Alpine Parking

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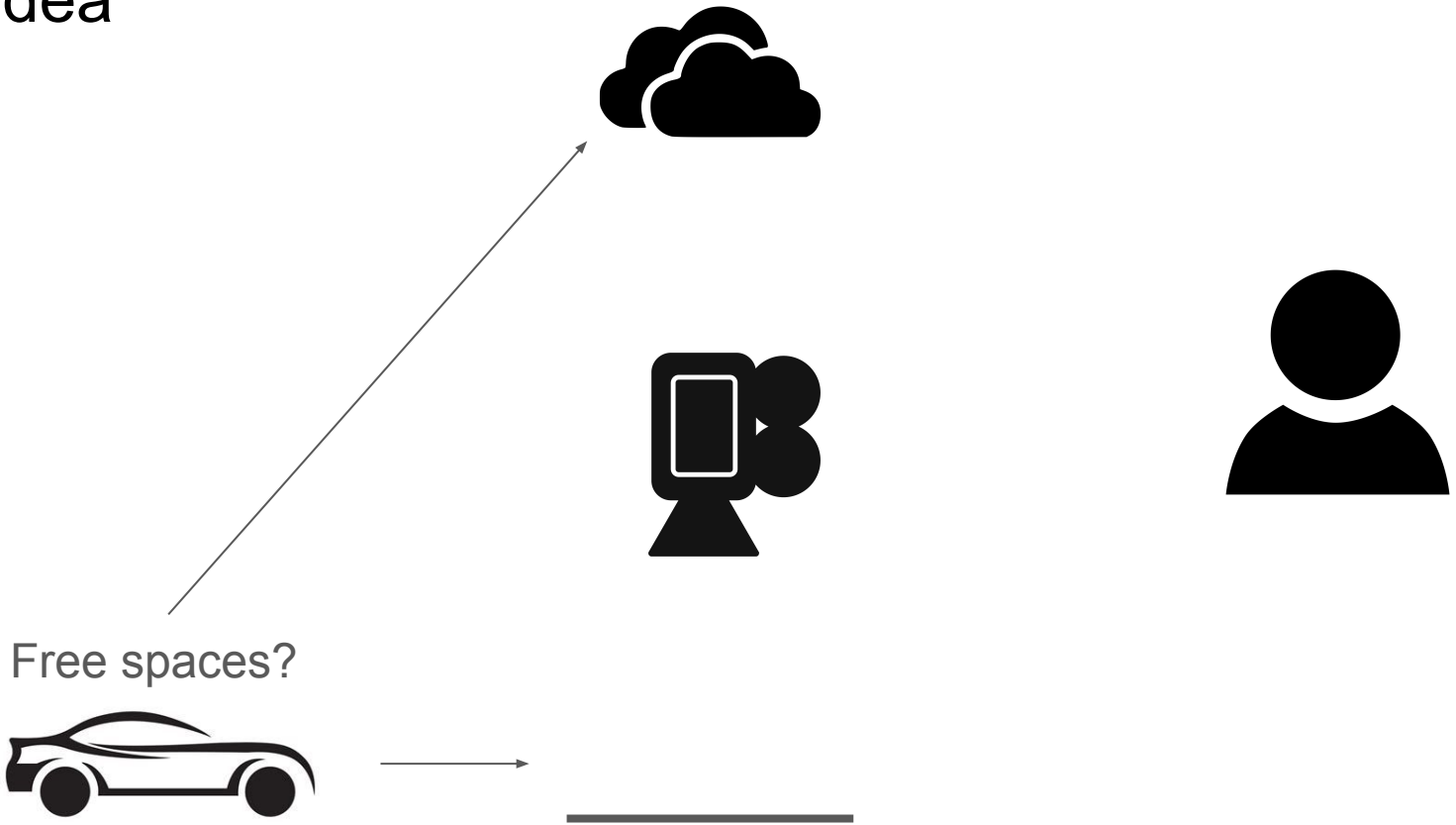
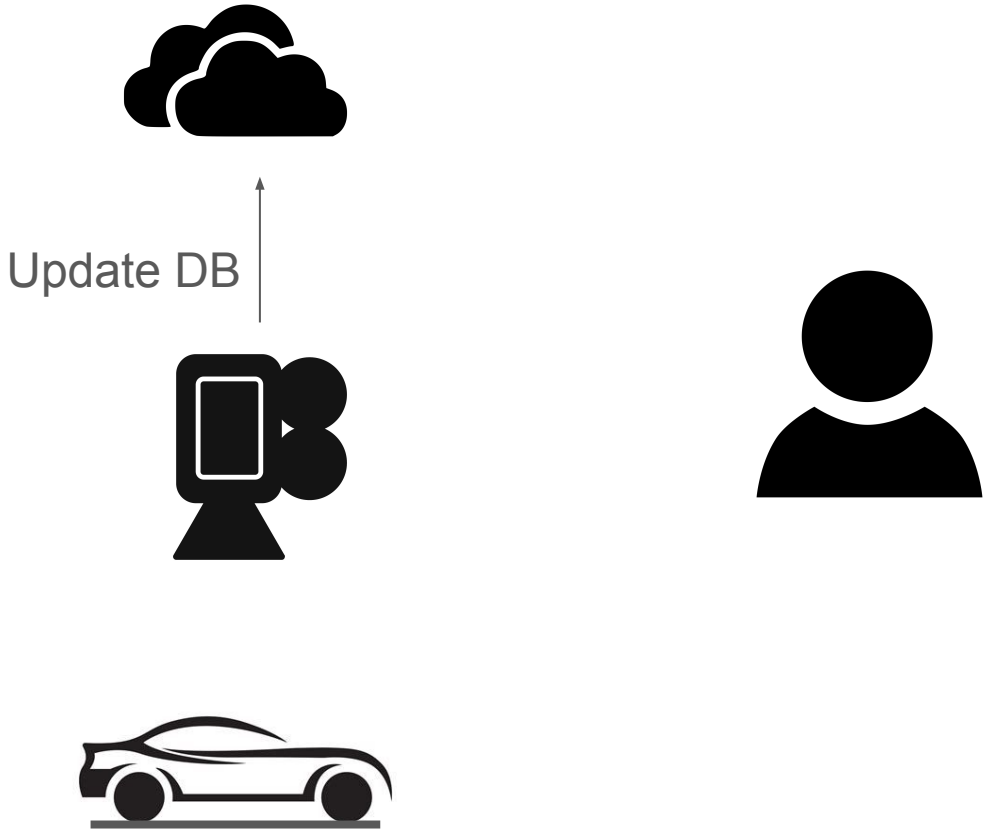
Structure

- Key Idea
- AWS Services
- Workflow
- Lambdas
- Frontend
- DEMO
- Costs

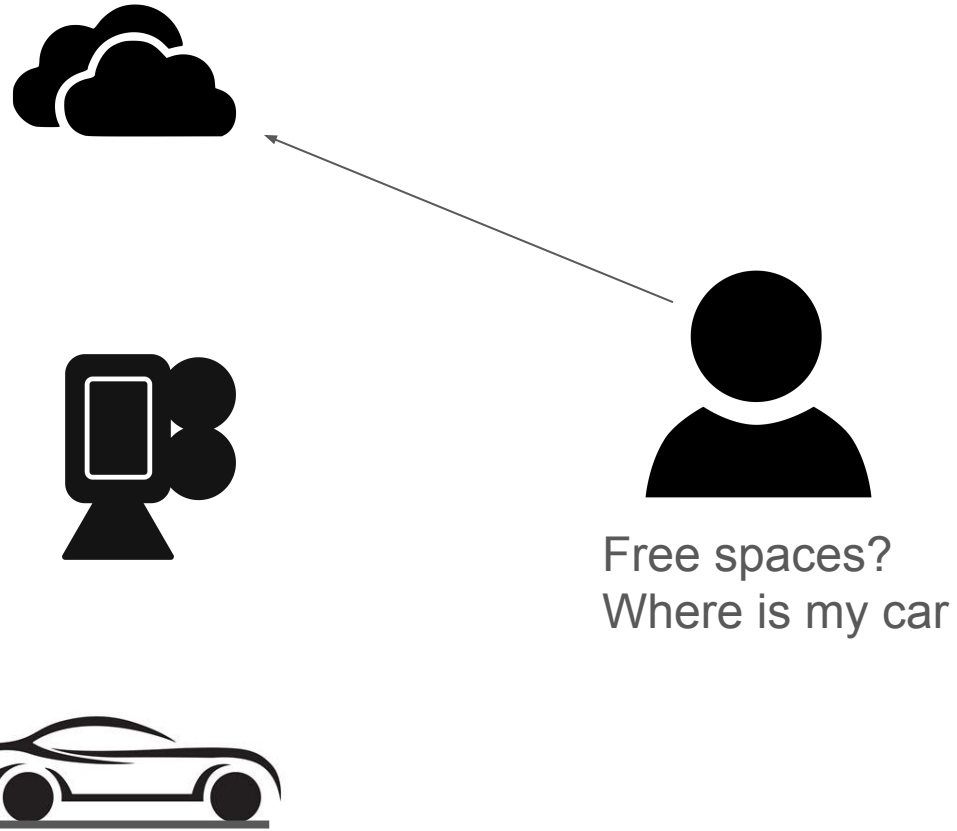
Key Idea



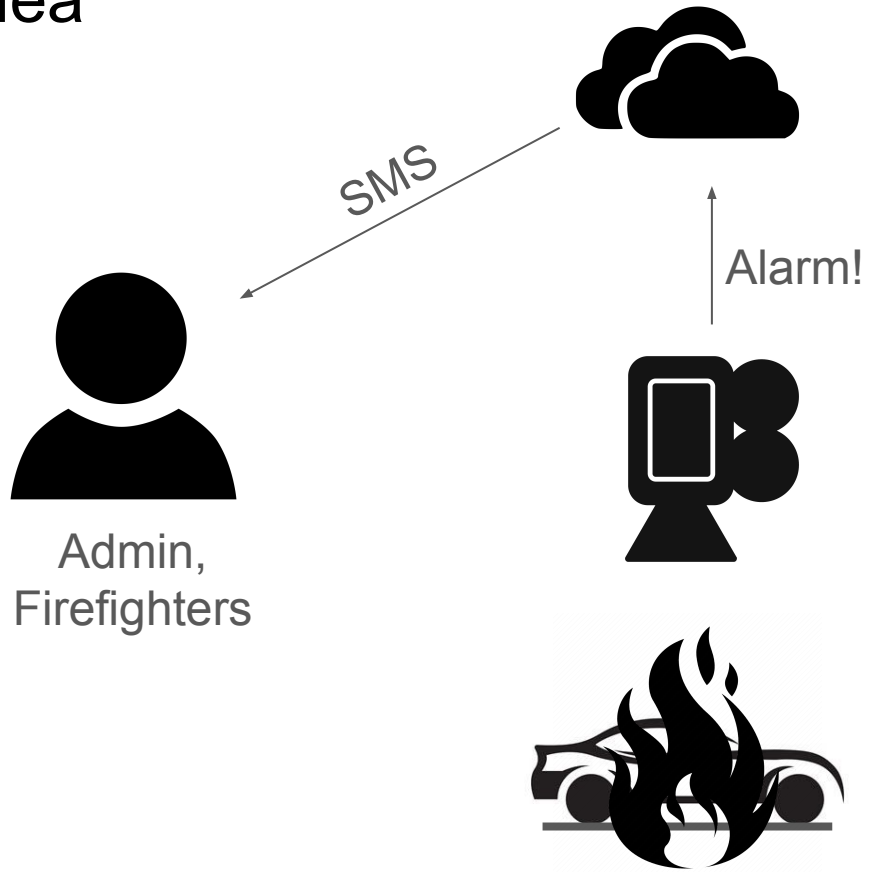
Key Idea

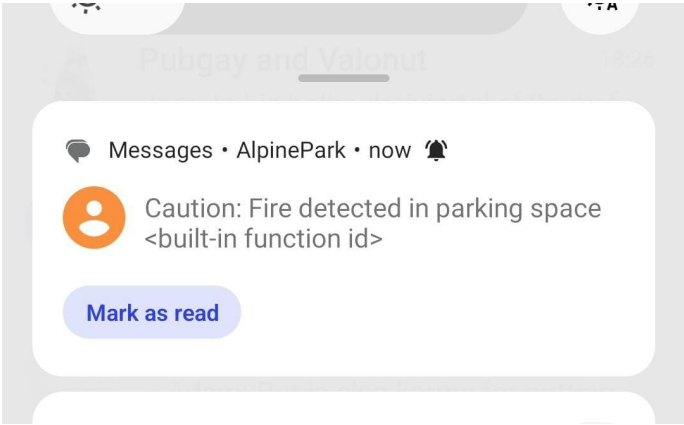


Key Idea



Key Idea


SMS
Alarm!
Admin,
Firefighters


Messages • AlpinePark • now
Caution: Fire detected in parking space
<built-in function id>
Mark as read

AWS Services

Lambda Functions

Step functions

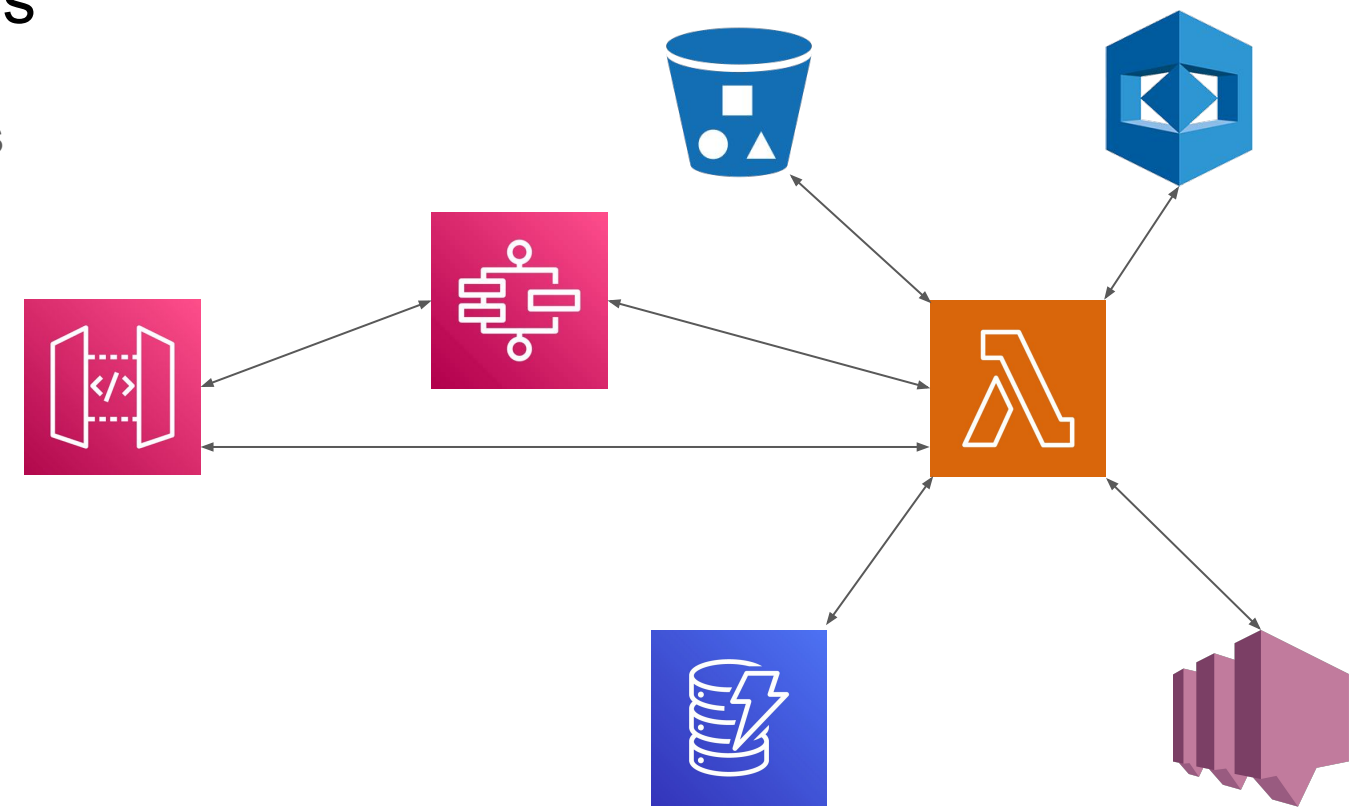
Api Gateway

DynamoDB

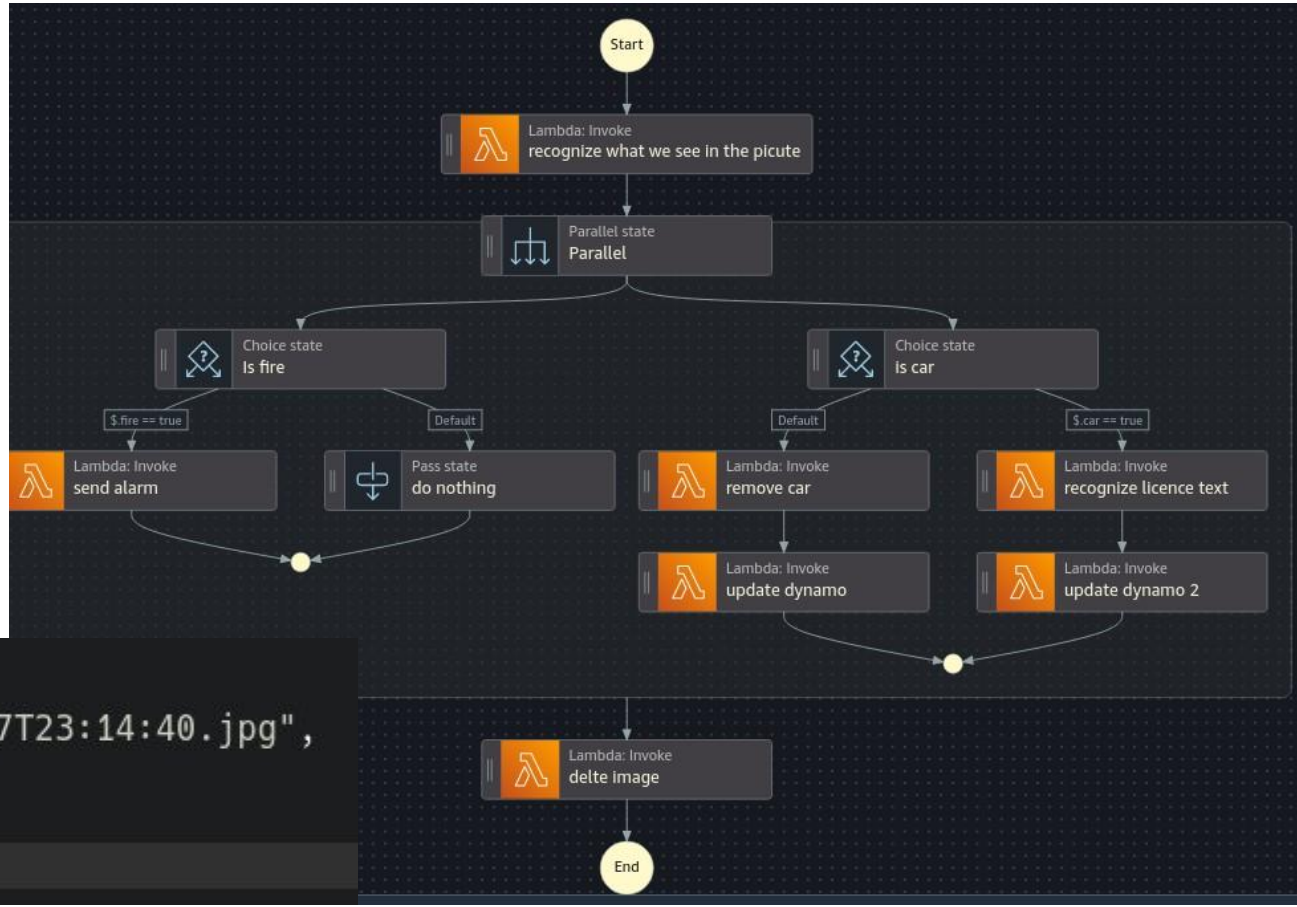
S3 bucket

AWS Rekognition

SNS



Workflow




```
{
  "image_key": "1_2024-01-17T23:14:40.jpg",
  "parking_space_id": 1
}
```

Lambdas

boto3 lib

nice integration of services

```python
bucket = 'verteiltesystemeparkingsystem'
fire_words = ['fire', 'flames']
car_words = ['car', "license plate", "vehicle", "transportation"]

def lambda_handler(event, context):
    s3 = boto3.client('s3')
    rekognition = boto3.client('rekognition')

    key = event['image_key']
    parking_space_id = event['parking_space_id']

    obj = s3.get_object(Bucket=bucket, Key=key)
    image = obj['Body'].read()

    response = rekognition.detect_labels(Image={'Bytes': image})

    fire = False
    car = False

    labels = []
    for label in response['Labels']:…

    output = {
        "image_key": key,
        "parking_space_id": parking_space_id,
        "car": car,
        "fire": fire,
        "rekognition_result": labels
    }
    return output
```

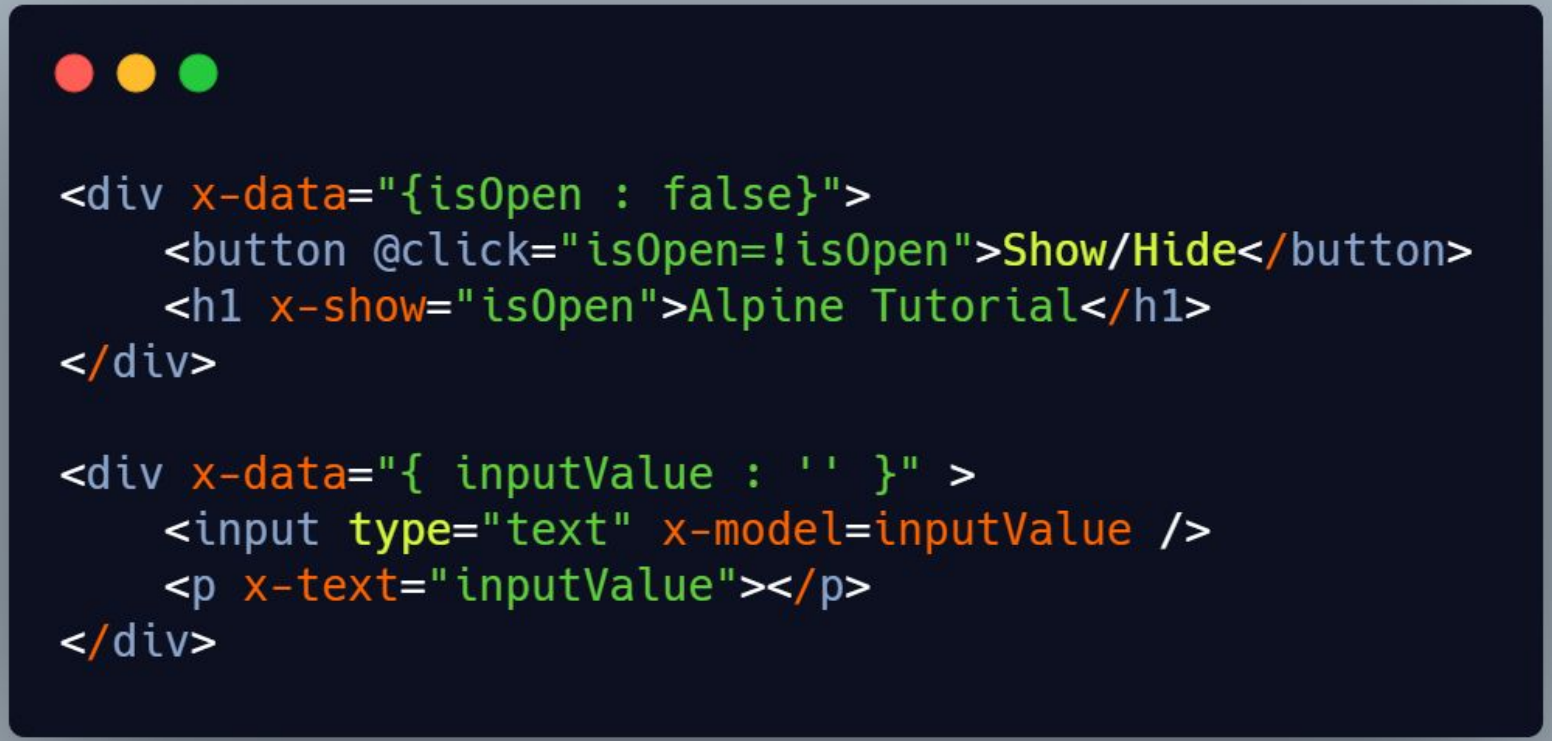
Frontend

- AngularJS Hello World like 200 mb

  => let's learn a new lightweight framework

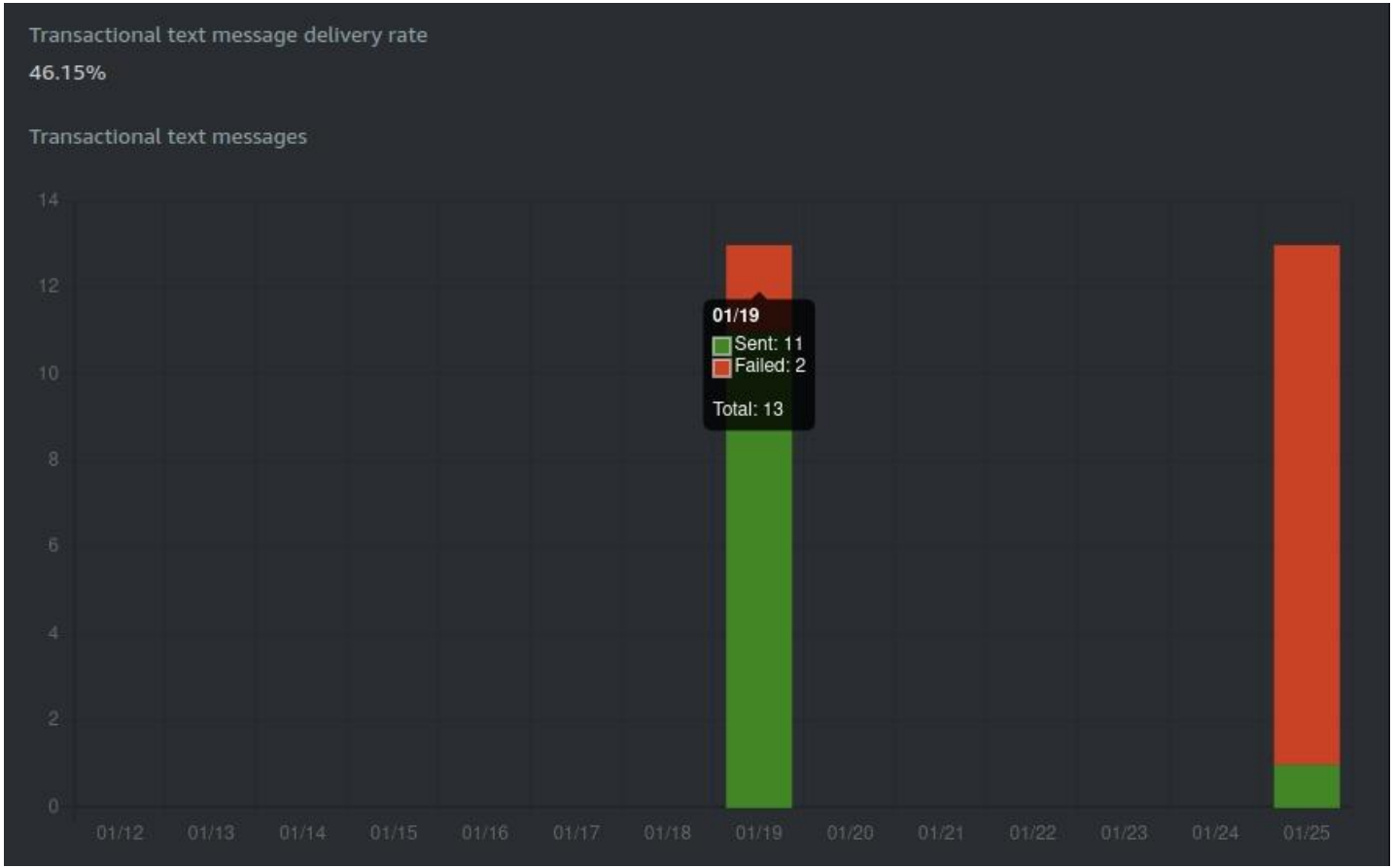
- Alpine JS

```
<html>
    <head>
        ...

        <script defer src="https://cdn.jsdelivr.net/npm/alpinejs@3.x.x/dist/cdn.min.js"></script>
    </head>
    ...
</html>
```



```
<div x-data="{isOpen : false}">
    <button @click="isOpen=!isOpen">Show/Hide</button>
    <h1 x-show="isOpen">Alpine Tutorial</h1>
</div>

<div x-data="{ inputValue : '' }" >
    <input type="text" x-model=inputValue />
    <p x-text="inputValue"></p>
</div>
```

LIVE DEMO


Transactional text message delivery rate
46.15%
Transactional text messages
14
12
10
8
6
4
2
0
01/19
Sent: 11
Failed: 2
Total: 13
01/12
01/13
01/14
01/15
01/16
01/17
01/18
01/19
01/20
01/21
01/22
01/23
01/24
01/25

Costs: car in parking spot

- Assumptions: 1 Parking space
- Critical Path: $0,001505851 per Execution
- $1,505851 per 1000 Executions

- Assumption: 100 Parking spaces
- $150,5851 per 1000 Executions
- Optimization is possible:
  - More parking spaces per camera
  - Motion detection per parking space

Costs: case of fire

- Assumptions: 1 Parking space
- Critical Path: $0,000406351 per Execution
- $0,406351 per 1000 Executions

- Assumption: 100 Parking spaces
- $40,6351 per 1000 Executions
- Optimization is possible:
  - More parking spaces per camera
  - Motion detection per parking space

Thank you for your attention