On the wings of SREs; JPMorgan Chase’s journey into the cloud
Hi, I’m Fred

- Executive Director, SRE Observability
- Writing software, operating production for 20+ years
- Nagios, Zabbix, top, vmstat, dtrace, $vendors[0..n-1]
- Histograms, TSDBs, SLOs, Latency
- Opinions and statements in this talk are my own
Global Technology at JPMorgan Chase

- 57,000 technologists, 60 countries
- $14B annual tech spend
- In house systems built over decades of work
- Security is table stakes
- Reliability (availability + correctness) is paramount
JPMorgan Chase Digital Transformation

- 2022 annual tech spend increase by over 25% to $14B
- “Digital products are now table stakes for consumers”
- Initiative from leadership to transition architecture and operations to the public cloud
- Regulations demand attestation to robust security
JPMorgan Chase
Digital Transformation

- Financial services company for 224 years
- Hired thousands of software eng, data science, cyber, cloud computing each year
- Combine tech industry expertise with financial services domain knowledge
- Tech empowers movement of $10T/day
- SRE function created as a catalyst
Operating at Scale

- Multiple lines of business, multiple orgs within
  - Corporate & Investment Bank
    - Markets, Equities, Sales & Research
  - Commercial Bank
  - Asset & Wealth Management
  - Consumer & Community Banking
- Multiple SRE teams; per org, per LOB
Compute Landscape

FPGA

Rackmount Servers

Quantum Computing

Public Cloud

Mainframe
Non-Exhaustive Programming Landscape
Technology Estate

• 60k+ Applications

• 500 PB Data Storage

• 270k virtual workspaces
Applying the SRE mindset

Pre 2023
A journey from 100 public cloud apps to 500
Applying the SRE mindset

SRE at JPMorgan Chase is

*Software methodology applied to web operations to solve problems at scale*
Challenge #1

Mapping legacy on premise systems to a cloud native landscape

* Compiled by the Cloud Native Computing Foundation (CNCF)
Challenge #1

Issue 1: Resource Management

On premise approach – static resource capacity management

Cloud native approach – resource usage optimization in an auto-scaling environment
Challenge #1

Issue 2: Reliability Measurement

- Incident focused approach – how many incidents did we get this time period

- SLO approach – set service level objectives, measure error budget burn
Challenge #1

Issue 3: Infrastructure Management

Persistent deployment management – configure X servers for an app

IaC - provision ephemeral resources with DSLs (like the ones you may use)
Challenge #2
Digital transformation engagement

- 60k+ applications
- 57k engineers
- 60 countries
- 22 Technology Centers; NAMR, LATAM, EMEA, APAC, India
Challenge #2

Issue 1: Scale down to scale up

• Relationships matter
• Building trust matters
• Solve 1 before you solve N
Challenge #2

Issue 2: Use your SRE wings

- Your expertise is scaling operations
- App teams are domain experts
- Lead by following
- Lead with empathy
Challenge #2

Issue 3: JPMorgan Chase Scale

- Lots of specialized expertise
- SREs glue all expertise together
- Team relationships matter
- Lots of business processes
- Scale through automation

Dunbar’s Number

*the max number of relationships a person can maintain*
Safety First

Trust and reliability is industry currency

- Fixed Trading Windows
- Cost of Downtime
- White Swan Events
- Black Swan Events
Thank you