

# Screw DevOps, Let's Talk DataOps

Kellyn Pot'Vin-Gorman | Technical Intelligence Manager | February, 2018



## Kellyn Pot'Vin-Gorman

### Technical Intelligence Manager, Delphix

- Multi-platform DBA, (Oracle, MSSQL, MySQL, Sybase, PostgreSQL, Informix...)
- Oracle ACE Director, (Alumni)
- Oak Table Network Member
- Idera ACE 2018
- APEX Women in Technology Award, CTA
- STEM education with Raspberry Pi and Python, including DevOxx4Kids, Oracle Education Foundation and TechGirls
- President, Rocky Mtn Oracle User Group
- President, Denver SQL Server User Group
- DevOps author, instructor and presenter.
- Author, blogger, (<http://dbakevlar.com>)



# DevOps + DBA = DataOps

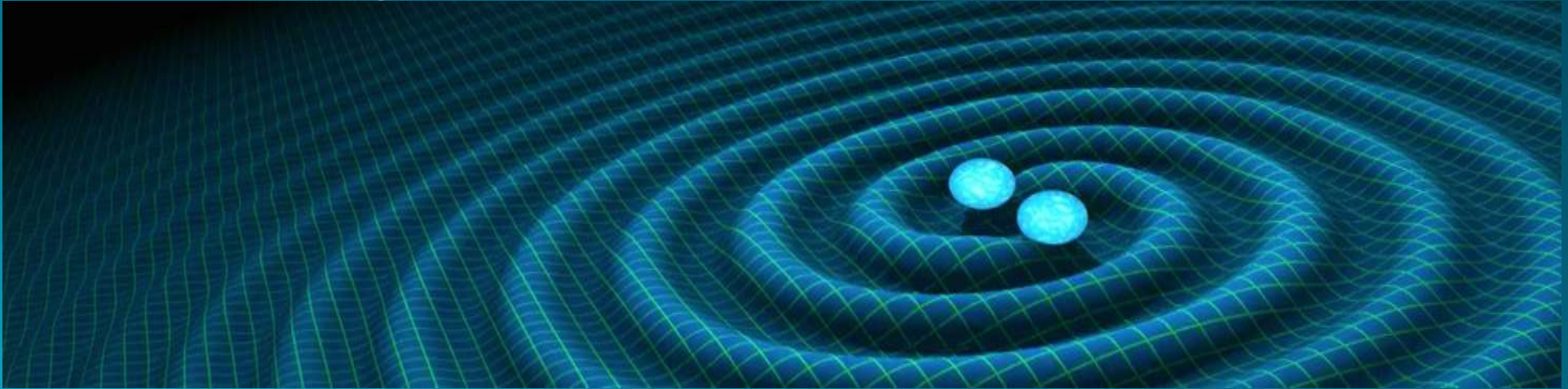
- Database Administrators heavily influence decisions.
- Adverse to bleeding edge, high risk.
- Introduction of the cloud, especially and SaaS, (Software as a Service).
- Demand for decreased development cycles introduce risk, DBAs are seen as a roadblock to this.

Still, DBA skills are in high demand towards DevOps initiatives...

# DataOps- Origin

*DataOps takes DevOps to the next level, recognizing that many DevOps projects have data integrated into them and requires that data to move at the same speed the rest of development and testing.*

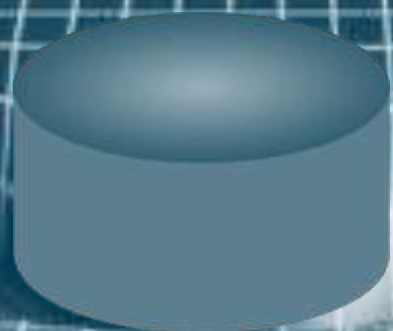
# Let's Talk Data Gravity



# What is Data Gravity?

*Data Gravity is the ability for data to attract applications, services, etc. As with the laws of physical gravity, data, due to its mass, will attract all else that has less mass.*





This is Data Gravity

# How much data are we talking about?

- More data has been created in just the last two years than the previous history of humanity
- 1.7MB of new information created every second per human on the planet.
- Introduction of big data often has same development pain points.



# From DevOps to DataOps

# Dave is a Developer New to Agile



His development team is about to start Scrum as their Agile Methodology

It will be their first Scrum “sprint”

- Looking to increase productivity 20%
- 25% increase in collaboration.
- Gains in revenue are predicted.

*And they're looking forward to succeeding...*

# The Company has hired George as the new Scrum Master



# The Periodic Table of DevOps Tools

**PERIODIC TABLE OF DEVOPS TOOLS (V2)**

EMBED DOWNLOAD ADD

Os	Open Source	SCM	Database Mgmt.	Build
Fr	Free	CI	Repo Mgmt.	Testing
Fm	Freemium	Deployment	Config / Provisioning	Containerization
Pd	Paid	Cloud / IaaS / PaaS	Release Mgmt.	Collaboration
En	Enterprise	BI / Monitoring	Logging	Security

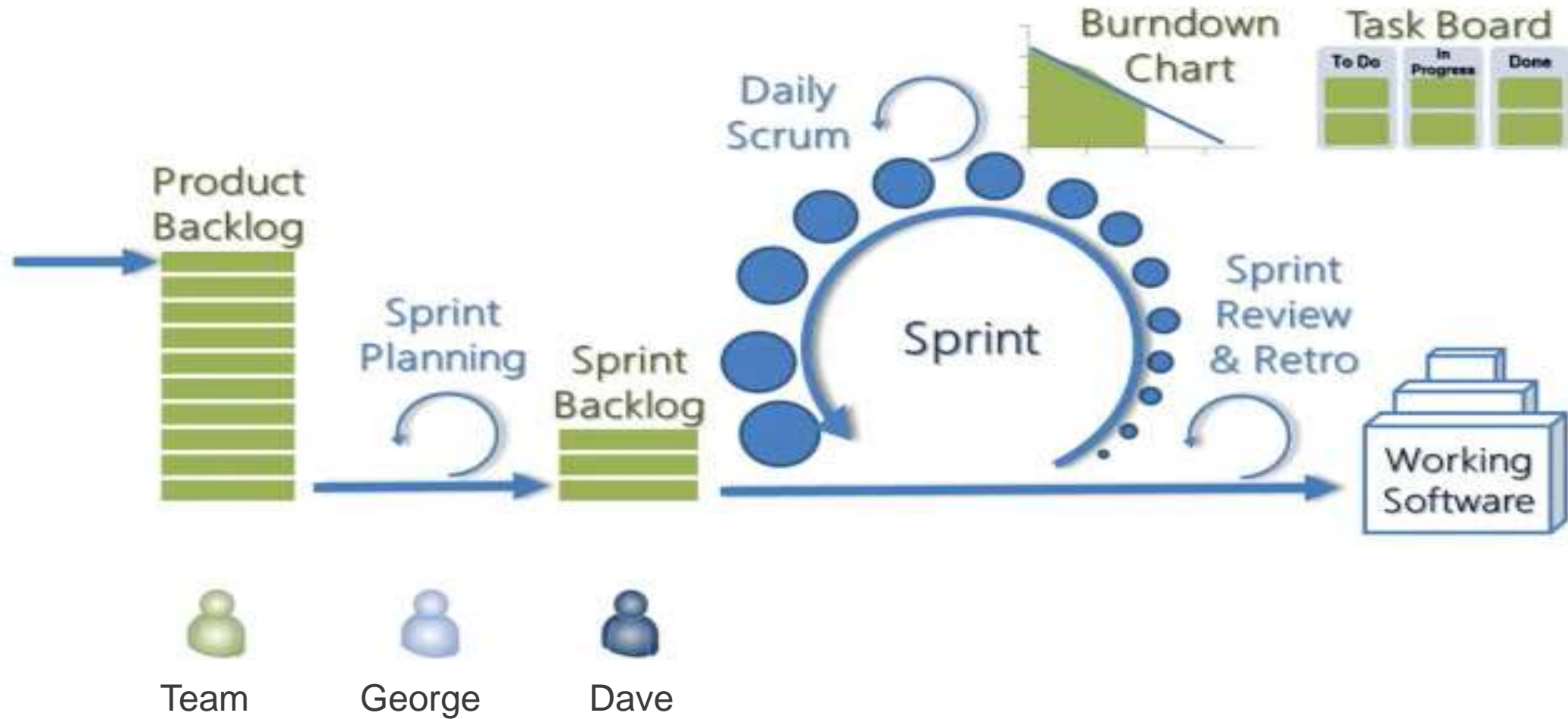
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En En	112 Os Os	113 Fm Fm	114 En En	115 Fm Fm	116 Fm Fm	117 Os Os	118 Os Os	119 Os Os	120 En 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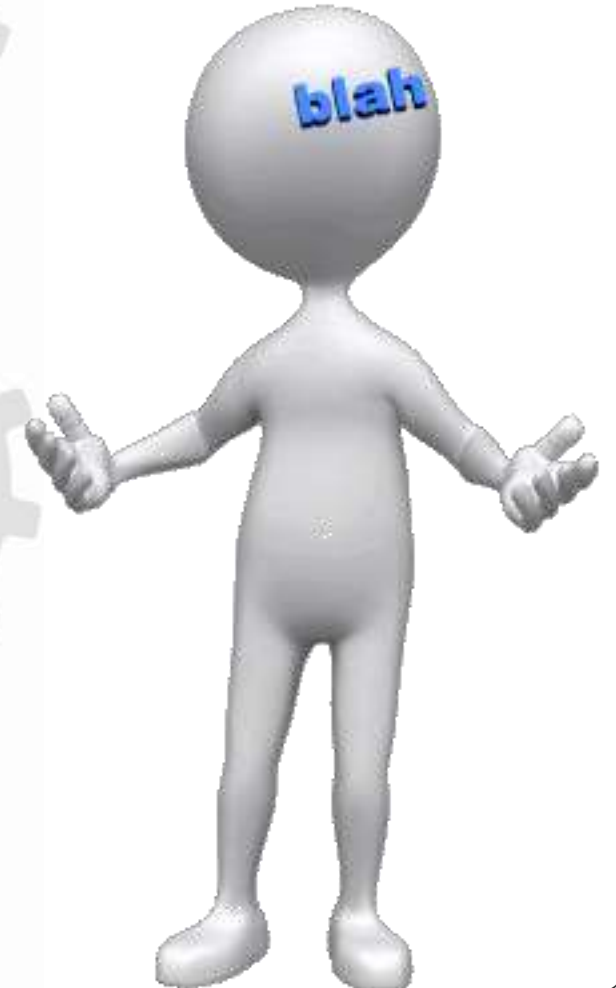
# George creates the burn down list for the sprint...



# Scrum



George is heading up the daily scrum meetings with the team....



Problem is, the team all needs their own development and testing environments.



# And Dave Needs to Test His New Script...

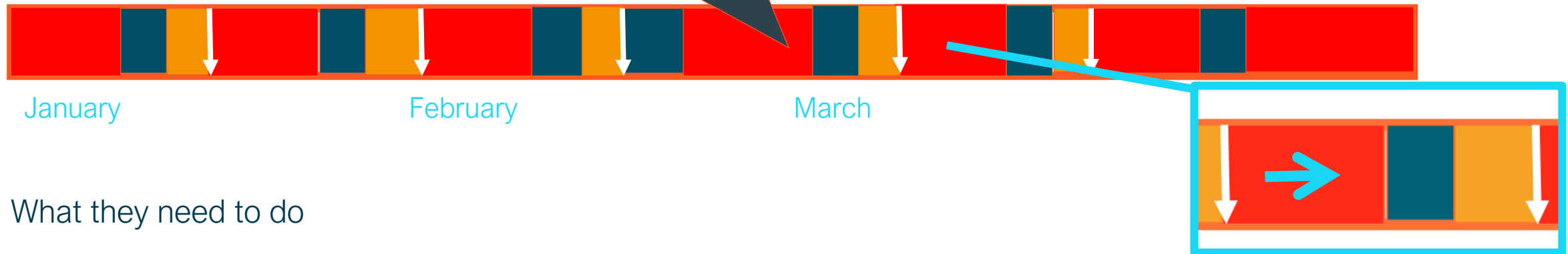
- name: Transfer and execute a script.  
hosts: server  
remote\_user: test\_user  
sudo: yes  
tasks:
  - name: Transfer the script  
copy: src=test.sh dest=/home/test\_user  
mode=0777
  - name: Execute the script  
command: sh /home/test\_user/test.sh



# Data is Holding Them Back



What they can do currently



What they need to do



How can they get here?

Without a self-service portal, Dave and the team is also chained to the DBAs...



# The Natural Life of Data is Growth

- DBAs are busier
- Development cycle shortens
- Demands increases
- DBA is less available
- Previous way of performing refreshes, provisioning and supporting are no longer sustainable.

Where is George, Dave and the rest of the team going to get what they need?

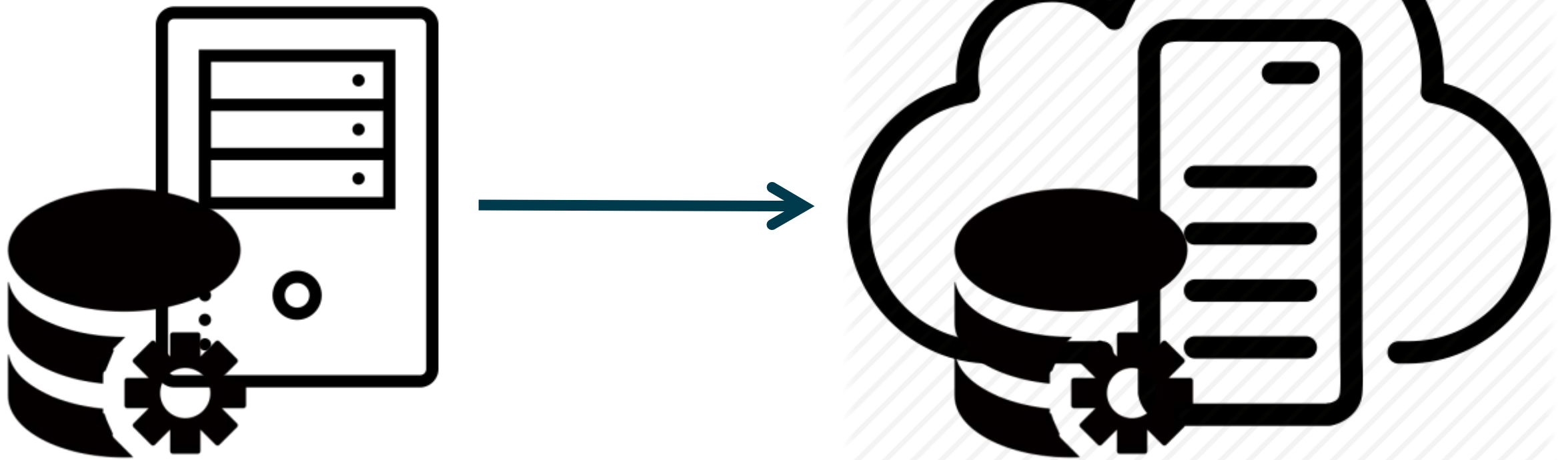


# Segway: the Cloud Backlash

Remember that One Outlier project?



# Evolution of the Cloud in the DBAs Eyes

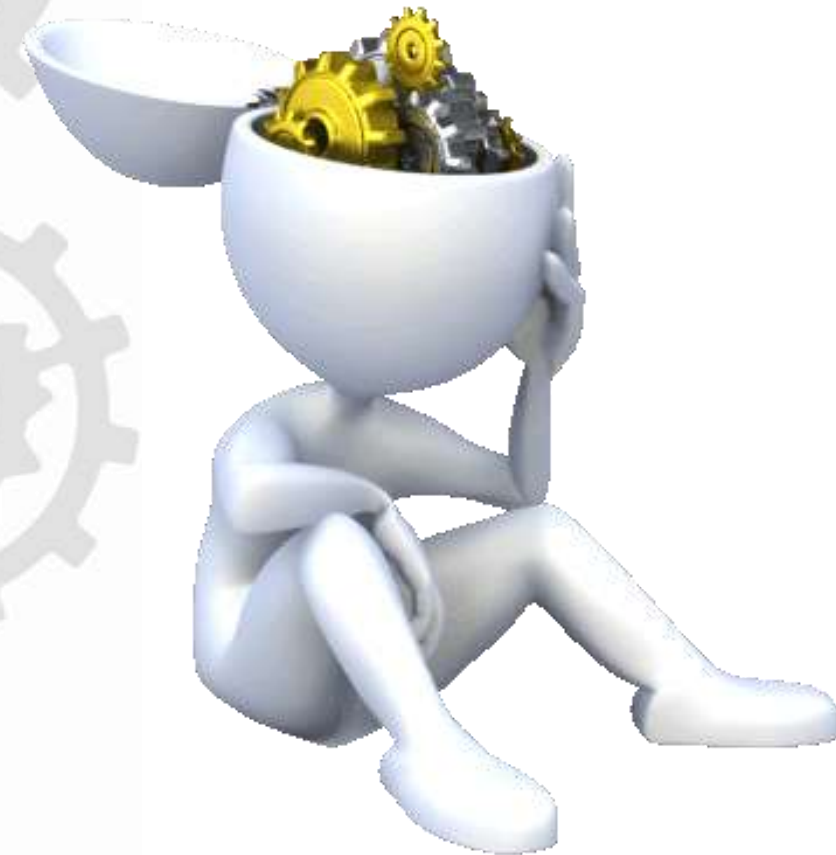


# Data Causes Friction

- If those managing the data sources aren't included and working well with those needing that data to produce features and products, friction is the result.
- DBAs are working with robust, but archaic utilities that guarantee outcome, rarely speed of results.

*The pain for friction is felt by everyone.*

The Result are the Developers  
and Testers Spending Upwards  
of 80% of Their Time **NOT**  
Performing their Primary  
Function...



Luckily, their DBA, Marc, is keen  
on Database Virtualization and  
Containers...



# 1<sup>st</sup>- Marc Embraces Virtualization...

MANAGEMENT

A technical approach in which users and applications do not use physical machines, but simulated systems running on actual, “real” hardware. Virtualization can be used to eliminate resource usage and enable savings for databases, network, file and application management, along with server infrastructure.

VM

VM

VM

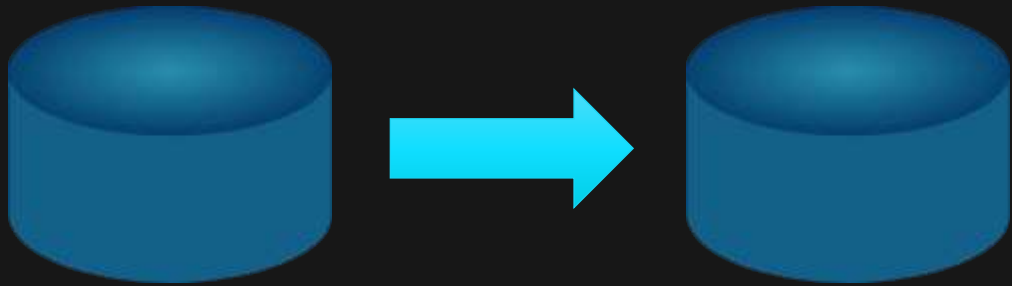
VM

HYPERVISOR



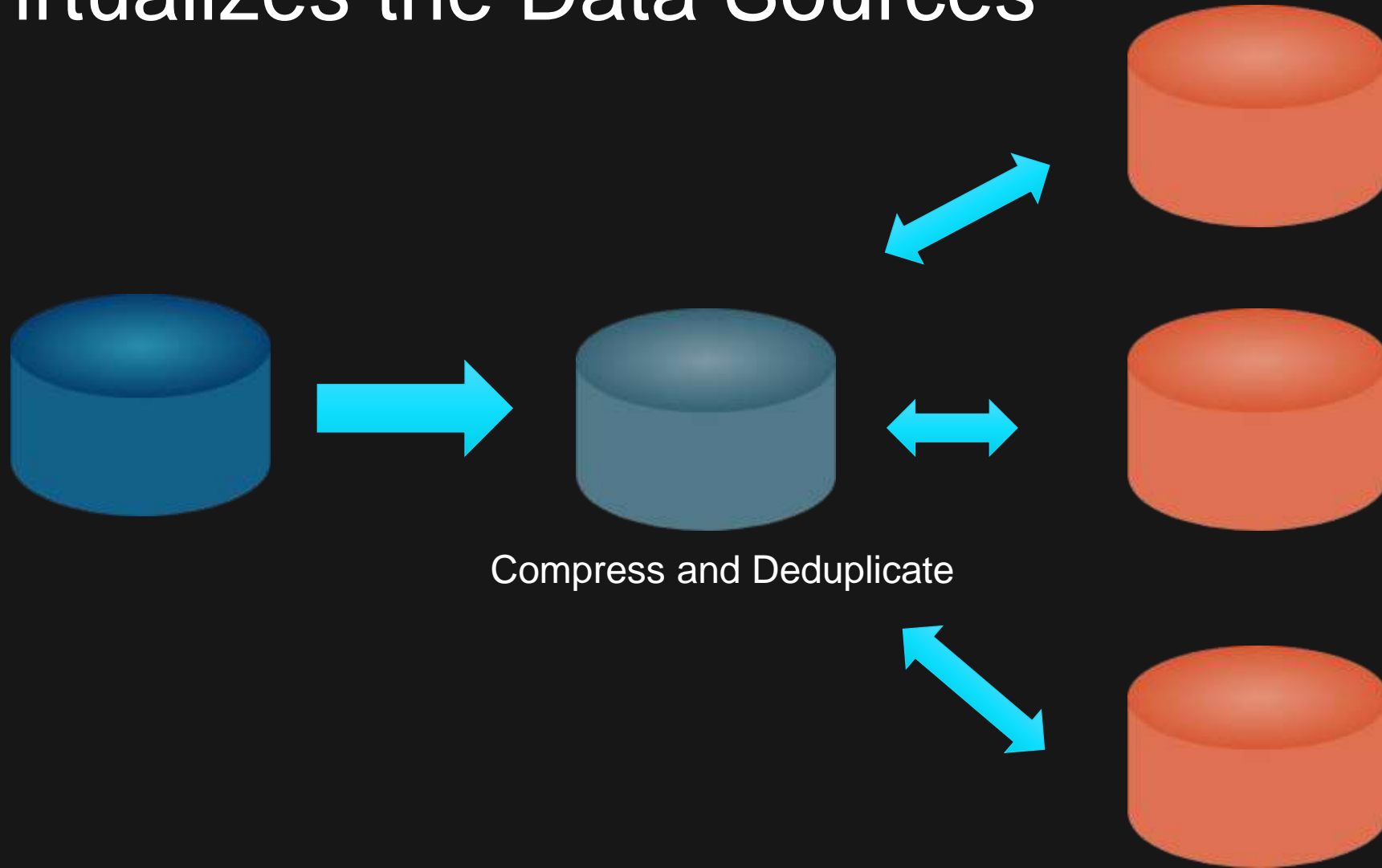


# Older Cloning Methods



Time Consuming

# Virtualizes the Data Sources

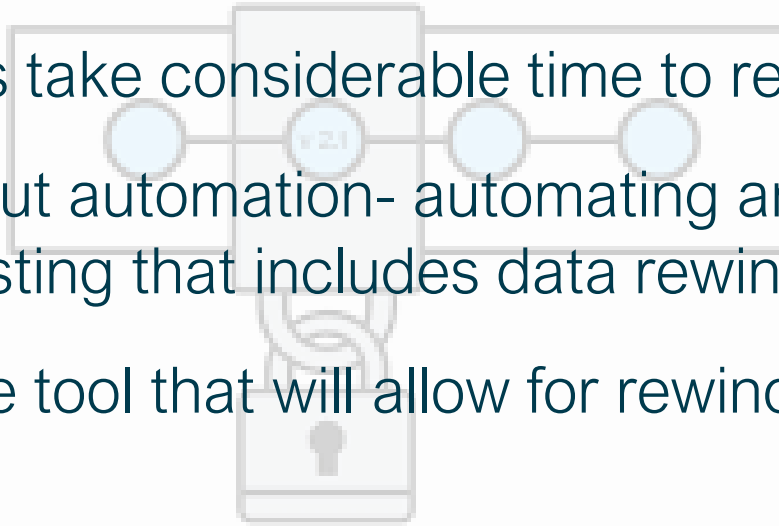


# Database Virtualization Tools

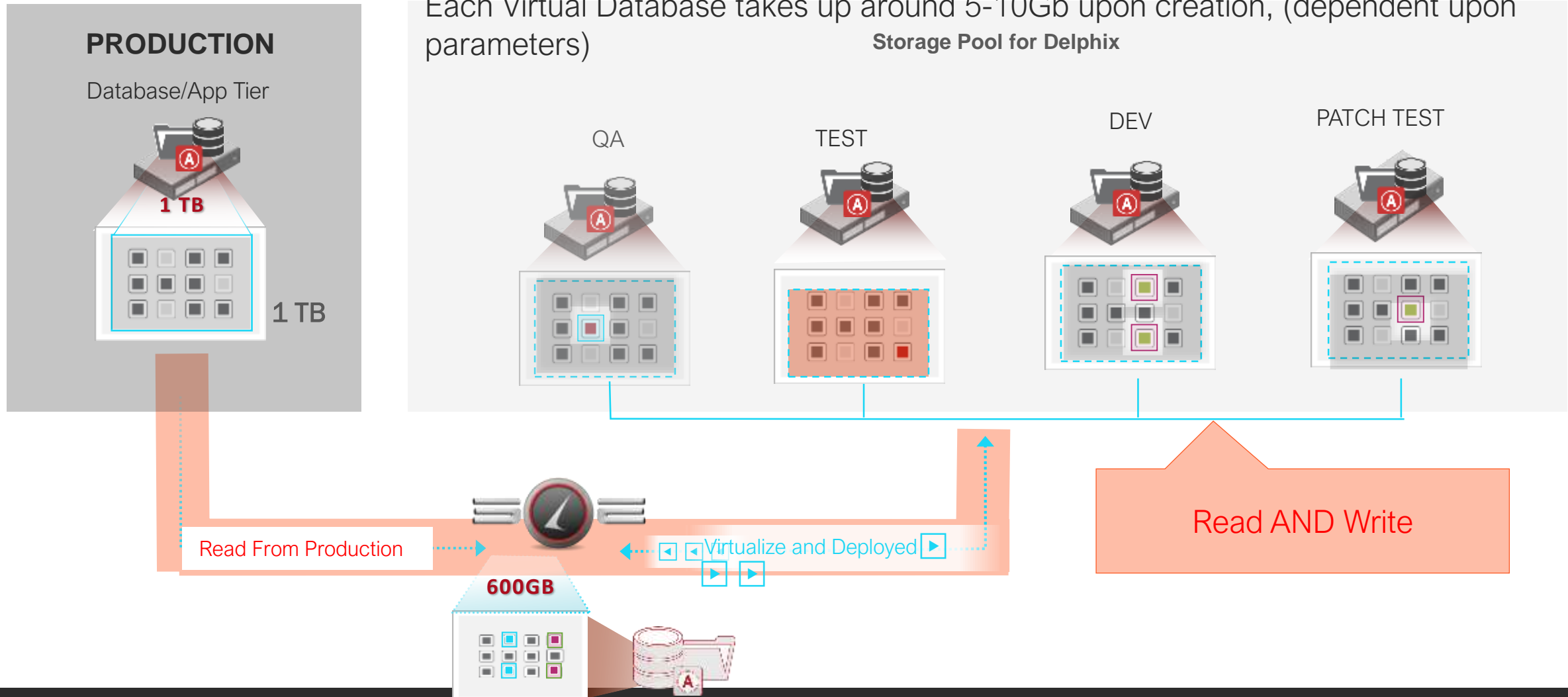
- Windocks
- Redgate SQL Clone
- Rubrik SQL Mount
- Actifio
- Delphix

# Why Database Virtualization is Different

- DBA is “only as good as their last backup”.
- Many database tools take considerable time to recover.
- DevOps is often about automation- automating an “undo” for development and testing that includes data rewind.
- Include a self-service tool that will allow for rewind without DBA intervention.
- Allows for data version control and DataOps, the next step in DevOps

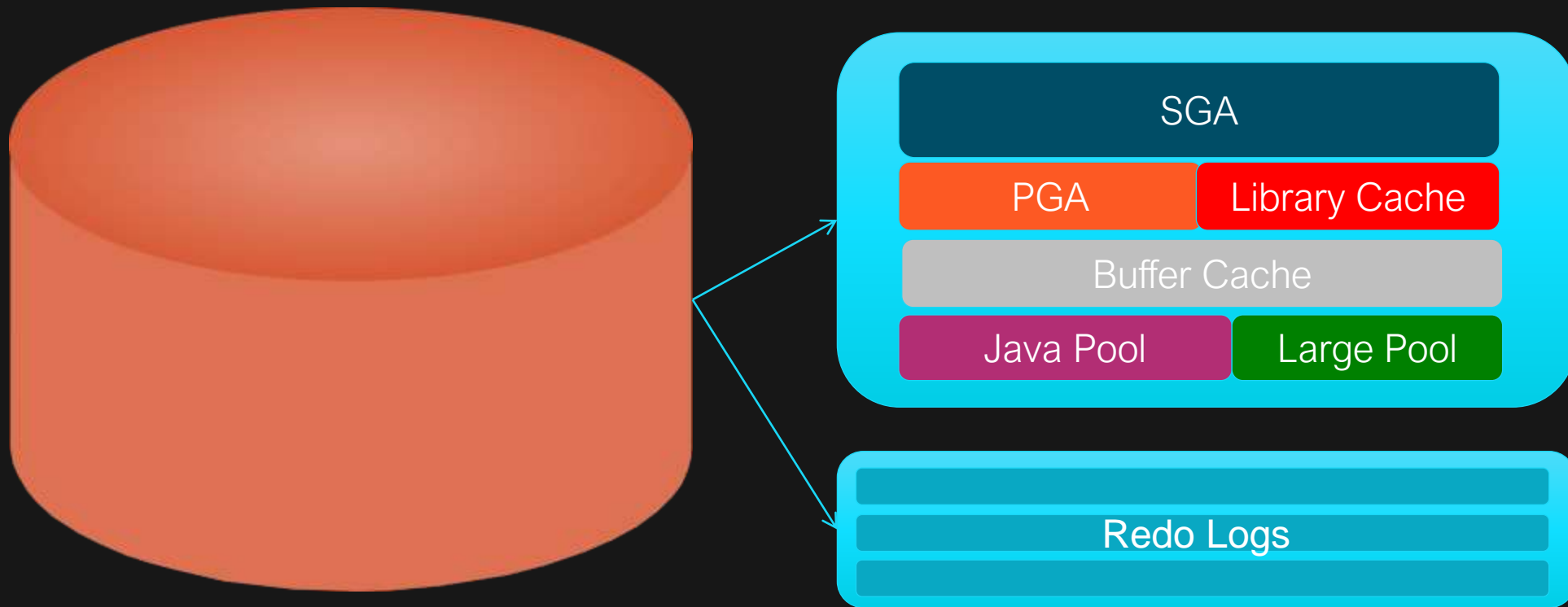


# Example of Virtualized Environment- Delphix

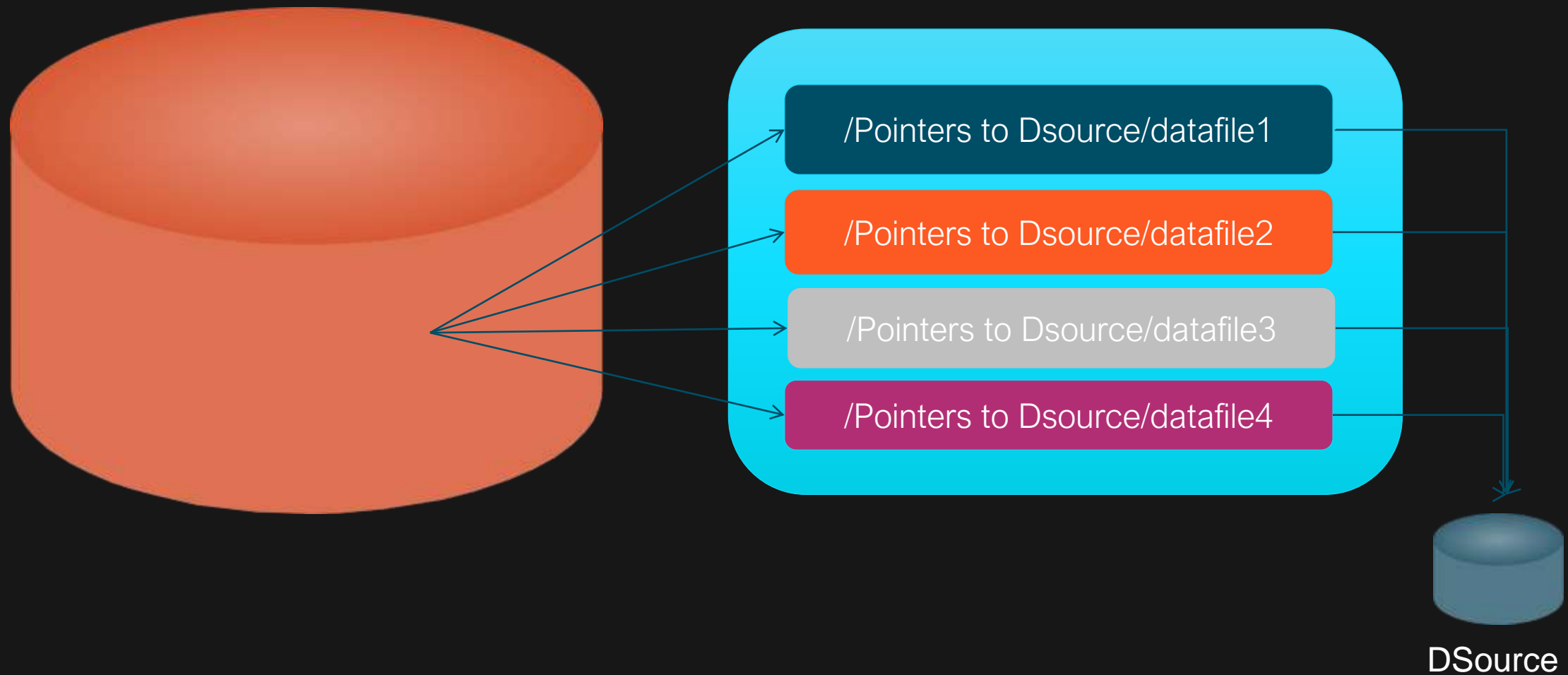




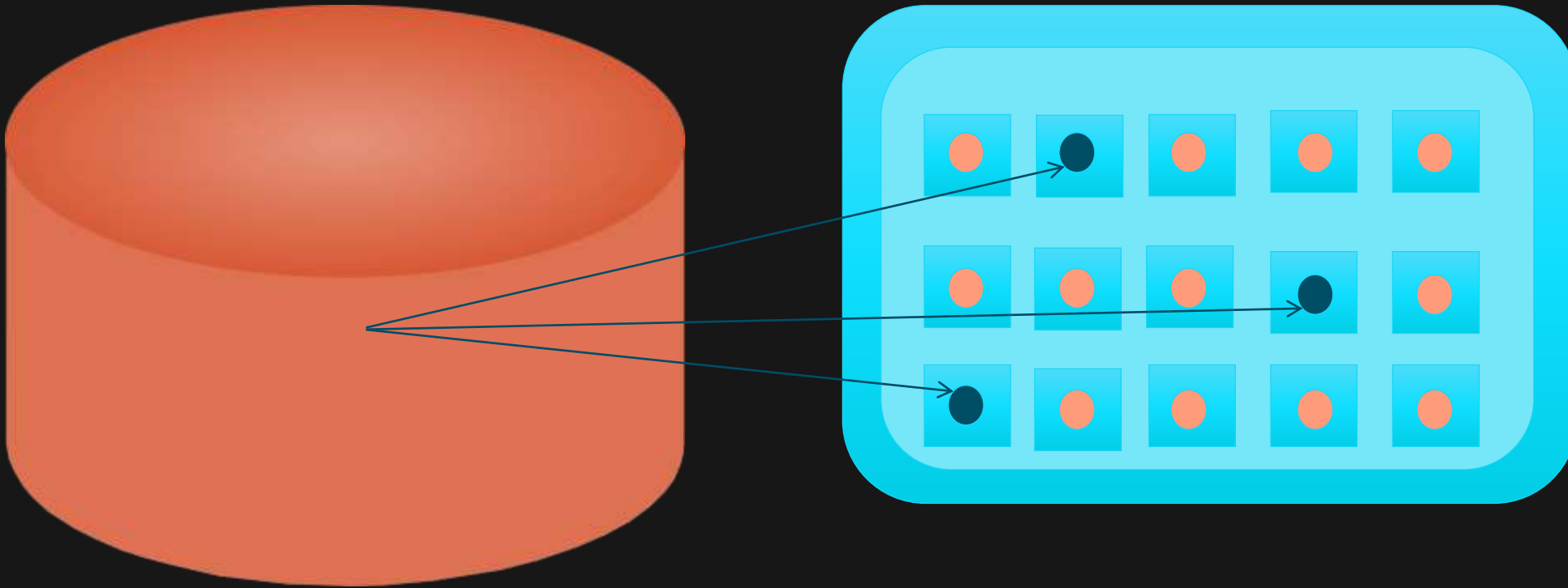
# Virtualized Database, Independence



# Virtualized Database, Datafiles



# Virtualized Database, (VDB)



# Marc Automates it all with Jenkins CLI

```
$ curl -d "script=./dlphx_dply_rend.groovy"  
http://jenkins/script
```

```
$ curl --data-urlencode  
"script=$(./dlphx_dply_rend.groovy)"  
http://jenkins/scriptText
```

```
$ curl --user 'username:password' --data-urlencode  
"script=$(<./dlphx_dply_rend.groovy)" http://jenkins/scriptText
```

# Marc Automates Database Deployments

- Creates Python and Shell Scripts to perform tasks he and his team used to perform manually.
- If any pieces are missing in his logic/scripting, able to use github repository/community examples to build out what is needed.
- As Virtual environments take little resources and almost no storage, creating a DBA specific environment for development, testing and maintenance makes the DBA team less invasive to the Development/Testing Team's scrum deadlines.



# Plugin for Delphix in Jenkins

The screenshot shows the Jenkins Plugin Manager interface. At the top, the Jenkins logo and name are on the left, and a search bar is on the right. Below the header, the breadcrumb "Jenkins > Plugin Manager" is visible. On the left sidebar, there are links for "Back to Dashboard" (with a green arrow icon) and "Manage Jenkins" (with a wrench icon). The main content area has a filter input field with the text "Filter: delphix". Below the filter, there are four tabs: "Updates", "Available", "Installed", and "Advanced". The "Available" tab is selected. A table lists the available plugins. The first entry is the "Delphix Jenkins Plugin" (version 1.0.4), which is highlighted with a red underline. The table has columns for "Install" (with a dropdown arrow), "Name", and "Version". Below the table, there are two buttons: "Install without restart" and "Download now and install after restart". To the right of these buttons is a link for "Update info".

Jenkins

search

Jenkins > Plugin Manager

[Back to Dashboard](#)

[Manage Jenkins](#)

Filter: delphix

Updates Available Installed Advanced

Install ↓	Name	Version
<input type="checkbox"/>	<u>Delphix Jenkins Plugin</u> Allows Jenkins jobs to connect to the Delphix Engine	1.0.4

Install without restart

Download now and install after restart

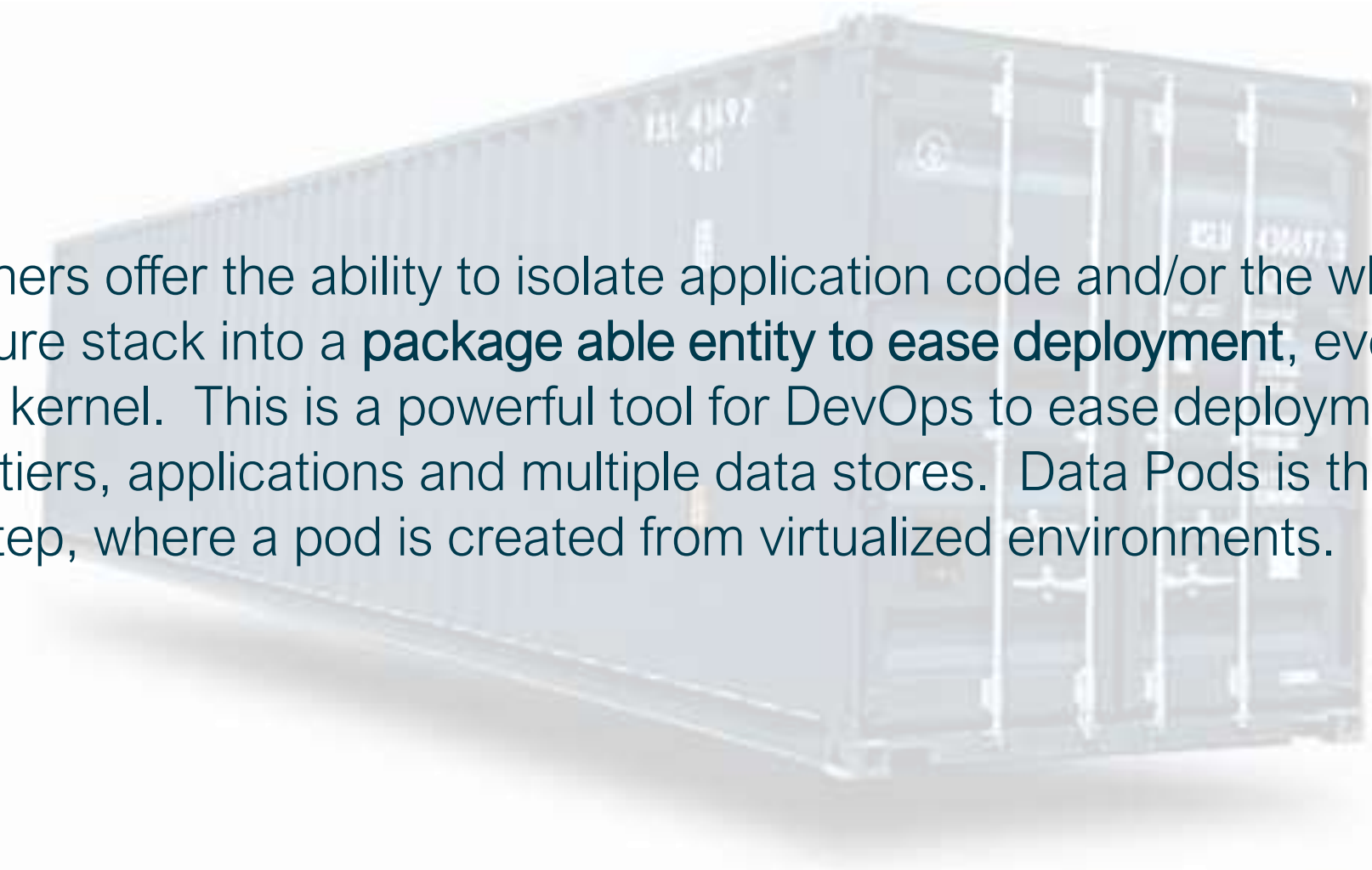
Update info

# Marc Adds Maven for Builds

```
a=Jenkins.instance.getExtensionList(hudson.tasks.Maven.DescriptorImpl.class)[0];  
b=(a.installations as List);  
b.add(new hudson.tasks.Maven.MavenInstallation("MAVEN3",  
"/home/apache-maven-3", []));  
a.installations=b  
a.save()
```



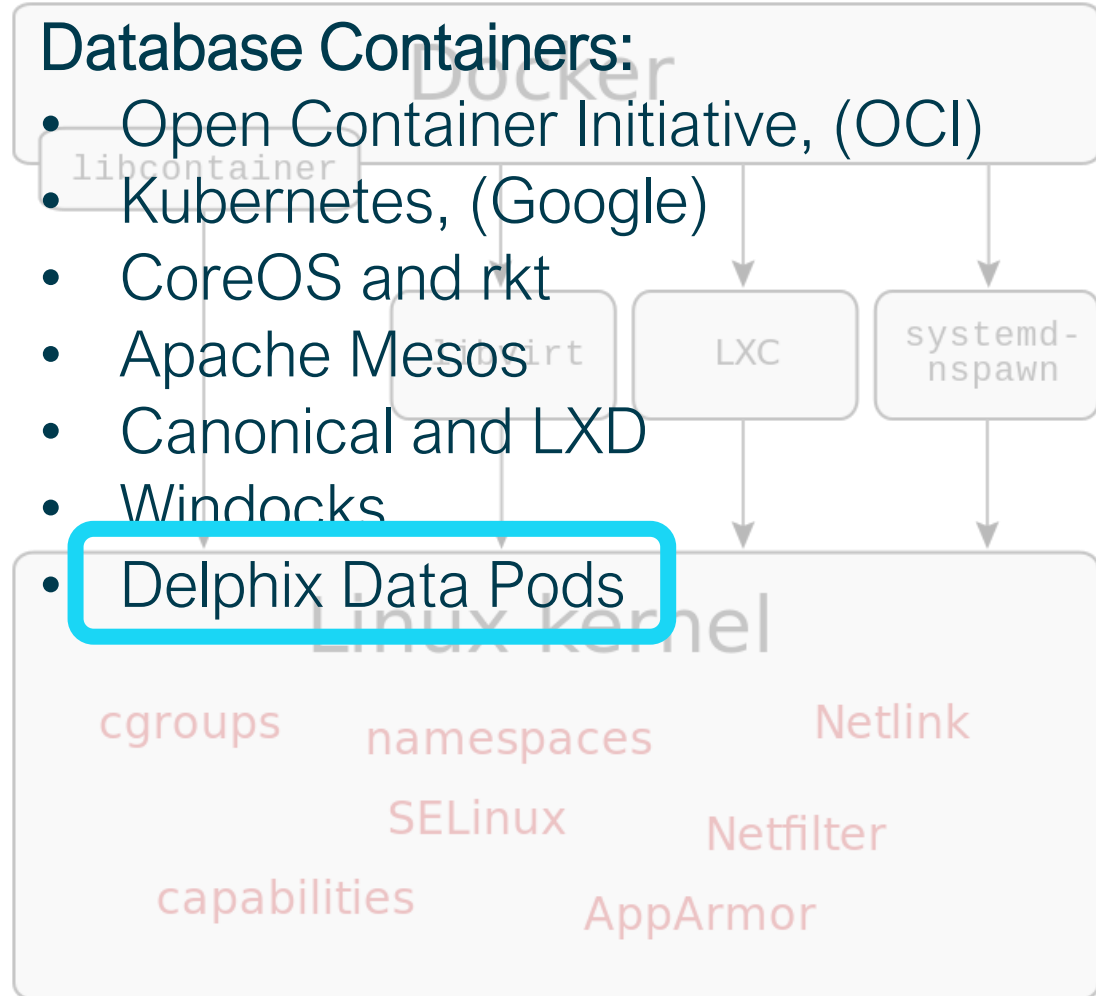
## 2<sup>nd</sup>- Marc Creates Containers/Data Pods



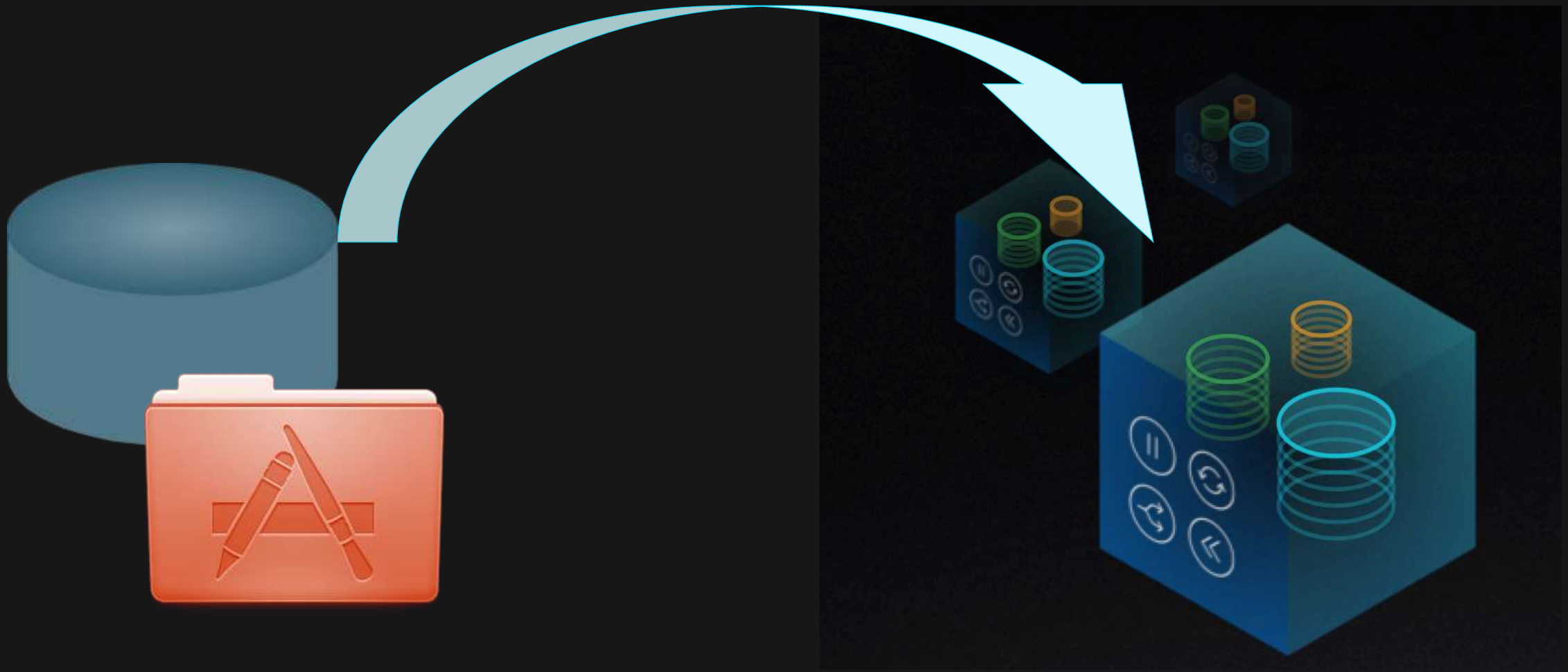
Containers offer the ability to isolate application code and/or the whole infrastructure stack into a **package able entity to ease deployment**, even from the same kernel. This is a powerful tool for DevOps to ease deployment for complex tiers, applications and multiple data stores. Data Pods is the next step, where a pod is created from virtualized environments.

# Docker != Container

- Virtualization is important, this is OS level
- Resource level isolation at the kernel level
- Technology such as OverlayFS, allows for containers, which removes overhead of other virtualization technologies.



# Group Environments into Containers

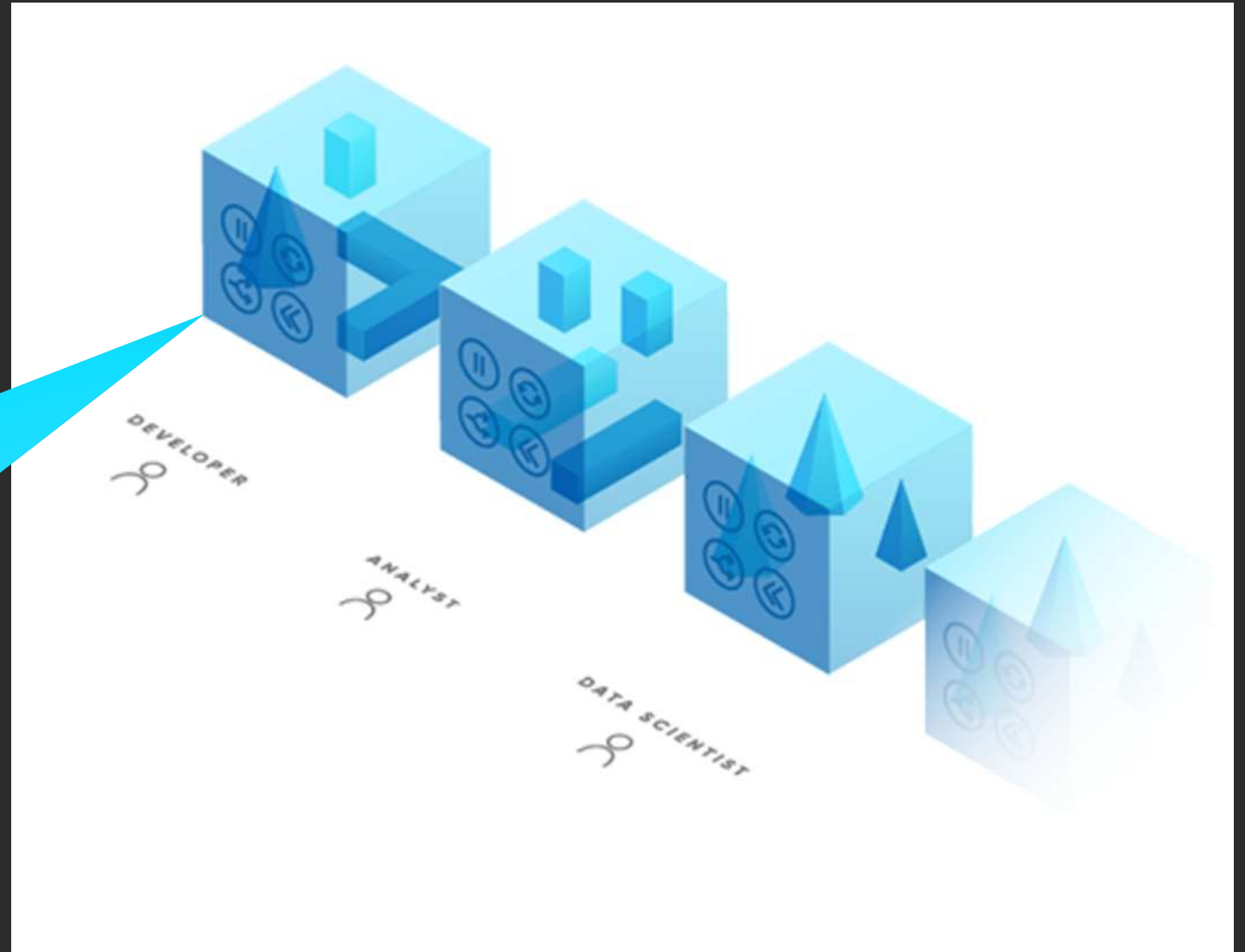
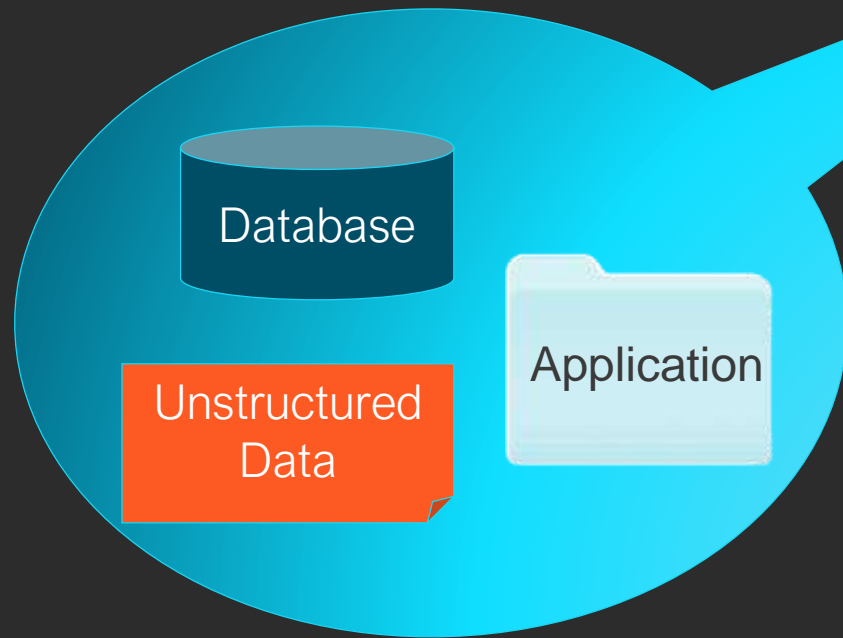


# Why Create Containers/Data Pods

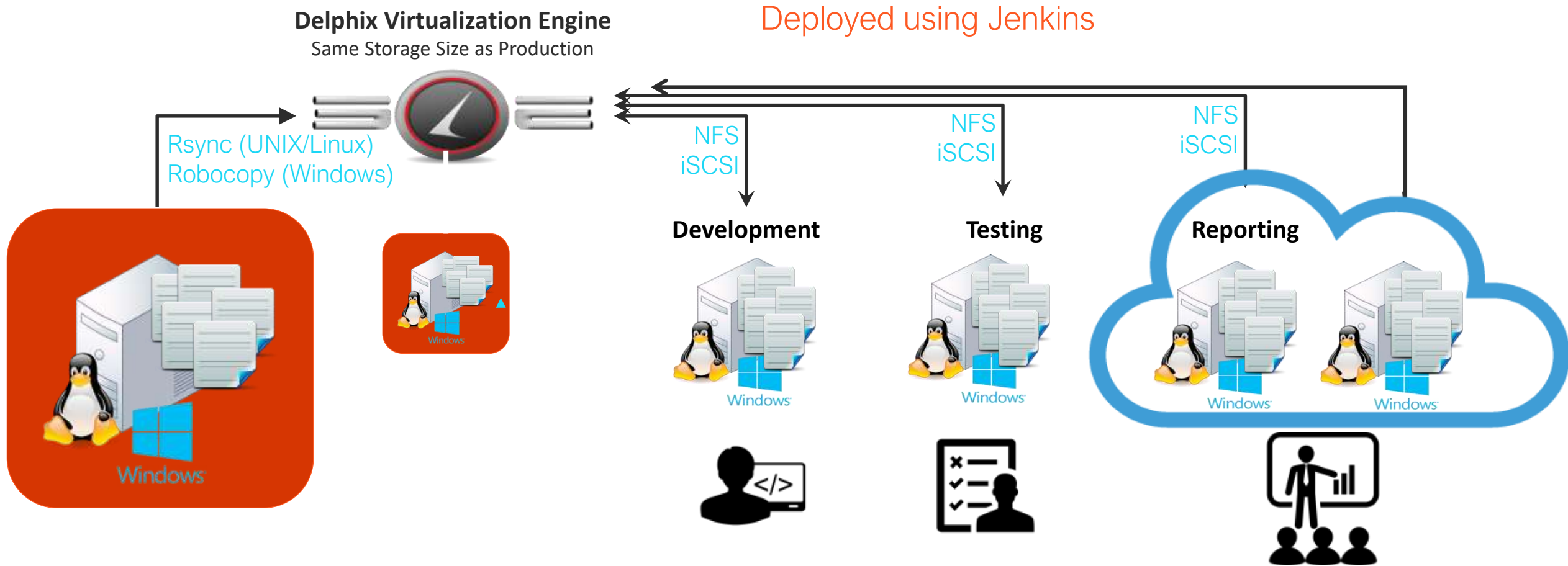
- Development is done by project or feature vs. tier or product.
- With the introduction to the cloud, the business requires those that can do more at a global scale.
- Ease of management and maintenance
- Provide more value to the business



# Data Pods



# Data Pods for Ease of Delivery

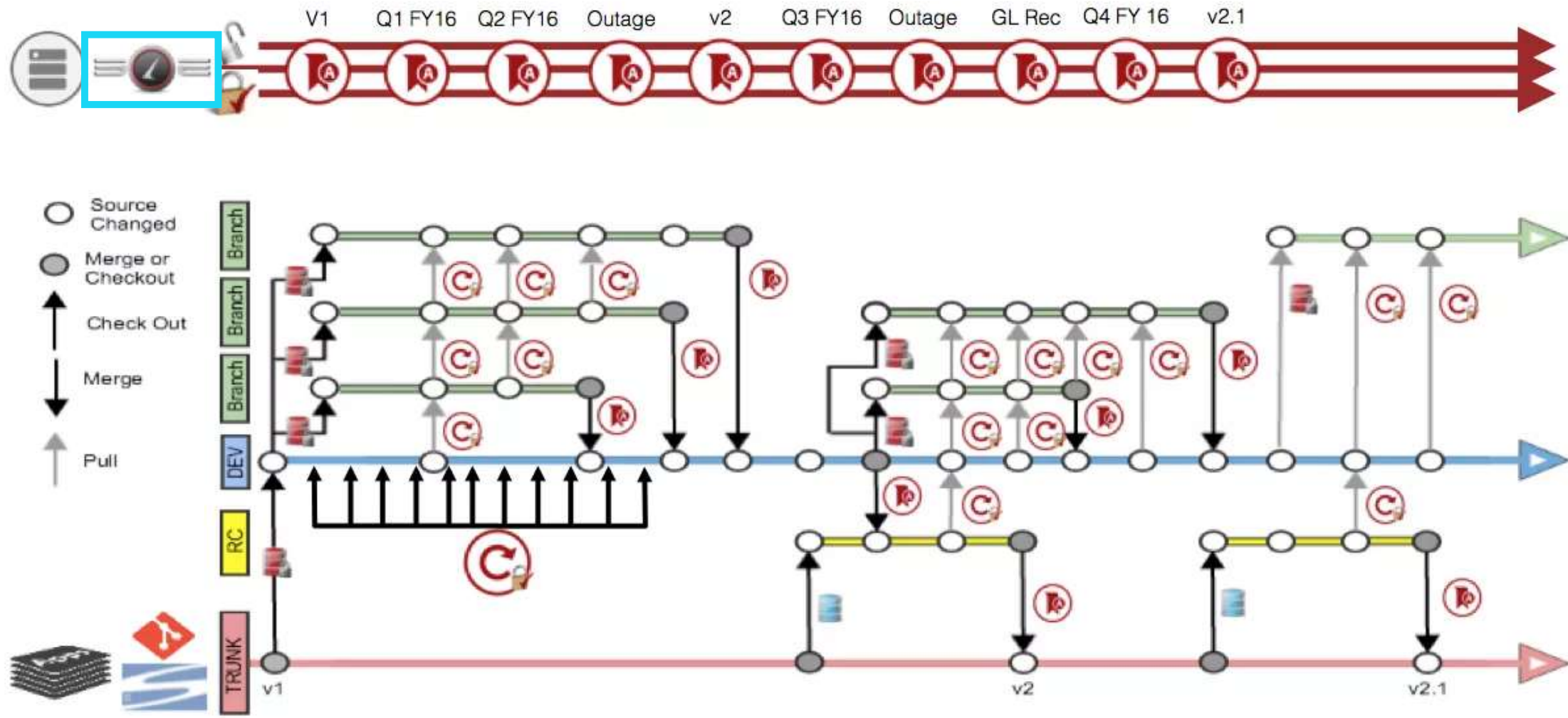


Now the Developers and Testers  
can work at the speed the business  
needs them to....

*Thank you*



# DataOps and Source Control

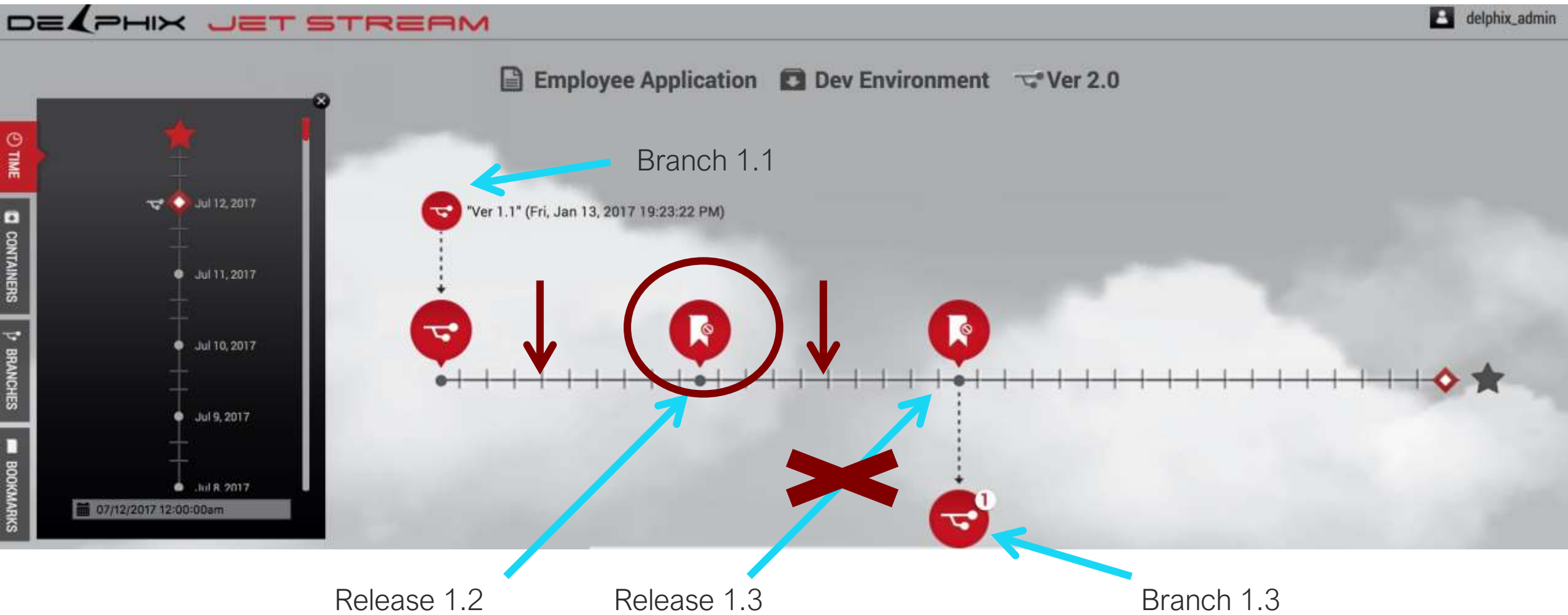


# Branching and Bookmarking

- The ability to mark each iteration of development with a bookmark
- Simplify to lock and deliver while testing a consistent image via a virtual database, (VDB)
- If a something goes wrong, the ability to “bookmark”, (and subsequent snapshot) to deliver to development to address.



# Self Service Portal





# Sprint Goals are Now Possible to Meet!



The background is a solid teal color with a subtle pattern of white speckles, resembling a starry sky or digital noise. A thin, white vertical line is positioned to the left of the text.

# Secure It

# Confidential Data

- GDPR, (General Data Protection Regulation States):
  - Must have lawful basis to post process data
  - Subject must have consented
  - Must have contract that needs data
  - Necessary and in order:
    - Compliance
    - Protect vital interests
    - In public interest
    - In legitimate interest of the owner/other party and doesn't violate the freedom and rights of the subject.

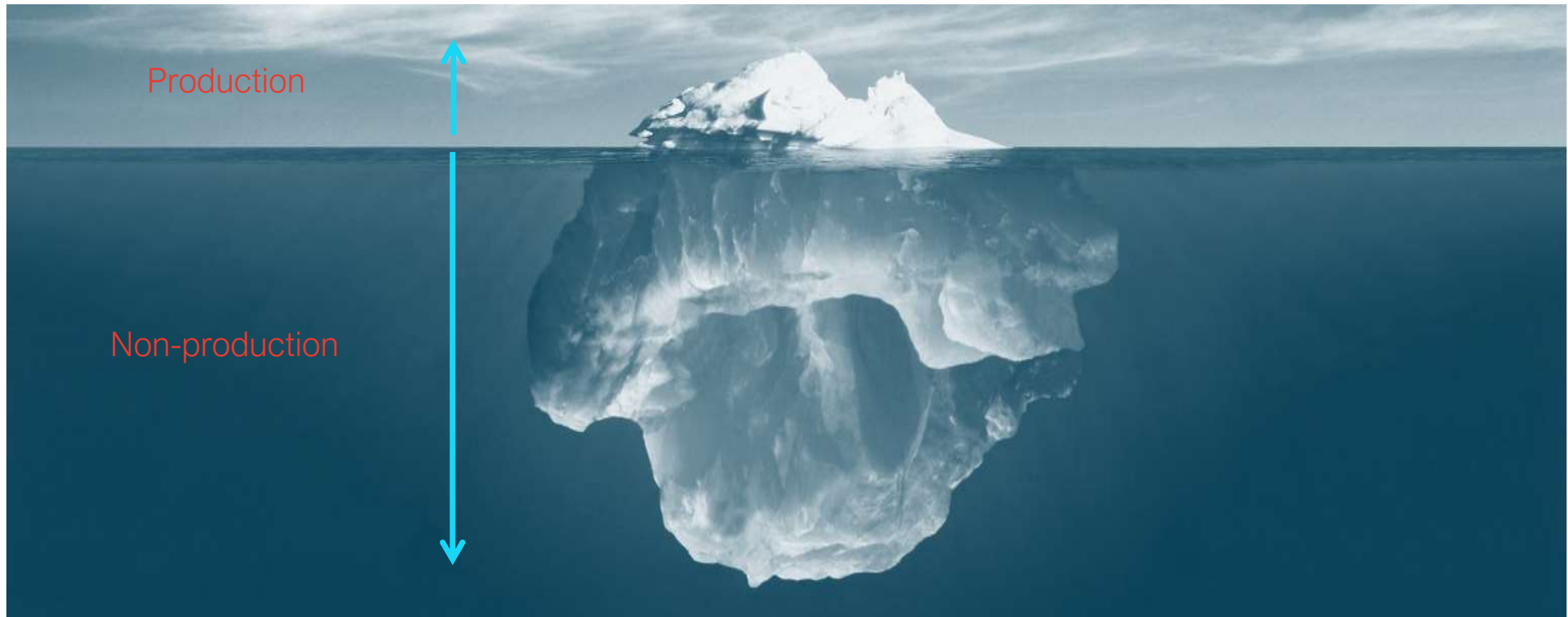
[http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2014/wp216\\_en.pdf](http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2014/wp216_en.pdf)

# What is GDPR Data?

- Standard Personal Data: Name, Address, Phone Number
- Identification Numbers: Social Security Numbers, IP Address
- Medical and Financial Information
- Cookies, Geo Tracking Info

# Confidential data

Exposure



# Confidential data

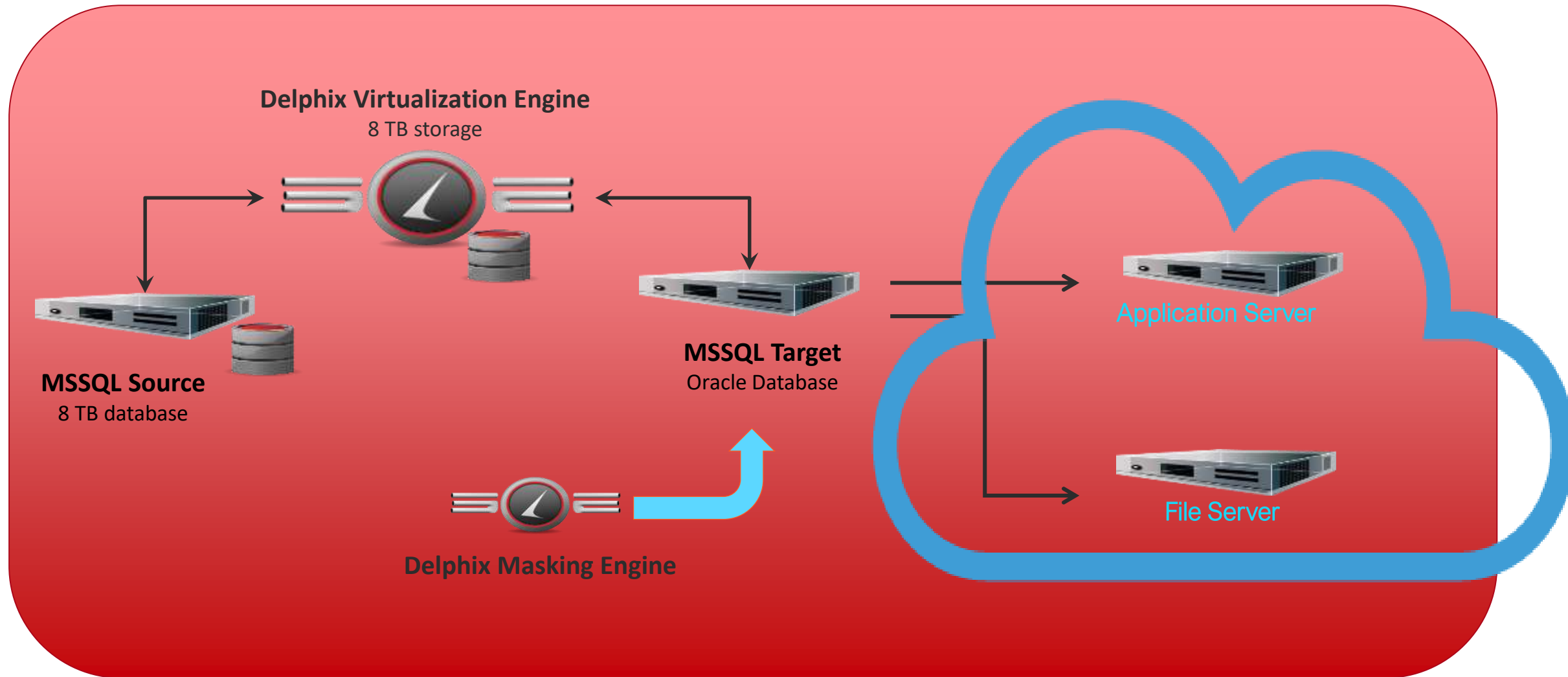
- *Encryption* is **reversible** data obfuscation, which is essential for production access and MUST be DONE.
- Data masking is ***non-reversible***.
  - It solves the issue at the **data level**.
- Is authentication and authorization in non-production in compliance with security goals?
  - All organizations will soon need to review if critical data in non-production environments be accessible to developers, testers and users.

# Why Masking is Important-

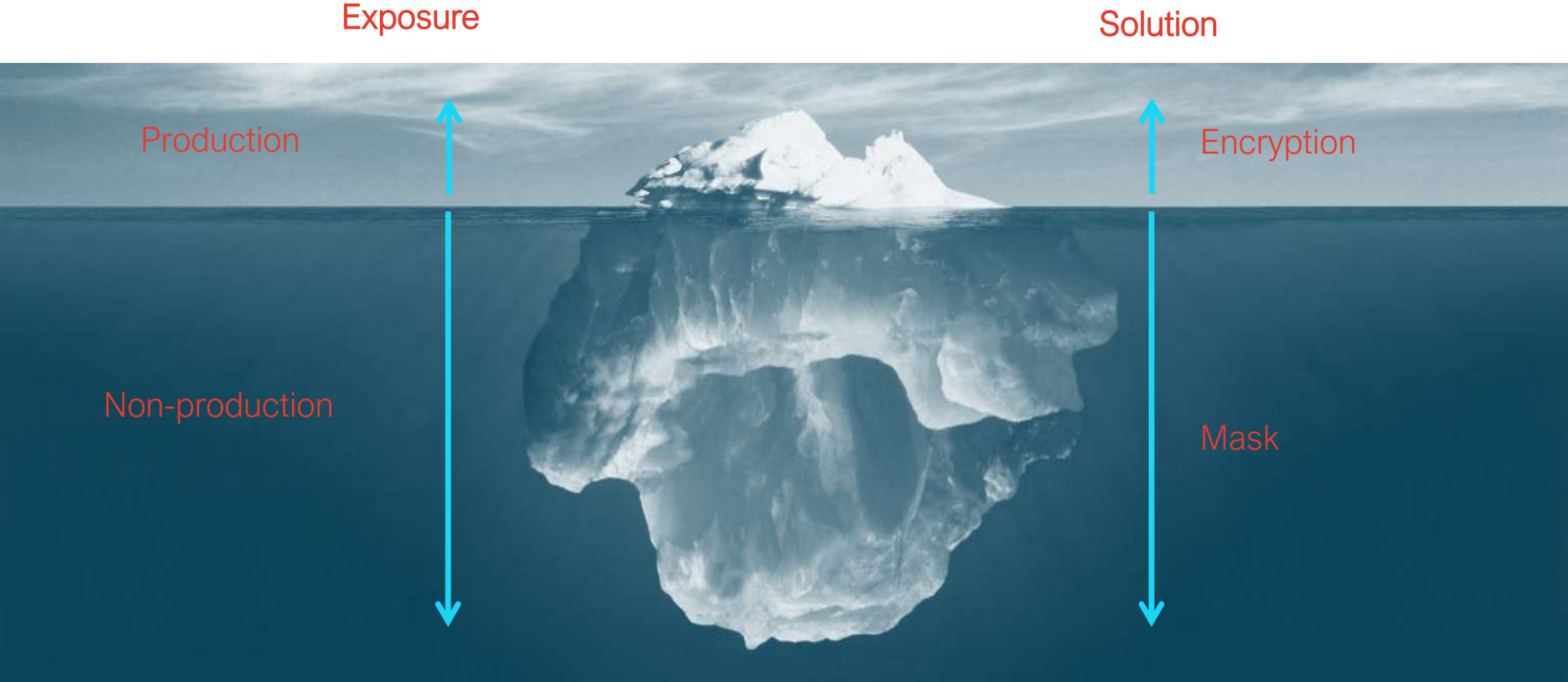
- Masking personally-identifiable, (PII, HIPPA, PCI, etc.) information renders it useless from a security standpoint
- Resolves both the *technical* and personal responsibility issue.
- The data can be masked before it moves to non-production, removing unnecessary risk.
- As we discussed, on average, 80% of data is non-production.
- GDPR is on the horizon and US must be compliant by May, 2018



# Data Virtualization, Masking, to the Cloud



# Confidential Data with Masking



# DataOps Summary

# The Goals Achieved?

- DevOps skills, (scripting, release builds, security, advanced optimization.
- Automate or phase out tedious tasks with platform automation, (monitoring, backups, maintenance jobs, etc.)
- Escape data gravity through features such as advanced self-service portals, virtualization and container technology.
- Which encompasses advance features of DataOps, removing the data friction and allowing data to move as fast as the rest of development and testing.

And George and the DBAs are no longer viewed as a roadblock, but heroes....



# DevOps != DataOps

- DevOps is automation, culture and collaboration, WITH tools
- DBAs are viewed as the roadblock and often are the solution!
- Data, although gold, is viewed as the cause of friction.
- DevOps and Agile can't be successful if they can't get the data they need.
- Just because you've gone DevOps doesn't mean anything with GDPR is on the horizon.

This is the difference between DataOps and DevOps in the World of Data...

## With the Enhancement to DataOps

Dave's company is experiencing an increase of 10% in data accessibility which should result in more than \$65 million in additional net income. You can see why DataOps was important.



# Embracing DataOps

- Removes the last piece holding developers and testers back.
- Uses virtualization and containers to simplify.
- Self-service portals for developers and testers to refresh and develop the way they do in an agile environment.
- Tools with an interface made for Agile and Development data at its focus.

# How DevOps Becomes DataOps

Where do you go from here?

- Automating repeatable and complex processes
- Locating heterogeneous tools/scripting languages that can support multiple tiers of technology.
- Use tools to speed up the development cycle.
- Secure ALL the data- GDPR is coming!
- Understanding that automation does not lessen anyone's value.
- The tools are important, but that cultural changes are the biggest hurdle.

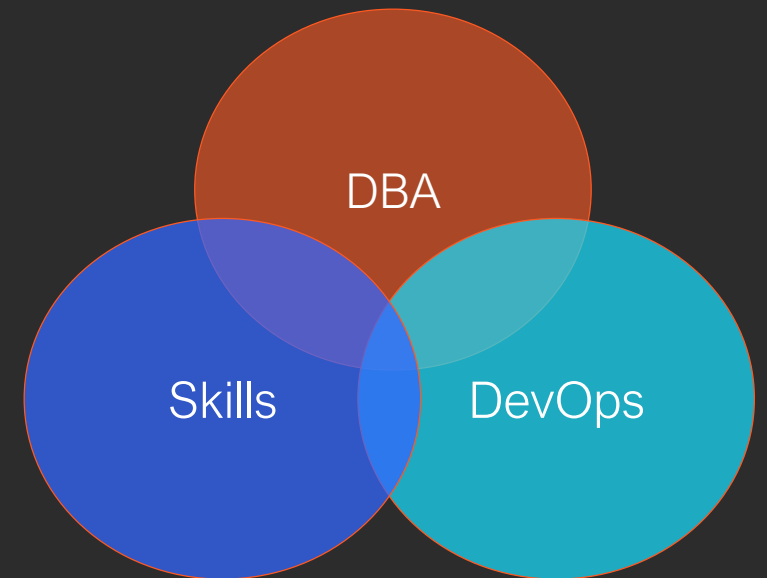
# References

## Blog Posts-

- [The DBA and DevOps: The Last Frontier](#)
- [The DBA and DevOps: Automation and Configuration Management](#)
- [The DBA and DevOps - Orchestration and Monitoring](#)
- [DBA and DevOps: The Ghost in the Machine](#)

## Webinar Recordings

- [The DBA and DevOps- the Last Frontier](#)
- Read- [The Phoenix Project](#) and the [DevOps Handbook](#)!





# Q&A

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