



Embracing Database DevOps through CI/CD

Carlos Robles
Solution Architect
DBA Mastery



Explore Everything PASS Has To Offer

Free Resources
Online PASS.org



Unlock exclusive
training &
networking



PASS
LOCAL
GROUPS



*PASS
SQLSATURDAY



*PASS
MARATHON

Back-to-back live
webinar events



PASS
VIRTUAL
GROUPS

Online special
interest user
groups



PASS
VOLUNTEERS

Get involved



Carlos Robles

Solutions Architect

DBA Mastery

/croblesdba

@dbamastery

dbamaster

Multi-platform
+ 10 years experience
Cloud, Data & DevOps

PASS Group Leader
Author, blogger
International speaker

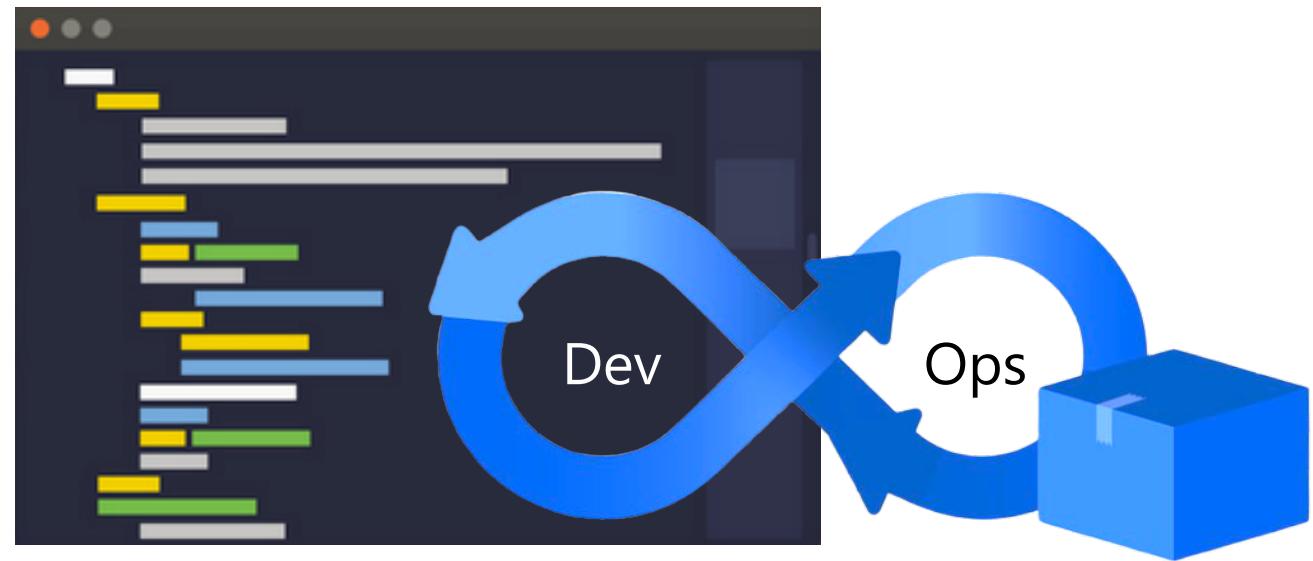
dbamastery.com

Agenda

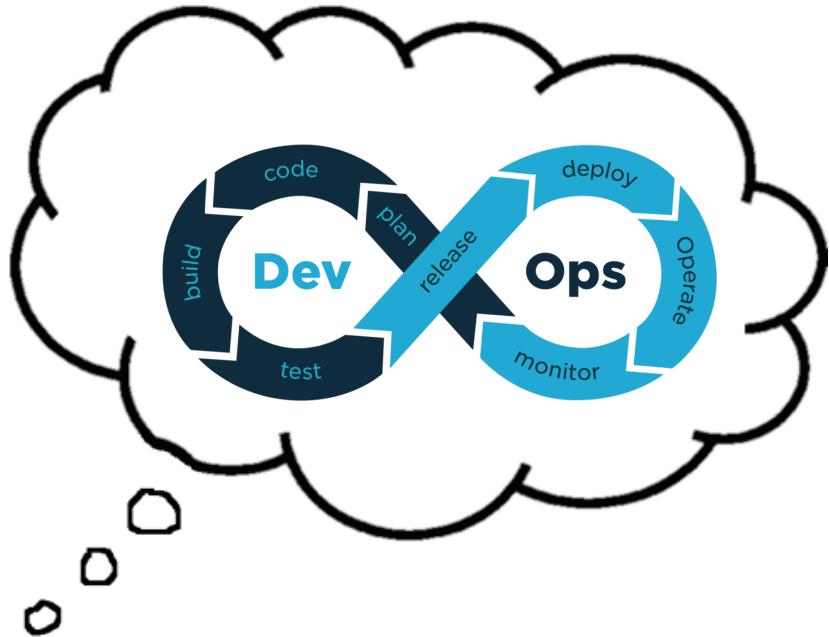
- DevOps
 - DevOps for the database
 - Flyway
 - Integrated pipeline
-



DevOps



What is DevOps?



“

DevOps is the union of **people**, **process**, and **products** to enable continuous delivery of value to your end users. ”

–Donovan Brown

Benefits

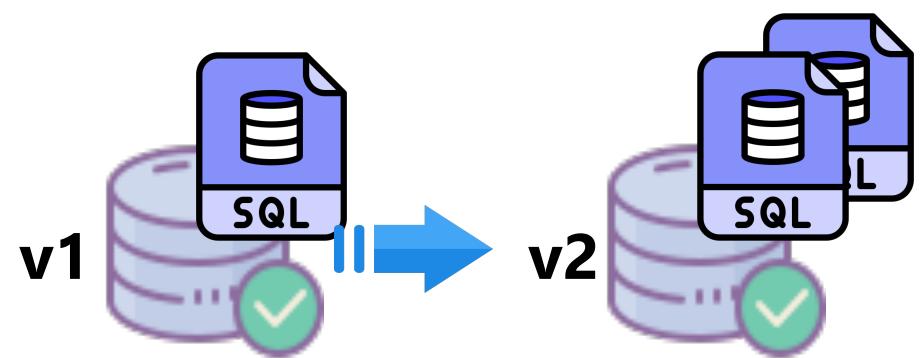
- Speed
- Rapid delivery
- Reliability
- Scale
- Innovate mindset
- Greater customer experience

Practices

- Infrastructure as code
- Continuous integration
- Continuous delivery
- Microservices
- Monitoring and logging
- Collaboration



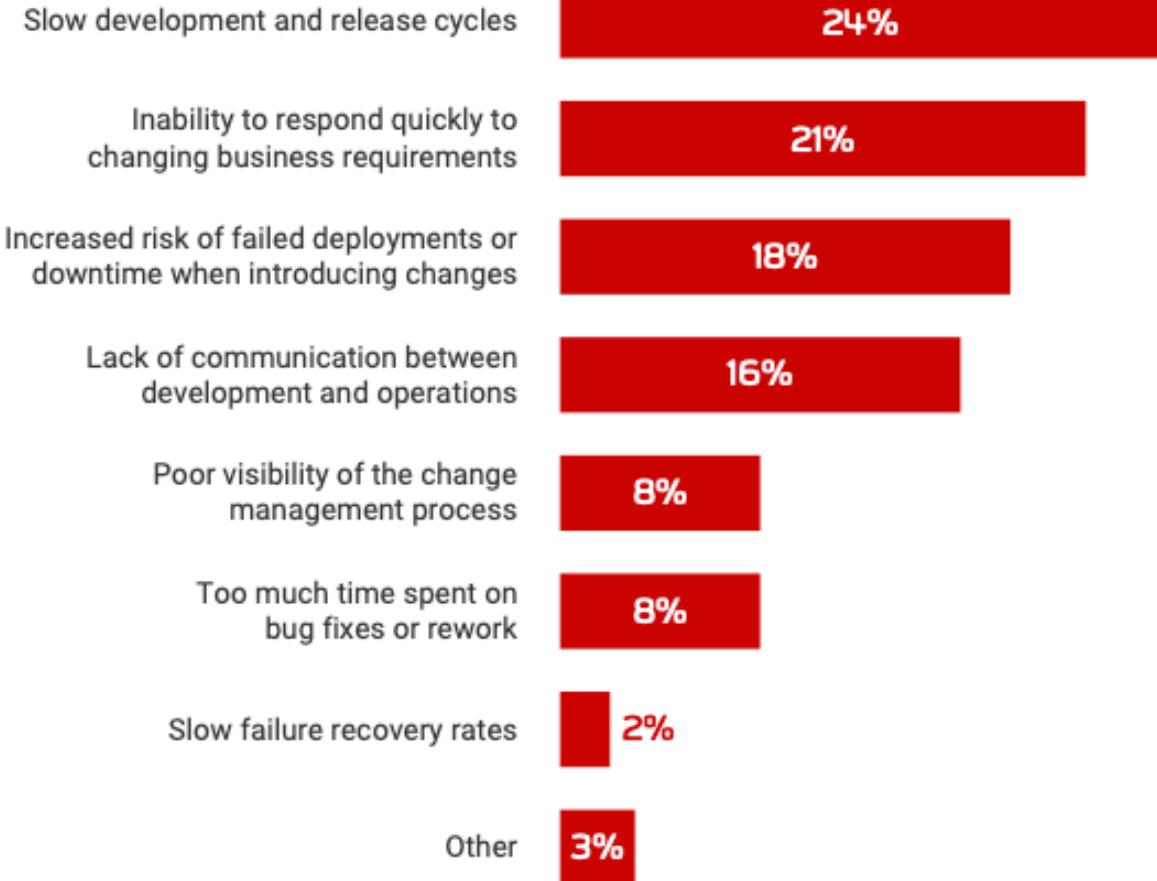
DevOps for the database



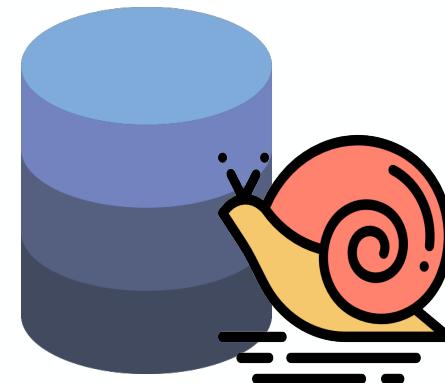
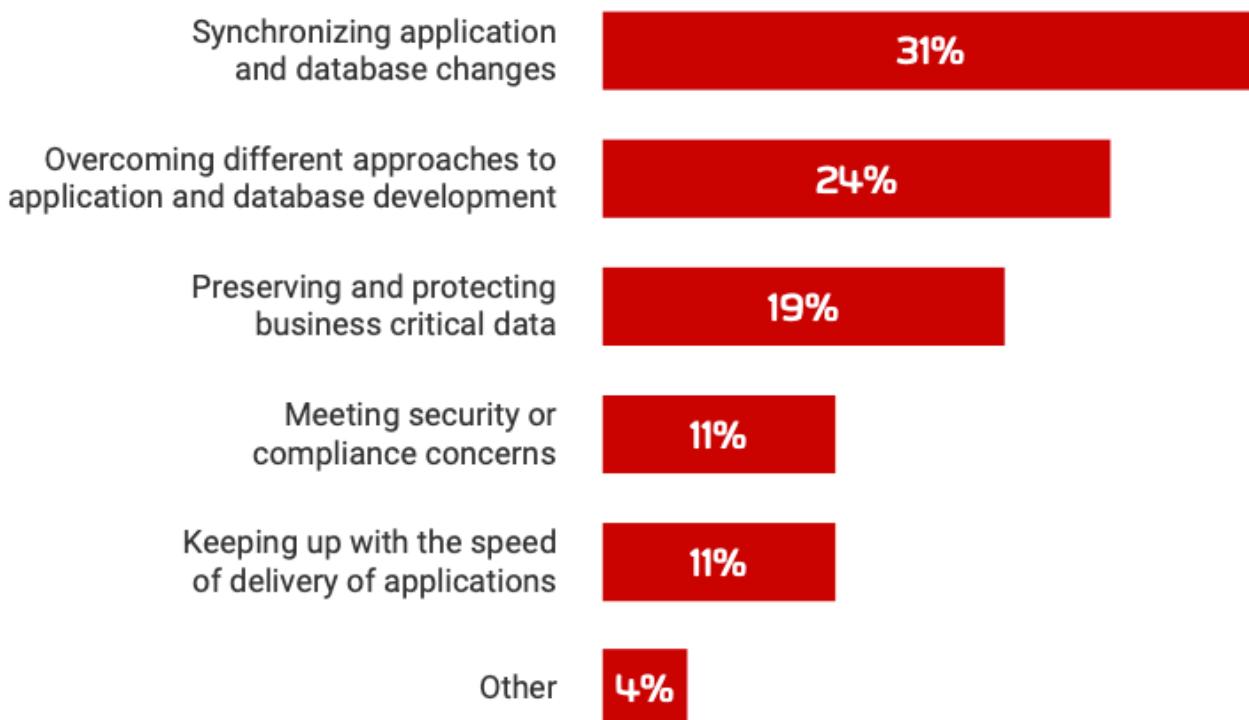


2020 State of Database DevOps

What do you consider the greatest drawback in traditional, siloed database development?



What do you consider the greatest challenge in integrating database changes into a DevOps process?



Shiny Soft

Version: 5.2.4

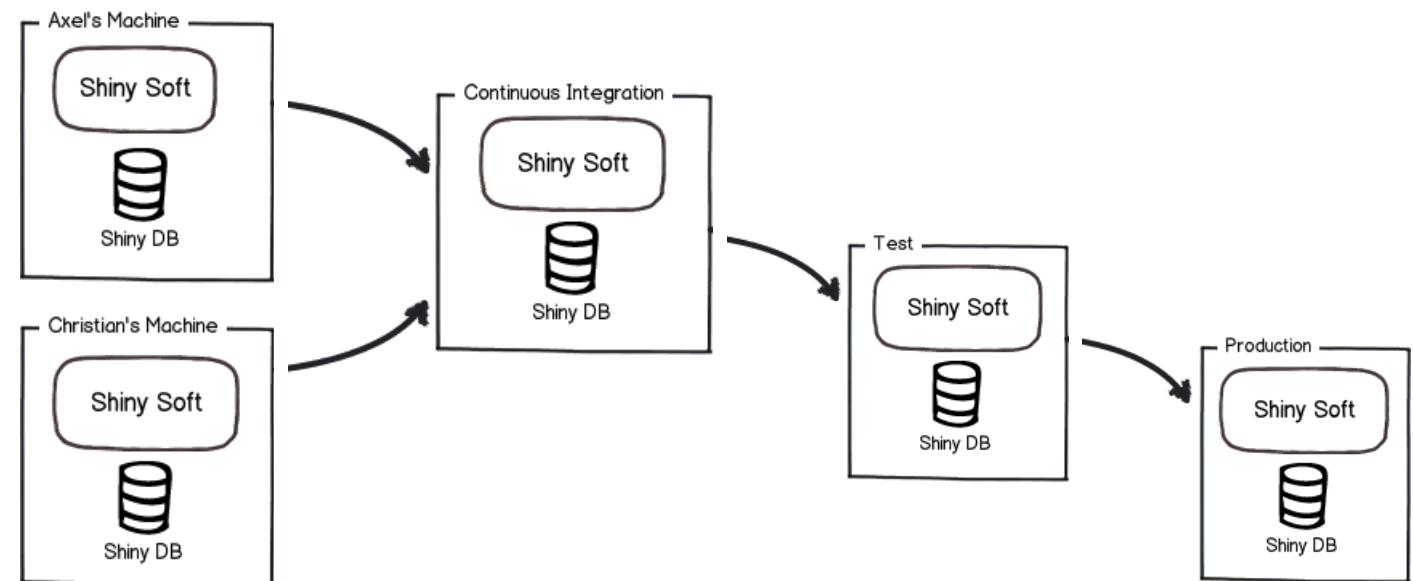
-> Well defined and
reproducible

Version: ?

-> No exact idea about
state

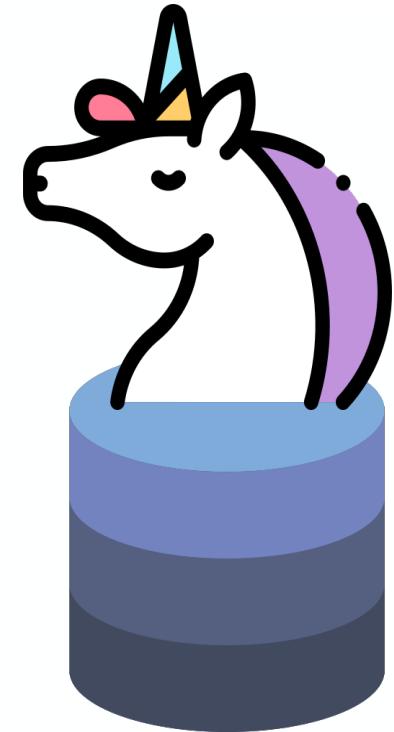


Shiny DB



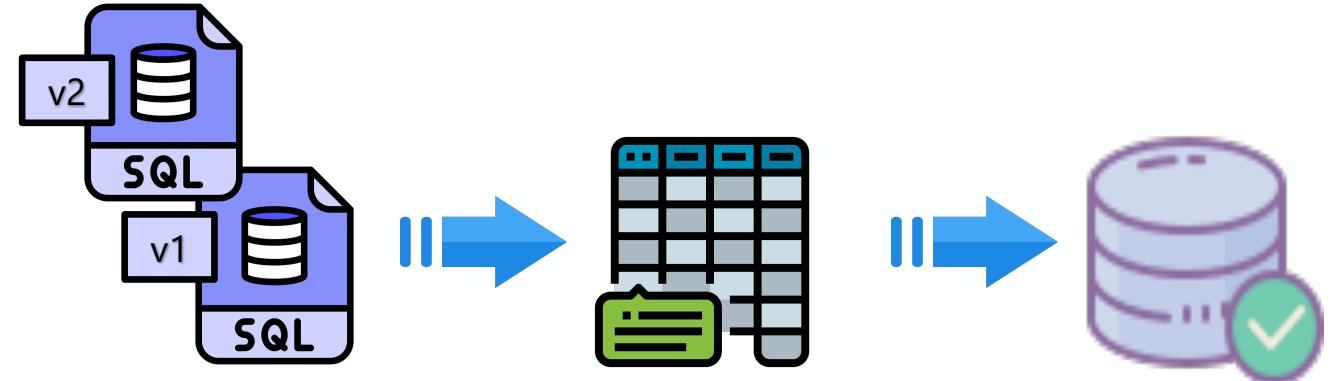
Evolutionary database design

- DBA + Developer = Collaboration
- Version control
- Change = Migration
- Own database instance / database
- Continuous integration

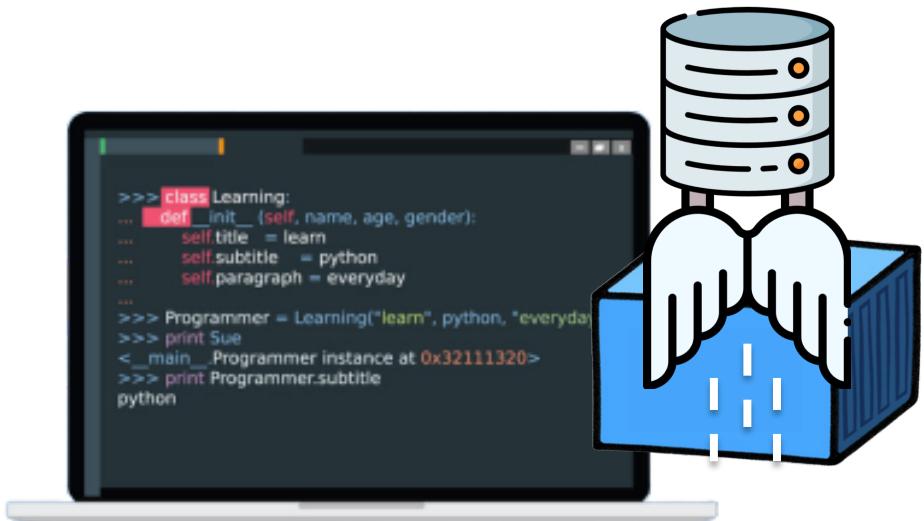


Database migrations

- Unique identifier
- Migration history
- Sequence
- Consistent



Flyway



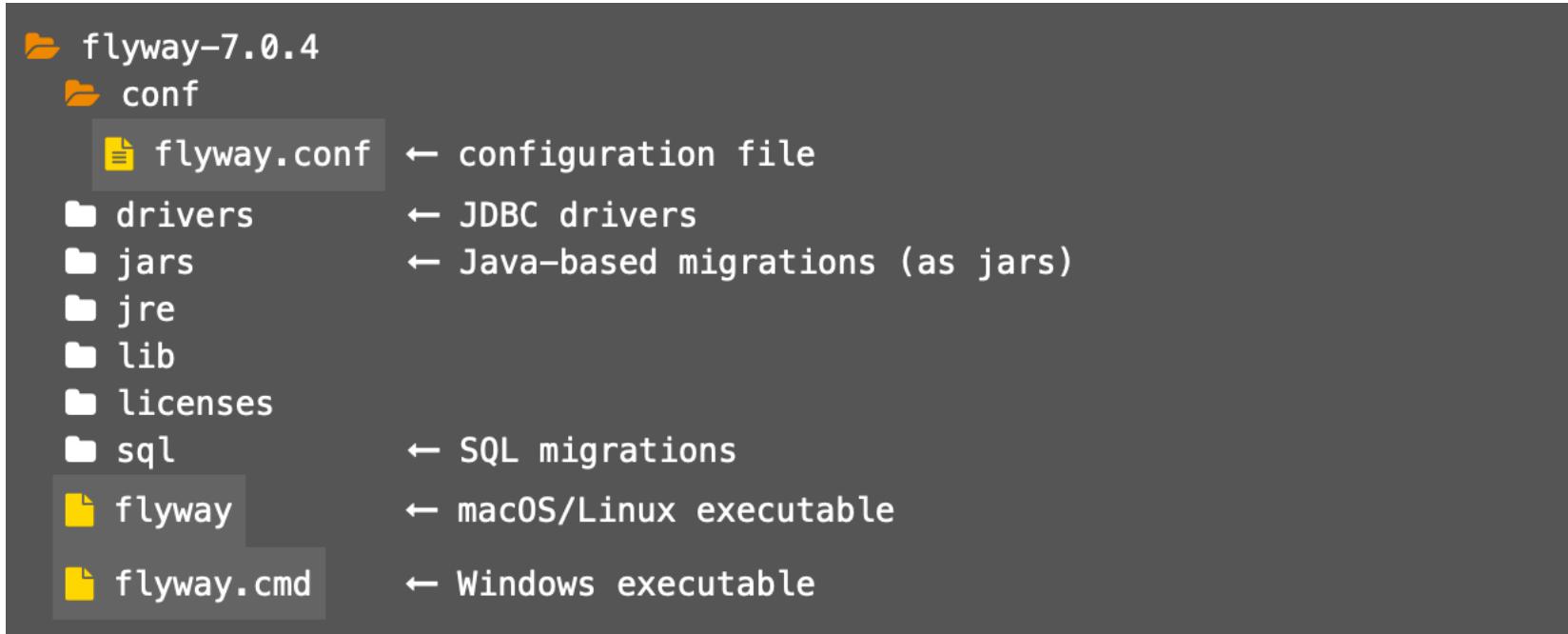
```
>>> class Learning:  
...     def __init__(self, name, age, gender):  
...         self.name = name  
...         self.age = age  
...         self.gender = gender  
...     def print_info(self):  
...         print(f"Name: {self.name}, Age: {self.age}, Gender: {self.gender}")  
>>> Programmer = Learning("Sue", 25, "Female")  
>>> Programmer.print_info()  
<__main__.Programmer instance at 0x10101010>  
>>> Programmer.subtitle = "python"  
>>> Programmer.print_info()  
Name: Sue, Age: 25, Gender: Female  
Subtitle: python
```

What is Flyway?

- Open source, by Redgate
- Multi-platform / database
- Database migrations
- CLI, SQL Scripts
 - API, Java, plugins
- Schema history

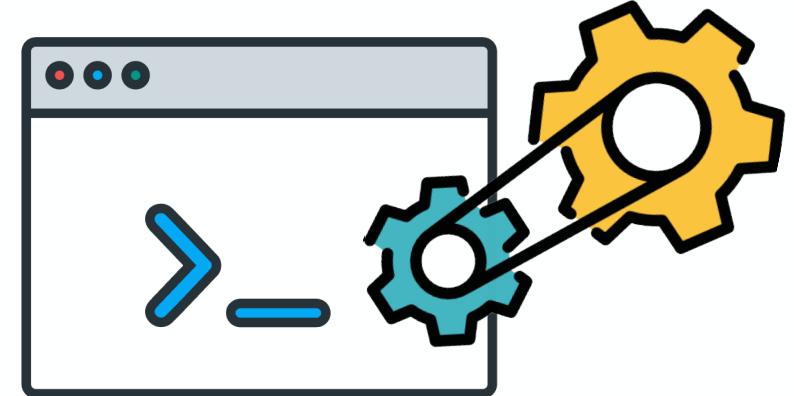


Folder structure



Commands

- Migrate
- Clean
- Info
- Validate
- Baseline
- Repair
- Undo (pro version)



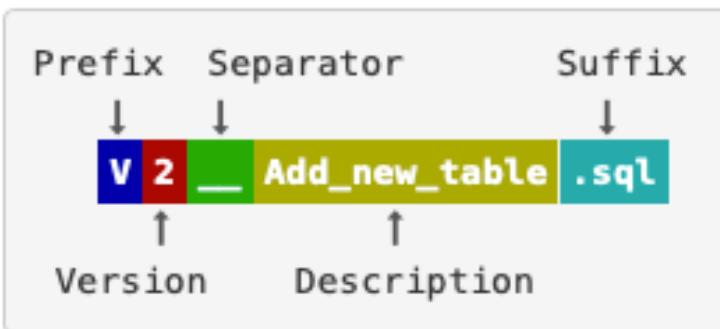
Configuration file

flyway.url	jdbc:<db>:<host>:<port>
flyway.user	sa / flyway / postgres
flyway.password	s3cr3Tp@s\$
flyway.env_abc	\${abc}

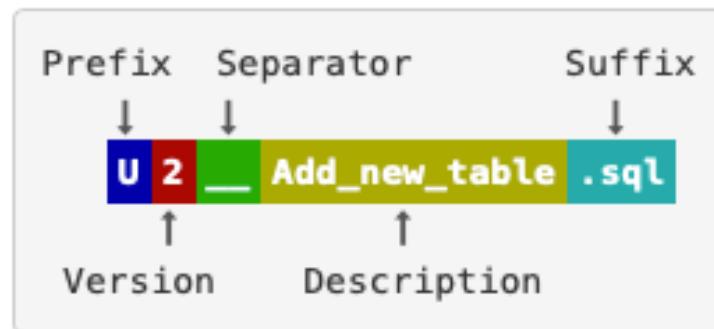


SQL migrations

Versioned Migrations



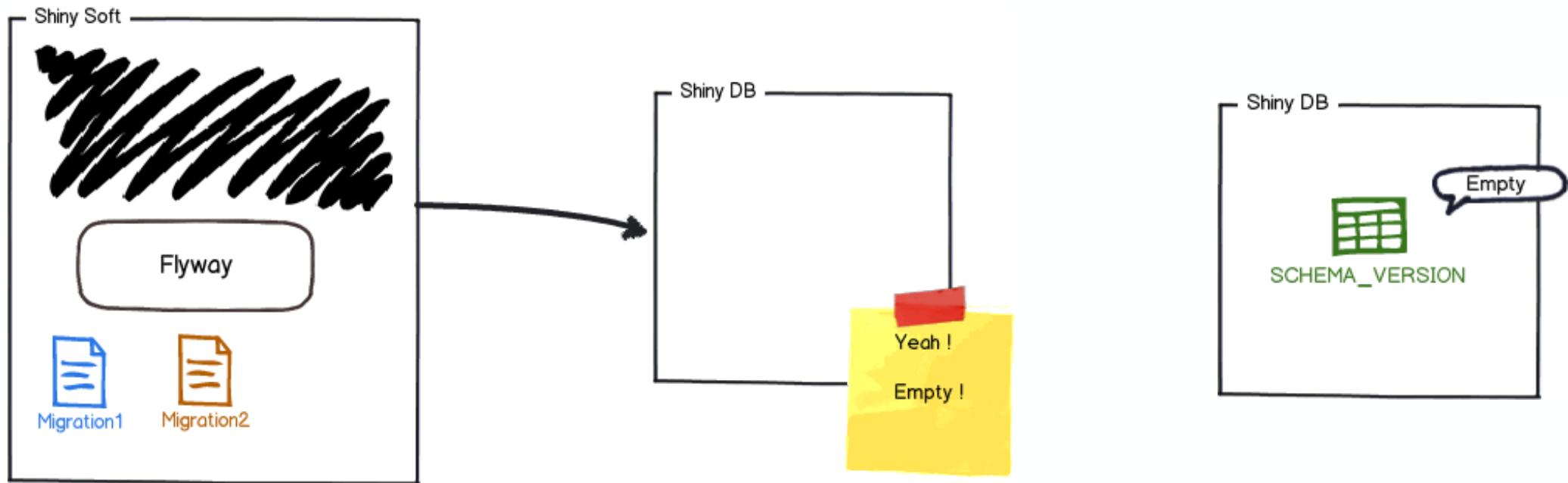
Undo Migrations

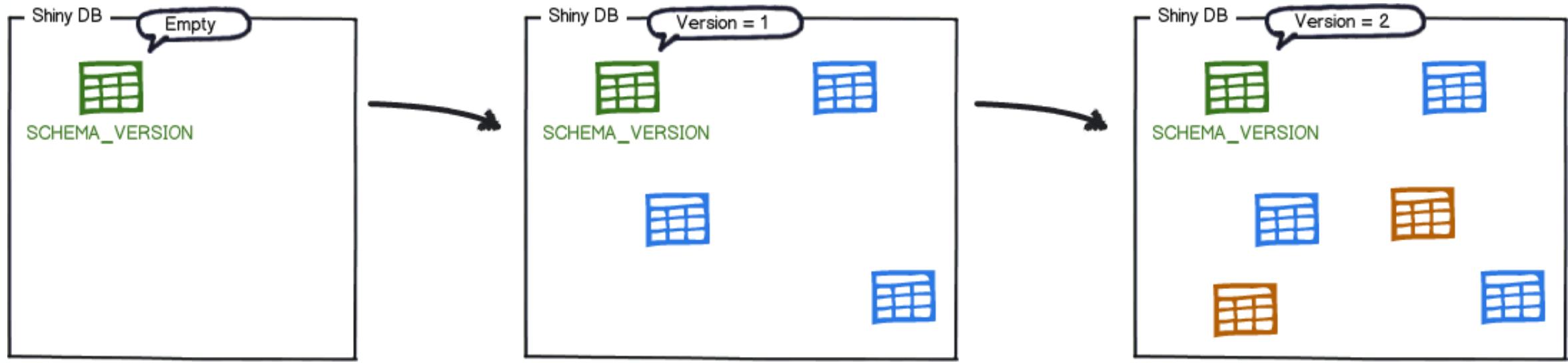


Repeatable Migrations



How it works?



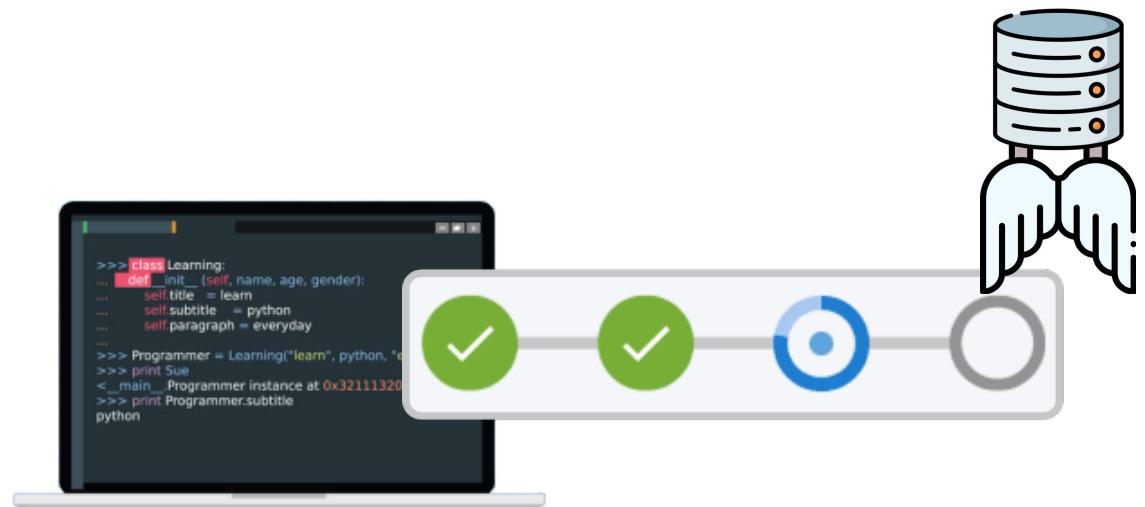


DEMO

Flyway migrations with containers



Integrated pipeline



Integrated pipeline



- Build
- Test
- Deploy

Azure DevOps



- Any language / platform / cloud
- Free for open source
- Extensible
- Containers & Kubernetes
- YAML support

Kubernetes

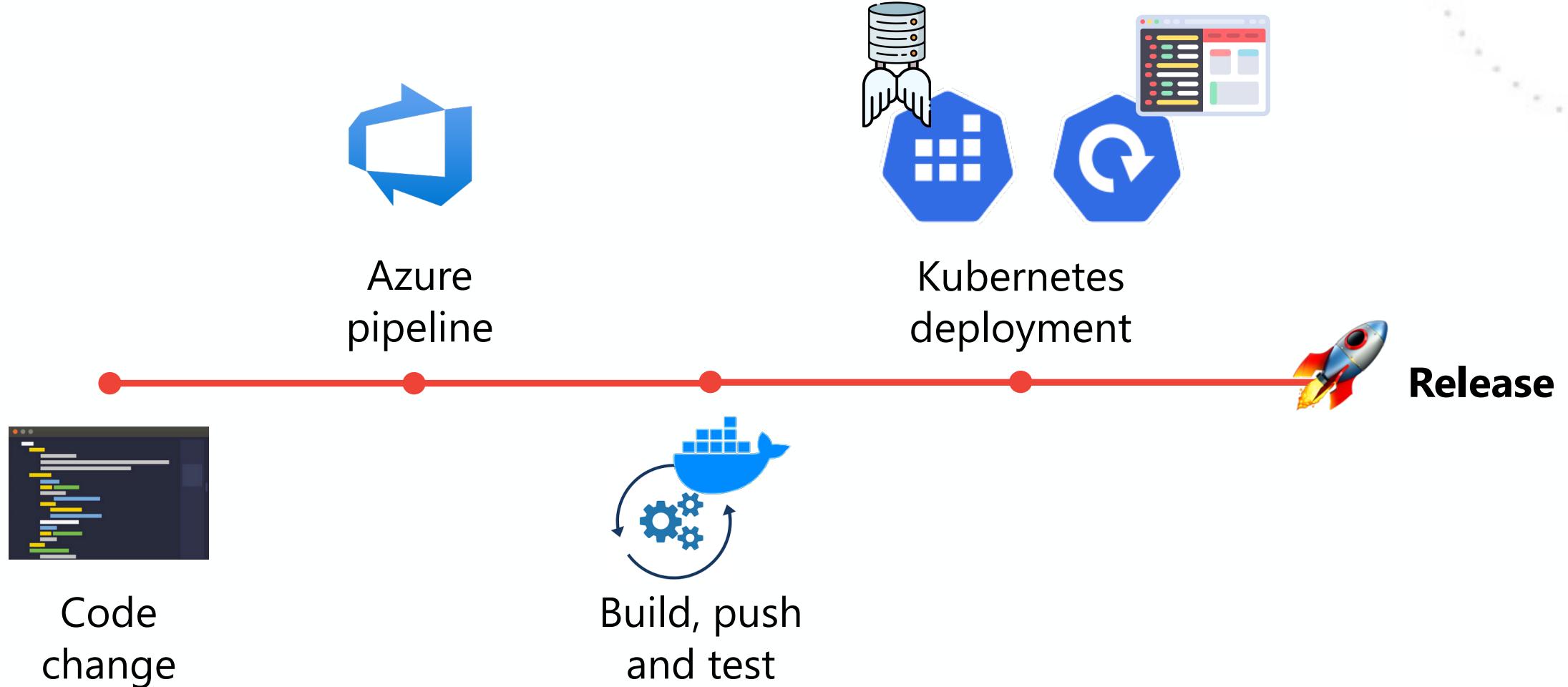
- Open source
- Container orchestrator
- Declarative model
- Loosely coupled



DEMO

Integrated pipeline





Review

- DevOps + databases
- Database migrations
- Flyway
- Integrated pipeline (DB + App)
- Azure DevOps → Azure pipelines
- Kubernetes



References

Flyway

- [Documentation](#)
- [Blog](#)

Books

- [The Phoenix & Unicorn project](#)
- [The DevOps Handbook](#)
- [Kubernetes: Up and running](#)
- [Continuous delivery](#)
- [Refactoring databases](#)

Microsoft learn

- [Kubernetes](#)
- [Azure SQL](#)
- [Azure DevOps](#)
- [Modern apps in Azure](#)

More about it

Articles

- [Simple-talk](#)
- [SQL Server Central](#)

Blog

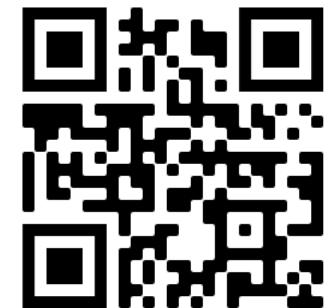
- [http://dbamastery.com](#)

GitHub

- [https://github.com/dbamaster](#)

Demos

- [https://git.io/JT49Y](#)



Session Evaluation

Submit before
Friday, Nov. 20
at 5pm EST to
win prizes

Your feedback is important to us!

Please visit the “Session Evaluation” link
in the left hand side navigation bar to
rate this session.

Thank you

Carlos Robles



@dbamastery



crobles@dbamastery.com