=['GET', 'POST'])
24 def status():
25     if flask_request.method == 'GET':
26         discounts = Discount.query.all()
27         app.logger.info(f"Discounts available: {len(discounts)}")
28         time.sleep(2.5)
29         return jsonify([b.serialize() for b in discounts])
30     elif flask_request.method == 'POST':
31         # create a new discount with random name and value
32         discounts_count = len(Discount.query.all())
33         new_discount = Discount("Discount " + str(discounts_count + 1),
34                                 r.get_random_word(),
35                                 random.randint(10, 500))
36         app.logger.info(f"Adding discount {new_discount}")
37         db.session.add(new_discount)
38         db.session.commit()
39
40         discounts = Discount.query.all()
41
42         # adding a half sleep to test something
43         time.sleep(2.5)
44         return jsonify([b.serialize() for b in discounts])
45     else:
46         err = jsonify({'error': 'Invalid request method'})
47         err.status_code = 405
48         return err
```

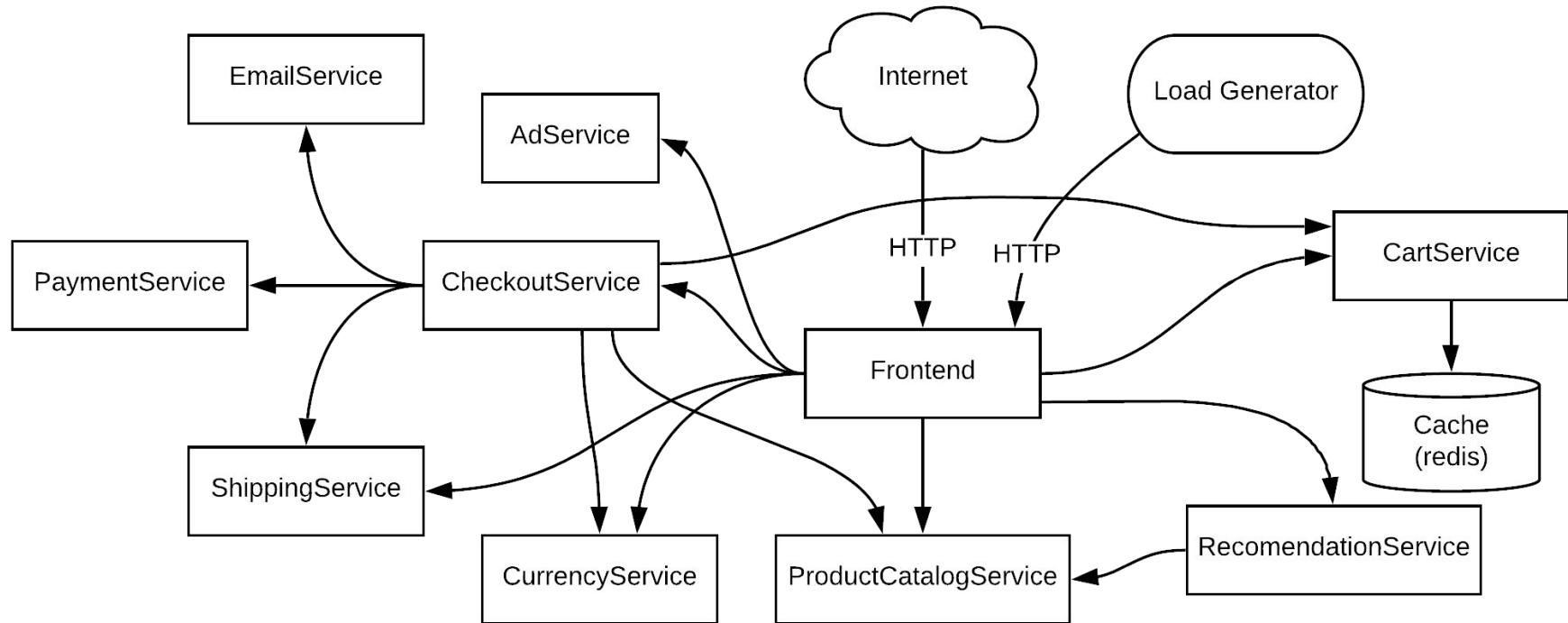
*discounts  
service code  
is causing  
performance  
issues*



gremlin/microservices-demo

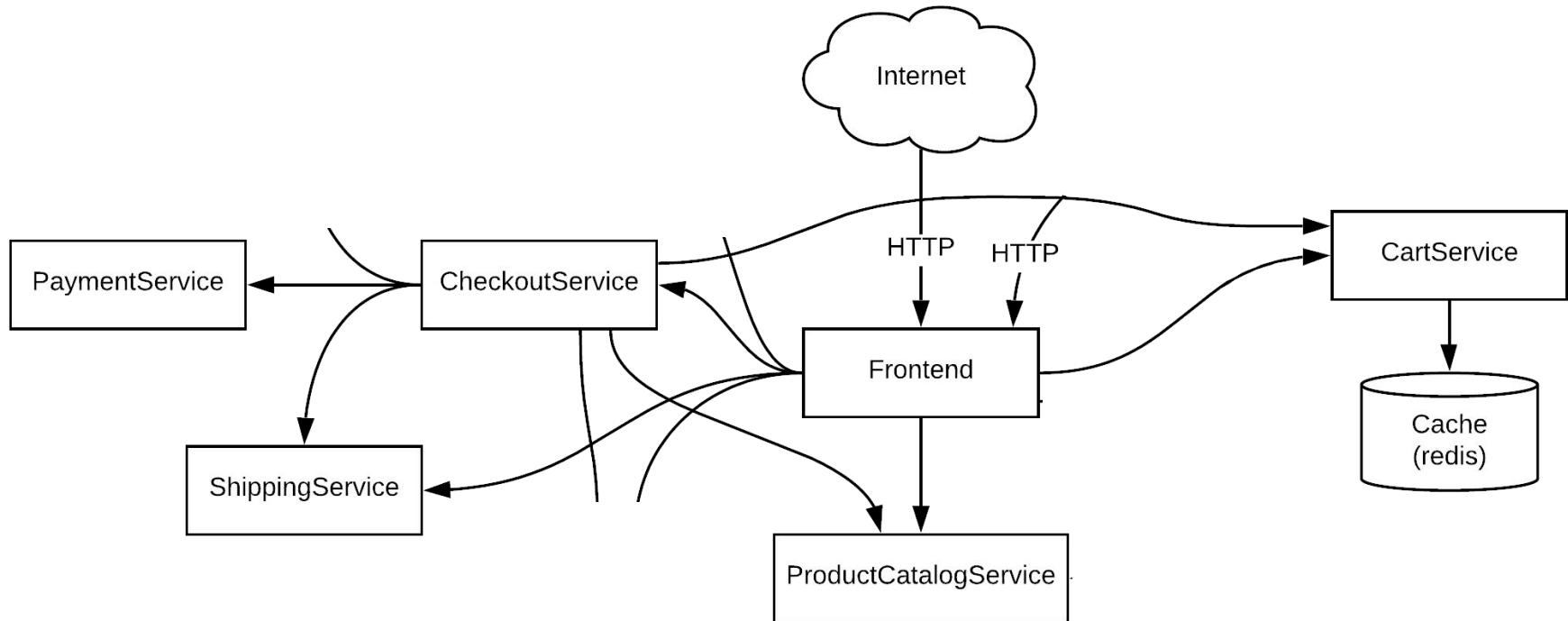
# Architecture

12 Services - What matters most to our customers?



# Architecture

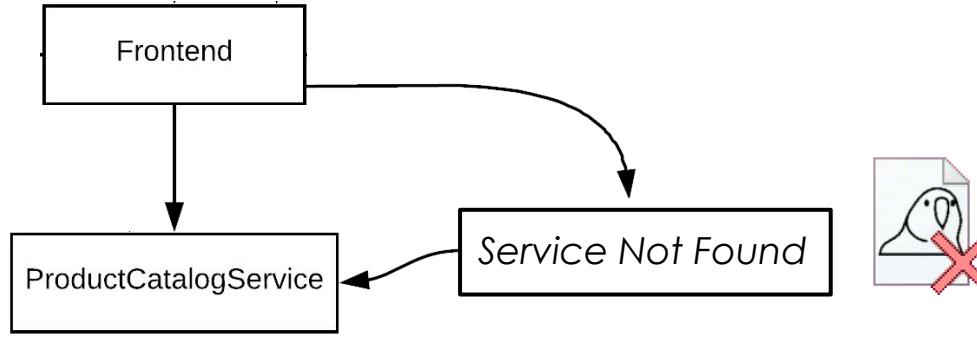
What can we remove from the critical path?





OH: “Getting out of the critical path is a good thing”

# Architecture



**Does blackholing a non-critical path service like the Recommendation Service cause unexpected failures for critical services like the Product Catalogue or Frontend?**



Blackhole → Ads

*other Products*  
**YOU MIGHT LIKE**



METAL  
CAMPING  
MUG



VINTAGE  
RECORD  
PLAYER

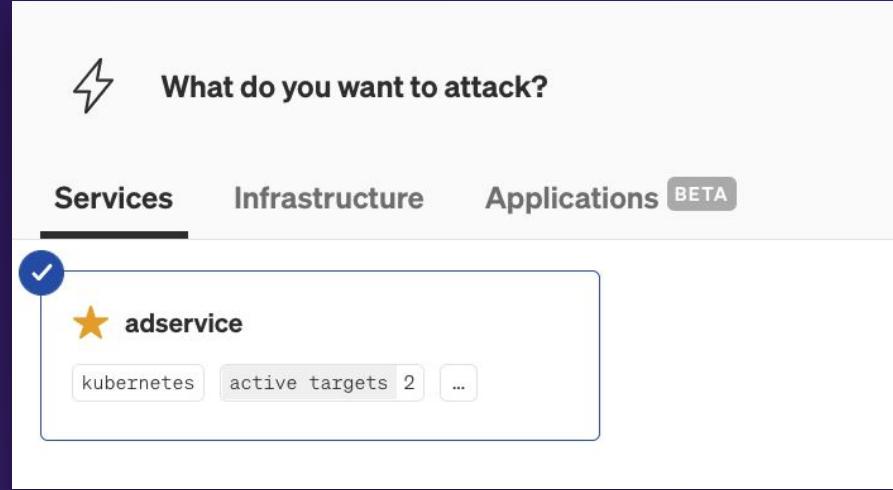


VINTAGE  
CAMERA  
LENS



TERRARIU  
M

Advertisement: City Bike for sale. 10% off.





**Does blackholing a non-critical path service like the Ad Service result in graceful degradation of the customer experience?**

*other Products*  
**YOU MIGHT LIKE**



METAL  
CAMPING  
MUG



VINTAGE  
RECORD  
PLAYER



VINTAGE  
CAMERA  
LENS



TERRARIU  
M



# Graceful Degradation

**Yes, our experiment was successful and our results  
were what we expected them to be.**

# SRE Apprentice



*Learn by shadowing: on-call*

[twitter.com/tambryantbutow/status/1387778372688830465](https://twitter.com/tambryantbutow/status/1387778372688830465)

 **Tammy Bryant Butow**  @tambryantbutow · 4m ...

When giving interns and apprentices their first on-call experience, what role do you give them first?  #oncall

Shadow Primary Pages	90.9%
Secondary	9.1%
Primary	0%
Other	0%

11 votes · 23 hours left

[twitter.com/tambryantbutow/status/1387778372688830465](https://twitter.com/tambryantbutow/status/1387778372688830465)



**Tammy Bryant Butow**  @tambryantbutow · 14m

...

I prefer "other" - put them as primary on-call for a demo app that you break on-purpose. Demo app pages them during business hours, then they need to resolve the incident.

Learn the 101 of on-call in a safe environment.

After that it's time to shadow the primary 😊

3



4



**dani** @danielillu · 2m

...

I love this approach!!

1



1



## On-Call Rotation Example

Week 1	Week 2	Week 3	Week 4	Week 5
<b>Primary:</b> Prima	<b>Primary:</b> Sylvain	<b>Primary:</b> Atul	<b>Primary:</b> Diane	<b>Primary:</b> Eric
<b>Shadow:</b> Prima's SRE Apprentice	<b>Shadow:</b> Sylvain's SRE Apprentice	<b>Shadow:</b> Atul's SRE Apprentice	<b>Shadow:</b> Diane's SRE Apprentice	<b>Shadow:</b> Eric's SRE Apprentice
<b>Secondary:</b> Sylvain	<b>Secondary:</b> Atul	<b>Secondary:</b> Diane	<b>Secondary:</b> Eric	<b>Secondary:</b> Prima



SRE  
Apprentice  
on-call  
shadow role

@secnerdette



Security Nerdette  
@secnerdette

...

Replying to [@tambryantbutow](#)

I'm team 'Shadow Primary, but with homework' i.e. actively add meaningful comments on every on-call ticket that comes through (even if it's just you saying you don't understand a particular step of the investigation, that's fine).

7:38 PM · Apr 29, 2021 · Twitter Web App

The men also asked the school's 120 volunteer mentors, professional engineers and tech executives, to help create the curriculum. Tammy Butow, a site reliability manager at Dropbox, wanted students to learn to review one another's code, a common practice at tech companies. Holberton worked that into the collaborative process of the program. She also suggested that the school break students' projects, so the students must troubleshoot and fix them.

**Partner with your local community to teach the required skills engineers need**

[holbertonschool.com](http://holbertonschool.com)



Students at Holberton working together. To help replicate the collaborative nature of tech companies, the school's founders structured the classroom around problems that the students would solve in small teams. Jason Henry for The New York Times

# SRE Apprentice



*Learn by practice: code + code reviews*

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**Partner with your local community to teach the required skills engineers need**



Students at Holberton working together. To help replicate the collaborative nature of tech companies, the school's founders structured the classroom around problems that the students would solve in small teams. Jason Henry for The New York Times





Craft a daily email using python to send via cron job that includes key metrics; disk capacity, availability, latency etc.



Build a web page that uses the PagerDuty API to display the most common alerts ordered by frequency - this enables us to use the Pareto Principle to improve system reliability.

# SRE Apprentice



*Learn by community: peer mentoring, lunch and learns, study hall, AMAs & slack*

[gremlin.com/slack](https://gremlin.com/slack)

A screenshot of a Slack workspace interface. On the left is a sidebar with a dark background containing a list of channels and other workspace options. The channels listed include: Threads, All DMs, Mentions & reactions, Saved items, Slack Connect, More, Starred, # announcements, chaos-champions, # donut-intros, # introductions, # jobs, # kudos, # learning (which is currently selected and highlighted in blue), # meet, meetup-organisers, # questions, # random, # students, and # support. The main area shows a channel named '#learning' with a star icon. A message from user Sarah Lutteropp at 11:41 AM is displayed, reading: "Very nice audiobook, read by a robot: <https://www.youtube.com/watch?v=1X5lvCEkFFo&list=PLdHNjaW09dud7BG~3hI5-lvL73V467Br&index=3>". Below the message is a thumbnail image of a book titled "Building Secure & Reliable Systems" by Google Cloud, with a note below it stating "No copyright infringement intended". At the bottom of the screen is a message input field with the placeholder "Message #learning" and various text formatting icons.

7000+ engineers

# learning  
# donut-intros  
# questions

**SRE Apprentices  
share tips for mentors**



## Tips for SRE Teachers:

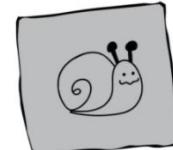
- 1. Meet your apprentice where they are and help them get where they need to be.**
- 2. Don't limit yourself as a mentor: Your apprentice's role isn't limited to code, so why should your mentorship?**
- 3. Don't forget to establish open lanes of communication.**

[funretrospectives.com/draw-your-feelings/](http://funretrospectives.com/draw-your-feelings/)

## Draw your feelings

**Draw your feelings** is a great check-in activity for helping people express feelings for a retrospective meeting. Drawing enables people to express their emotions. Thus, it is a good starter before the main course activity, where participants typically will write notes and verbalize things and actions for the given context.

DRAW YOUR FEELINGS



**SRE Apprentices  
share tips for future padawans**



## Tips for Apprentices:

- 1. One of the secrets to being effective is being willing to ask questions.**
- 2. Don't just accept a task.**
- 3. Unrealistic expectations happen all the time in software.**
- 4. Invest in your relationships with your colleagues**

# Thank you



Get some chaos community stickers  
based on the path you'll be taking:

Padawan: [gremlin.com/talk/padawan](https://gremlin.com/talk/padawan)

Jedi:  
[gremlin.com/talk/jedi](https://gremlin.com/talk/jedi)

