

Crossing the chasm with cloud native

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Agenda

- How Google does ops
- The role of the CNCF with cloud native
- Looking forward to 2019

How Google does ops



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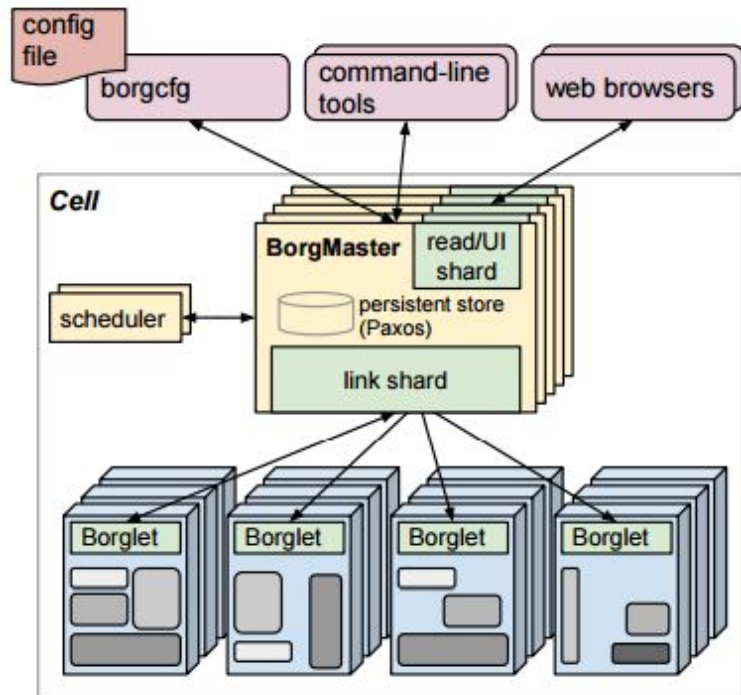
2010: In the beginning

I joined Google to work on Maps.

C++ engineer and Borg user.



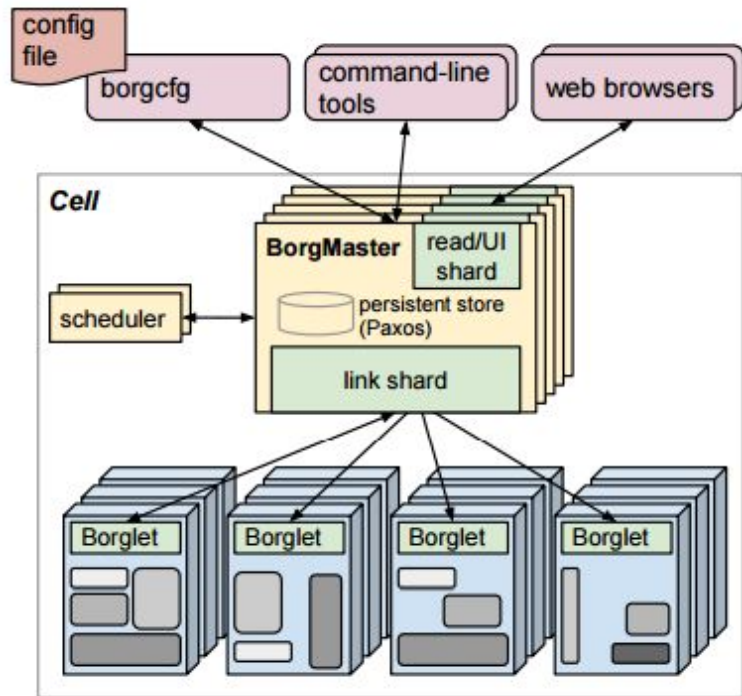
Borg high-level architecture



Cell is typically 10K servers.

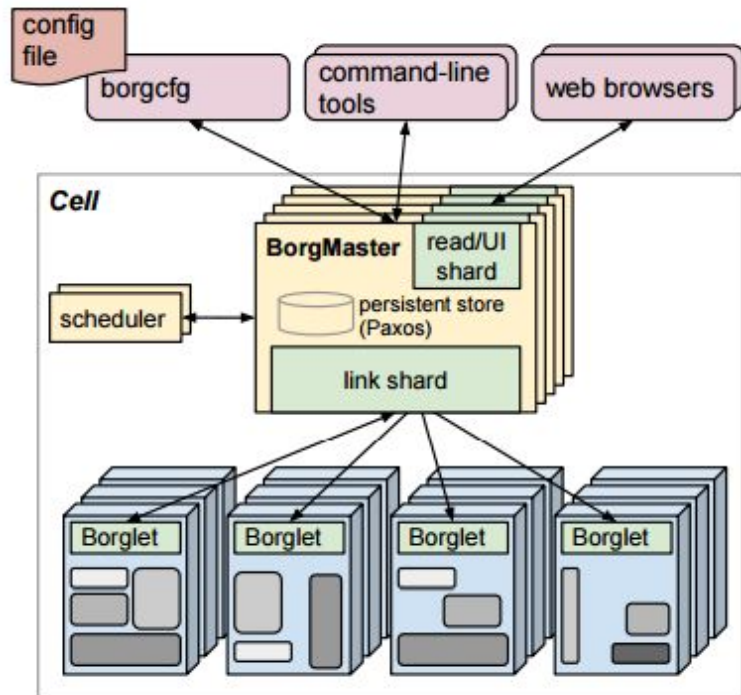
Cluster is one or more cells in a single data center.

Borg high-level architecture



```
job hello = {  
  runtime = { cell = "ic" }  
  binary = '../hello_webserver'  
  args = { port = '%port%' }  
  requirements = {  
    RAM = 100M  
    disk = 100M  
    CPU = 0.1  
  }  
  replicas = 10000  
}
```

Borg high-level architecture



Kubernetes, but maximise utilization.

A key difference is priority, quota and chargeback.

Developer experience

Microservices and testing culture is amazing



Developer experience

Microservices and testing culture is amazing

... but learning curve is steep



Developer experience

Microservices and testing culture is amazing

... but learning curve is steep

... and it's easy to start cargo culting!



A Google internal meme on Borg

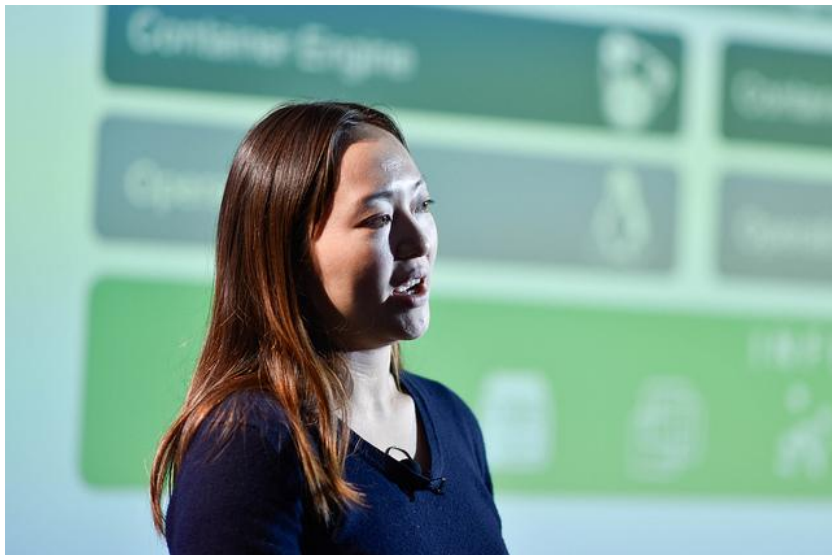
“~~Borg~~ Kubernetes makes it very hard to run one of something, and very easy to run 10,000 of something.”



2015: Culture shock!



2017: Community, storage



“Success, we moved everything to Docker containers!”

**Except legacy stateful apps”*



2018: Joined CNCF

..so what does the
CNCF actually do?



The role of the CNCF

The CNCF's mission

Mission: **Make cloud native computing ubiquitous**

The CNCF's mission

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...by fostering and sustaining an ecosystem of **open source, vendor-neutral projects.**

In practice

- Community
- Legal
- Marketing
- Events

Non-profit, supported by 350 members.



The CNCF structure

Governing Board

- Budget and marketing

Technical Oversight Committee

- Projects

End User Community

- Requirements and best practices

8 full time staff and ~20 shared staff with Linux Foundation

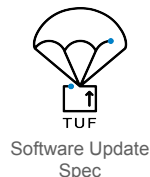


CNCF Projects

Graduated (3)



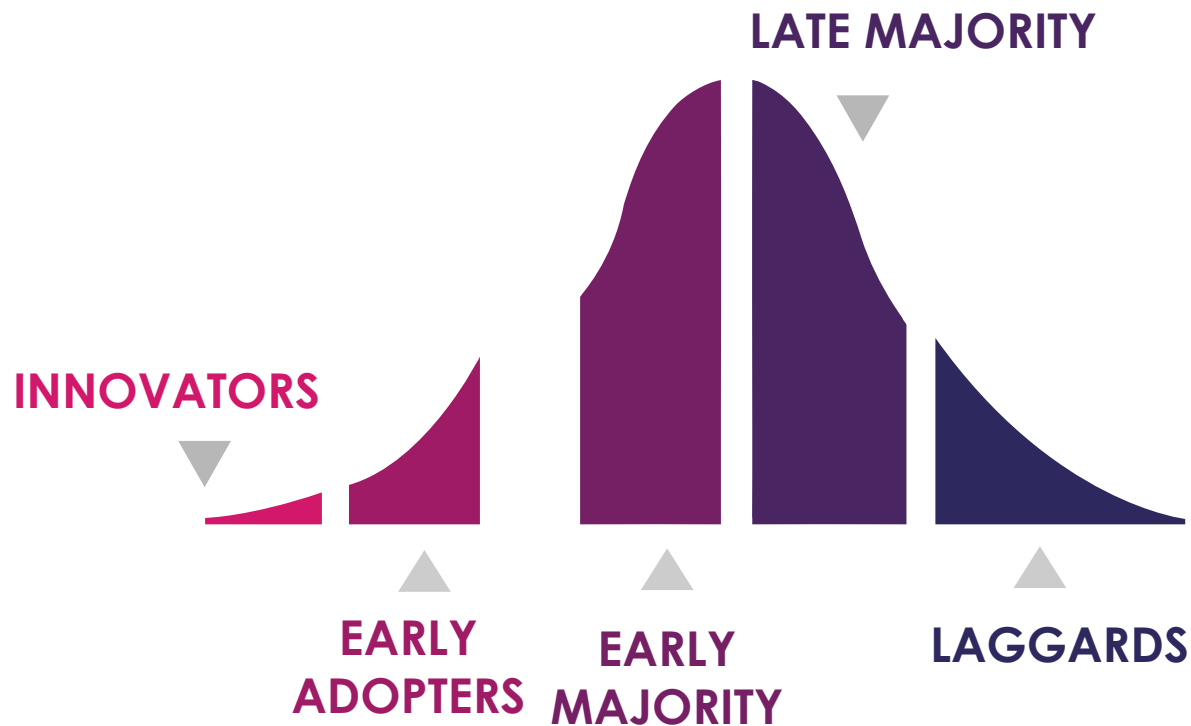
Incubating (17)



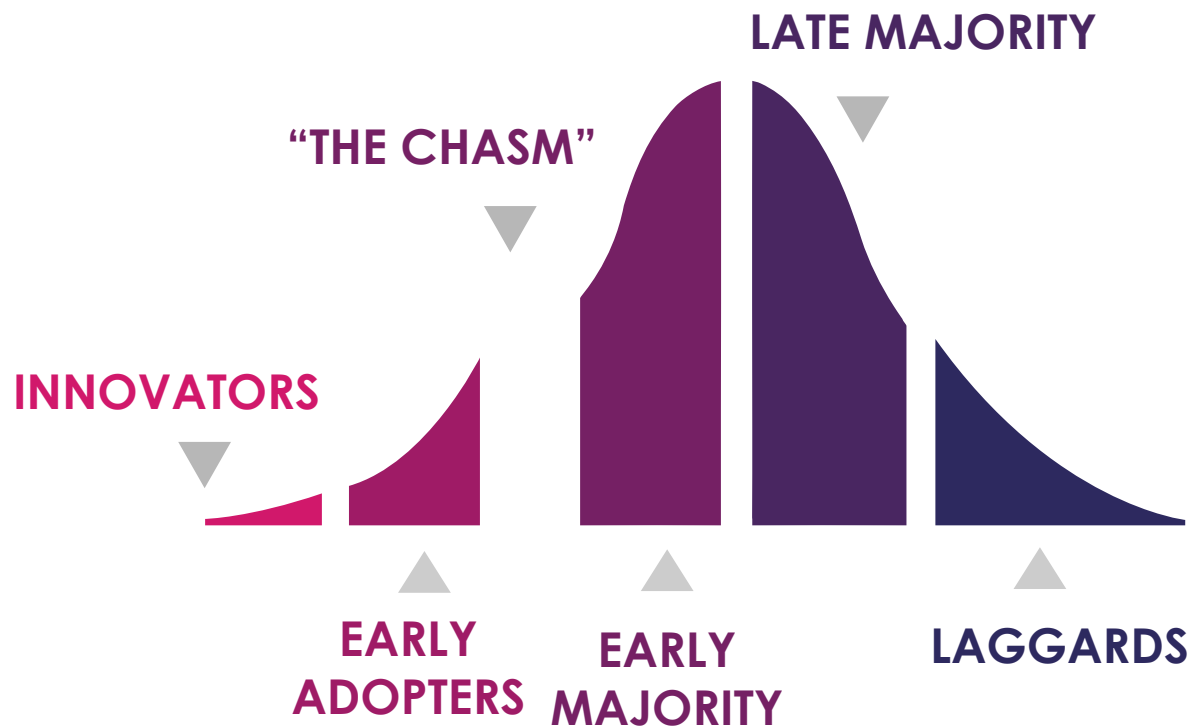
Sandbox (12)



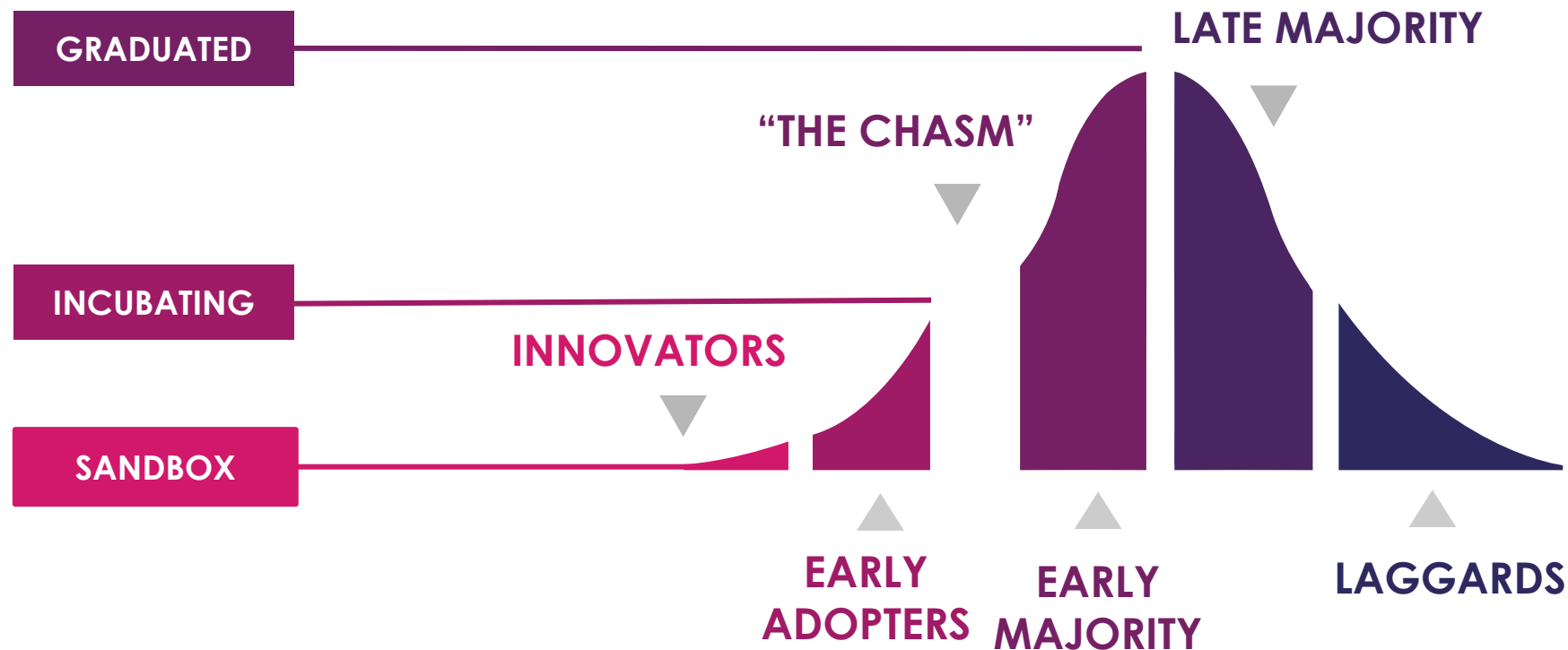
Crossing the chasm



Crossing the chasm



CNCF Project Maturities



Consider how you *use* projects

- Sandbox: lots of debugging, incomplete docs
- Incubation: understand the business value first
- Graduated: case studies and managed services



Challenges in 2019

- Increasing options => increasing complexity
- Storage, security, serverless
- Industry-specific best practices
- Best practices for open source programs
- Recruiting



KubeCon + CloudNativeCon

- Europe 2019 (sponsorships and [CFP](#) open)
 - [Barcelona](#): May 20-23, 2019
- China 2019 (sponsorships open)
 - [Shanghai](#): June 24-26, 2019
- North America 2019 (sponsorships open)
 - [San Diego](#): November 18-21, 2019



Thanks!

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