



# Chaos Experiments Datacenter Stress Testing

---

**SRECon 2025**

**Clayton Krueger**

Infrastructure Staff Engineer - USAA

# Get to Know Clayton

---

- Reside in Texas
- Longhorn Football Fan
- Gamer
- Staff Engineer @USAA – Founding member SRE
- Legal Note



## OUR MISSION

is to empower our members to achieve financial security through highly competitive products, exceptional service and trusted advice. We seek to be the #1 choice for the military community and their families.

### OUR CORE VALUES

Service. Loyalty. Honesty. Integrity.

### OUR BEHAVIORS

We take ownership.

We strive for excellence.

We foster belonging.

### OUR PERFORMANCE STANDARDS

Exceptional Service  
for members.

Winning Team  
for employees.

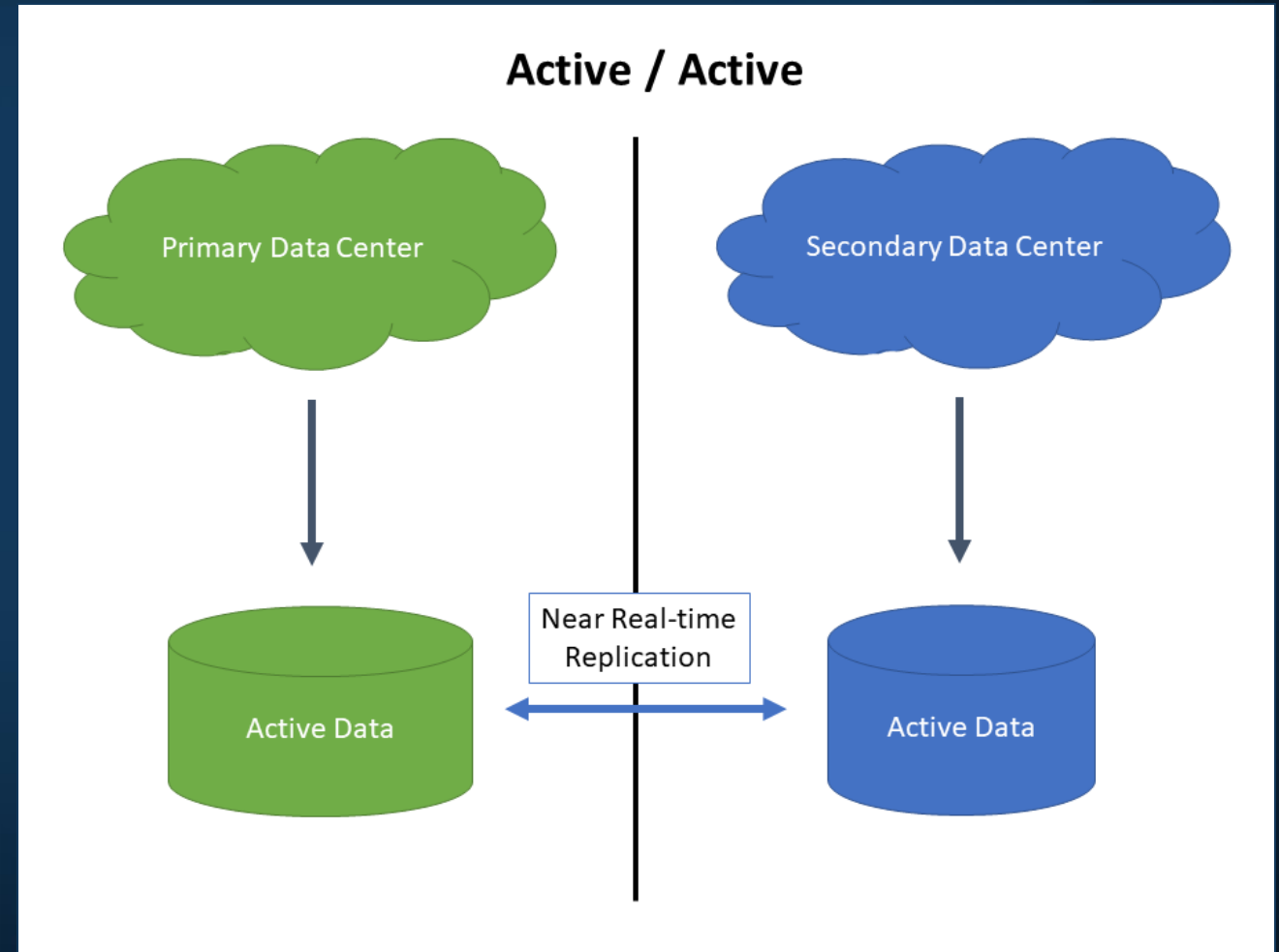
Financial Strength  
for the association.

Community Impact  
for external stakeholders.

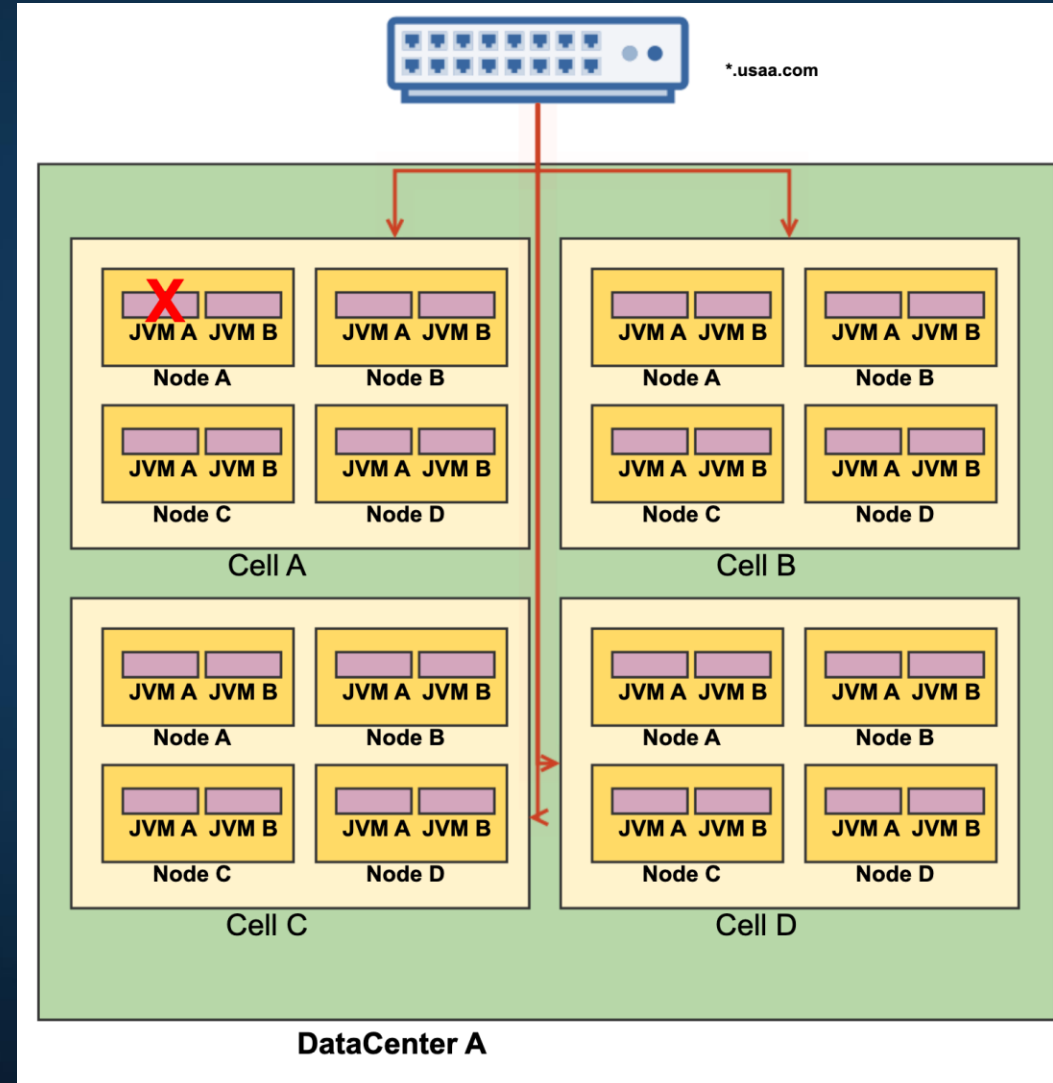
OPERATING WITHIN RISK APPETITE

# Stress Testing all of Production

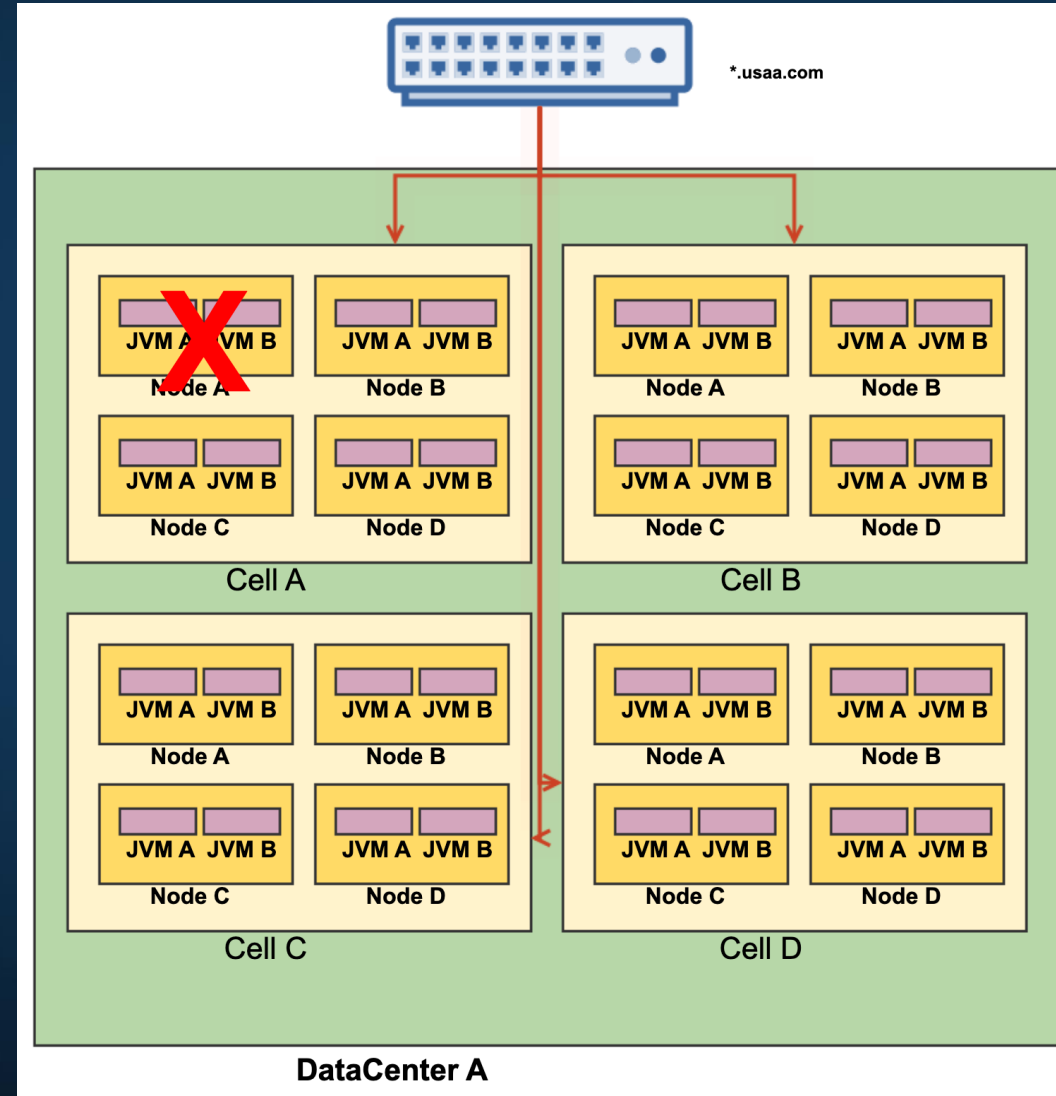
- What our environment looked like at the start
- What it looks like now
- How we distribute traffic
- Automation
- Monitoring Journey
- <https://www.continuitycentral.com/feature0660.html>



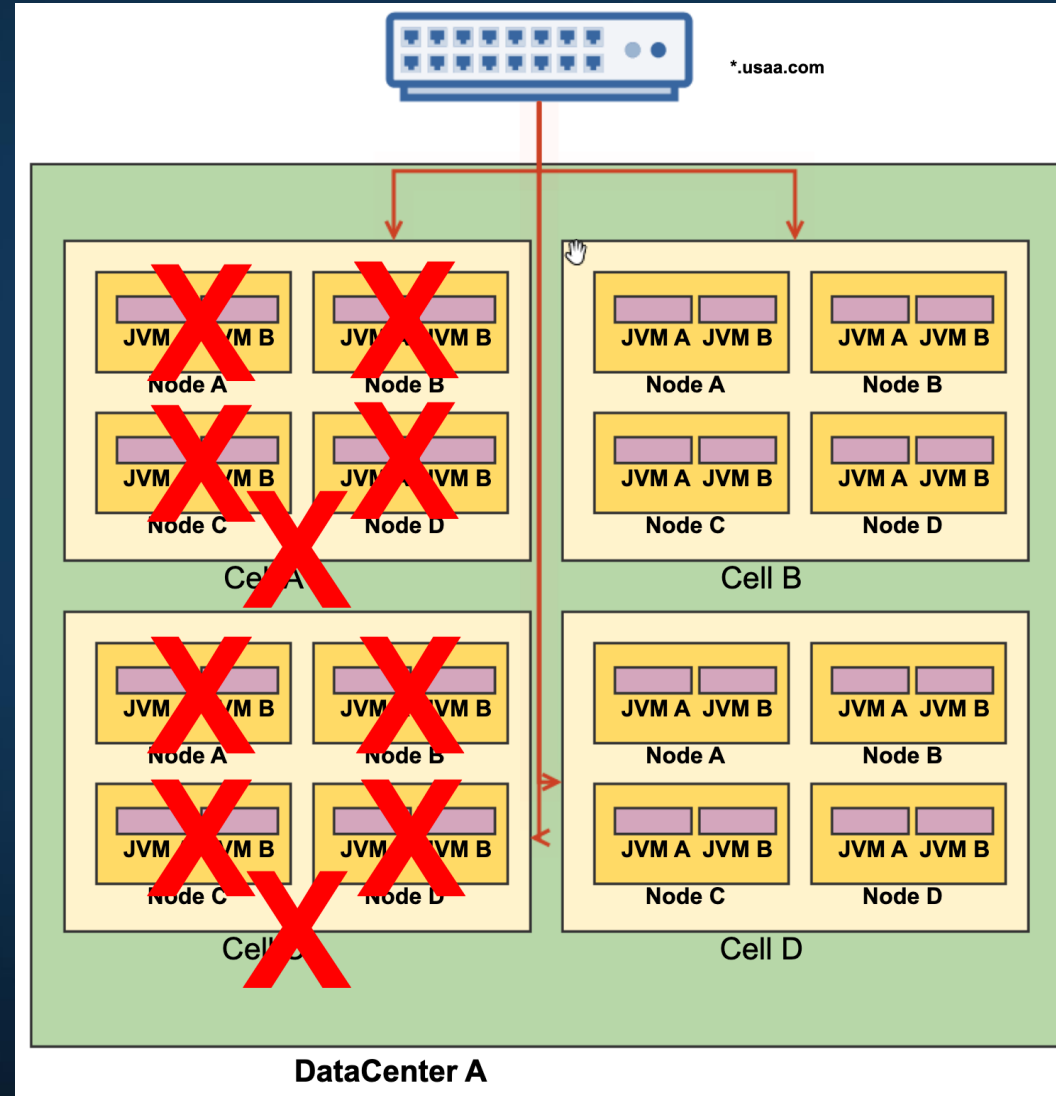
# Stress Testing all of Prod



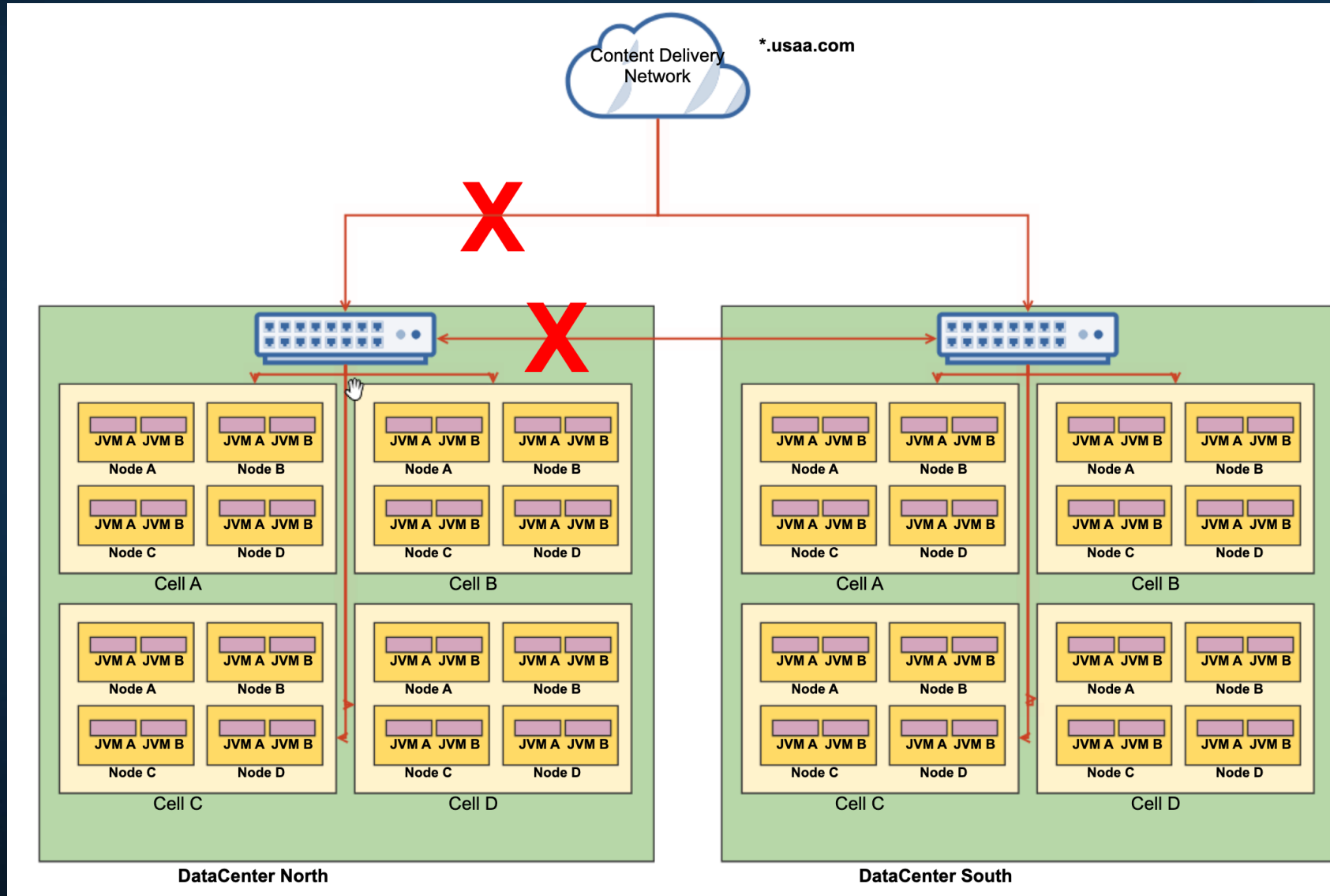
# Stress Testing all of Prod



# Stress Testing all of Prod



# Stress Testing all of Prod





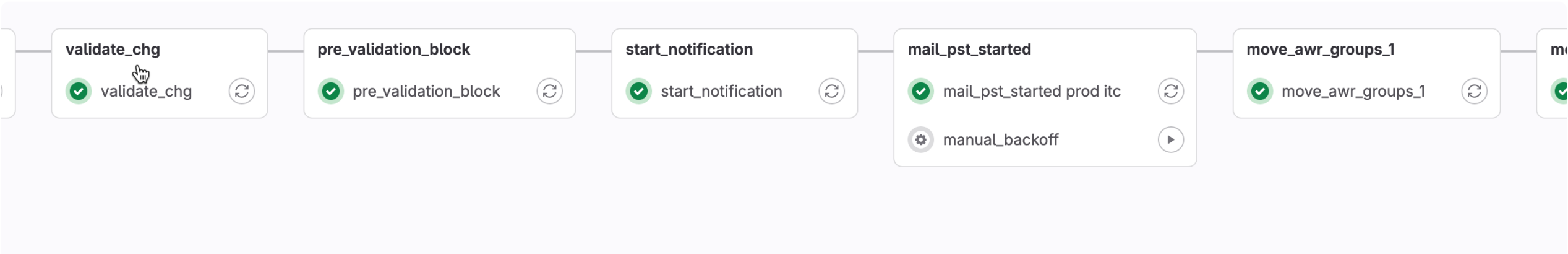
# Automation



Scheduled latest 19 jobs In progress, queued for 2 seconds

**Pipeline** Needs Jobs 19 Tests 0 Security

Group jobs by Stage Job dependencies




## Downstream


trigger\_rollback\_...  
#16767748  
Child

>


# SLO Driven Automation

Downstream


trigger\_rollback\_...  
#16767748  
Child



>



Catnip
APP
11:06 AM

Backoff Alert Detected

Backoff alert detected - reverting test


Representatives for the alerts below, please click on the alert name to propose a MI candidate for a new ACC call.

===== ALERTS =====

- Availability Short Burn Rate

- Alert Destination: sre- alerts

Show more



Catnip
APP
2:00 PM

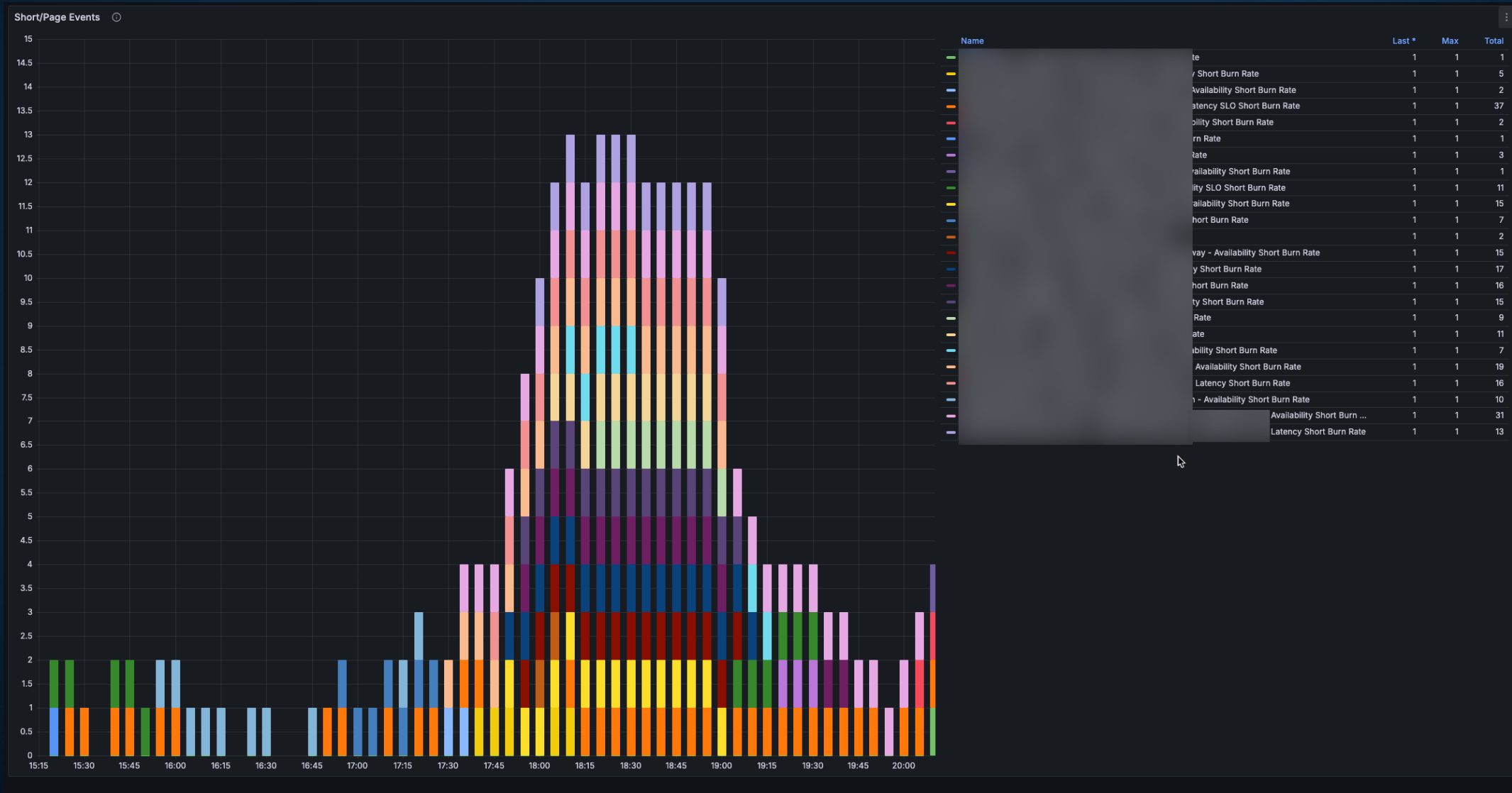
Backoff Alert Detected

Test end time has been reached - backing off test

# Evolution of Monitoring




# Evolution of Monitoring



# Evolution of Monitoring

- More SLO driven monitoring

 **USAA Status**

## USAA Service Status

[Learn More](#)

✓ No Issues ⚠ Alerts ✖ Outage

[Pillars](#) > [PnC](#) > Policy

### Policy

77/79

Personal Property Plus	✓ >
Auto	✓ >
Dwelling	✖ >
Umbrella	✓ >
Shared Services	✓ >

**Report an Issue**  
If you are experiencing a service outage, please create an incident.  
[Report an Incident](#)

## Dealing with Findings...

- Culture, people, and process
- Use existing processes
- People > Person
- Use your arsenal
- Small items lead to large problems



# Dealing with LARGE Findings...

- Use existing process (Align)
- "What went Wrong"
- Data Not Emotions



# "What went Wrong" Fallout

- Title: Postmortem - I Guess We Need Stress Tests
- Summary: The \*\*\*\* Database failed, triggering a DataCenter drain to DC1. DC1 database instance could not handle the load, tipping it over and causing a 100% failure across the board for \*\*\*\* Database
- Use Data Not Emotions

Facebook 2019 was "worst" outage company had.

- 14 hrs total downtime
- \$55.8B Total Revenue for 2018
- Daily: \$152.9M
- Hourly: \$6.4M
- Every Minute: \$106,700
- Estimated \$89.6M Revenue Loss



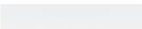
# People Gaps

- App Specific Focus during Tests
- "Driving synthetic load we've been able to stress Go to 5,600 requests/minute. Wondering if this is due to a bottleneck that we're unaware of."

## Timeline:

- 06:30 - Stress Test Begins
- 07:00 - GO Batch 1 Begins
  - 5 transactions per second more than normal
- 07:22 - GO Batch 2 Begins
  - 10 transactions per second more than normal
- 07:28 - GO Batch 3 Begins
  - 15 transactions per second more than normal
- 07:38 - GO Batch 4 Begins
  - 20 transactions per second more than normal
- 07:55 - **Breaking point seems to be reached**
  - **For all apps running on ENT LOB, not just the Go app**
  - **Sucking up too many sockets at the server level**

## Recommendation:

1. Utilize USAA's Infrastructure components (via JDBCConnectionFactory) so that standard things (like connection pooling and throttles) can be used
2. Add a custom throttle configuration behind the  so that you can appropriately scale down calls to the database when things slow down

# Expanding Education

- Performance testing education and resources.

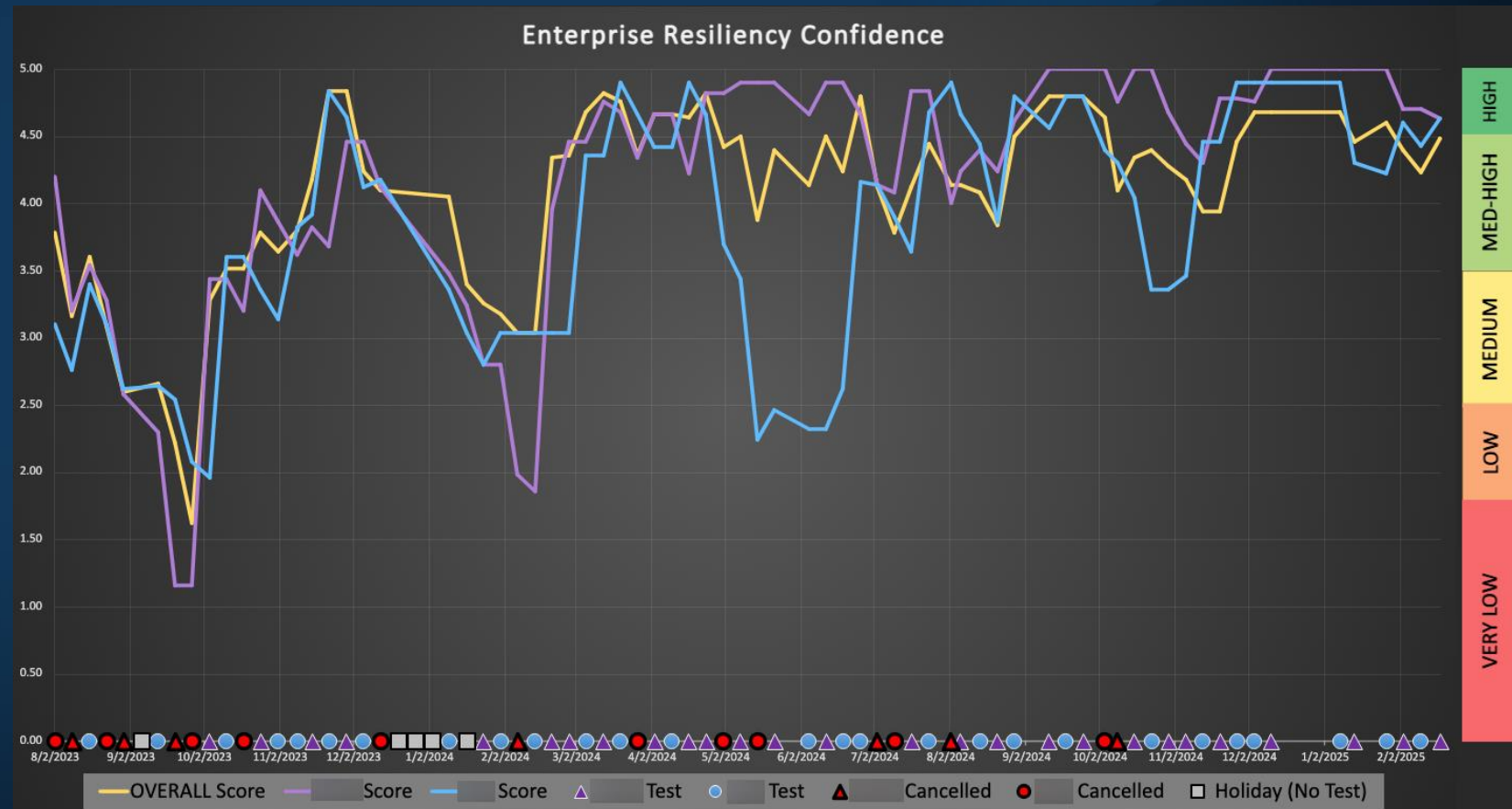


# Dealing with FUD

- **Fear, Uncertainty, and Doubt**
- **Our number one obstacle**
- "We have more outages during stress tests."
- "The risk of pain (outages) because of the stress test is too high."
- "We will support the stress test if you can guarantee no outage."

# Dealing with FUD

- Leadership education
- DATA
- Automated Backoffs
- Identify current/future risks



# The future

---

- More "bottom – up" testing
- Continue our roadmap
- Integrate better with vendors, SaaS, and public cloud solutions.



