Unstoppable Force vs. Immovable Object: DevOps and the DBA

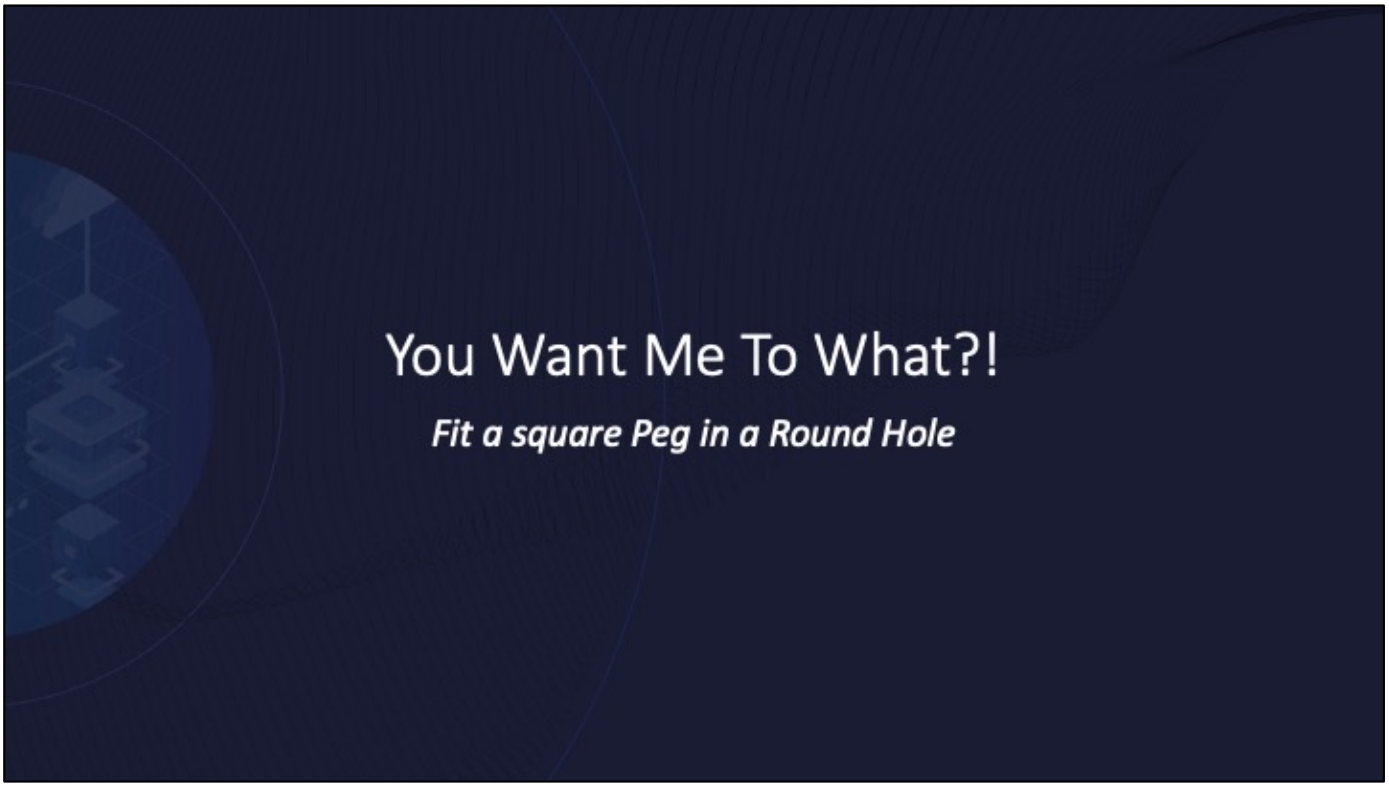
IDUG VIRTUAL
2021 NA Db2 Tech Conference

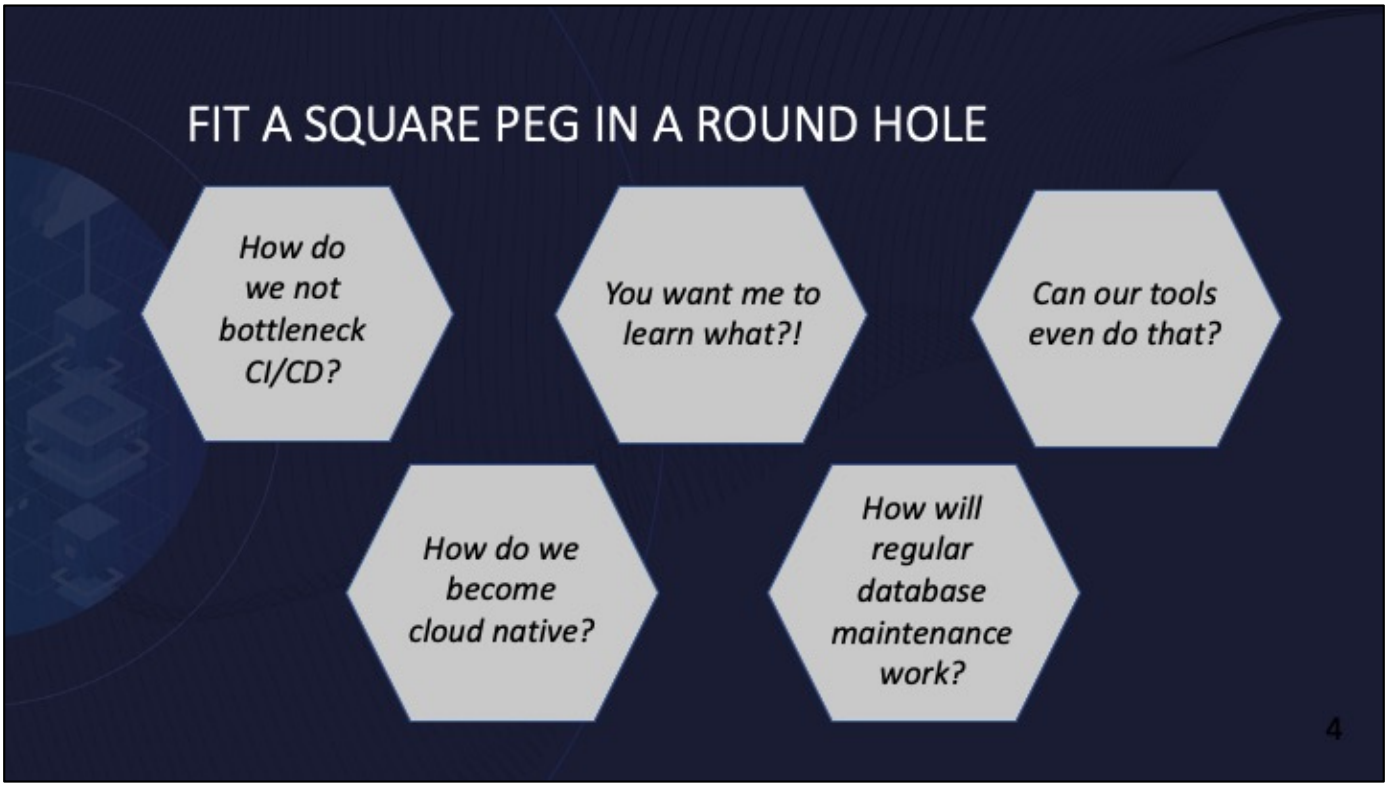
Michael Krafick, Sherwin-Williams

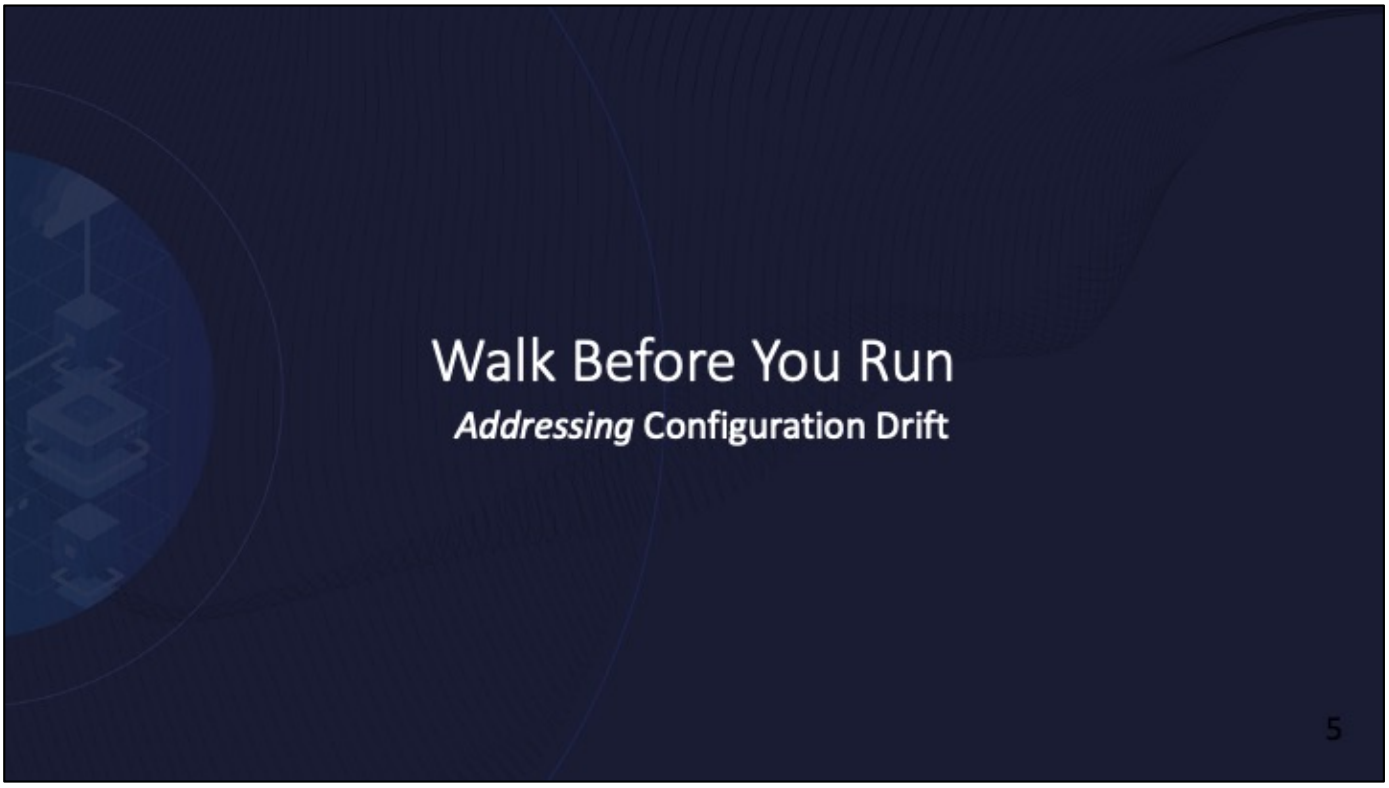
Db2 for LUW

Agenda

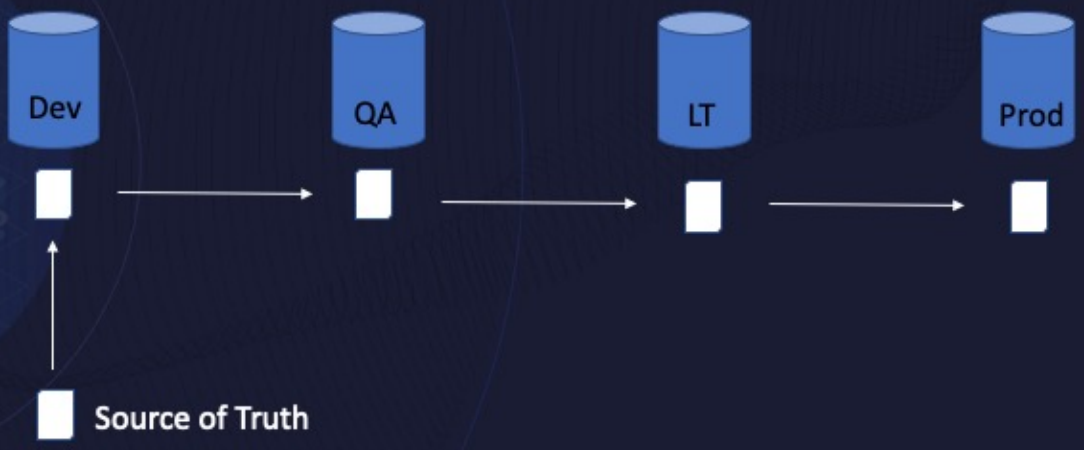
- Show exactly where DevOps and the database world collide and how to resolve the conflict based on a real world implementation.
- Explain database configuration drift and it's affect on implementing the DevOps process.
- Show examples of process and tooling that automate deployment of code and enforce a database state.
- Expand on the conflict between stateful databases in a managed environment that favors a stateless application
- Explore how this impacts the role of the database administrator and his skillset.


You Want Me To What?!
Fit a square Peg in a Round Hole


FIT A SQUARE PEG IN A ROUND HOLE
How do we not bottleneck CI/CD?
You want me to learn what?!
Can our tools even do that?
How do we become cloud native?
How will regular database maintenance work?
4

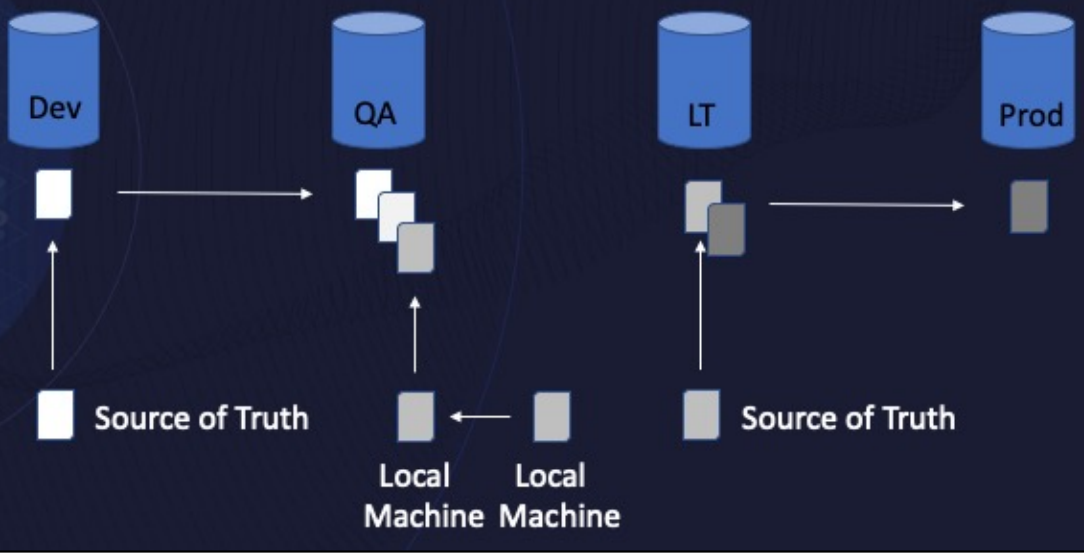

Walk Before You Run
Addressing Configuration Drift
5

Ideal Promotion of Code (Deployment)

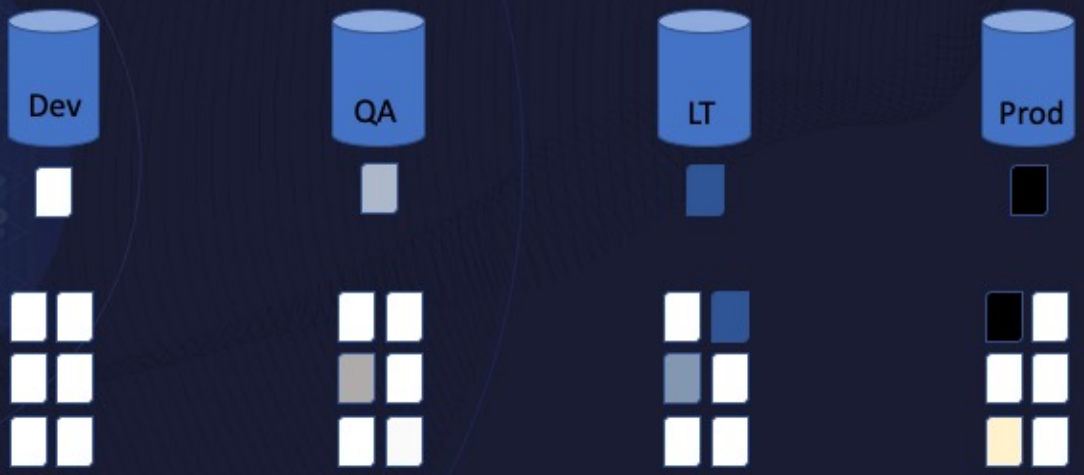


Source of Truth

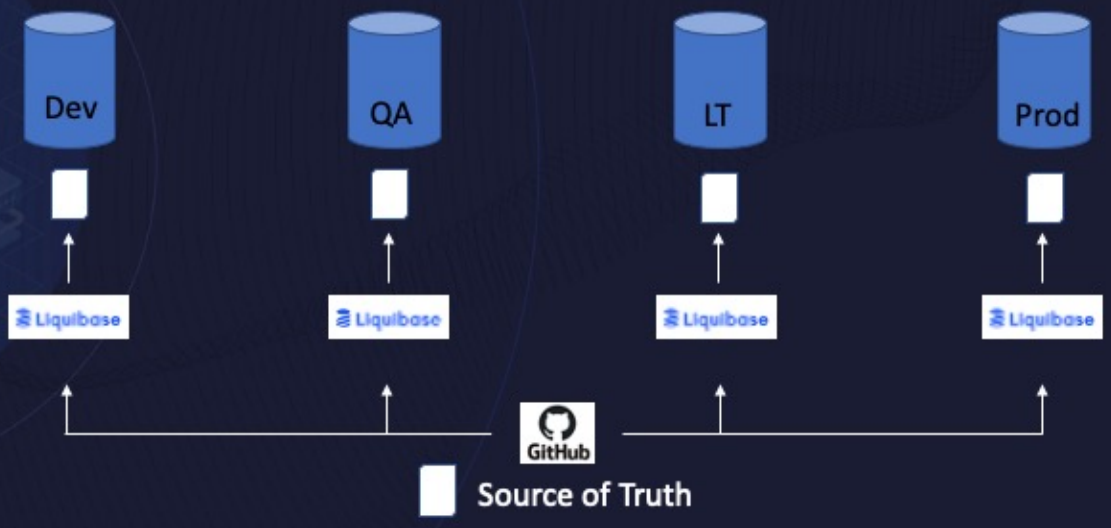
Actual Deployment of Crap

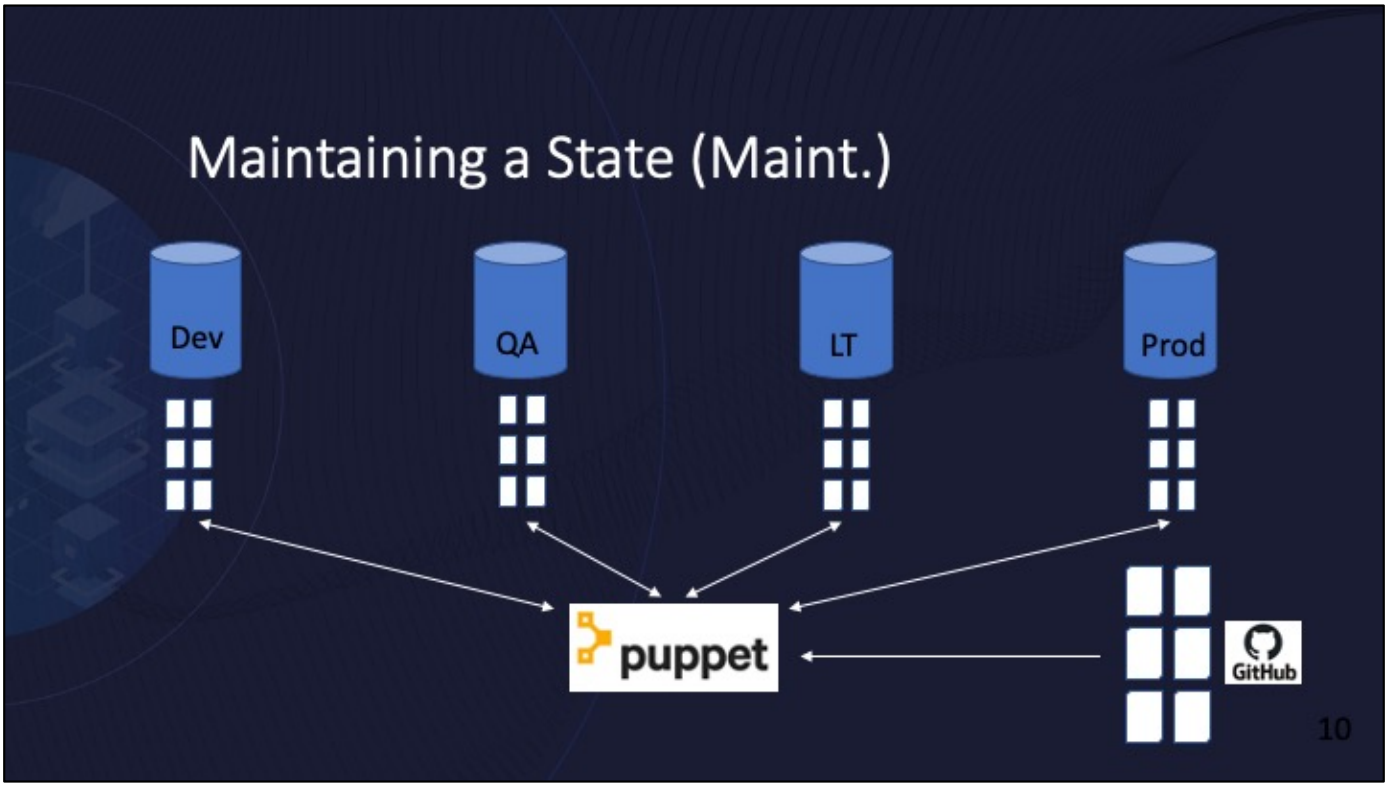


Exponential Deployment of Crap (Maint.)

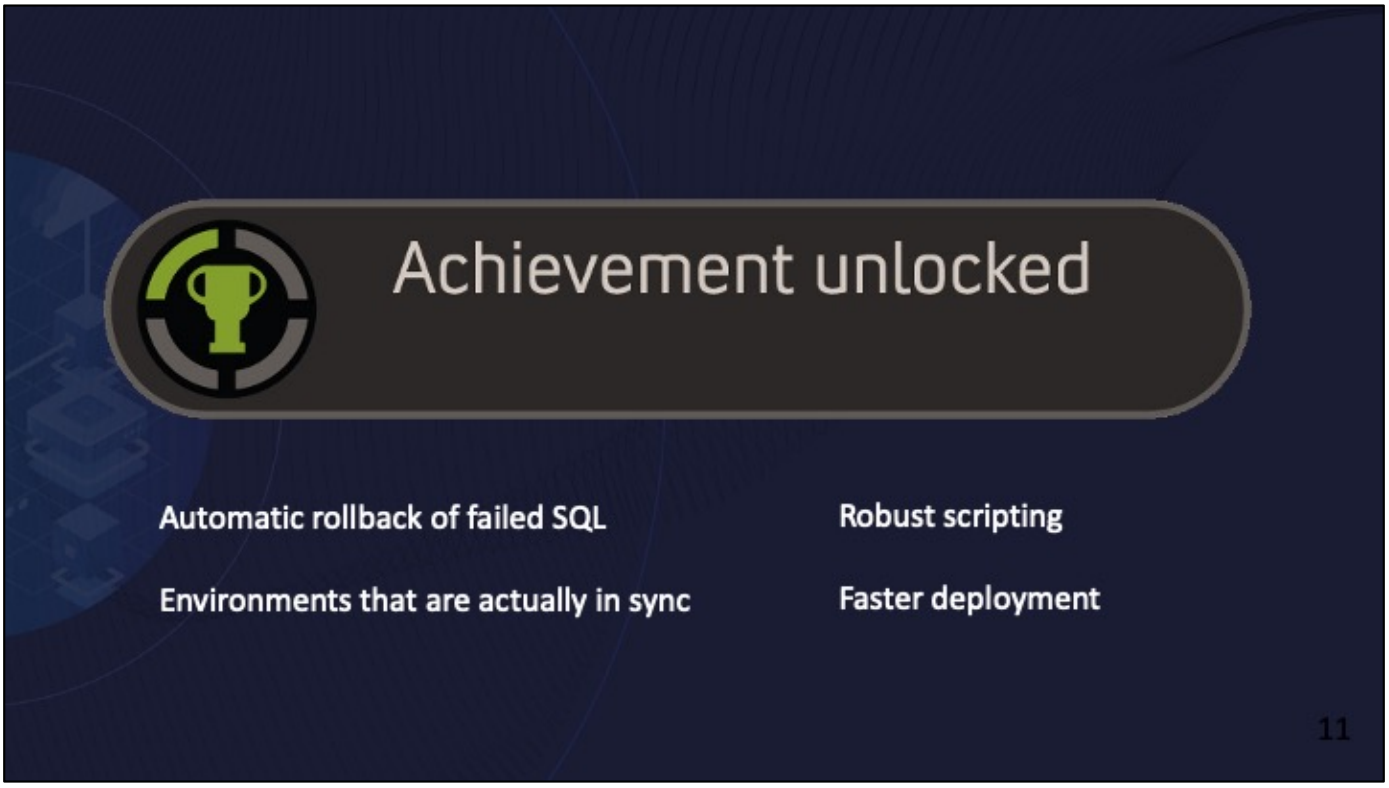


Ideal Promotion of Code (Deployment)



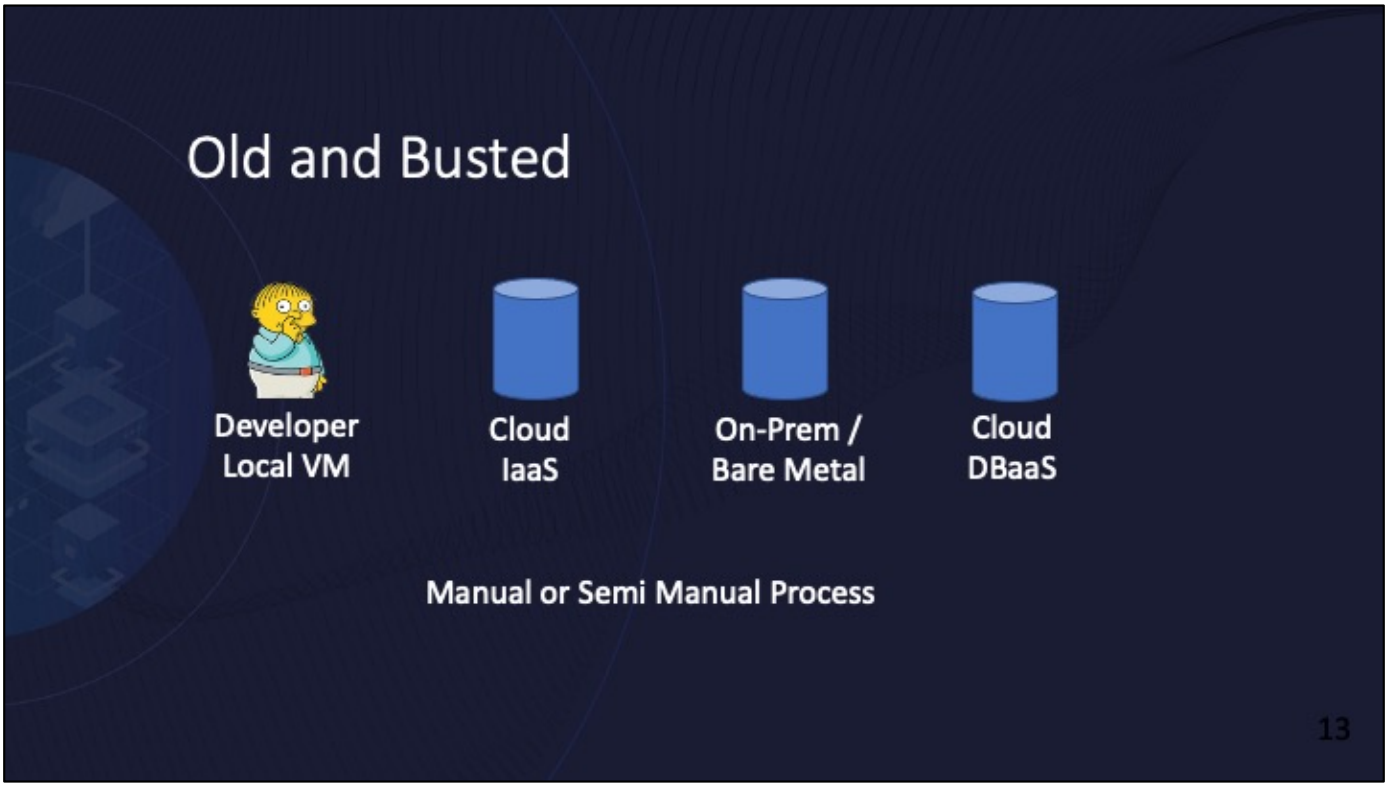


- A state doesn't just have to be scripts on the same server. Matter of fact, as you mature having 16 copies of each script on 16 servers will change. Puppet can maintain a state for things like ID's, Groups, UID's, Filesystem Permissions, even a database configuration, etc



- You could stop right here and enjoy the fruit of your effort if you wanted to.


Start Jogging
Striving for Infrastructure as Code
12



- Developer Local: Heavy VM, passed by thumb drive, no single source of ISO.
- Bare Metal: Manually provisioned by System Engineer with DBA help on size and shape. 3mo internal or few days via provider.
- Cloud: Relatively quick to provision, usually done by System Engineer a day to provide.
- DBaaS: Quick to provision, maybe by a System Engineer or Database Engineer

New Hotness

Developer
Local VM

Docker

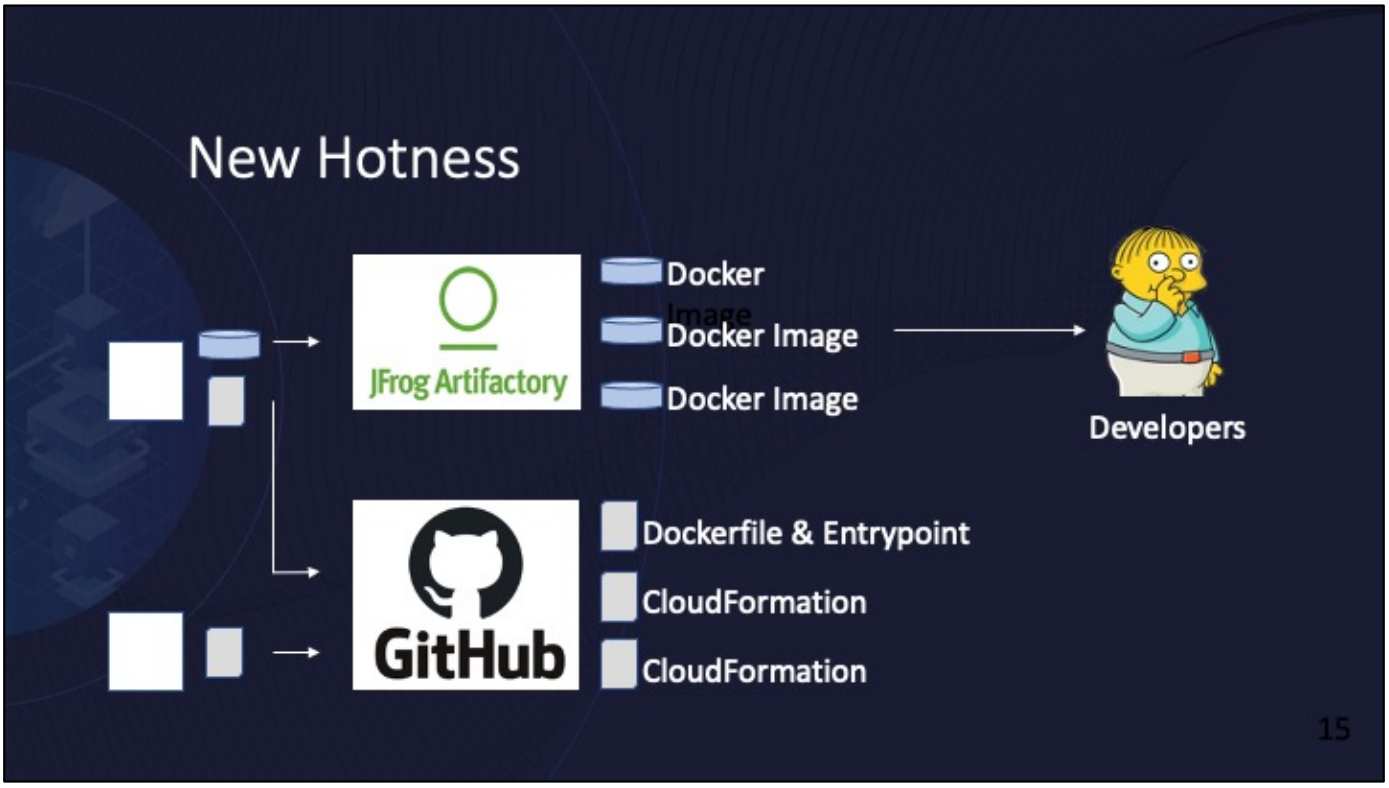
Cloud
IaaS

CloudFormation

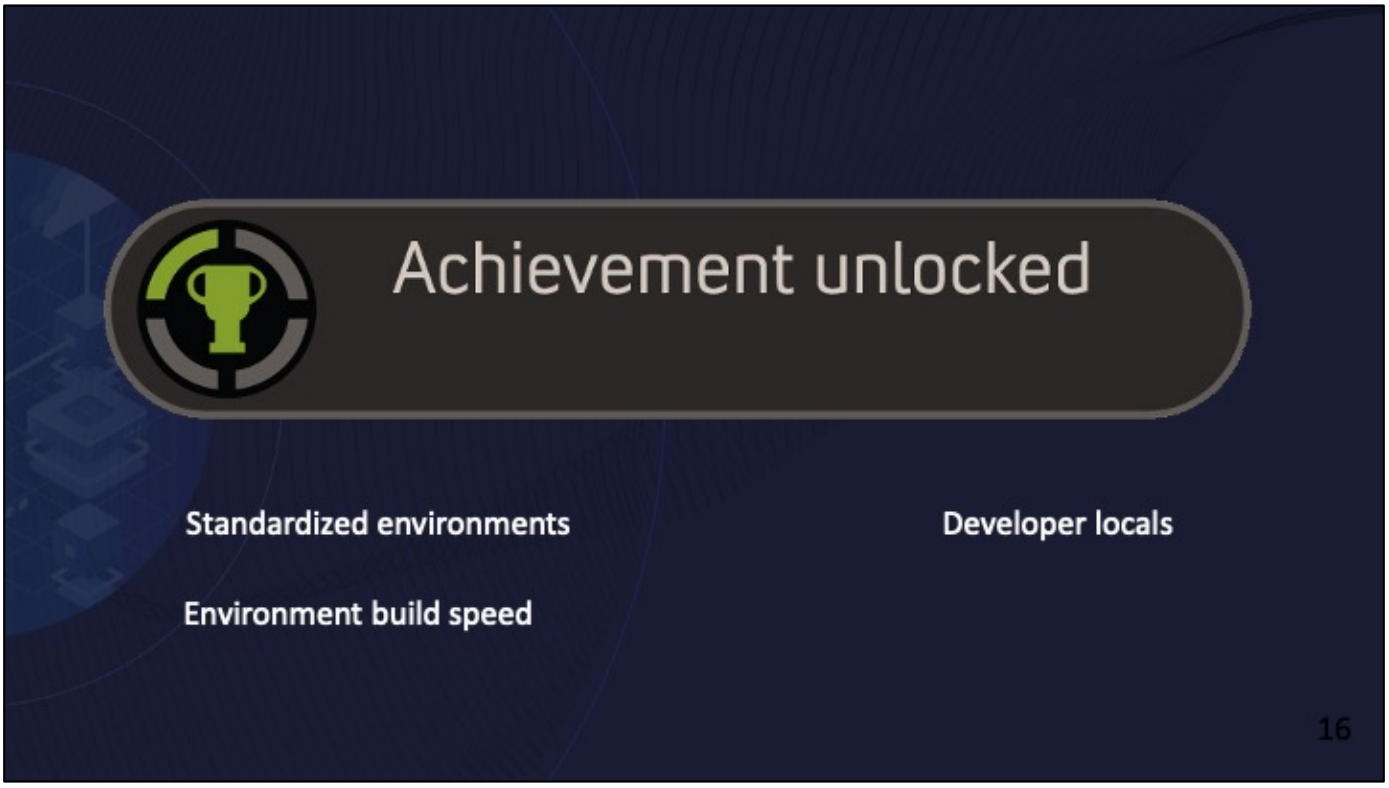
Docker

Cloud
DBaaS

CloudFormation



- Remember, this is only addressing new architecture. Your database schema is being kept in line by liquibase



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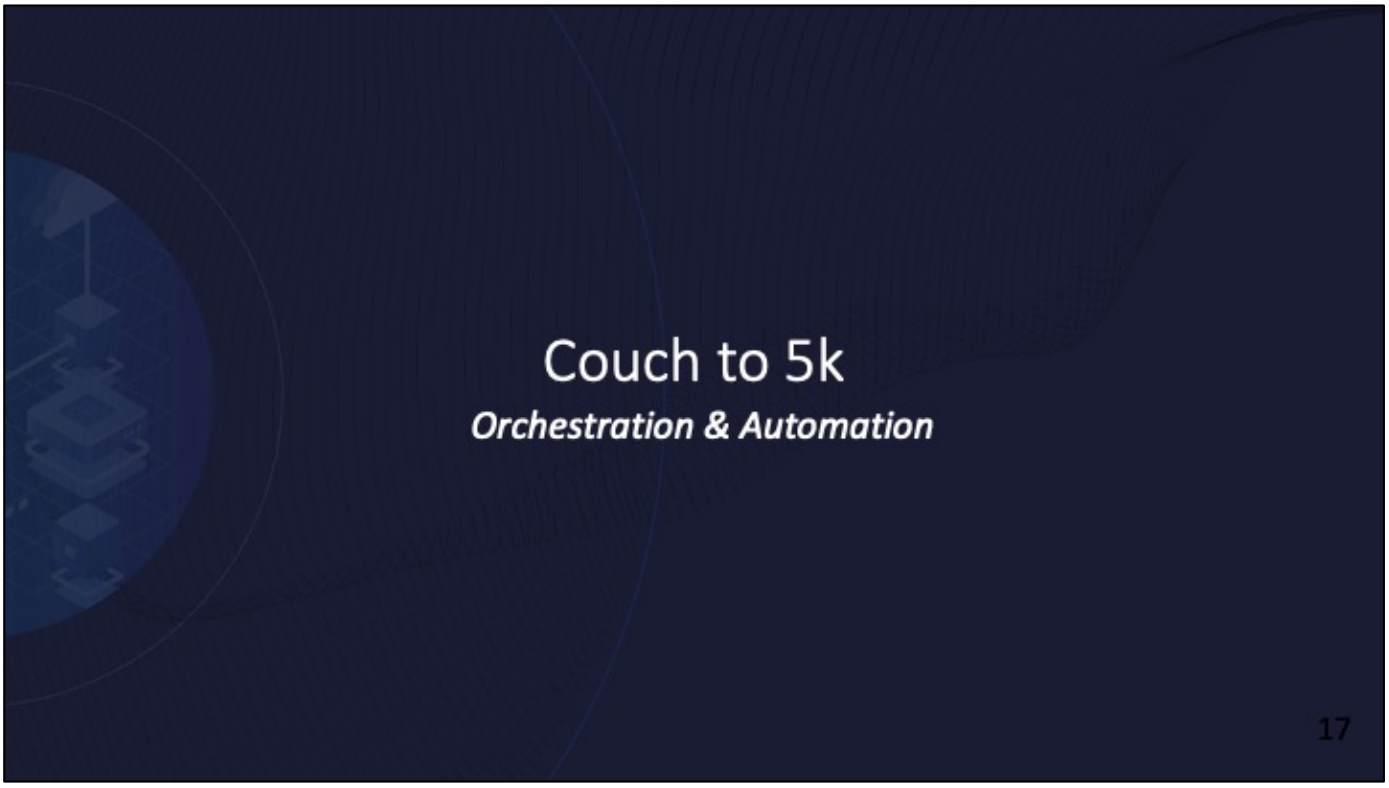
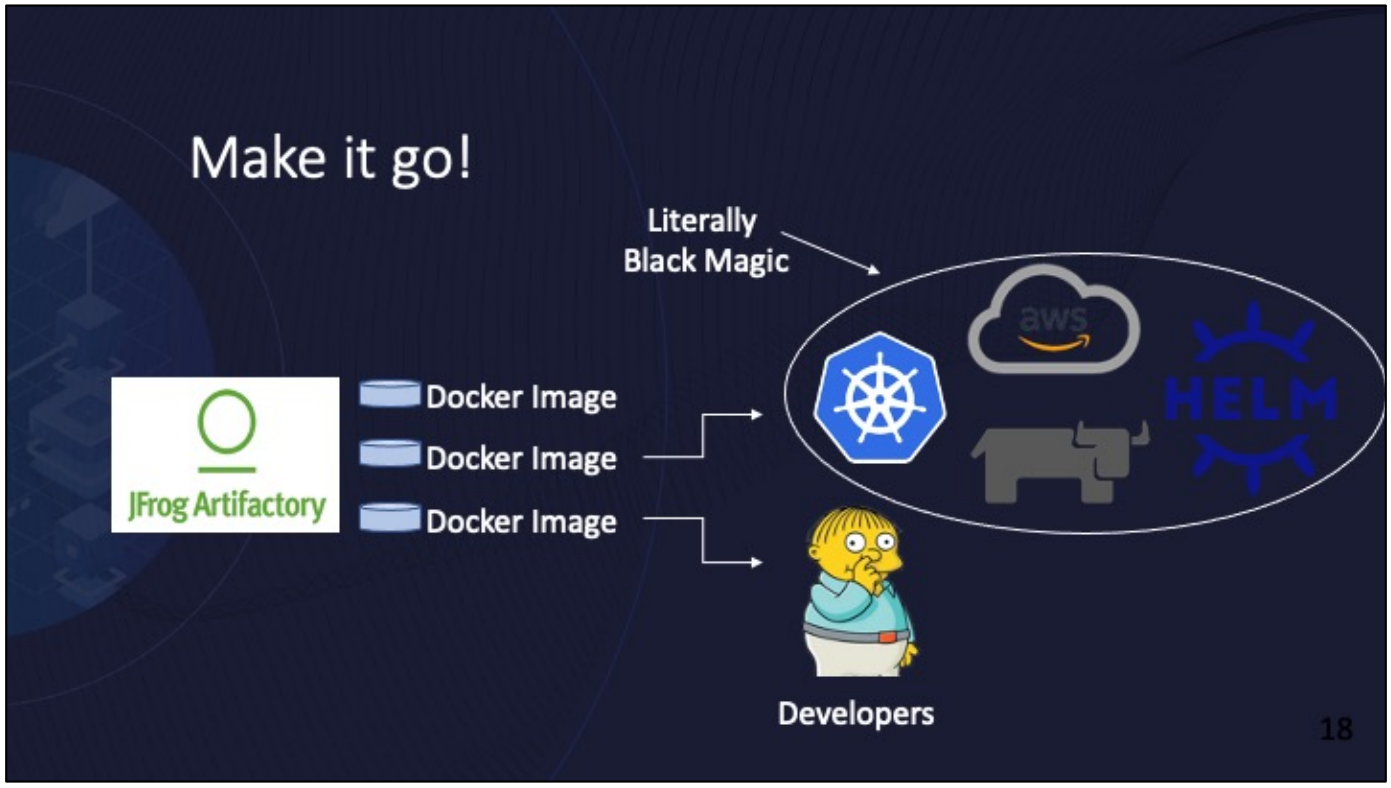
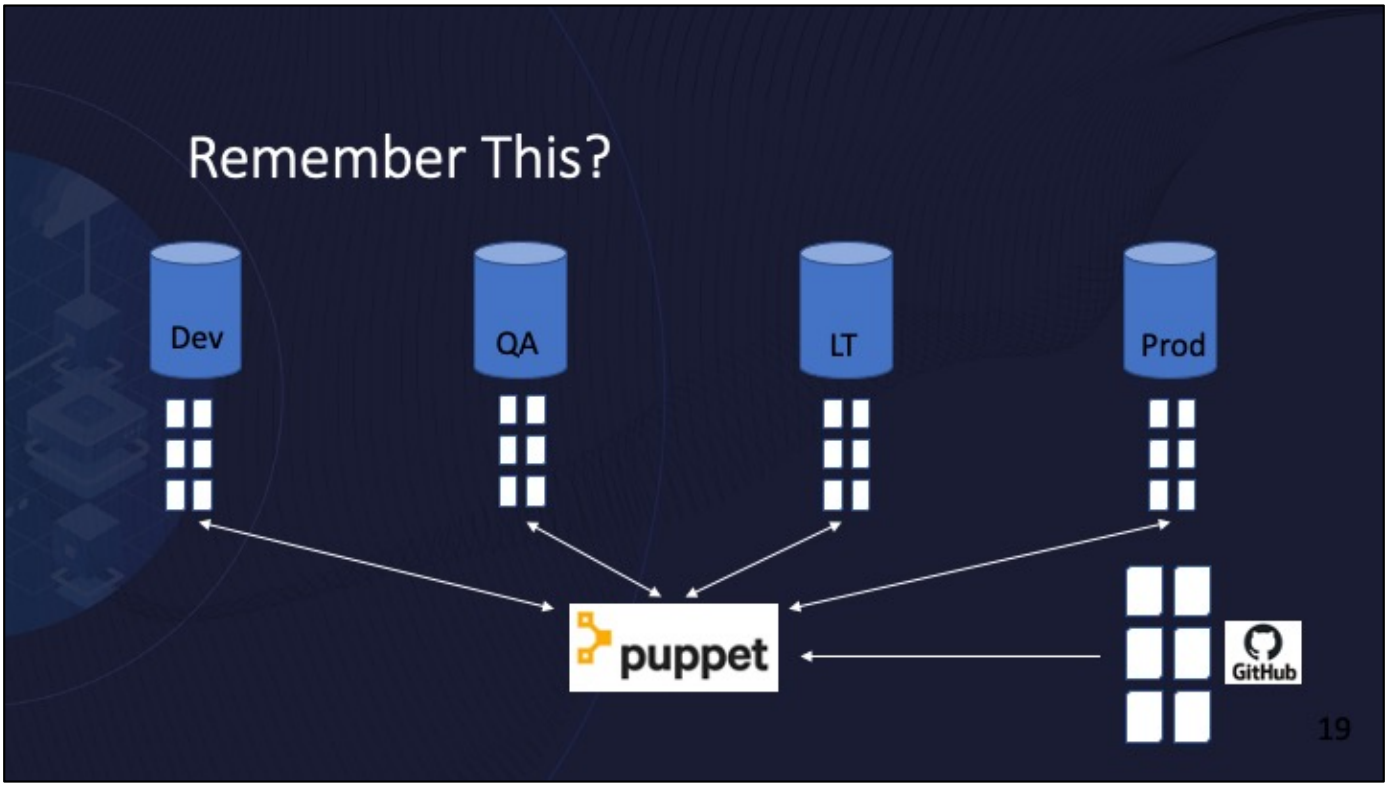

Couch to 5k
Orchestration & Automation
17

Make it go!


Literally
Black Magic
JFrog Artifactory
Docker Image
Docker Image
Docker Image
aws
HELM
Developers



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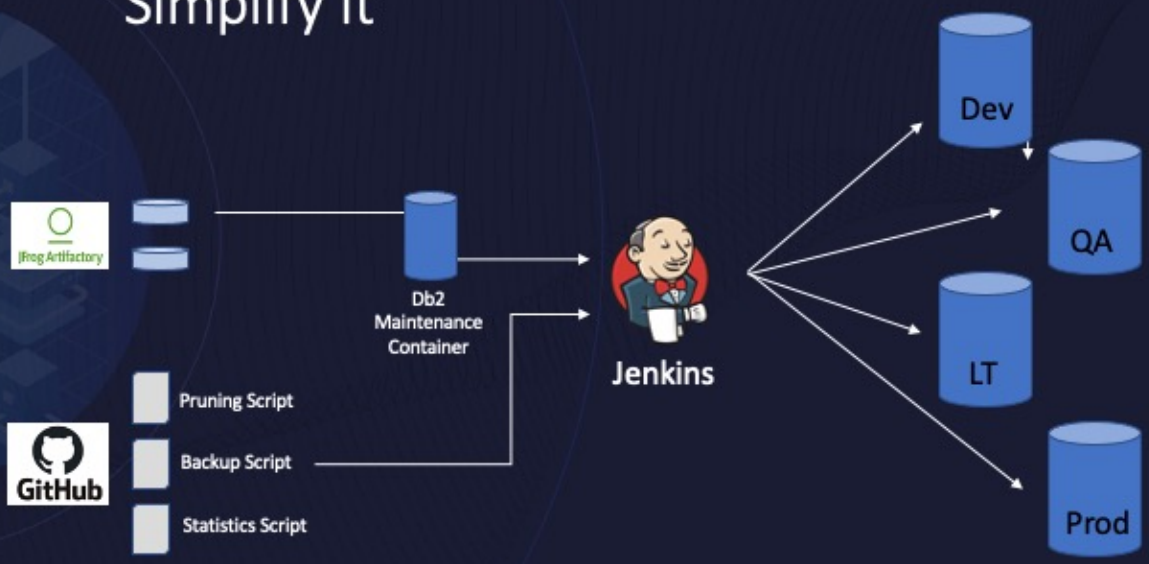
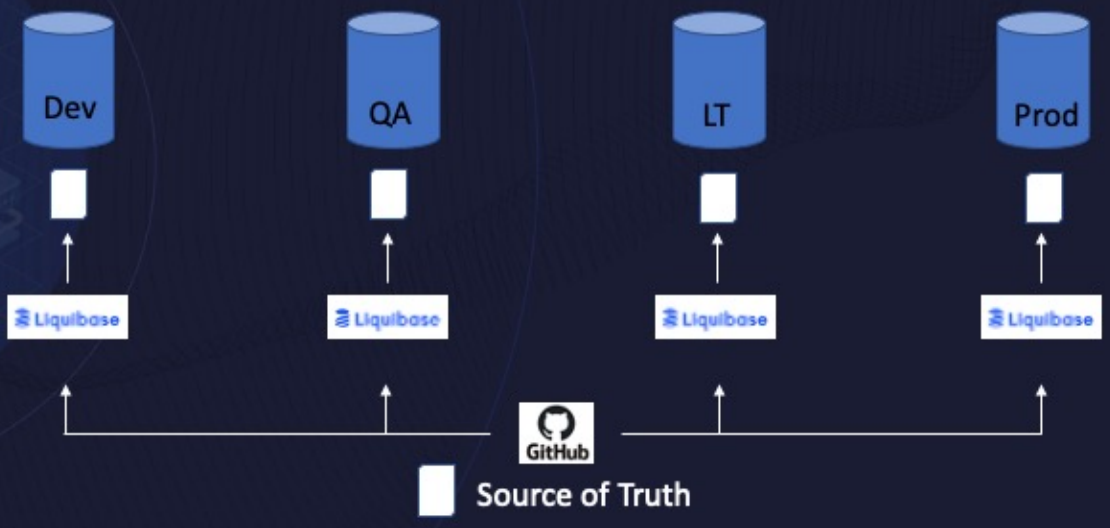
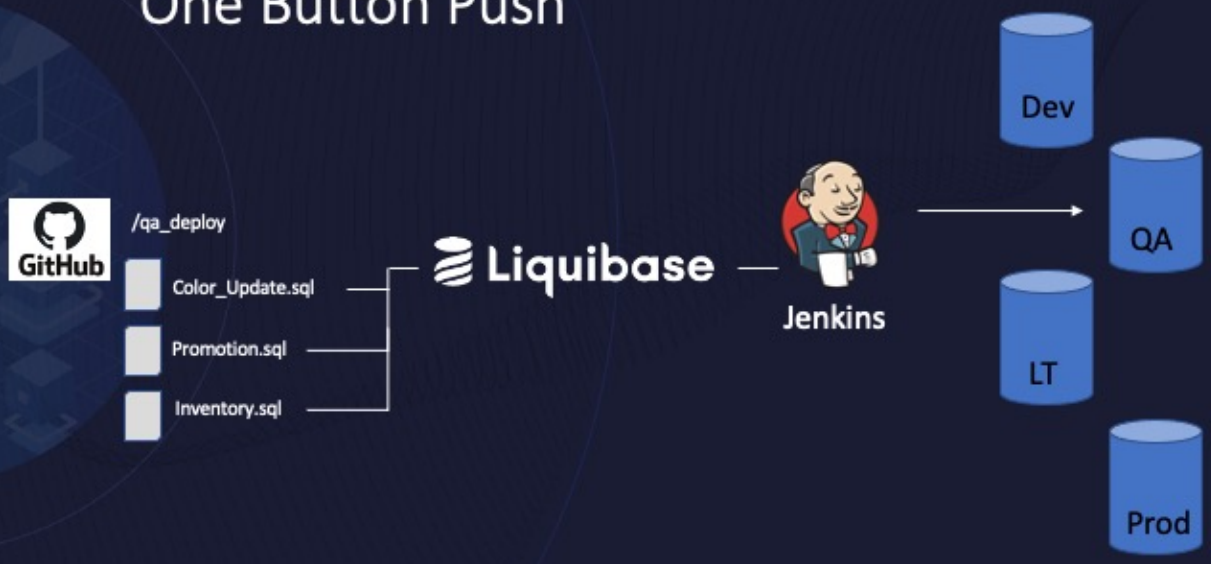
Simplify It


JFrog Artifactory
Db2
Maintenance
Container
Jenkins
Dev
QA
LT
Prod
Pruning Script
Backup Script
Statistics Script
GitHub

Remember This?



One Button Push



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Square Peg Meet Round Hole

Where DevOps and Databases Collide

Fast & Accurate

Database Engineer
Gatekeeper/Approver
X √

Project Manager
Promotes

Developers

GitHub

/qa_deploy

Color_Update.sql

Promotion.sql

Inventory.sql

Liquibase

Appeasing the Evil Overlords

Specific Code Changes

vs.

Deployment Process

Databases are Often Stateful

Stateless/Ephemeral

Stateful/Persistent

Wide Load

- 1G Memory
  2G Disk
- 1G Memory
  1G Disk
- 2G Memory
  2G Disk

- 8G Memory
  3T Disk
- 24G Memory
  2T Disk
- 16G Memory
  10T Disk

Eeny, Meeny, Miny, Moe …

Amazon
EC2

DBaaS

DBaaS: Double Edge Sword

Benefit:

- Turnkey
- Buttress missing skillset
- Basic monitoring
- High availability
- Backup/Recovery

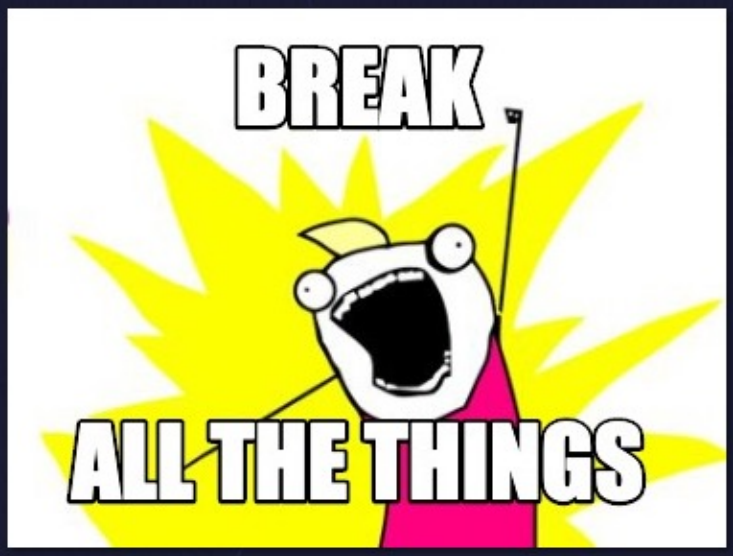
Drawback:

- Procedures vs. syntax
- Feature limitations
- "Knobs and levers" are missing.
- IMHO: Performance

Monitoring is for Suckas!

Database Metrics

Filesystem Capacity



Memory Consumption

CPU Utilization

High Availability

Automatic Takeover

Shifting Left

People, Preconceived Notions, and Skillsets

Developers

Database Engineer

DevOps Engineer

Cats and Dogs

- Micro POV
- Manipulates rows at a time
- Develop to feature not performance
- Database breadth
- Development focused

- Macro POV
- Thinks in data sets
- Performance centric
- Database depth
- Operationally focused

Old Dog vs. New Tricks

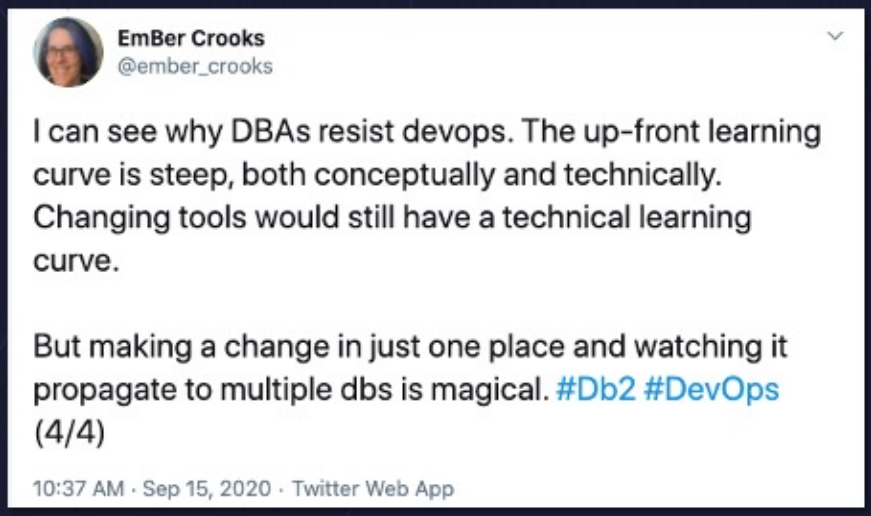
Traditionally:

- Siloed
- Operations based
- Scripter not programmer
- Specific complementary skillsets
- Limited OS exposure
- Command line vs. GUI

Learning Curve:

- DevOps concepts
- Cloud providers
- Containerization
- Registries
- Source control
- Orchestration concepts
- YAML & templating
- Ruby, Python, etc
- NOSQL
- Non traditional database design

DevOps: A DBA's Perspective



EmBer Crooks
@ember_crooks

I can see why DBAs resist devops. The up-front learning curve is steep, both conceptually and technically. Changing tools would still have a technical learning curve.

But making a change in just one place and watching it propagate to multiple dbs is magical. #Db2 #DevOps (4/4)

10:37 AM · Sep 15, 2020 · Twitter Web App

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