

Chaos as an Art

Fault Injection

Presented By

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Hi!
My name
is Yusuf.

Lead QA Engineer

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Agenda

- The Canvas of Chaos
- The Palette of Fault Injection
- The Brush: xk6 disruptor
- The Grand Finale

Cloud makes things
easier, which makes
things **harder**.

Whatever can go wrong,
will go wrong.



Traditional testing **is not enough.**

Unit Testing

Tested in isolation to ensure expect meet requirements.

Functional Testing

Each variations tested to assure expected results.

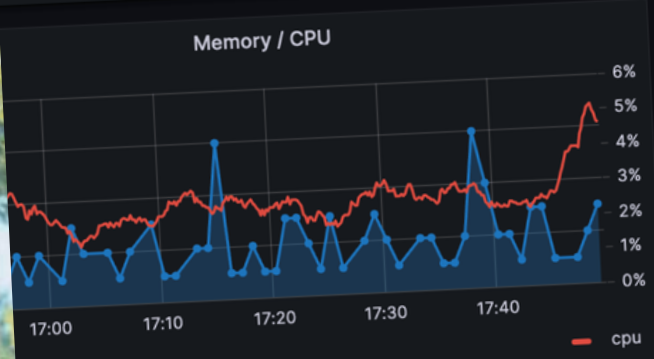
Testing = verify **known** conditions



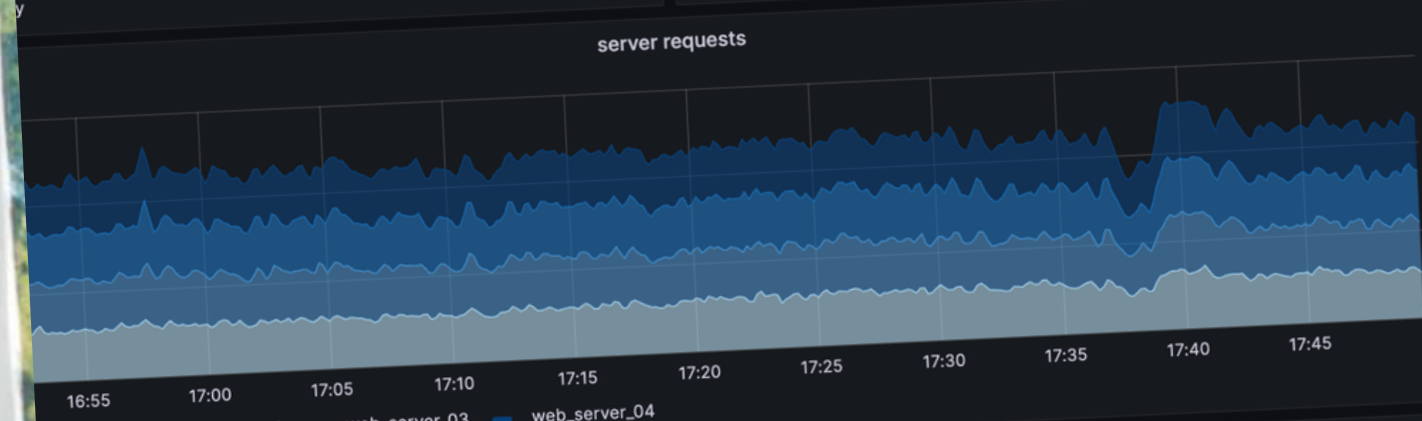
Search or jump to...

cmd+k

Dashboards > Website performance



Memory



Sur

Go

A-series B-series

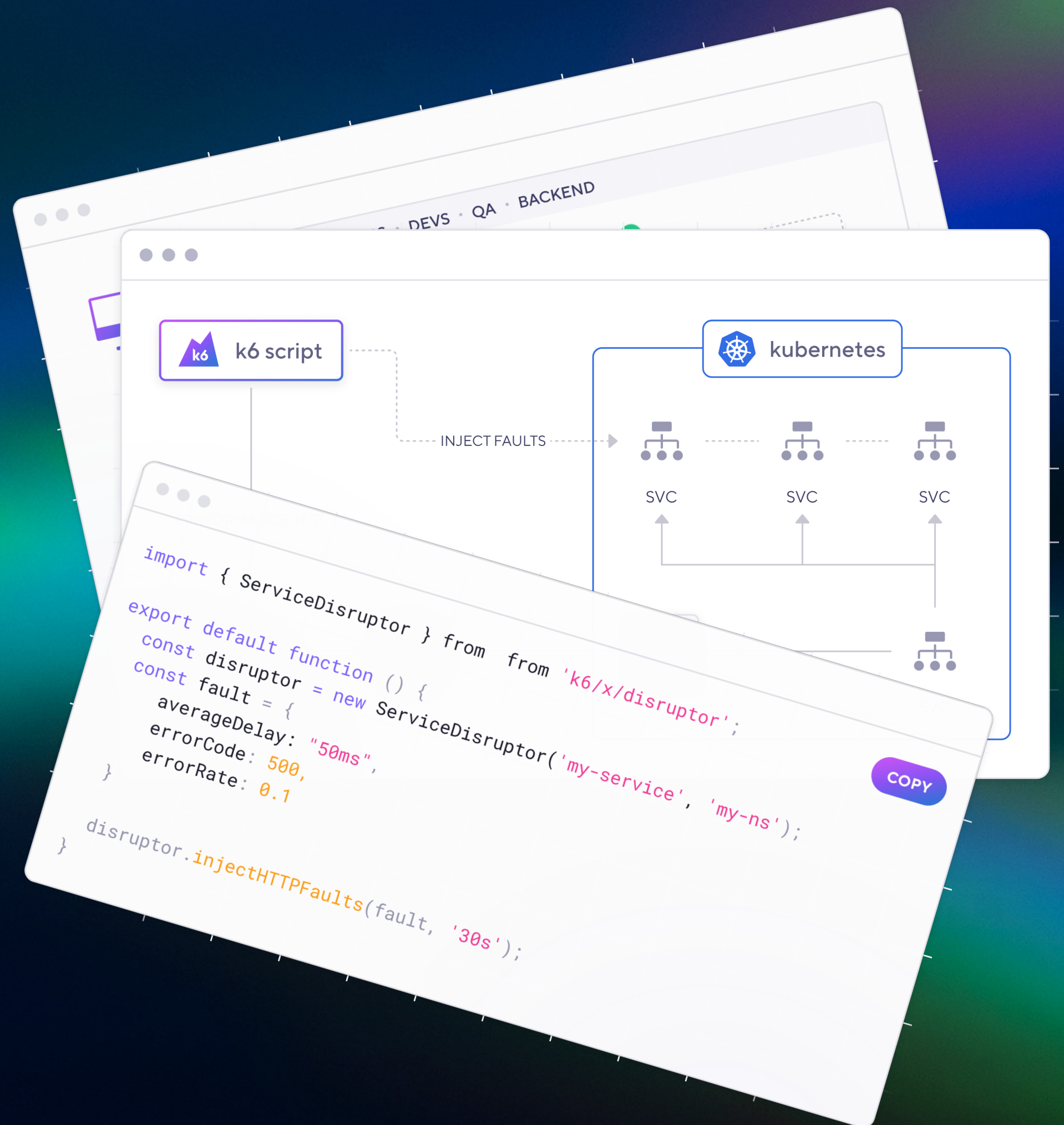


k6 disruptor

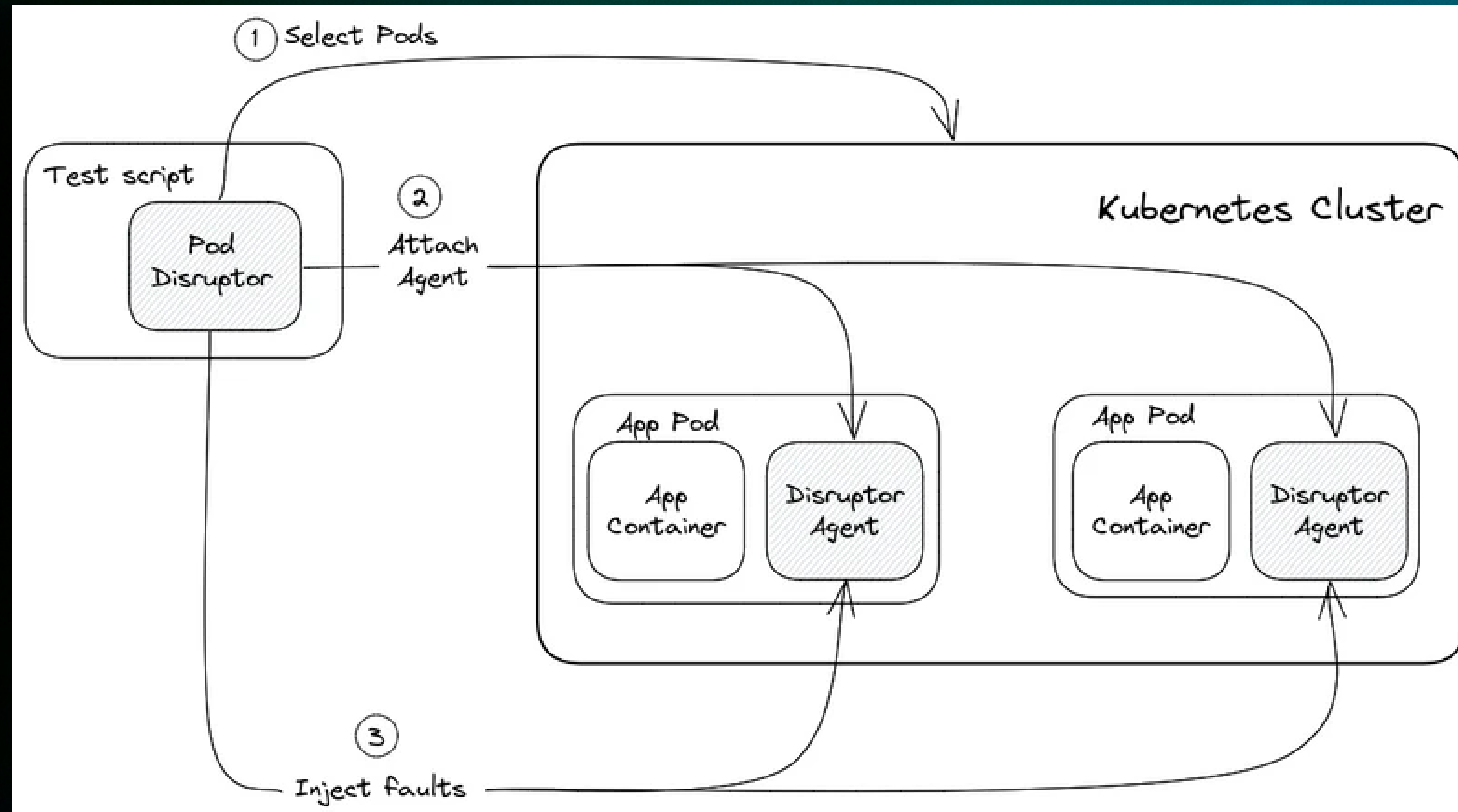
Design for failure. Collaborate across teams to handle errors.

-A large majority of outages result from incorrect handling of non-fatal errors.

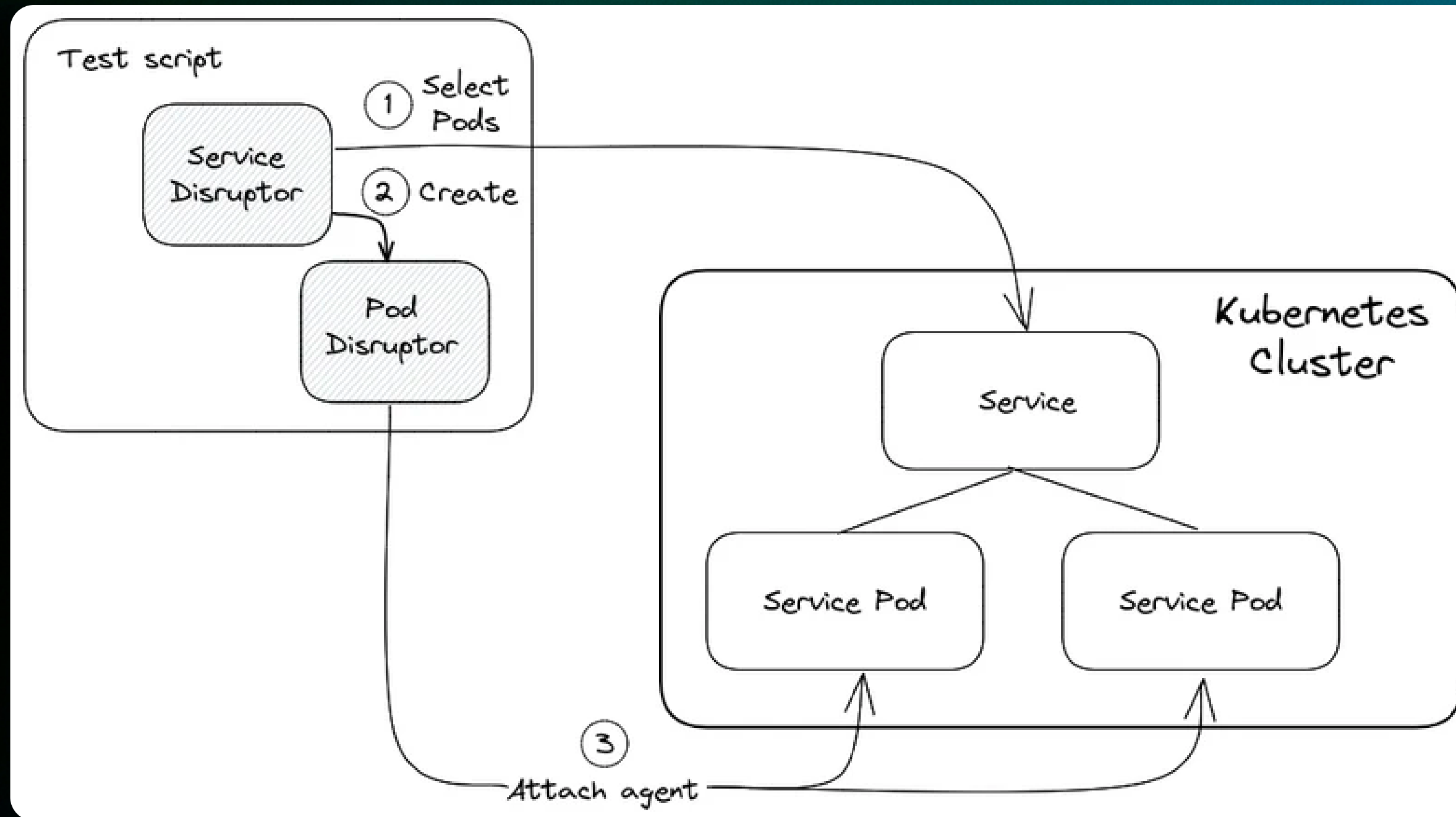
-Embrace and tackle errors to validate fallback logic at each layer of your infrastructure and application.



Pod Disruptor



Service Disruptor



sock-shop

```
$ kubectl --namespace sock-shop get svc
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)
carts	ClusterIP	10.96.176.27	<none>	80/TCP
carts-db	ClusterIP	10.96.106.244	<none>	27017/TCP
catalogue	ClusterIP	10.96.88.197	<none>	80:30158/TCP
catalogue-db	ClusterIP	10.96.147.225	<none>	3306/TCP
front-end	ClusterIP	10.96.106.155	<none>	80:30001/TCP
orders	ClusterIP	10.96.43.209	<none>	80/TCP
orders-db	ClusterIP	10.96.132.138	<none>	27017/TCP
payment	ClusterIP	10.96.168.23	<none>	80/TCP
queue-master	ClusterIP	10.96.12.238	<none>	80/TCP
rabbitmq	ClusterIP	10.96.104.144	<none>	5672/TCP,9090/TCP
session-db	ClusterIP	10.96.174.92	<none>	6379/TCP
shipping	ClusterIP	10.96.38.123	<none>	80/TCP
user	ClusterIP	10.96.57.44	<none>	80/TCP
user-db	ClusterIP	10.96.218.63	<none>	27017/TCP

sock-shop

```
> curl -s $SVC_IP/catalogue/3395a43e-2d88-40de-b95f-e00e1502085b | jq .
{
  "id": "3395a43e-2d88-40de-b95f-e00e1502085b",
  "name": "Colourful",
  "description": "proident occaecat irure et excepteur labore minim nisi amet i",
  "imageUrl": [
    "/catalogue/images/colourful_socks.jpg",
    "/catalogue/images/colourful_socks.jpg"
  ],
  "price": 18,
  "count": 438,
  "tag": [
    "brown",
    "blue"
  ]
}
```

sock-shop

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sock-shop

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  "count": 438,
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    "brown",
    "blue"
  ]
}
```

Initiation

```
import { ServiceDisruptor } from 'k6/x/disruptor';
import http from 'k6/http';
import { check } from 'k6';

const products = [
  'a0a4f044-b040-410d-8ead-4de0446aec7e',
  '808a2de1-1aaa-4c25-a9b9-6612e8f29a38',
  '510a0d7e-8e83-4193-b483-e27e09ddc34d',
  '03fef6ac-1896-4ce8-bd69-b798f85c6e0b',
  'd3588630-ad8e-49df-bbd7-3167f7efb246',
  '819e1fbf-8b7e-4f6d-811f-693534916a8b',
  'zzz4f044-b040-410d-8ead-4de0446aec7e',
  '3395a43e-2d88-40de-b95f-e00e1502085b',
  '837ab141-399e-4c1f-9abc-bace40296bac',
];
```

Scenarios

```
scenarios: {  
  base: {  
    executor: 'constant-arrival-rate',  
    rate: 20,  
    preAllocatedVUs: 5,  
    maxVUs: 100,  
    exec: 'requestProduct',  
    startTime: '0s',  
    duration: '30s',  
  },  
  inject: {  
    executor: 'shared-iterations',  
    iterations: 1,  
    vus: 1,  
    exec: 'injectFaults',  
    startTime: '30s',  
  },  
  fault: {  
    executor: 'constant-arrival-rate',  
    rate: 20,  
    preAllocatedVUs: 5,  
    maxVUs: 100,  
    exec: 'requestProduct',  
    startTime: '30s',  
    duration: '30s',  
  },  
}
```

Functions

```
export function requestProduct(data) {  
  const item = products[Math.floor(Math.random() * products.length)];  
  const resp = http.get(`http://${__ENV.SVC_IP}/catalogue/${item}`);  
  const body = JSON.parse(resp.body);  
  check(body, {  
    'No errors': (body) => !('error' in body),  
  });  
}
```

Functions

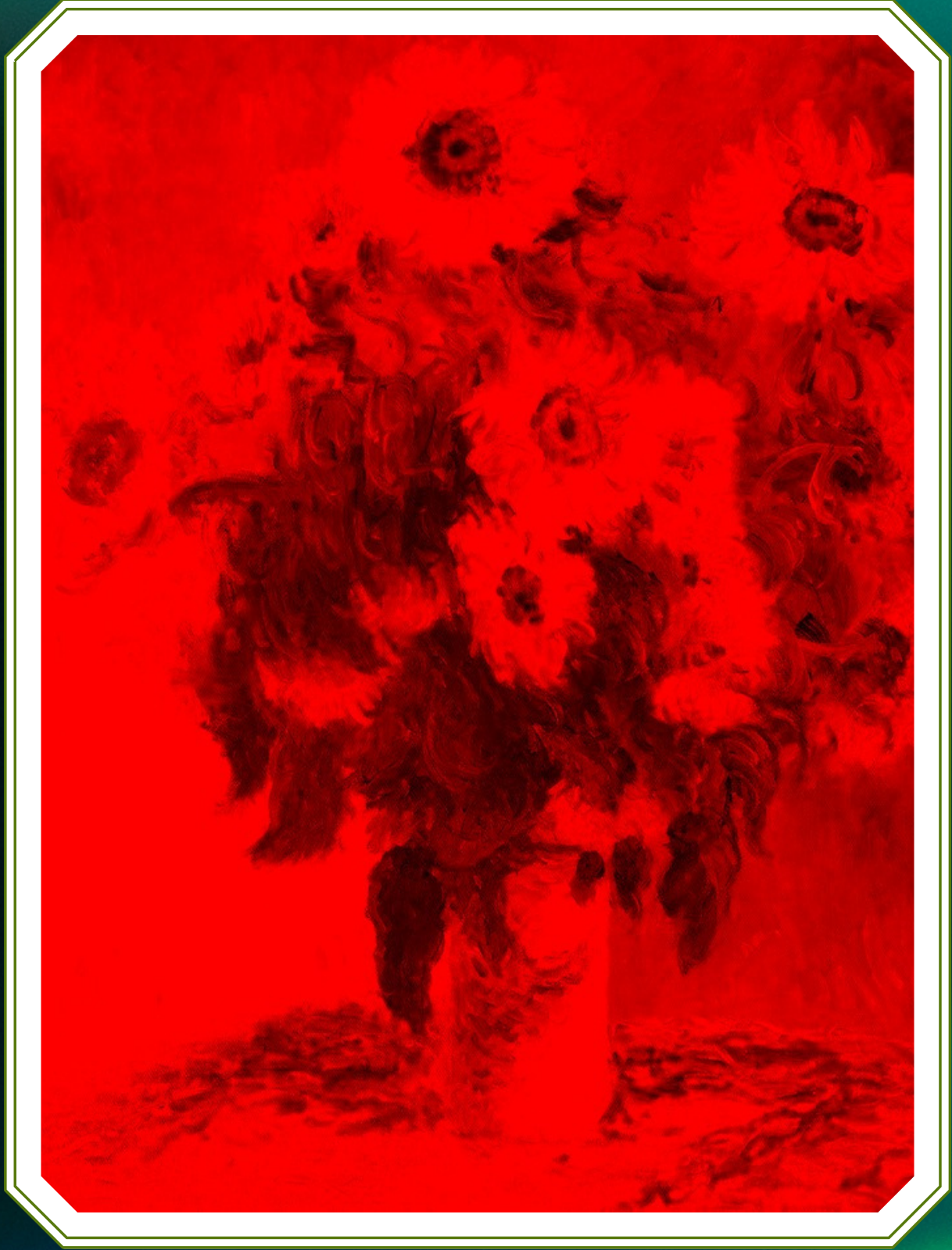
```
export function injectFaults(data) {
  const errorBody = '{"error":"Unexpected error","status_code":500,"status_text":'

  const fault = {
    averageDelay: '100ms',
    errorRate: 0.1,
    errorCode: 500,
    errorBody: errorBody,
    exclude: '/health',
  };
  const svcDisruptor = new ServiceDisruptor('catalogue', 'sock-shop');
  svcDisruptor.injectHTTPFaults(fault, '30s');
}
```

Metrics

```
checks.....: 93.75% ✓ 1126      x 75
  { scenario:base }.....: 100.00% ✓ 601      x 0
  { scenario:fault }.....: 87.50% ✓ 525      x 75
http_req_duration
  { scenario:base }.....: avg=5.62ms   min=4.38ms   med=5.39ms   max=18.51m
  { scenario:fault }.....: avg=106.52ms min=5.26ms   med=106.75ms max=139.44
```









Thank you
for listening!