

DBA MASTERY



Embracing DevOps through
database migrations with Flyway





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Experience

Microsoft Data Platform MVP

Friend of Redgate

+10 years of experience multi-platform
Solutions architect

Community

GTSSUG – Community Leader

Speaker, author, blogger, mentor

Simple Talk, SQL Server Central & MSSQL Tips

DBA Mastery

Tips, scripts, best practices & more



MAXDOP Calculator

Azure Data Studio wait stats widget

Azure Data Studio notebooks

PerfMon for DBAs - PowerShell



Your live webinar link
works to watch the
recording, in case you get
pulled away



Make the console suit you
and your screen by
resizing and / or moving
each window as required



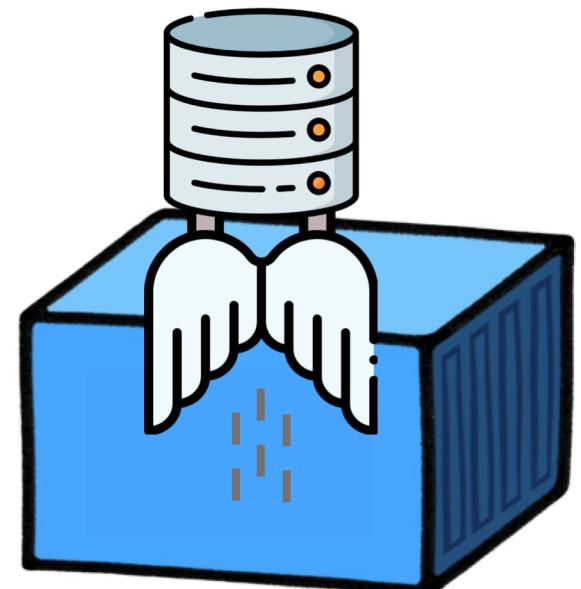
Be sure to check out the
useful resources list to
discover related content
and links



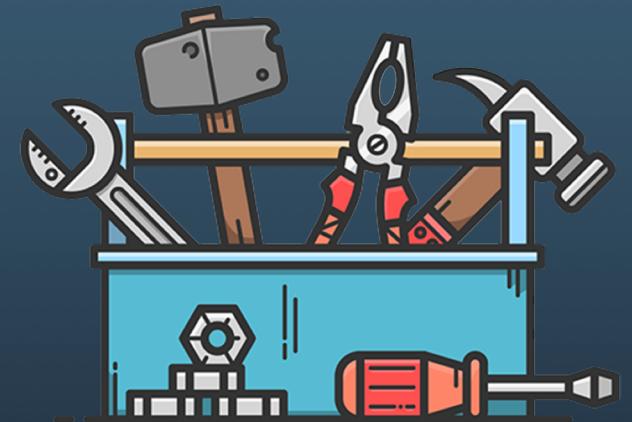
We love to hear from you,
so please ask your
questions in the Q&A box
at any time

AGENDA

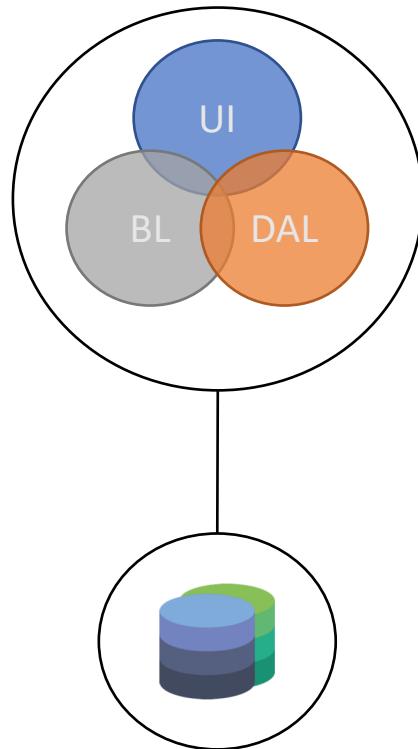
- Software development practices
- DevOps
- DevOps for databases
- Flyway
- Flyway in CI/CD pipelines



Software development practices



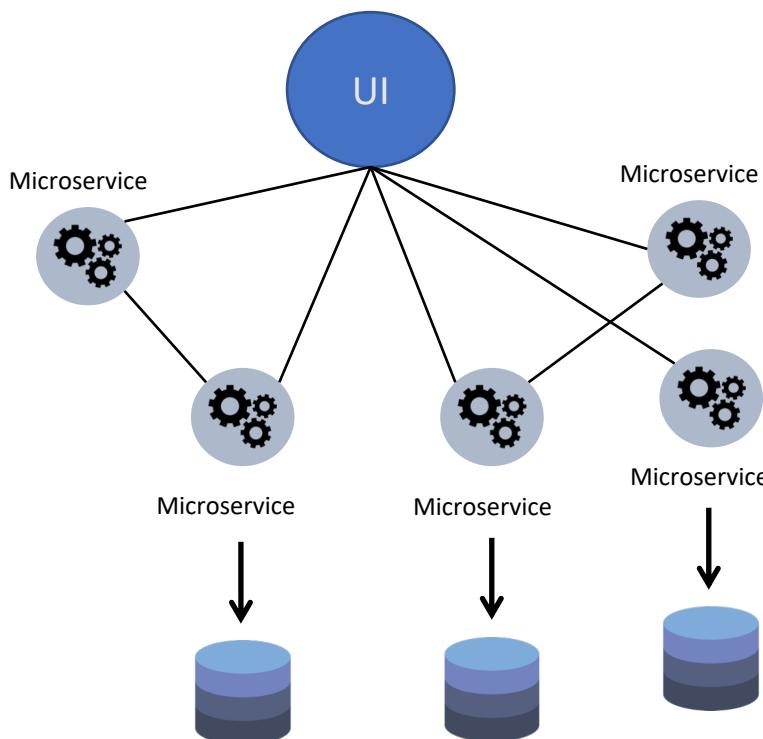
Traditional practices



- **Pros**
 - Simple development
 - Simple deployment
 - Simple testing / sharing
- **Cons**
 - Difficult to understand / change
 - Slowness / limited agility
 - Poor reliability



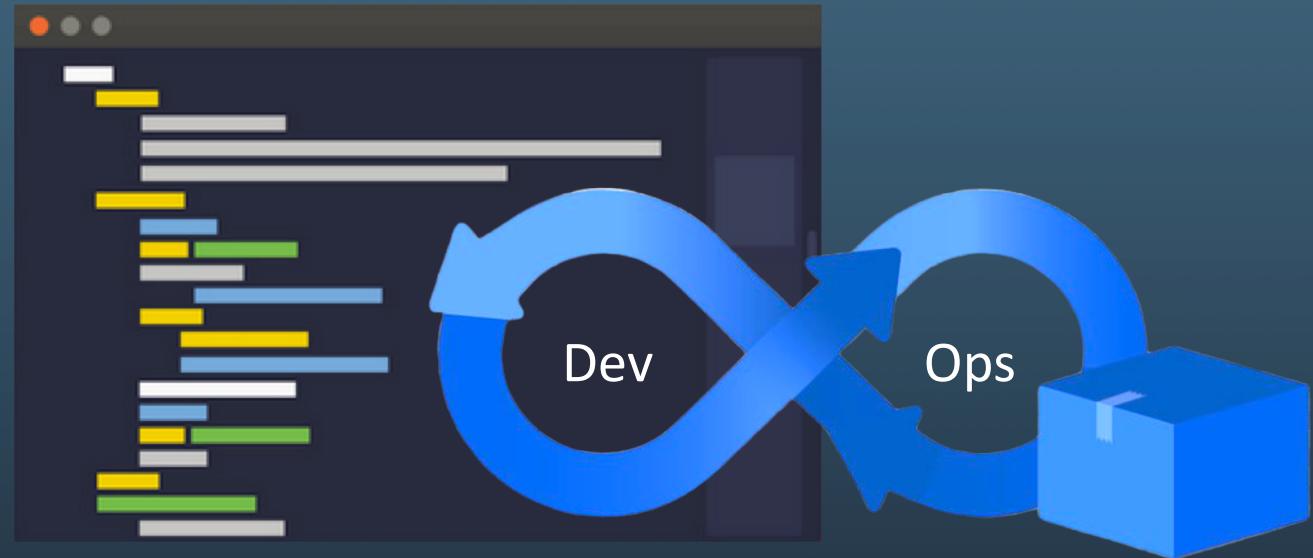
Contemporary practices



- **Pros**
 - Scalability
 - Reliability / flexible
 - Easy adoption of new tech
- **Cons**
 - Difficult integration / testing
 - Operational complexity
 - Skill demanding



Enter DevOps



What is DevOps?

- Culture
- Practices
- Tools



DevOps

Benefits

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

Practices

- Infrastructure as a code
- Continuous integration
- Continuous delivery
- Microservices
- Monitoring and logging
- Communication and collaboration

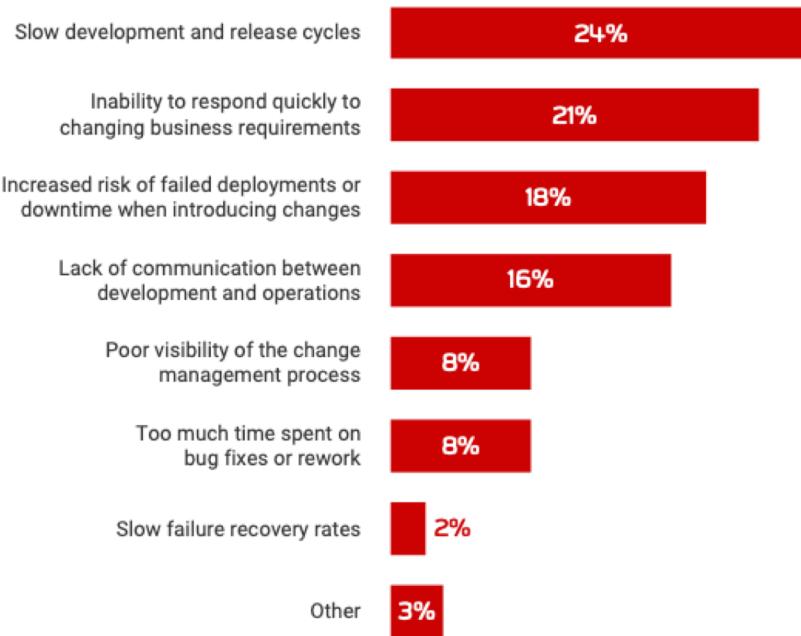


DevOps for databases

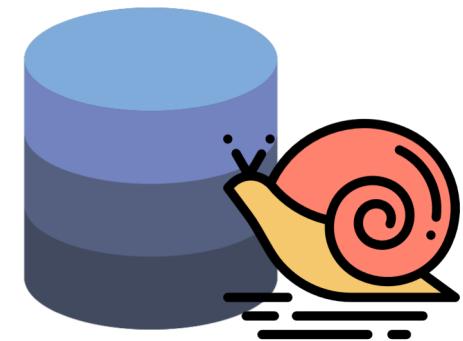
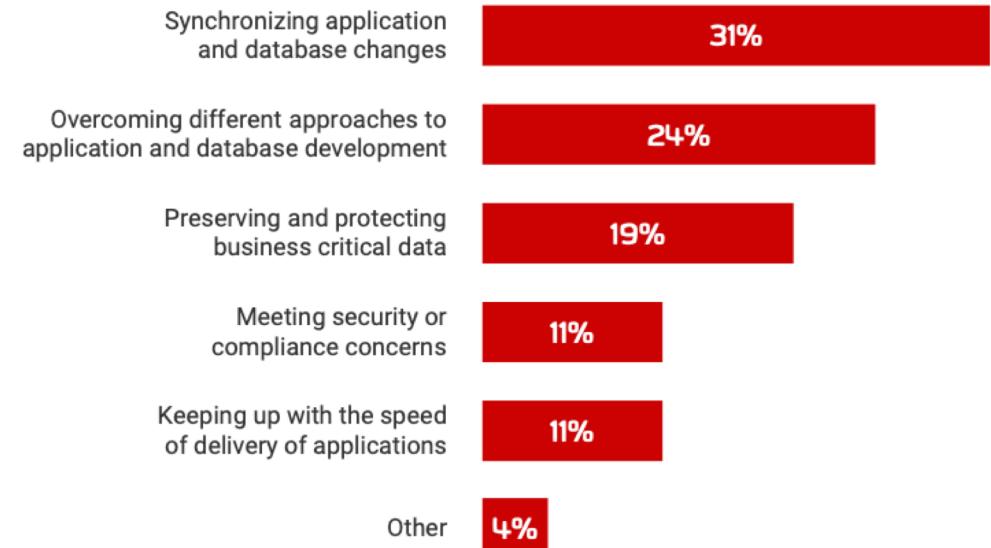


2020 State of Database DevOps

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

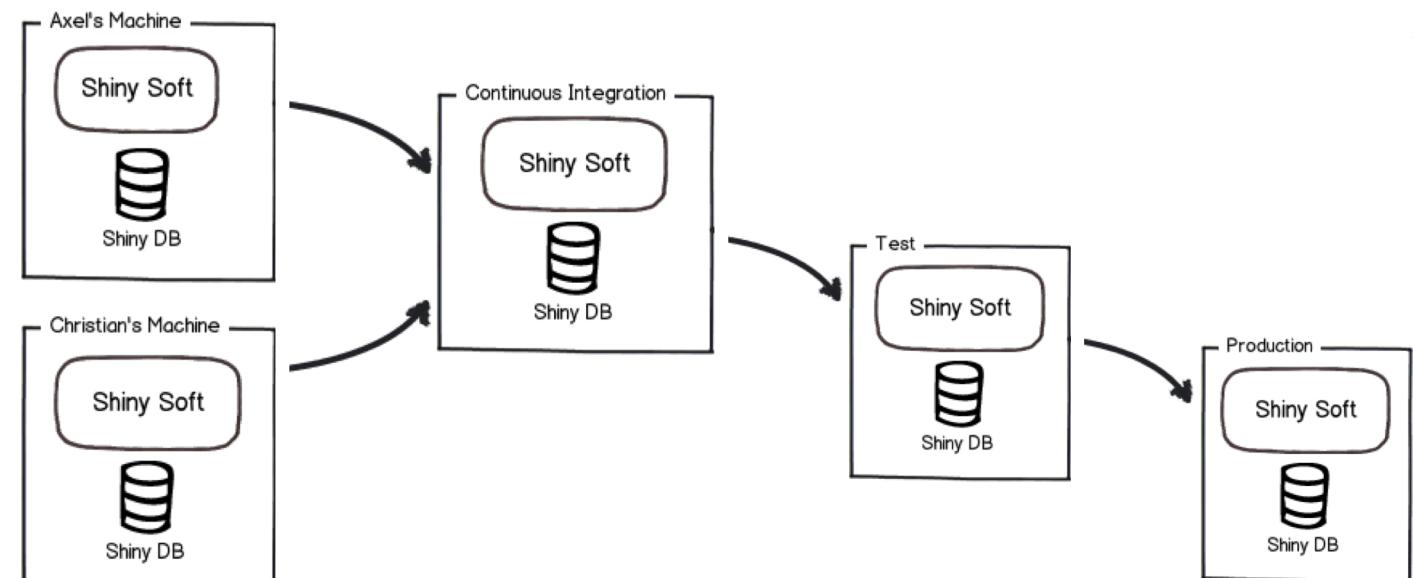
-> Well defined and
reproducible

Version: ?

-> No exact idea about
state



Shiny DB



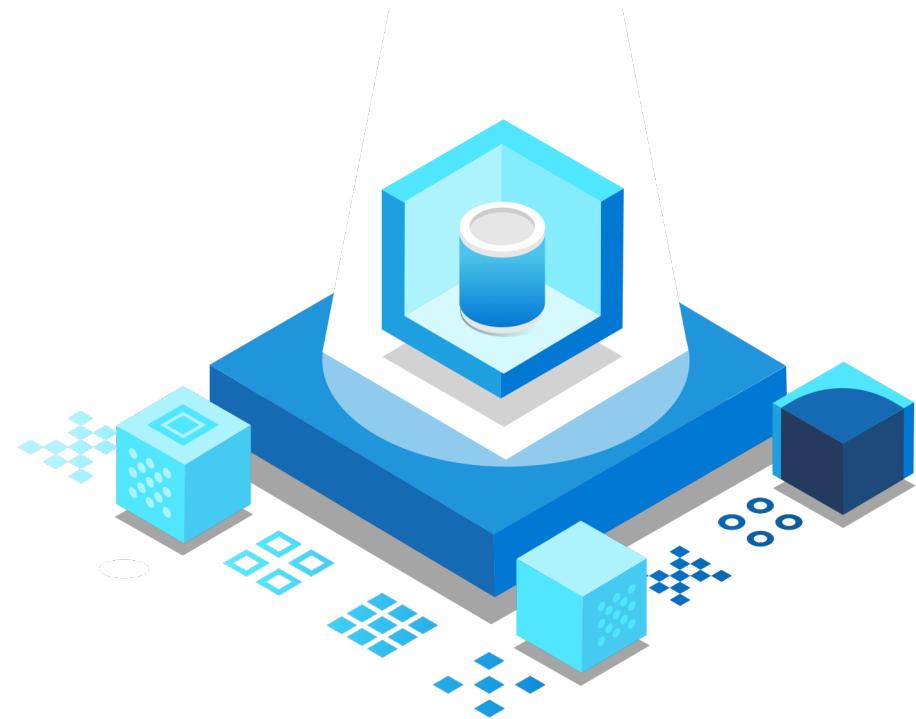
Evolutionary database design

- DBA + Developer collaboration
- Version control
- All changes are migrations
- Everybody gets their own database instance
- Continuous integration

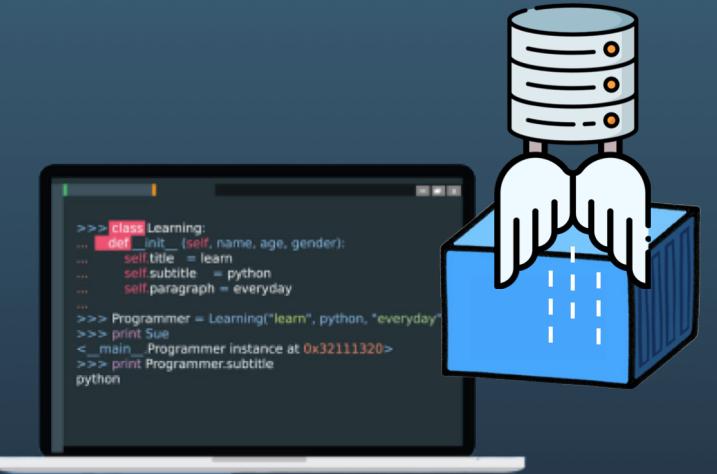


Database migrations

- Unique identifier
- Migration history
- Repeatable
- Consistent

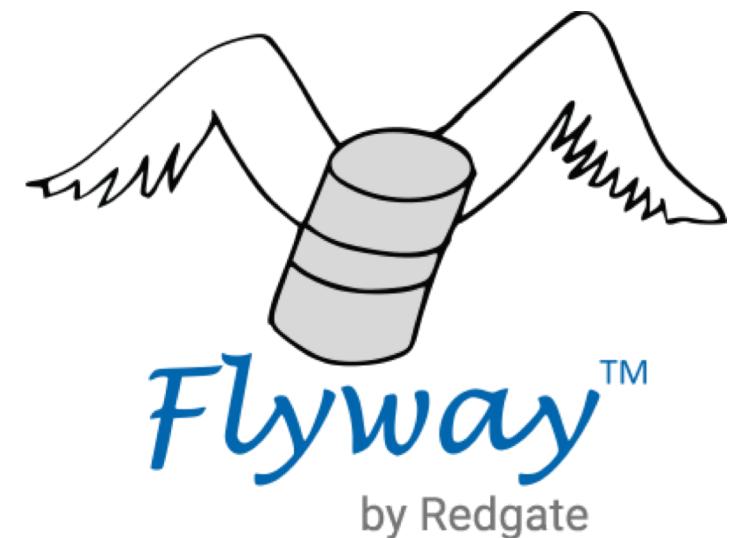


Enter Flyway



What is Flyway?

- Open source
- Multi-platform & DBMS
- Database migrations
- Schema version
- Command line & API



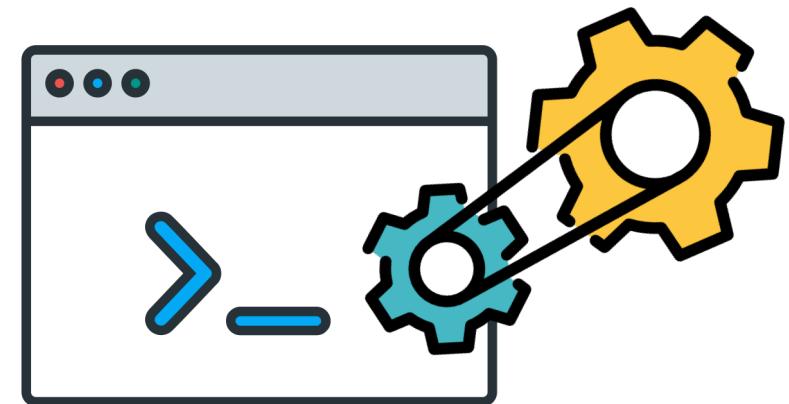
Folder structure

```
flyway-6.5.2
  conf
    flyway.conf   ← configuration file
    drivers       ← JDBC drivers
    jars          ← Java-based migrations (as jars)
    jre
    lib
    licenses
    sql           ← SQL migrations
    flyway        ← macOS/Linux executable
    flyway.cmd    ← Windows executable
```



Commands

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



Configuration file

`flyway.url`

`flyway.user`

`flyway.password`

`flyway.env_abc`

`jdbc:<db>:<host>:<port>`

`sa / postgres`

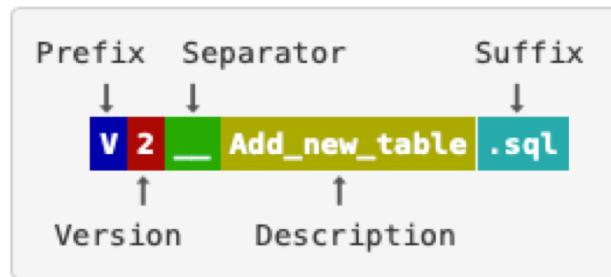
`s3cr3Tp@s$`

`${abc}`

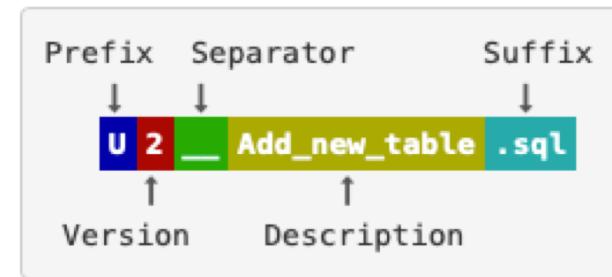


SQL migrations

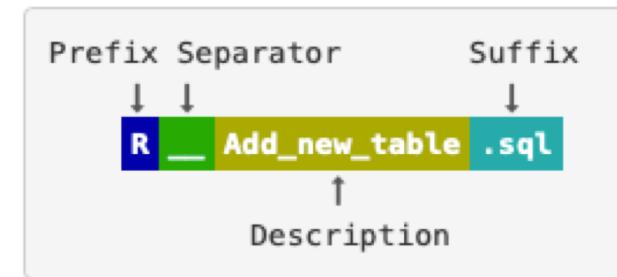
Versioned Migrations



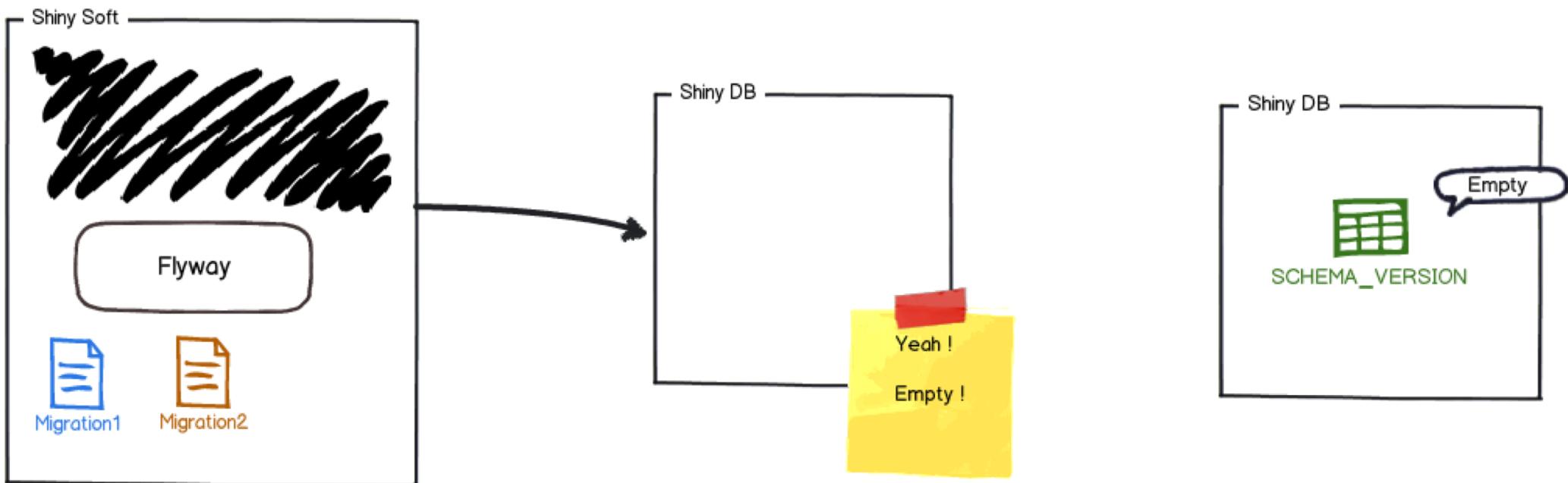
Undo Migrations

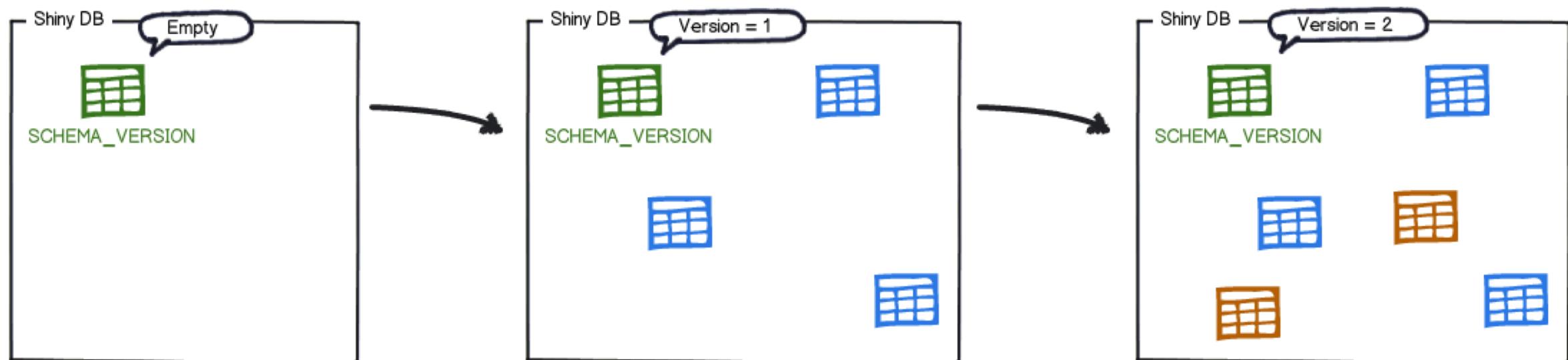


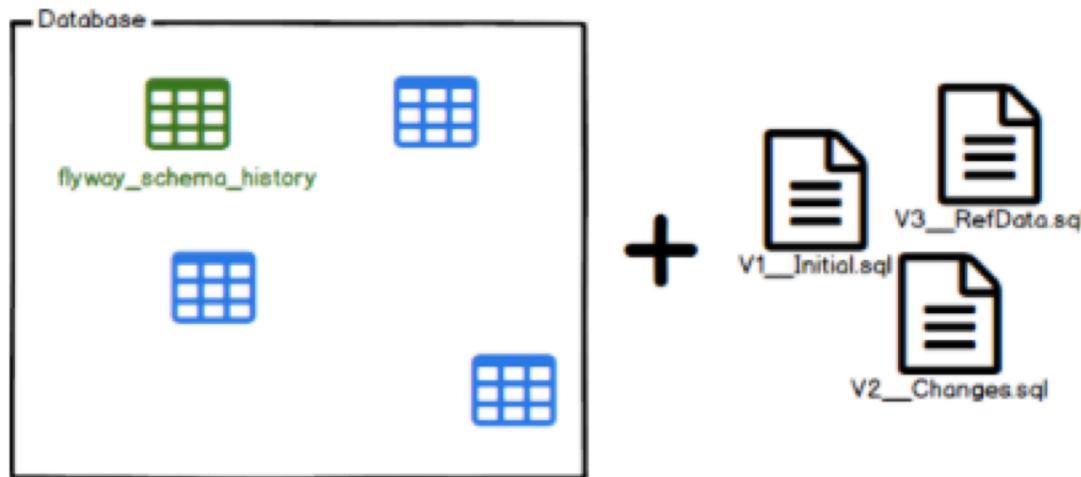
Repeatable Migrations



How it works?







Category	Version	Description	Type	Installed on	State
Versioned	1	Initial	SQL	2017-11-16 10:26:35	SUCCESS
Repeatable		Package	SQL	2017-11-16 10:26:37	SUCCESS
Versioned	2	RefData	JDBC	2017-11-16 10:26:41	PENDING

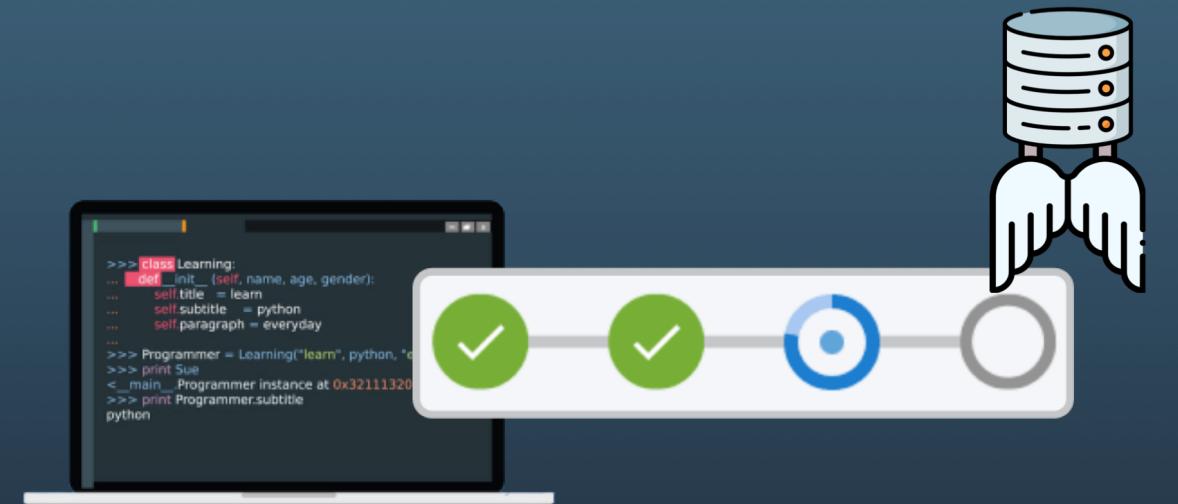


DEMO

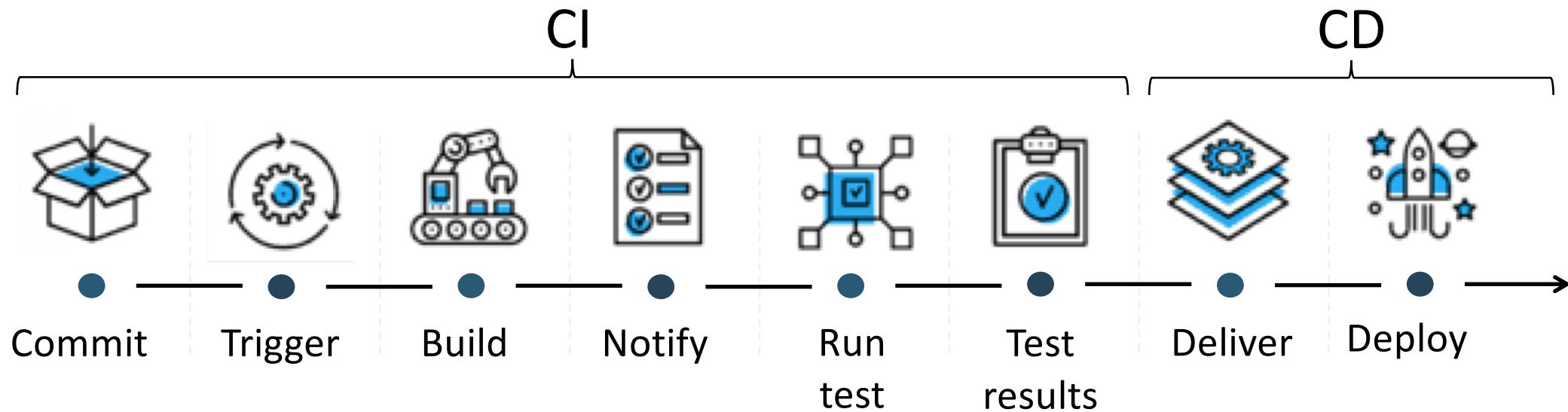
Using Flyway as a container



Flyway in CI/CD pipelines

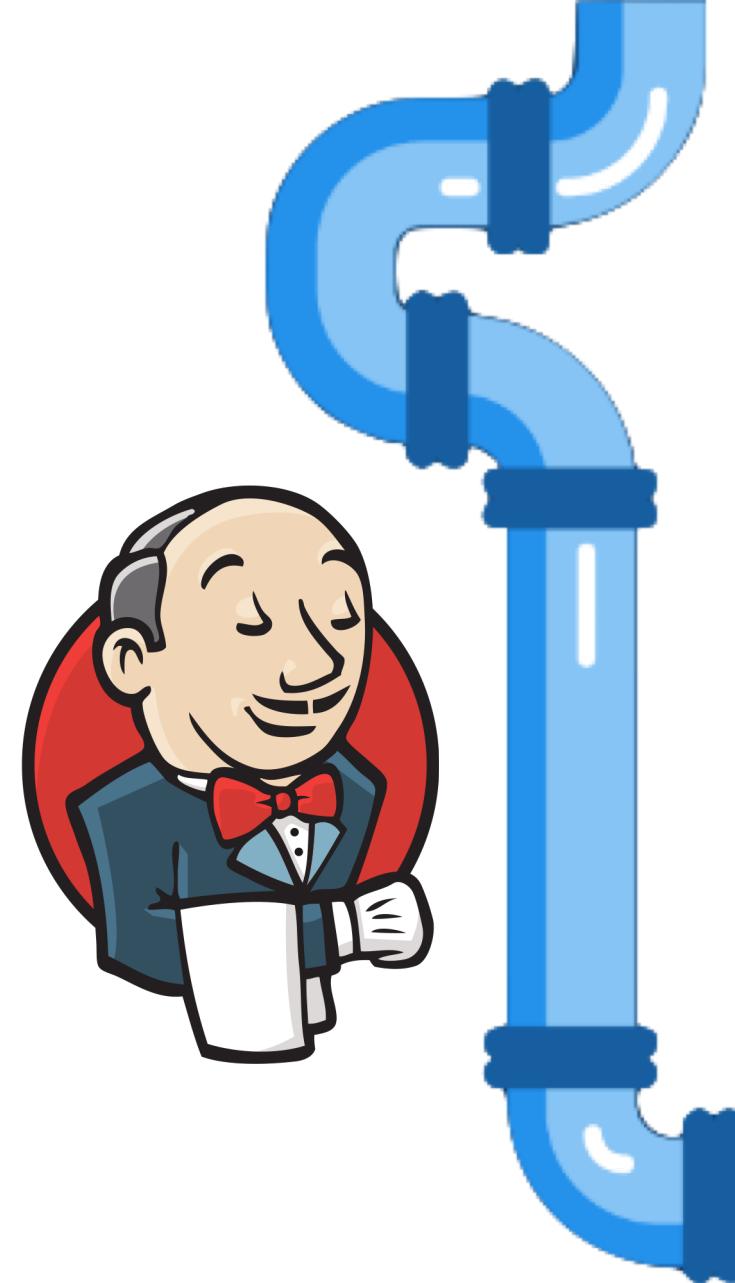


CI/CD in a nutshell



Jenkins

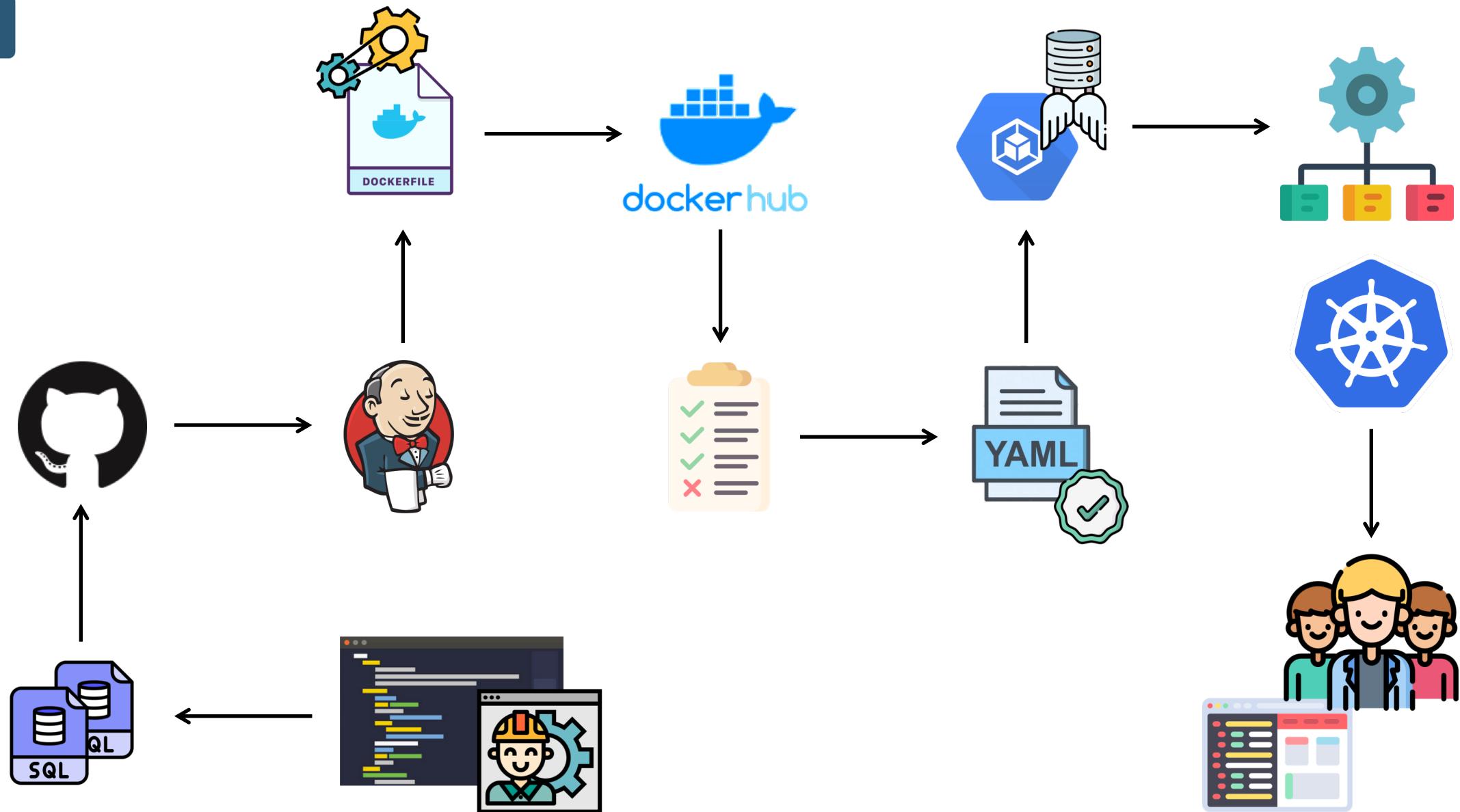
- Open source
- Automation server
- Jobs / pipelines (Jenkinsfile)
- Extensible (master / agents)
- Plugins



Kubernetes

- Open source
- Container orchestrator
- Declarative model
- Master / nodes
- Services, deployments
- Pods





DEMO

CI/CD pipeline with Flyway
Jenkins and Kubernetes



Review

- DevOps + databases
- Database migrations
- Flyway
- Six commands (+1 pro)
- Command-line, SQL, Java, API
- Open source



Questions?



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References

- **Flyway documentation**
 - [Flyway docs](#)
- **Other**
 - [Docker Docs](#)
 - [Jenkin Handbook](#)
 - [Kubernetes Docs](#)
- **Books**
 - [The Phoenix / Unicorn Project](#)
 - [The DevOps Handbook](#)
 - [Kubernetes: Up and Running](#)
- [Designing Distributed Systems](#)
- [Continuous Delivery](#)
- [Refactoring databases](#)
- [Database Reliability Engineering](#)



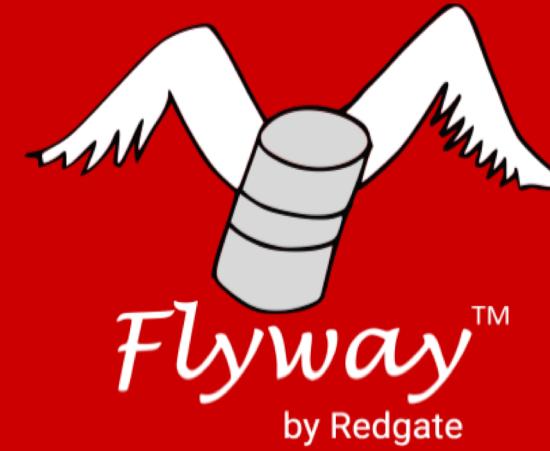
Articles and more

- **YouTube**
 - [SQL Containers on Docker & Kubernetes](#)
 - [SQL Server containers in Microsoft Azure](#)
- **Articles**
 - [Redgate - Simple Talk](#)
 - [SQL Server Central](#)
 - [MSQL Tips](#)





redgate



Try Flyway for free
flywaydb.org/download/

Discuss your Database DevOps goals with us
www.red-gate.com/contact



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Thanks!

