

for smaller, smoother and safer releases

DLM Consultants



Zero Downtime Database Deployments

Zero downtime database deployments

for smaller, smoother and safer releases

Alex Yates

DevOps Mentor

DLM Consultants

Welcome!

Zero Downtime Database Deployments



Welcome!



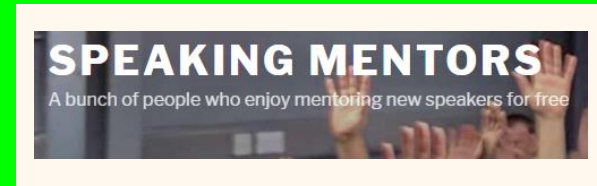
Zero Downtime Database Deployments

zero downtime database deployments

Zero Downtime Database Deployments

zero downtime database deployments

Zero Downtime Database Deployments



Alex Yates

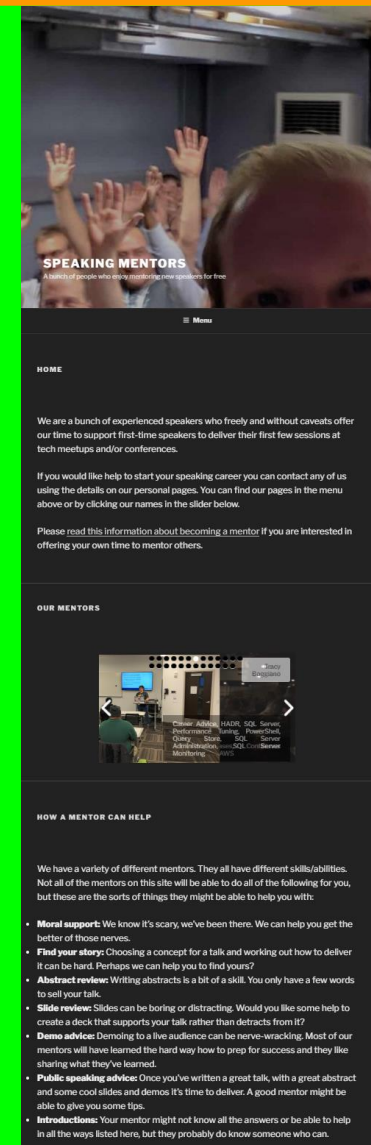
DevOps Mentor @ DLM Consultants
alex.yates@dmlconsultants.com
@_AlexYates_

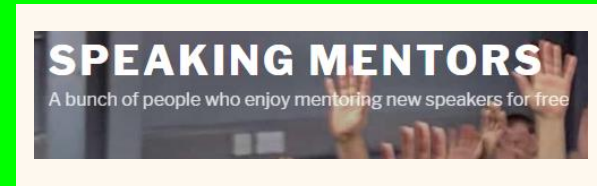
Zero Downtime Database Deployments

!!! TANGENT CAM !!!

Attribution:
I totally stole TANGENT CAM from YouTuber Joe Scott
Go check out his fun science-y content!

Zero Downtime Database Deployments





Alex Yates

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@_AlexYates_

Zero Downtime Database Deployments

Assumptions...

- Source control
- Automated deploy pipelines
- Infra as code

Zero Downtime Database Deployments

That Friday Deploy Feeling...



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Big deploys don't work...



Zero Downtime Database Deployments



“If we want more changes, we need more deployments.”

Chuck Rossi, Facebook

DevOps Handbook, p154

Zero Downtime Database Deployments



“approval by an external body (such as a manager or CAB) simply doesn’t work to increase the stability of production systems”

Nicole Forsgren, Accelerate

Zero Downtime Database Deployments



“It is, in fact, worse than having no change approval process at all.”

Nicole Forsgren, Accelerate

Zero Downtime Database Deployments



“Deployment need not expose customers to a new version of your service.”

Art Gillespie, Deploy != Release

blog.turbinelabs.io/deploy-not-equal-release-part-one-4724bc1e726b

Zero Downtime Database Deployments

Release patterns

Environment-based

- Blue – Green deployments
- Canary
- Cluster immune system

Application-based

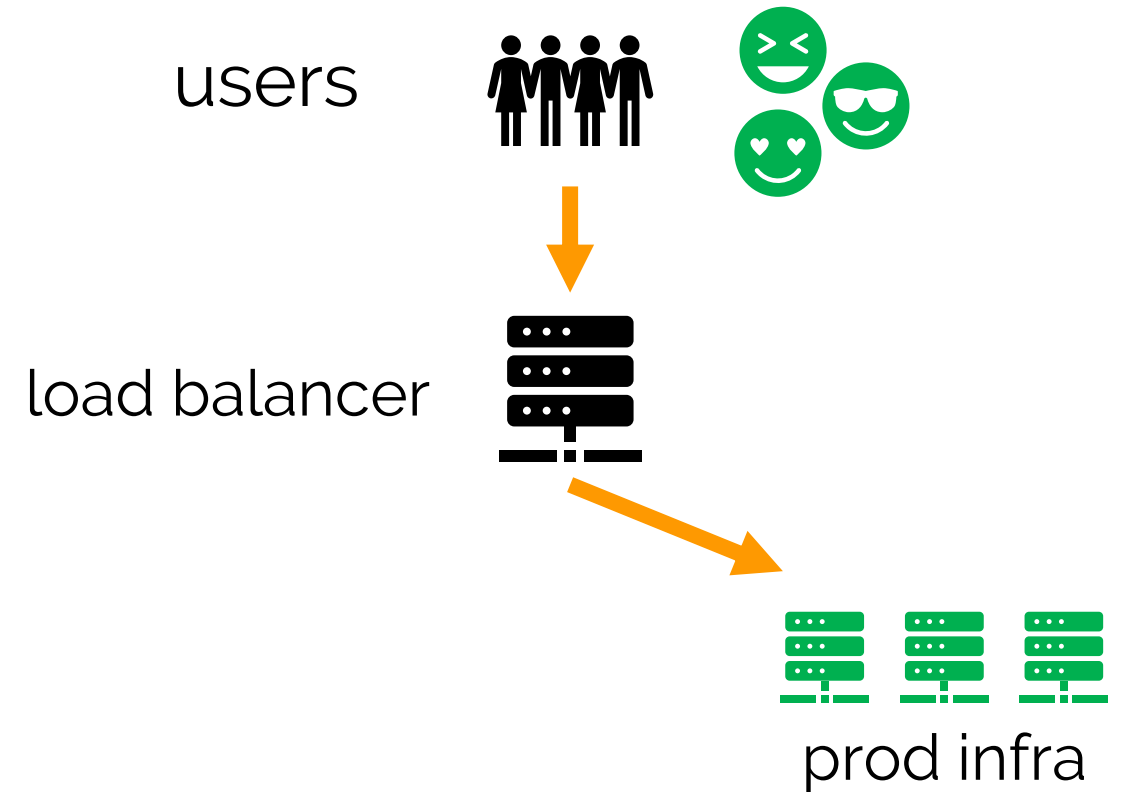
- Feature toggles
- Dark launches

Zero Downtime Database Deployments

Environment-based

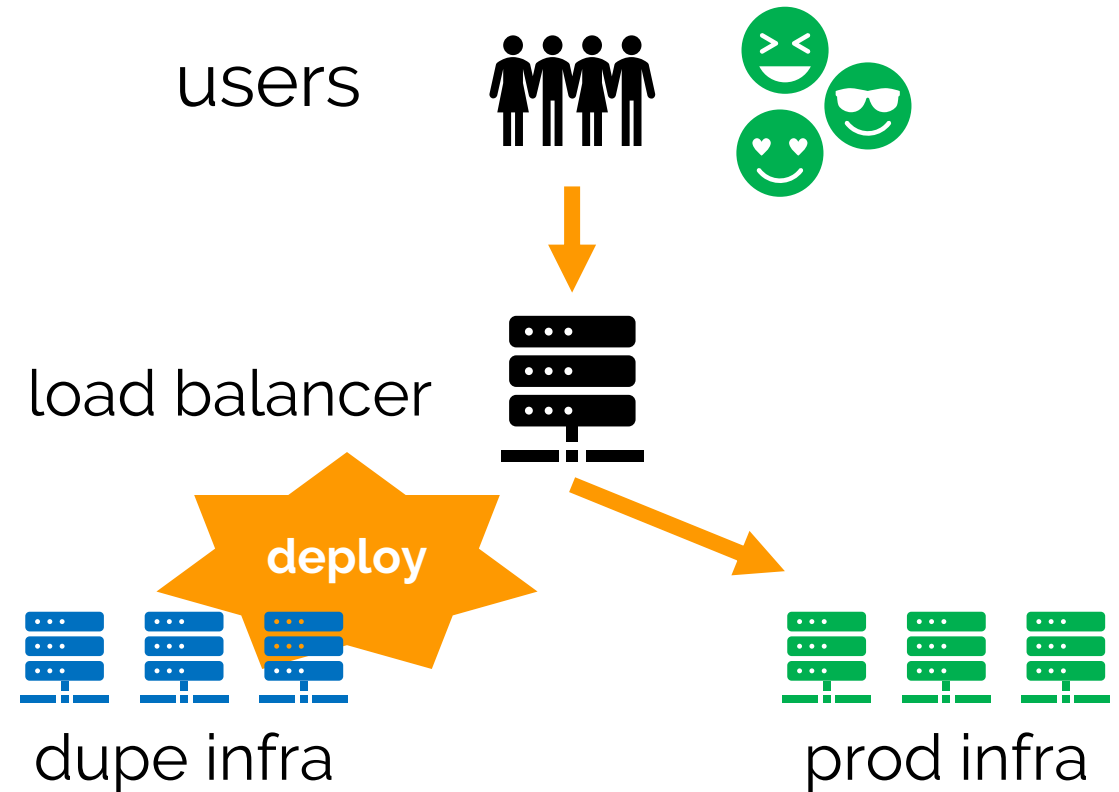
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Environment-based Blue – Green deployments



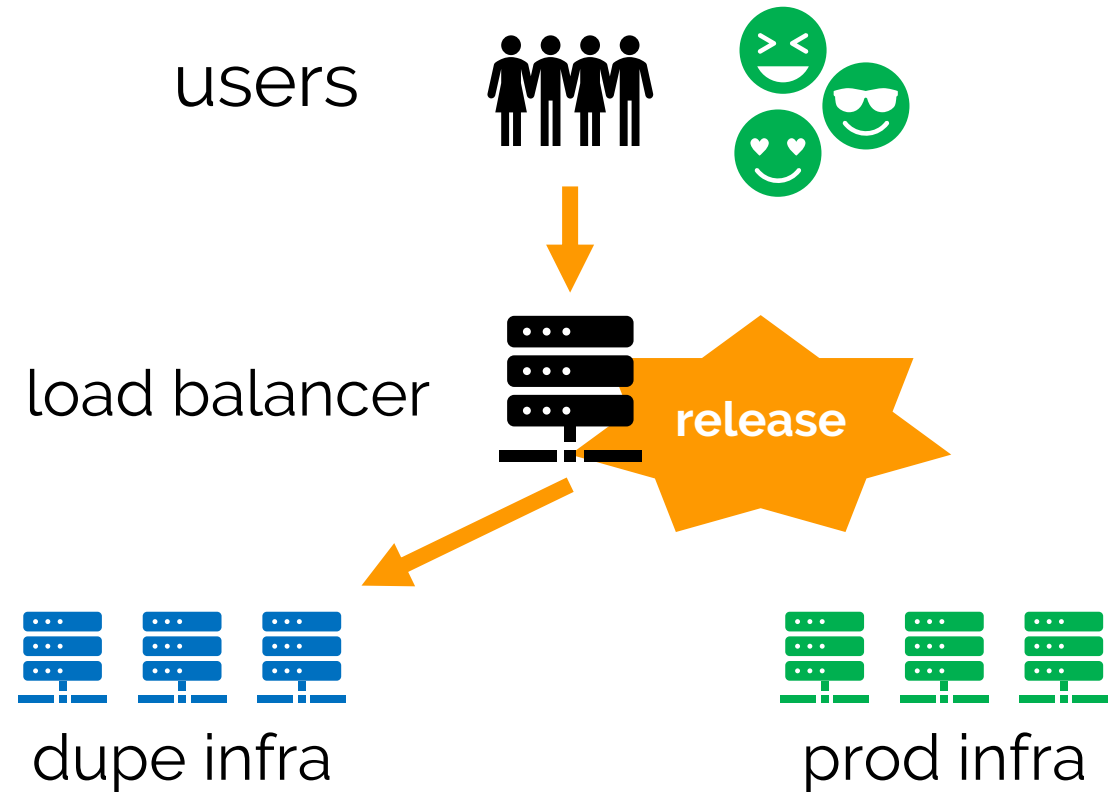
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Environment-based Blue – Green deployments



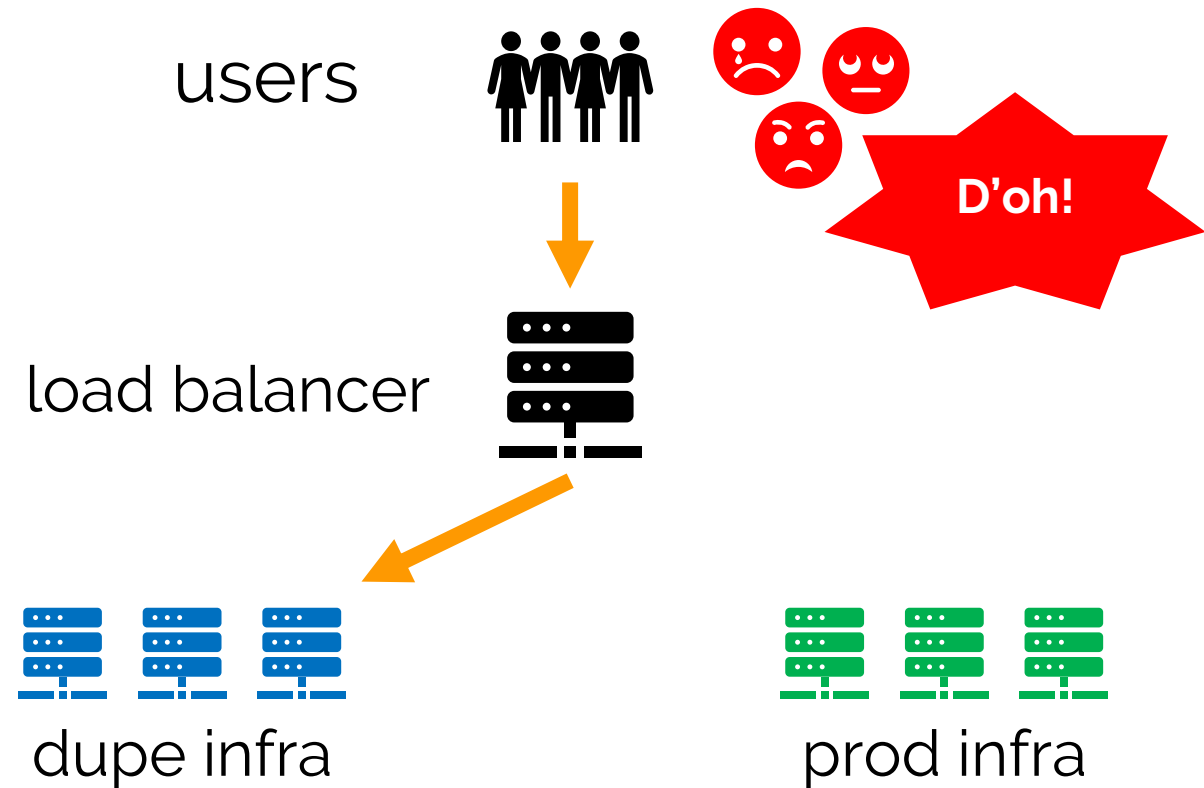
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Environment-based Blue – Green deployments



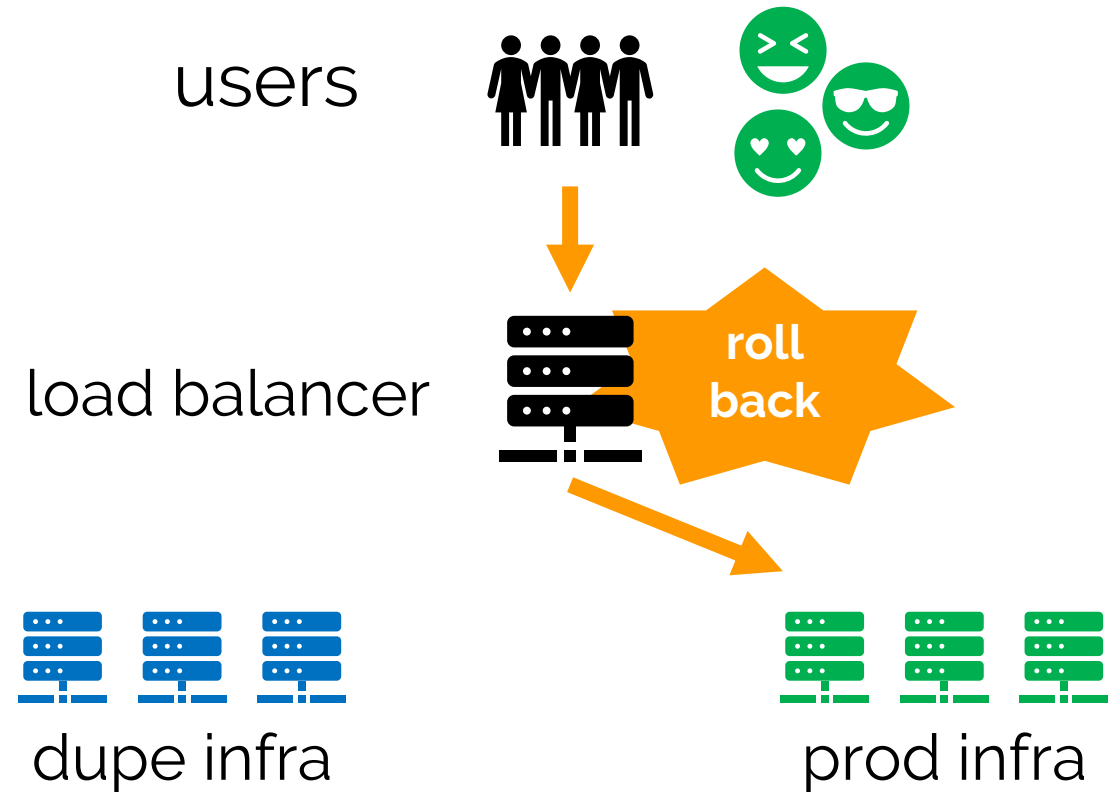
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Environment-based Blue – Green deployments



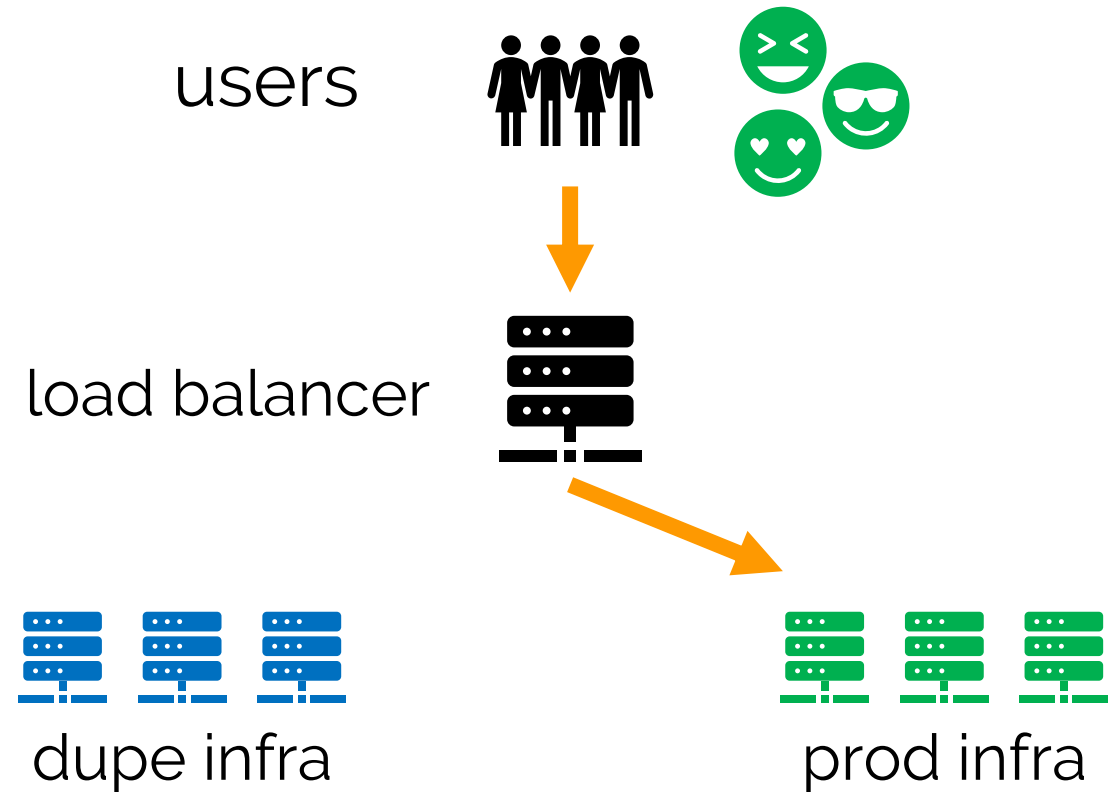
Zero Downtime Database Deployments

Environment-based Blue – Green deployments



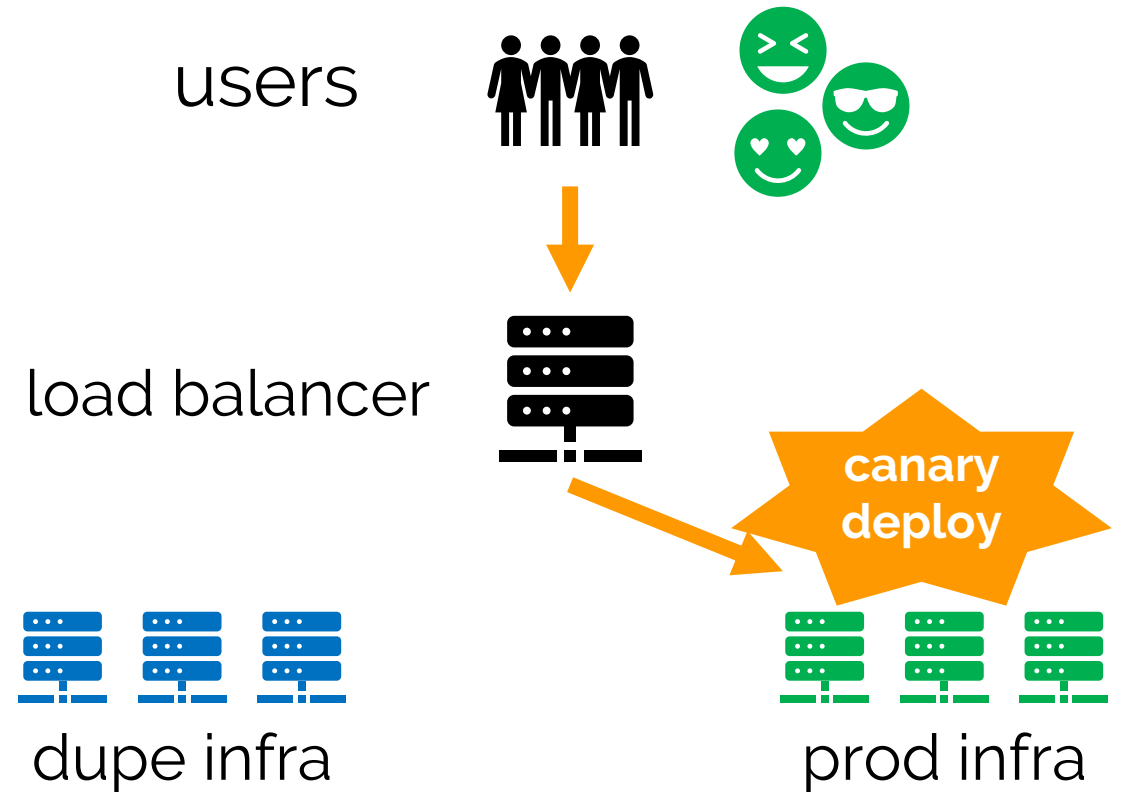
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Environment-based Blue – Green deployments



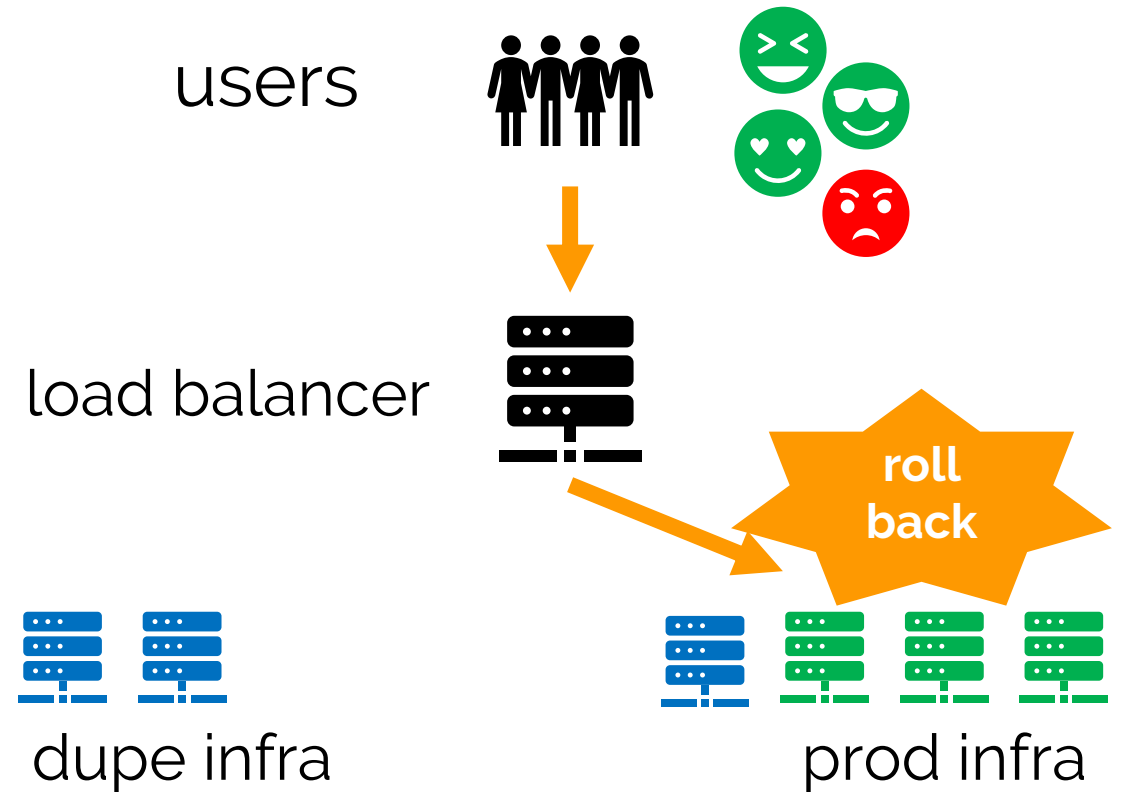
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Environment-based Canary deployments



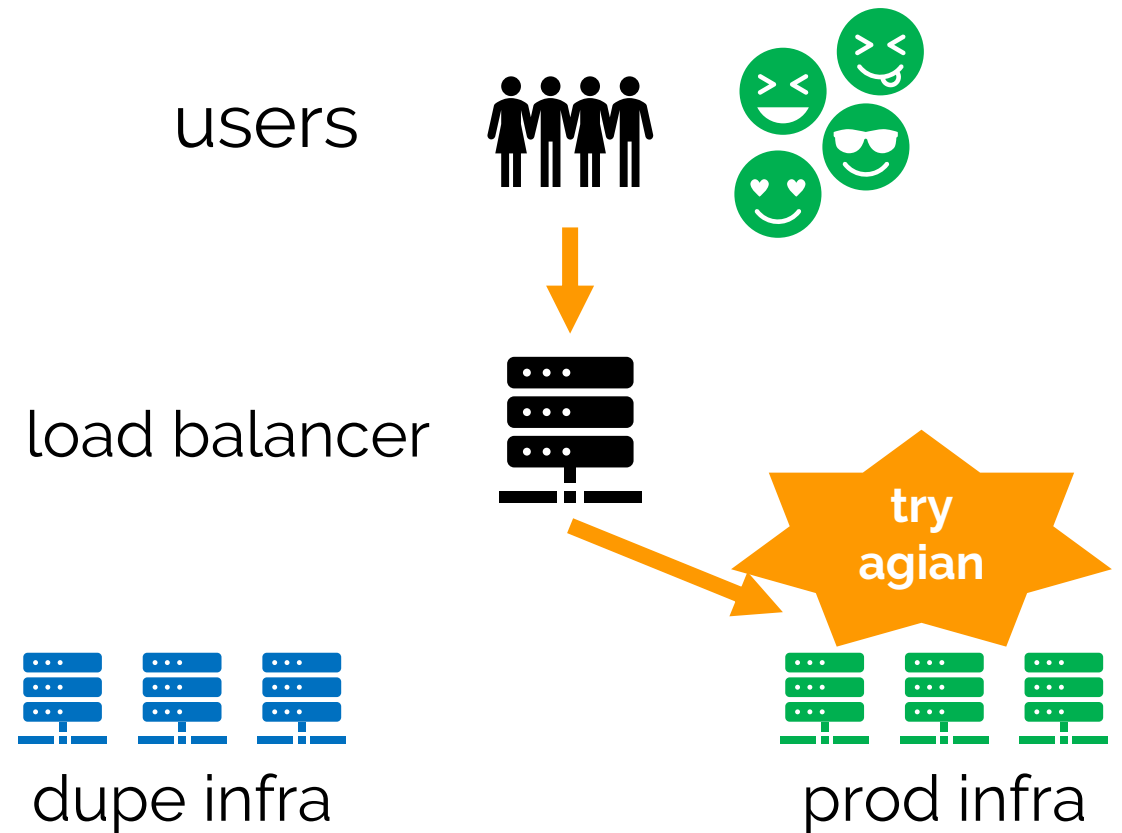
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Environment-based Canary deployments



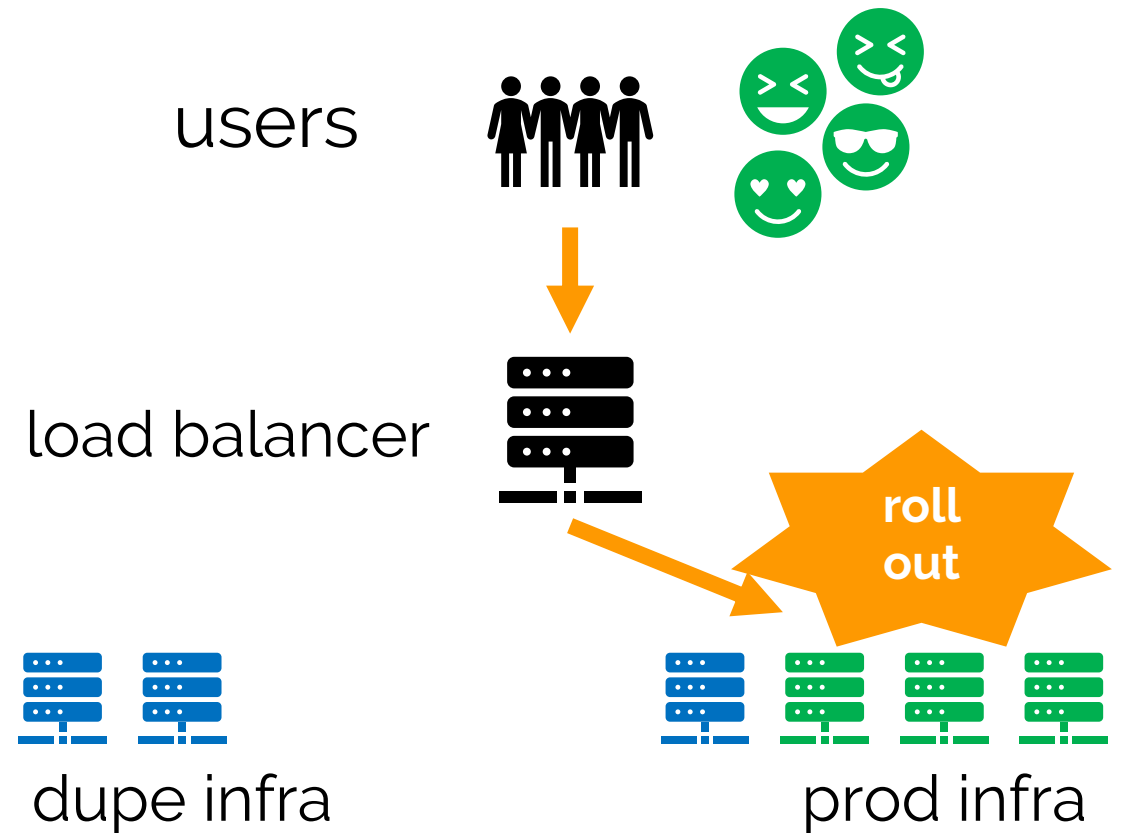
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Environment-based Canary deployments



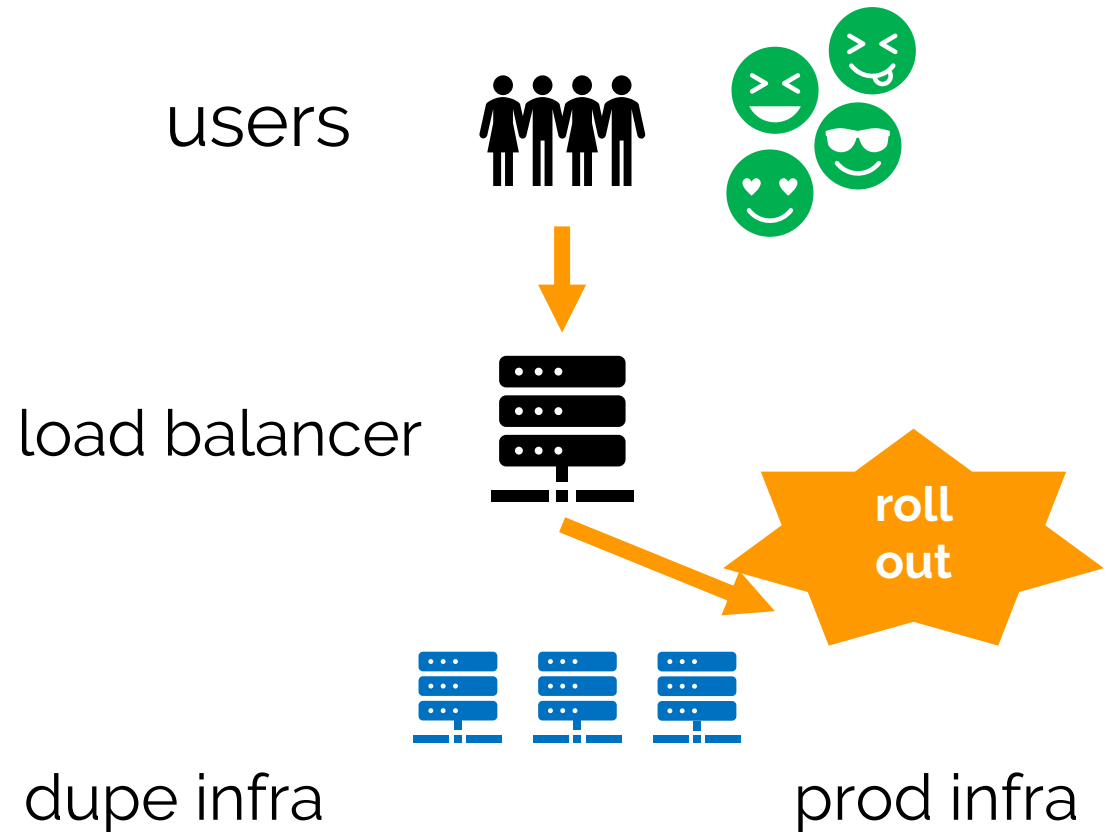
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Environment-based Canary deployments



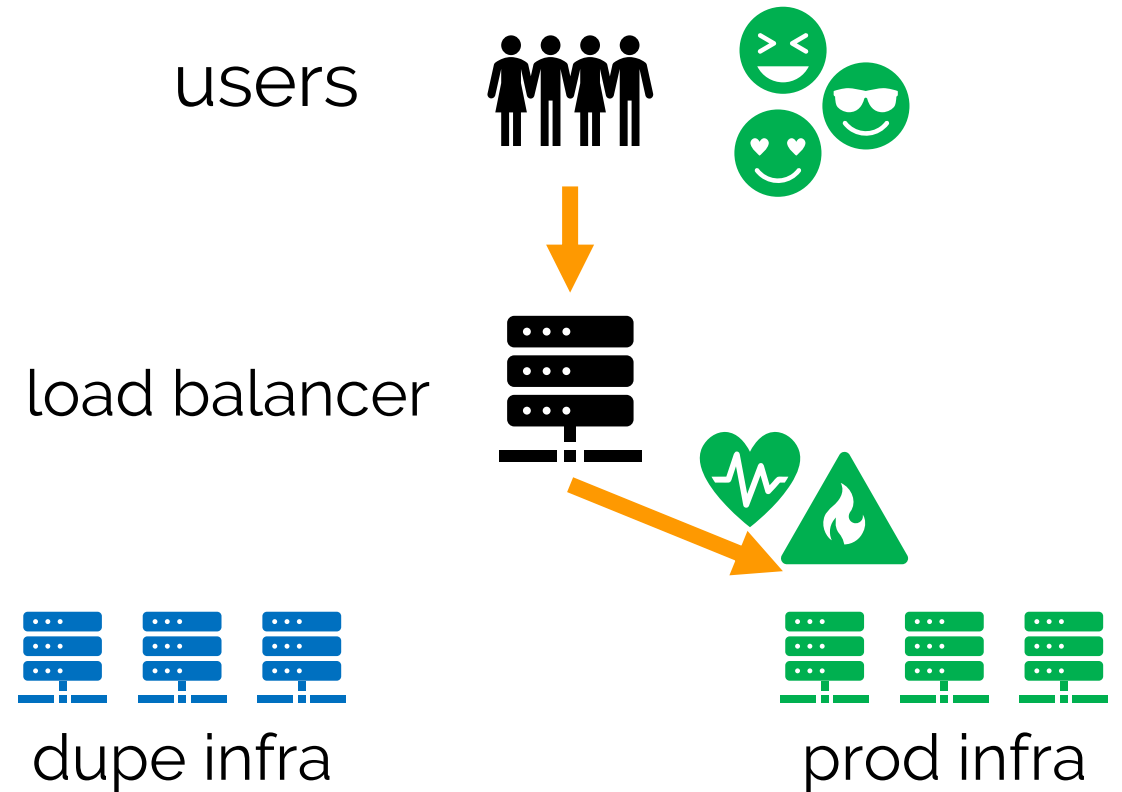
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Environment-based Canary deployments



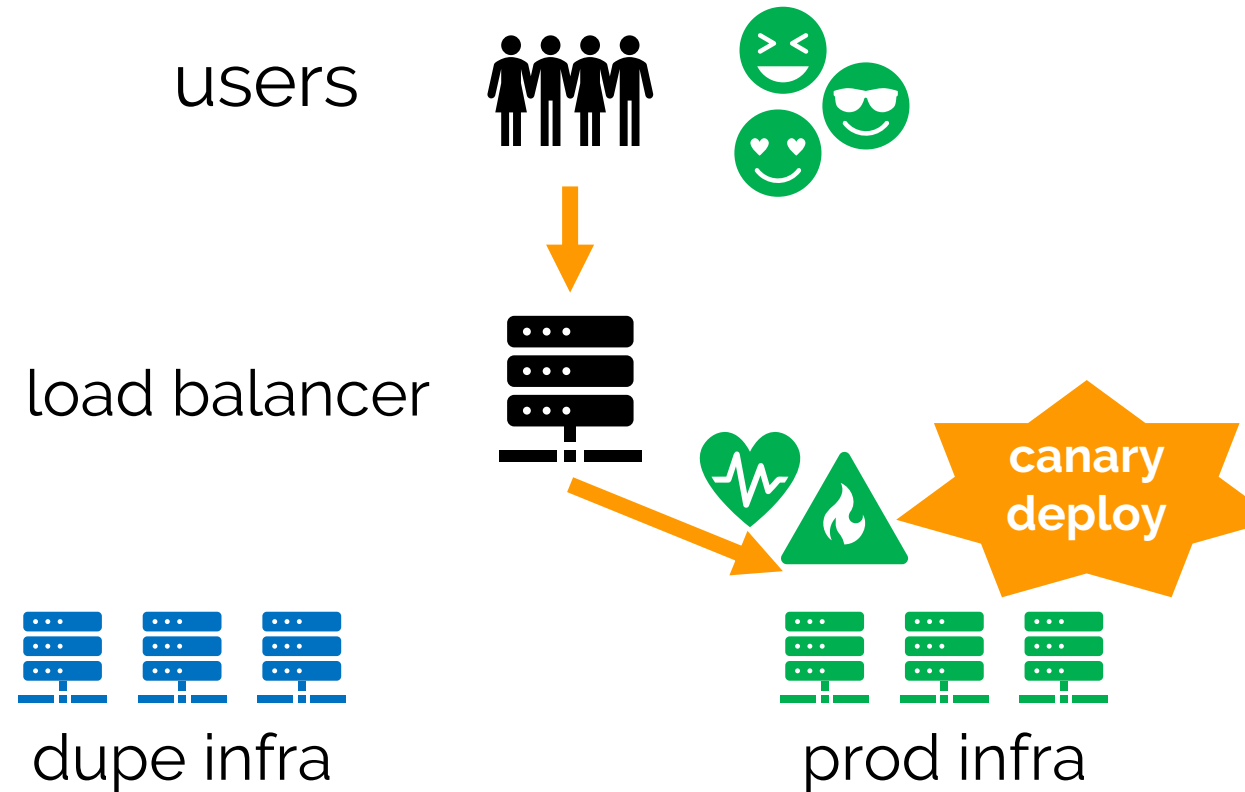
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Environment-based Cluster immune system



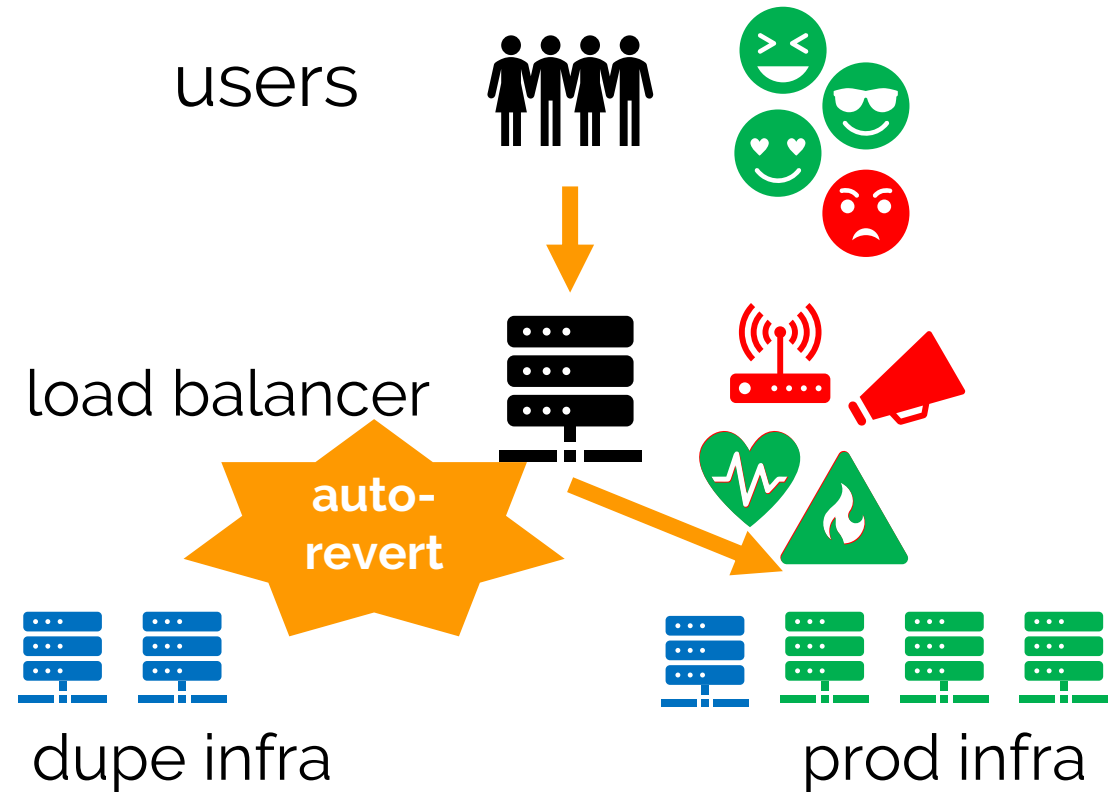
Zero Downtime Database Deployments

Environment-based Cluster immune system



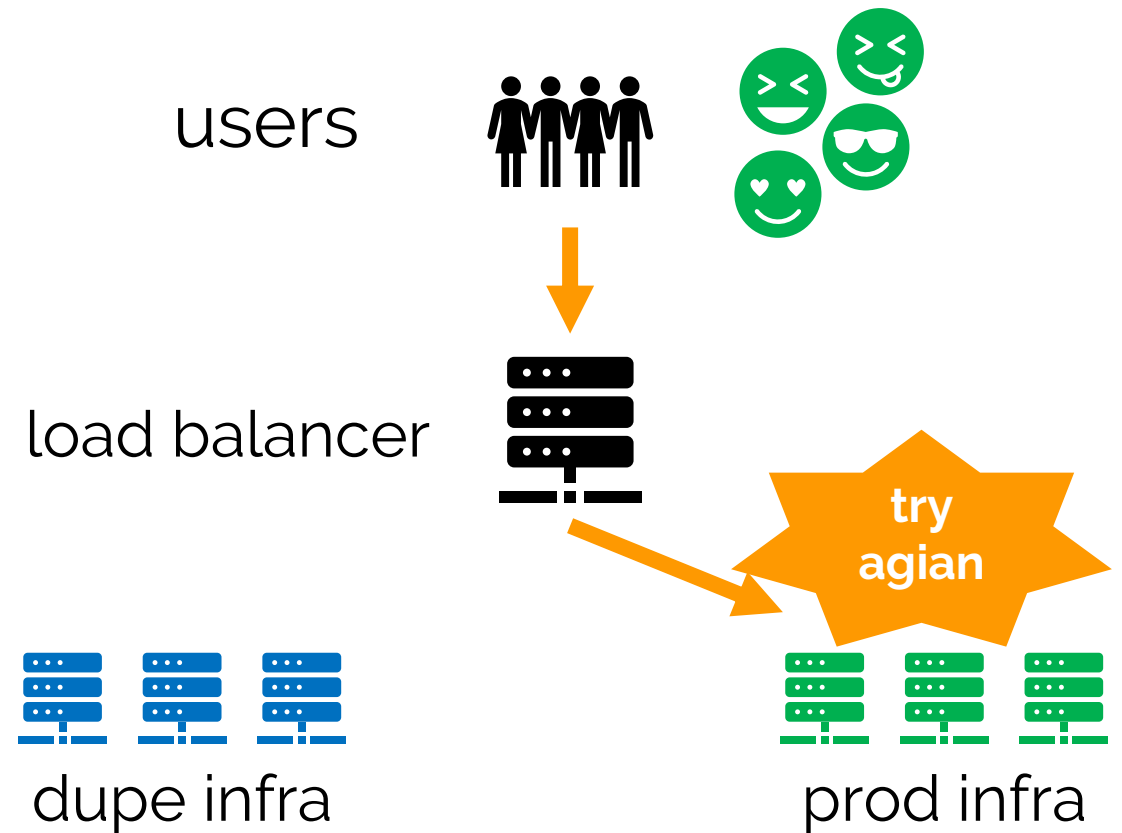
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Environment-based Cluster immune system



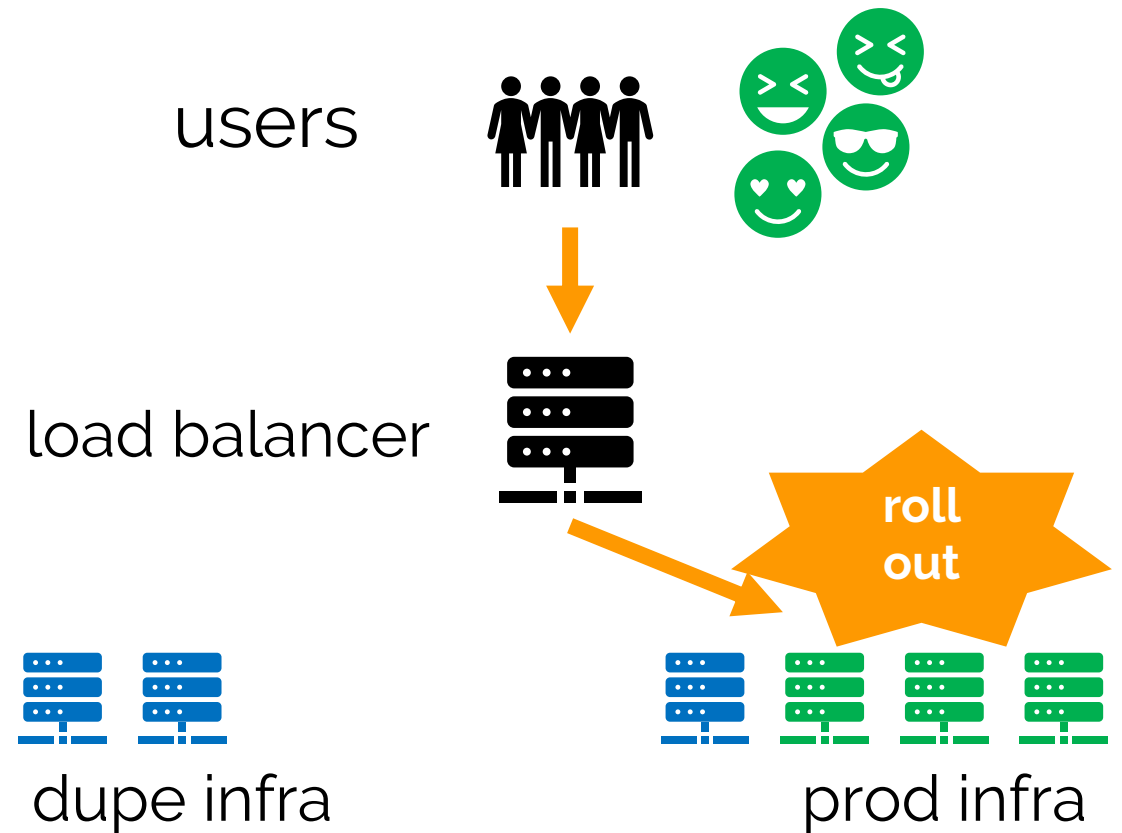
Zero Downtime Database Deployments

Environment-based Cluster immune system



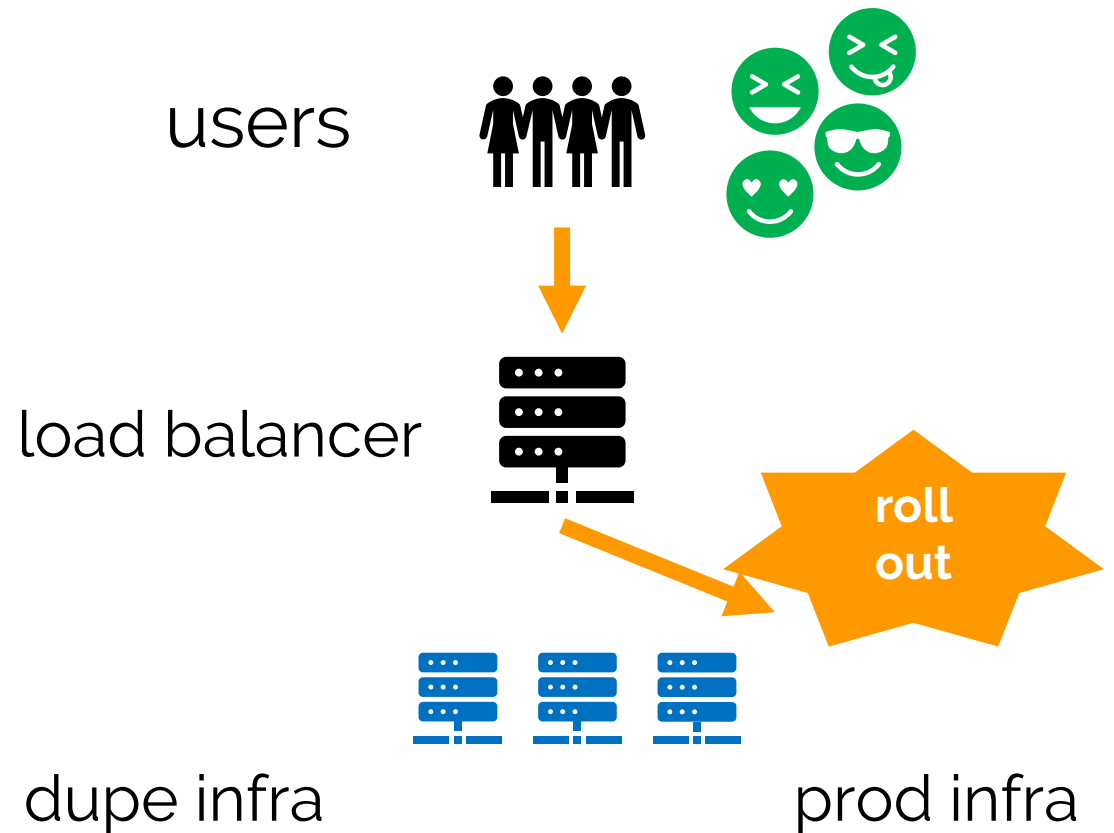
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Environment-based Cluster immune system



Zero Downtime Database Deployments

Environment-based Cluster immune system



Zero Downtime Database Deployments

Application-based

Zero Downtime Database Deployments

Application-based Feature flags / toggles

```
function reticulateSplines() {  
  // current implementation lives here  
}
```

```
// Attribution:  
// https://martinfowler.com/articles/feature-toggles.html
```

Zero Downtime Database Deployments

Application-based Feature flags / toggles

```
function reticulateSplines() {  
    // current implementation lives here  
}
```

```
function oldFashionedSplineReticulation() {  
    // copy current implementation here  
}
```

```
// Attribution:  
// https://martinfowler.com/articles/feature-toggles.html
```

Zero Downtime Database Deployments

Application-based Feature flags / toggles

```
function reticulateSplines() {  
    // current implementation lives here  
}
```

```
function oldFashionedSplineReticulation() {  
    // copy current implementation here  
}
```

```
function enhancedSplineReticulation() {  
    // TODO: implement better SR algorithm here  
}
```

```
// Attribution:  
// https://martinfowler.com/articles/feature-toggles.html
```

Zero Downtime Database Deployments

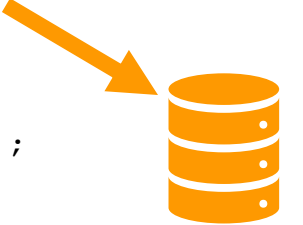
Application-based Feature flags / toggles

```
function reticulateSplines() {  
    var useNewAlgorithm = false;  
    // UNCOMMENT BELOW IF USING NEW SR ALGORITHM  
    // useNewAlgorithm = true;  
  
    if ( useNewAlgorithm ) {  
        return enhancedSplineReticulation();  
    } else {  
        return oldFashionedSplineReticulation();  
    }  
}  
  
function oldFashionedSplineReticulation() {  
    // copy current implementation here  
}  
  
function enhancedSplineReticulation() {  
    // TODO: implement better SR algorithm here  
}  
  
// Attribution:  
// https://martinfowler.com/articles/feature-toggles.html
```

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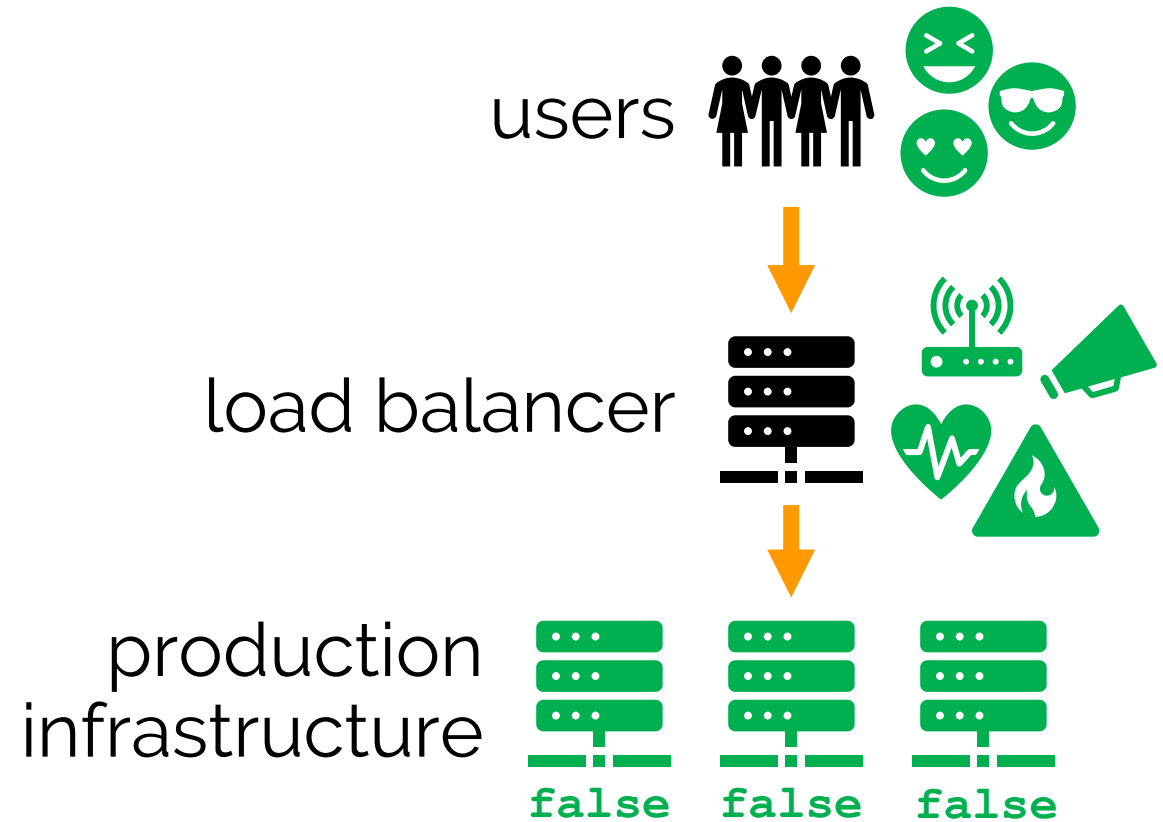
Application-based Feature flags / toggles

```
function reticulateSplines() {  
  var useNewAlgorithm = false;  
  // Or we could use a config database  
  useNewAlgorithm = [[ SELECT FROM CONFIG DB ]]  
  
  if ( useNewAlgorithm ) {  
    return enhancedSplineReticulation();  
  } else {  
    return oldFashionedSplineReticulation();  
  }  
}  
  
function oldFashionedSplineReticulation() {  
  // copy current implementation here  
}  
  
function enhancedSplineReticulation() {  
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```



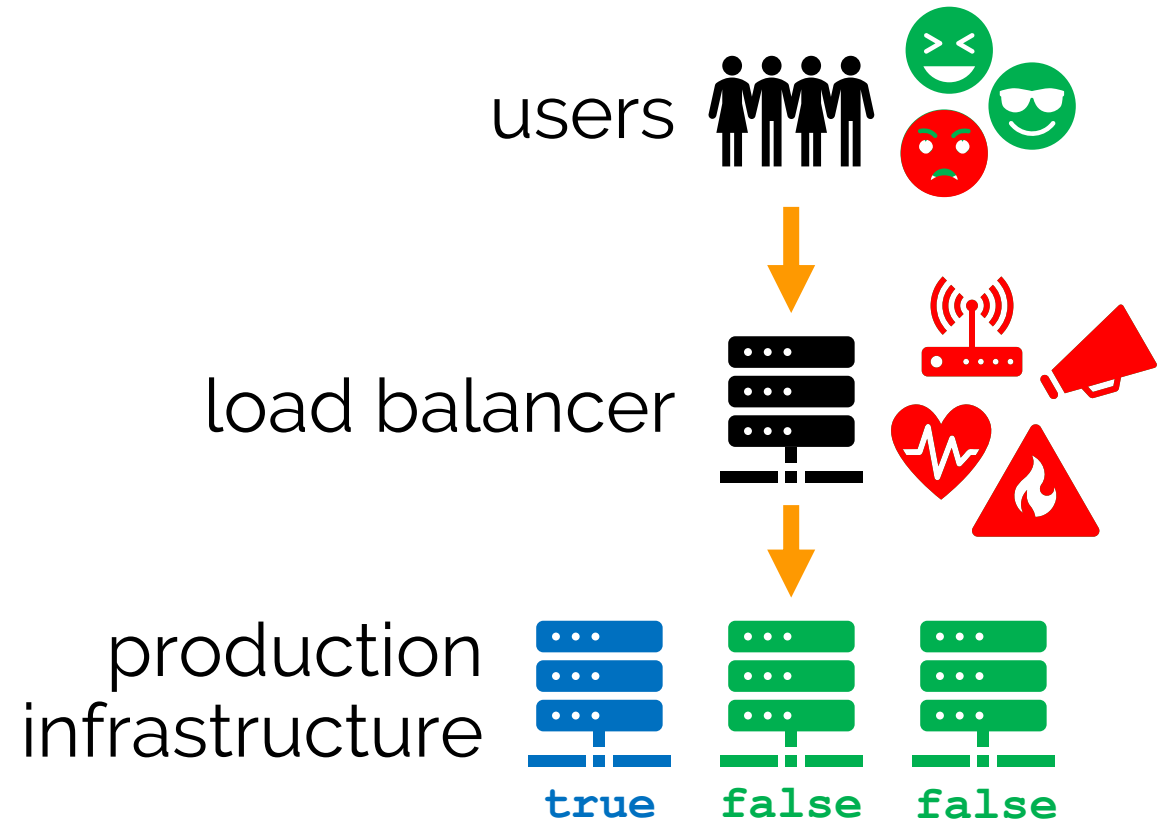
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Application-based Feature flags / toggles



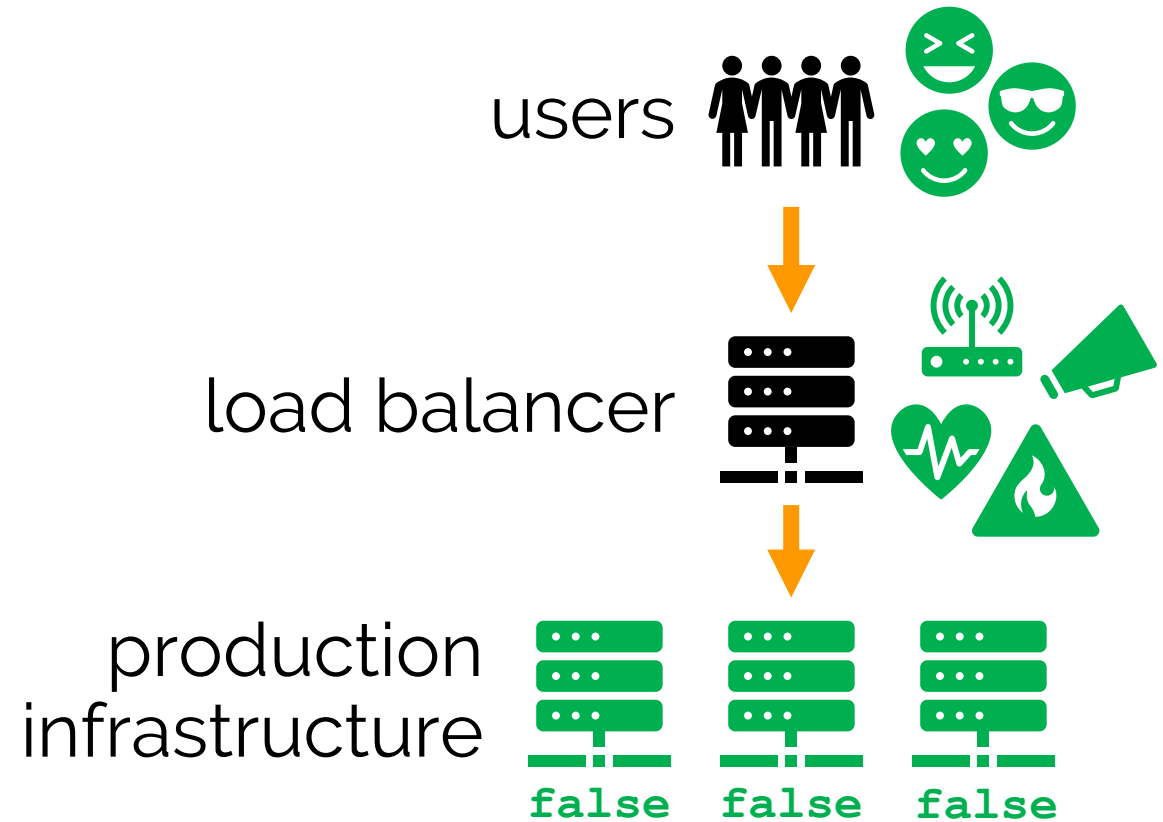
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Application-based Feature flags / toggles



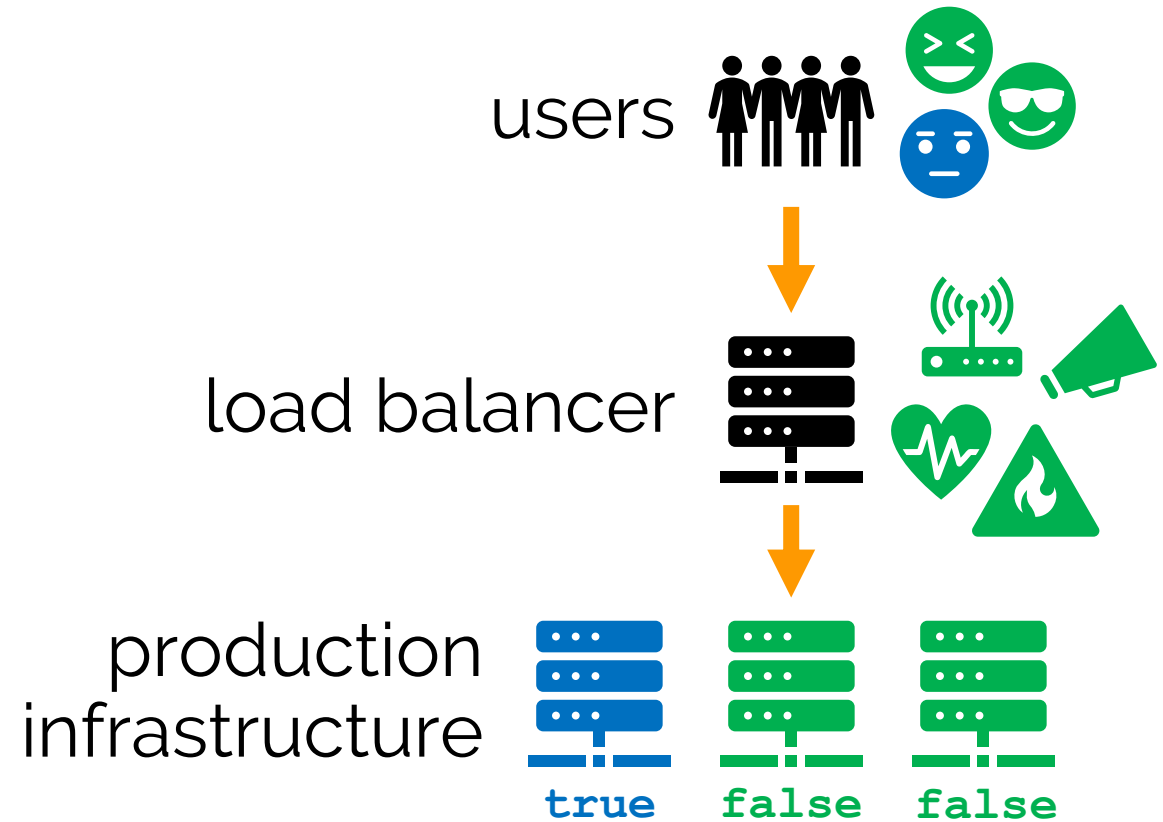
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Application-based Feature flags / toggles



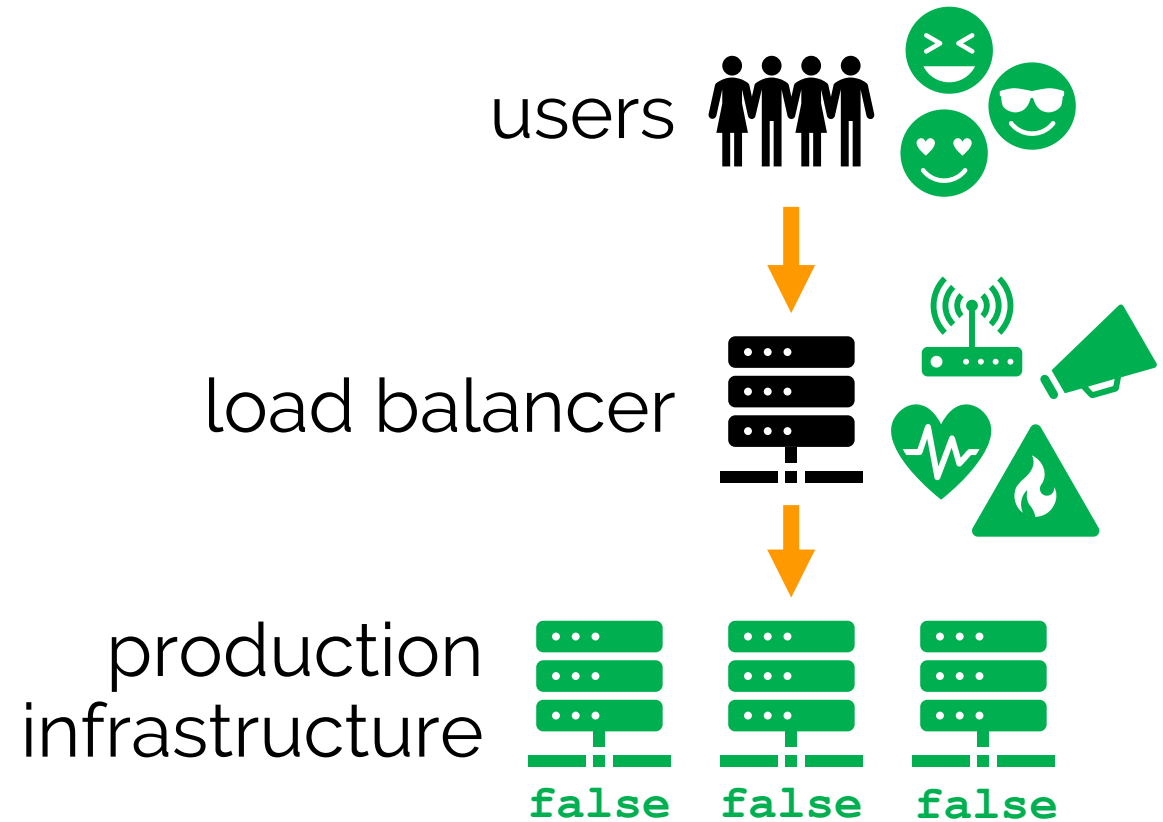
Zero Downtime Database Deployments

Application-based Feature flags / toggles



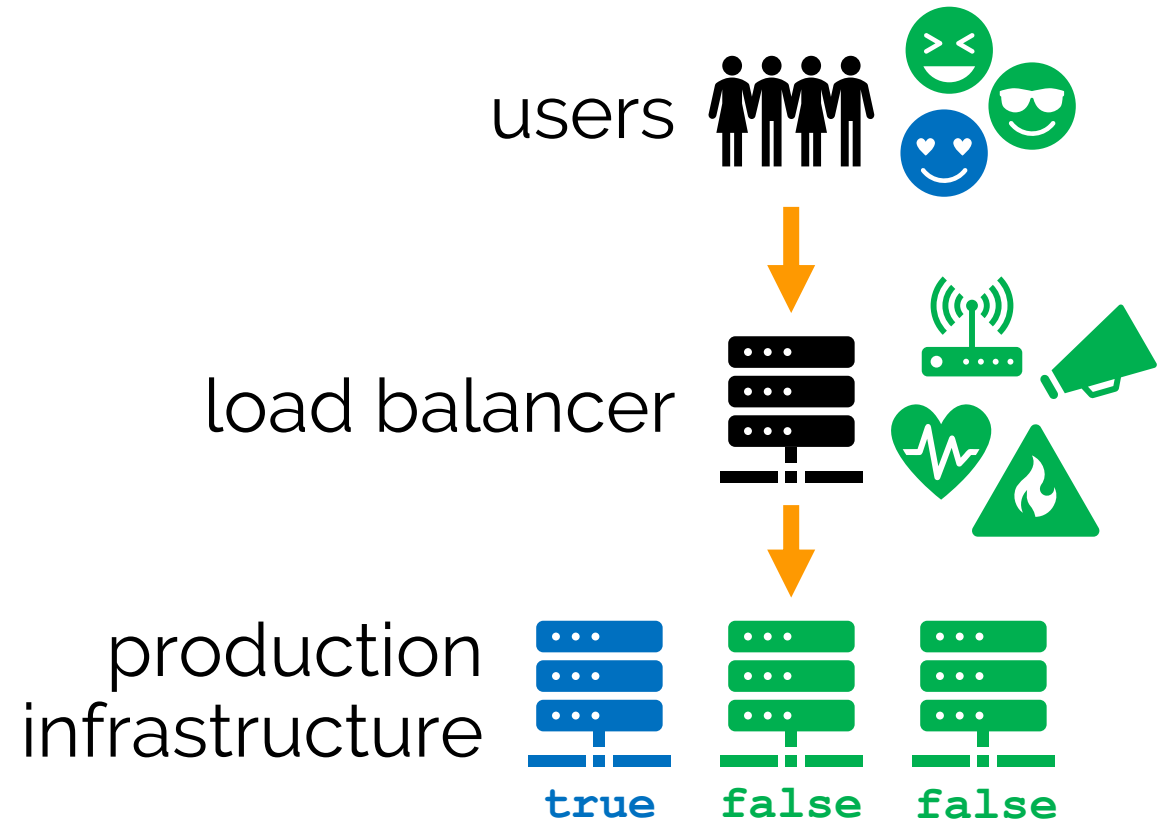
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Application-based Feature flags / toggles



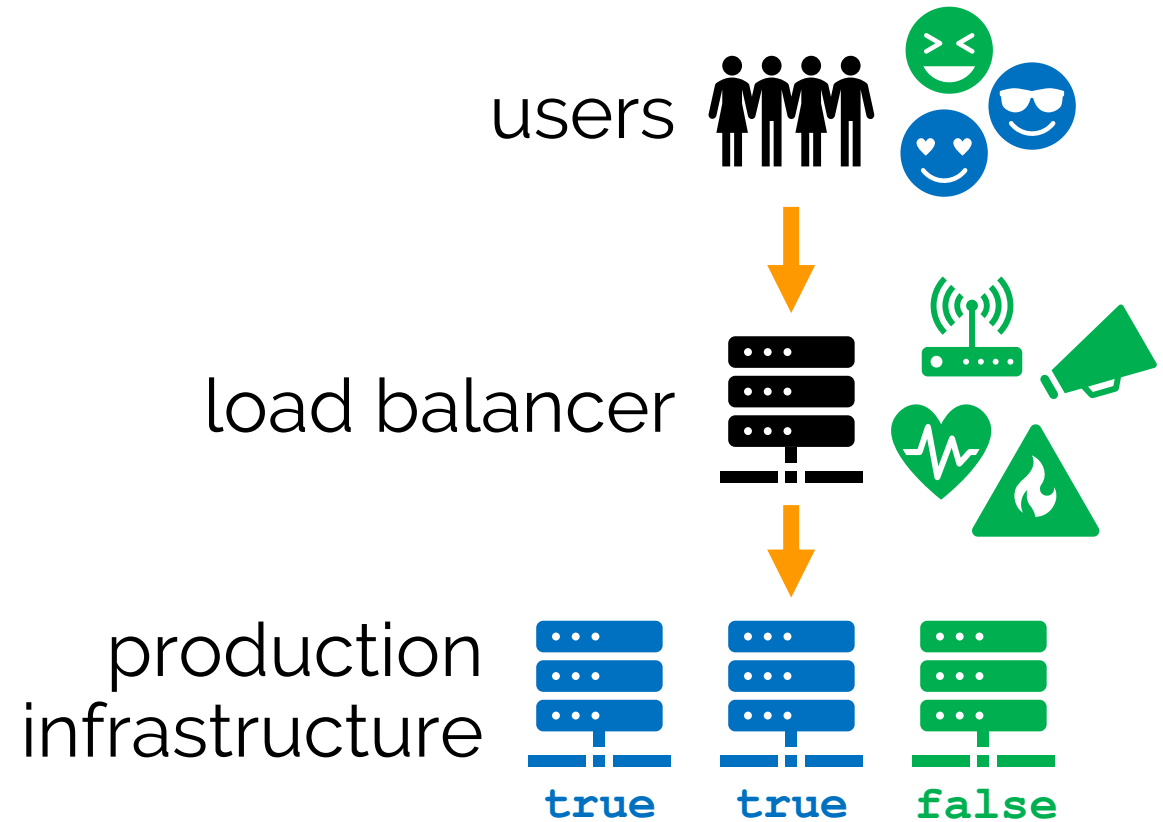
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Application-based Feature flags / toggles



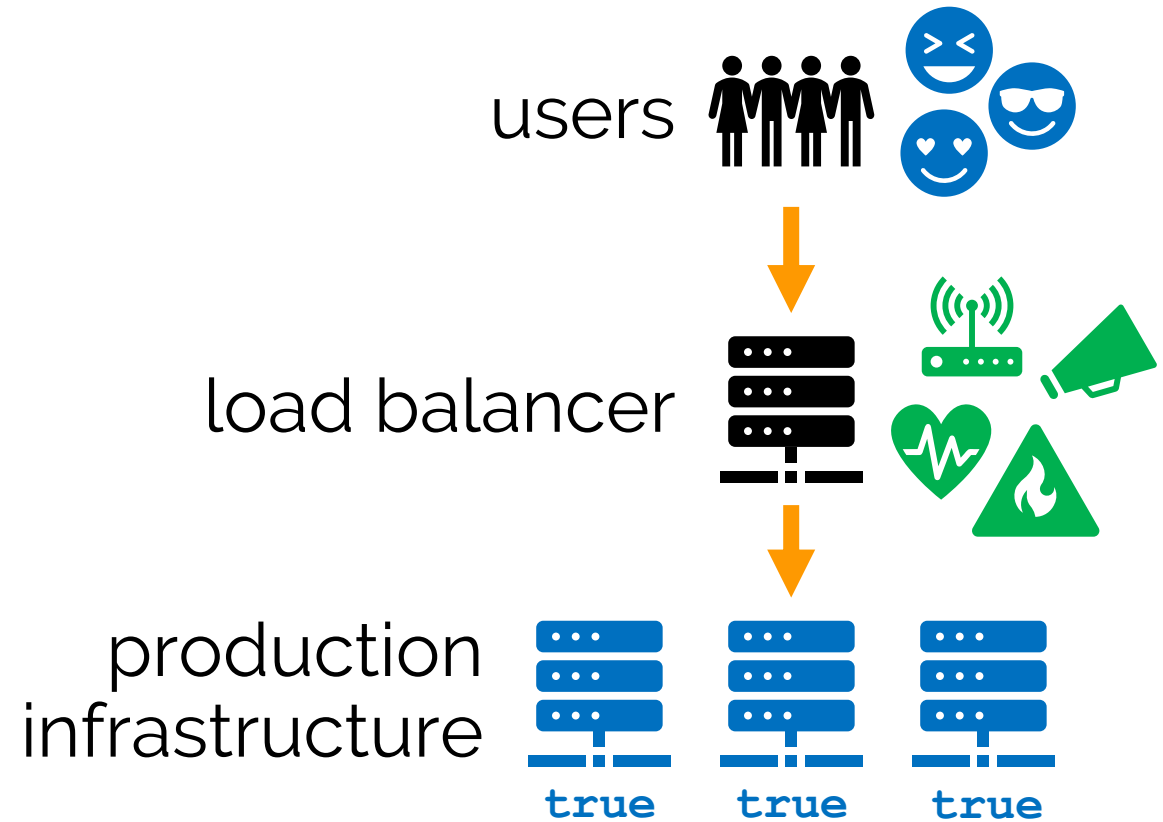
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Application-based Feature flags / toggles



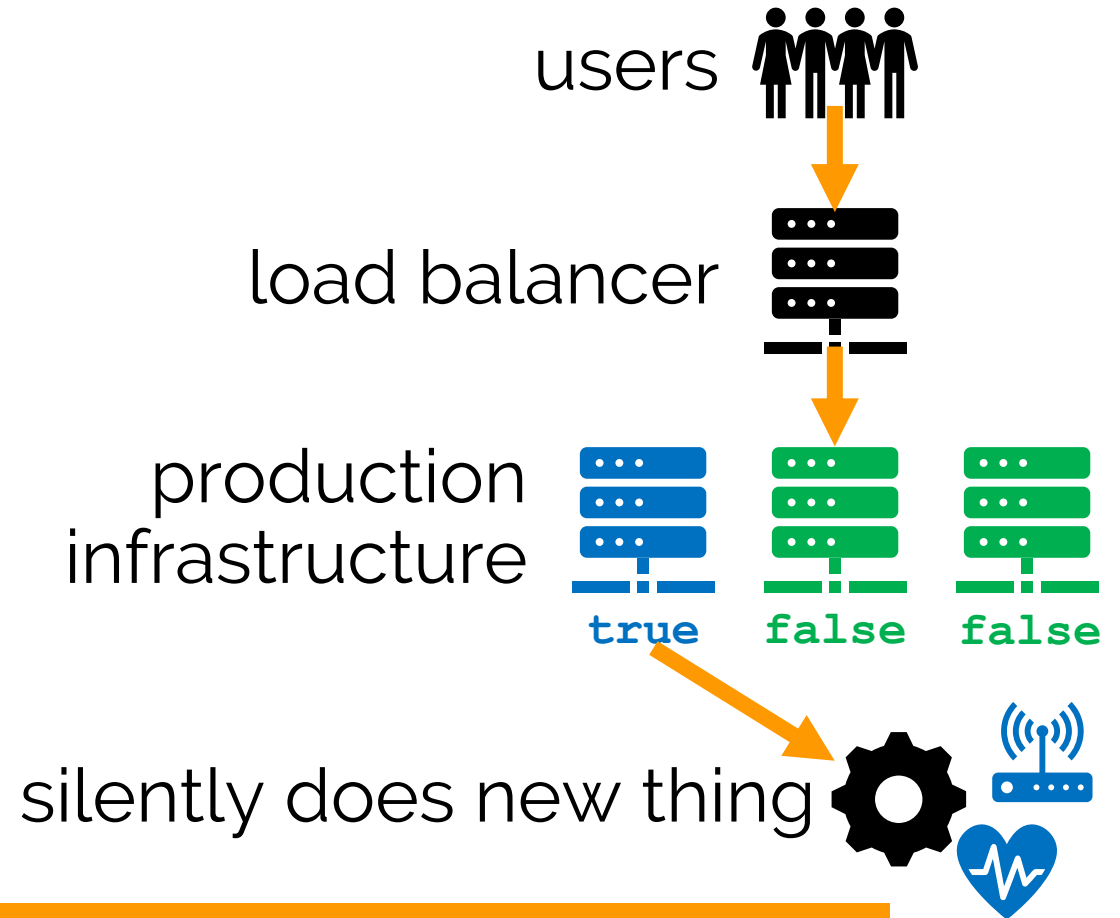
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Application-based Feature flags / toggles



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Application-based Dark launches



Zero Downtime Database Deployments

Release patterns

Environment-based

- Blue – Green deployments
- Canary
- Cluster immune system

Application-based

- Feature toggles
- Dark launches

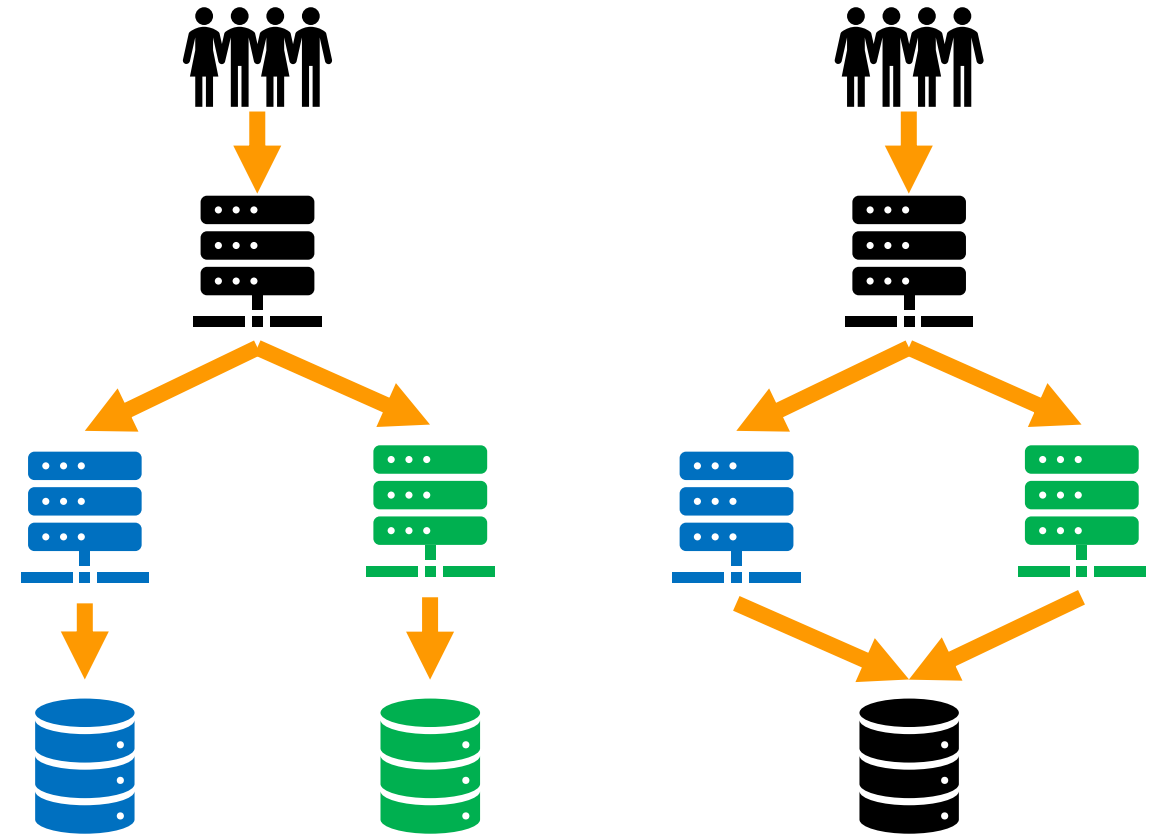
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Let's talk about data

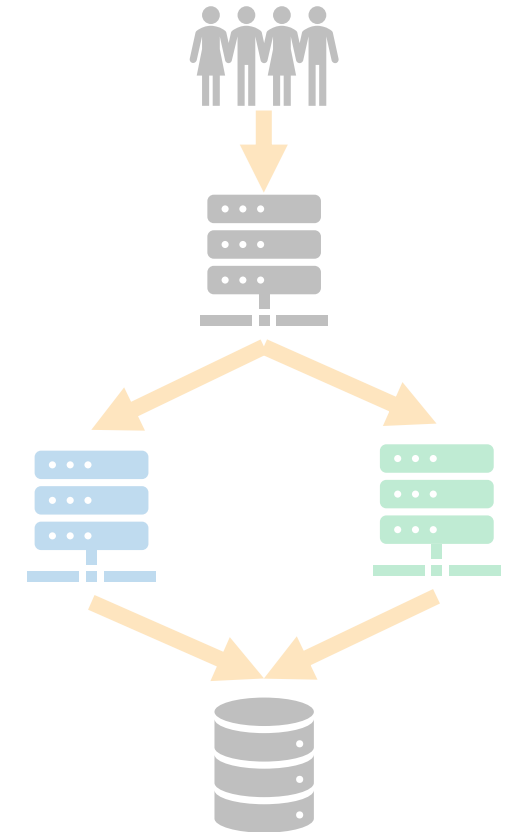
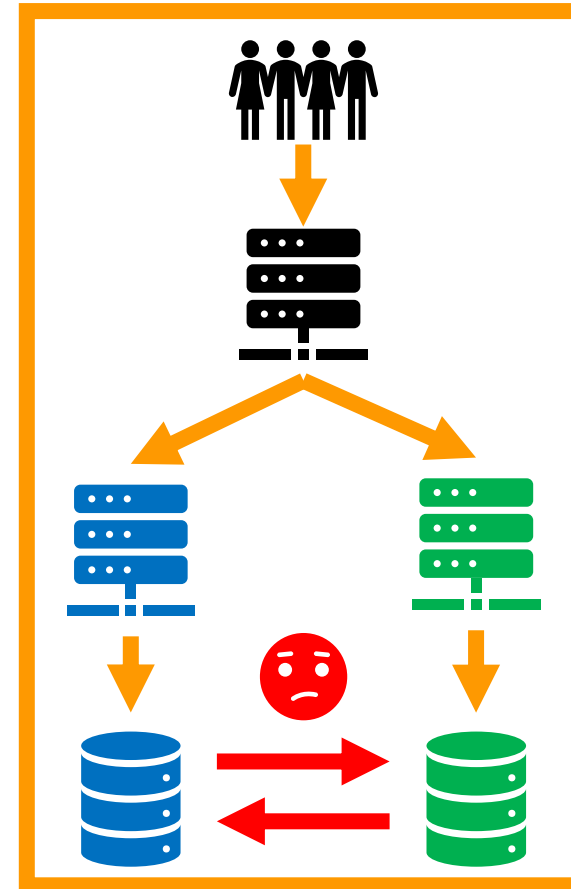
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Data and databases



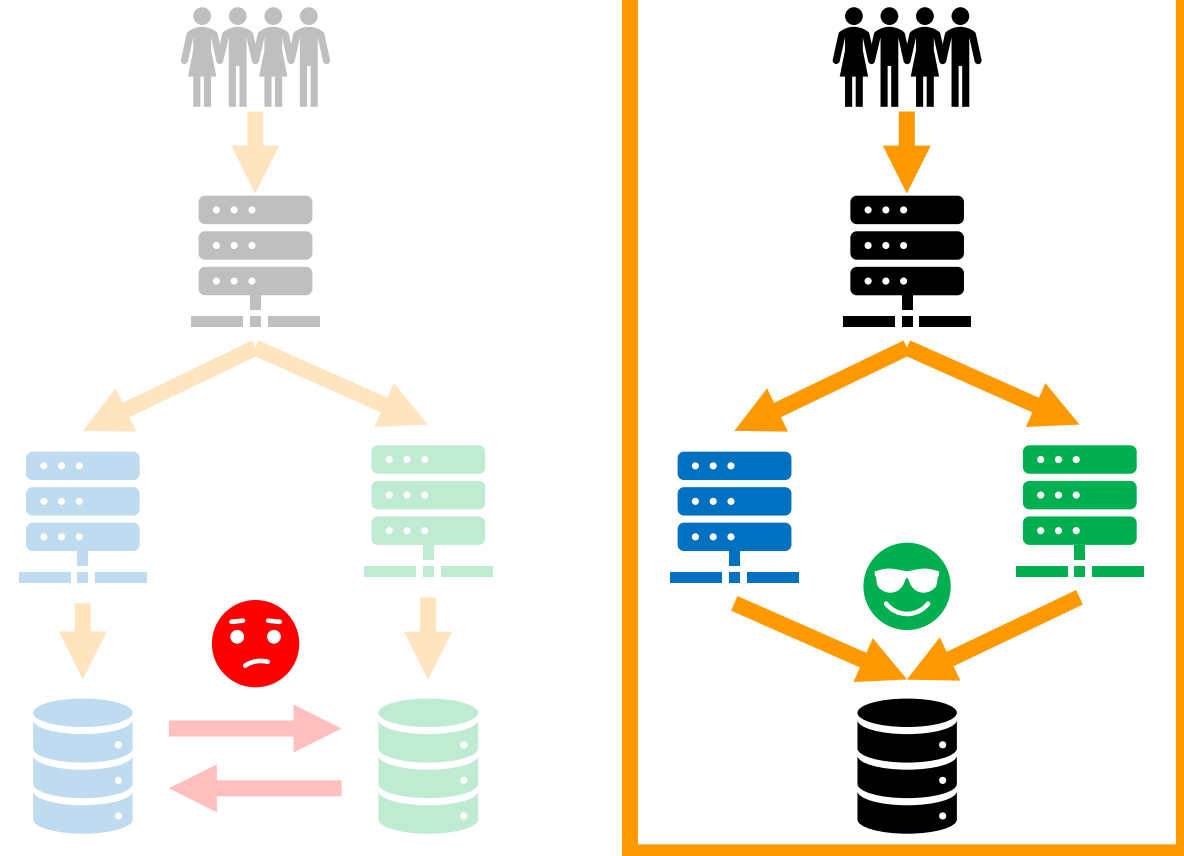
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Data and databases



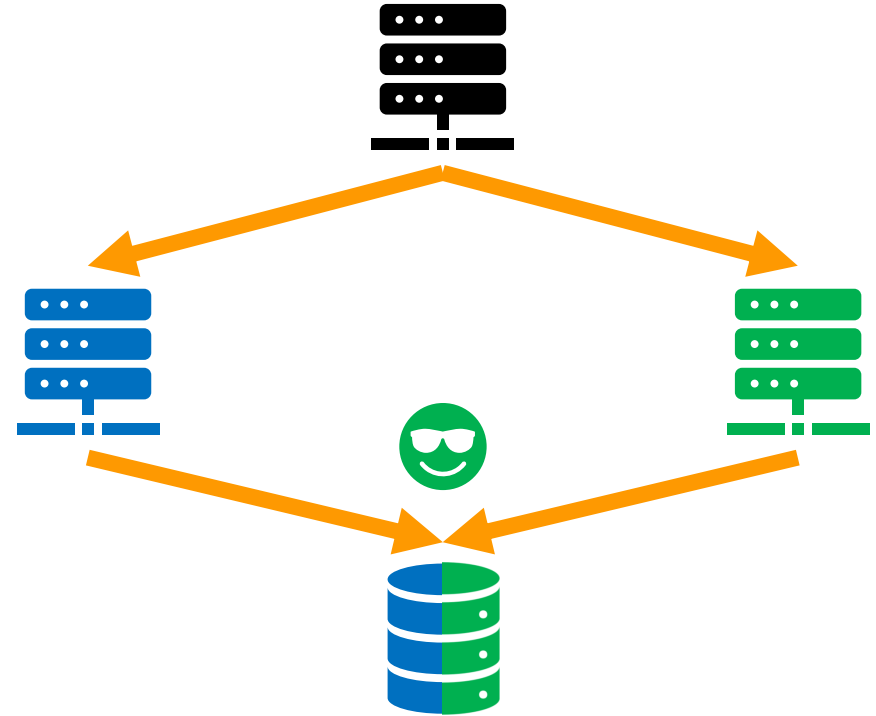
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Data and databases



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Data and databases



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Expand / Contract

1. Add the new column
2. Migrate data
3. Switch to the new column
4. Kill the old column

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Splitting a column



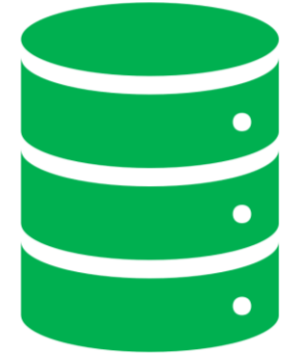
FullName
Martin Fowler
Pete Hodgeson
Danilo Sato

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Splitting a column



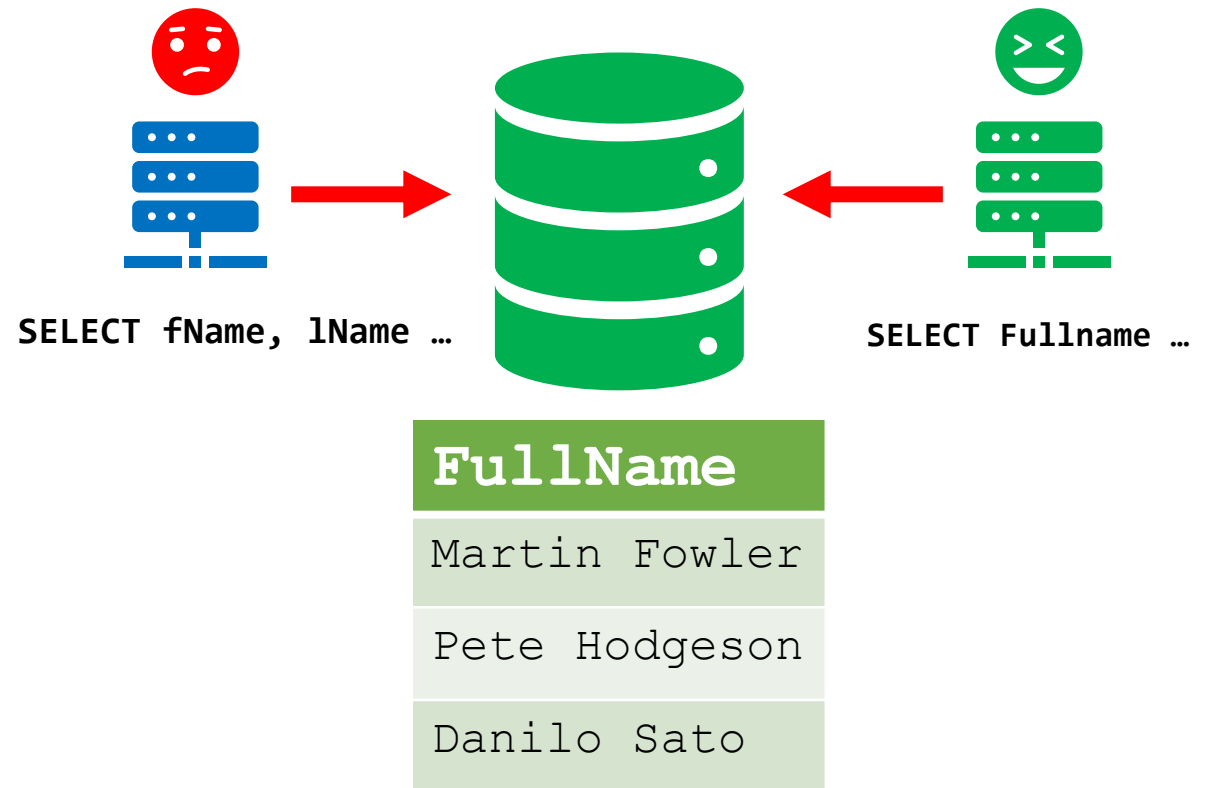
fName	lName
Martin	Fowler
Pete	Hodgeson
Danilo	Sato



FullName
Martin Fowler
Pete Hodgeson
Danilo Sato

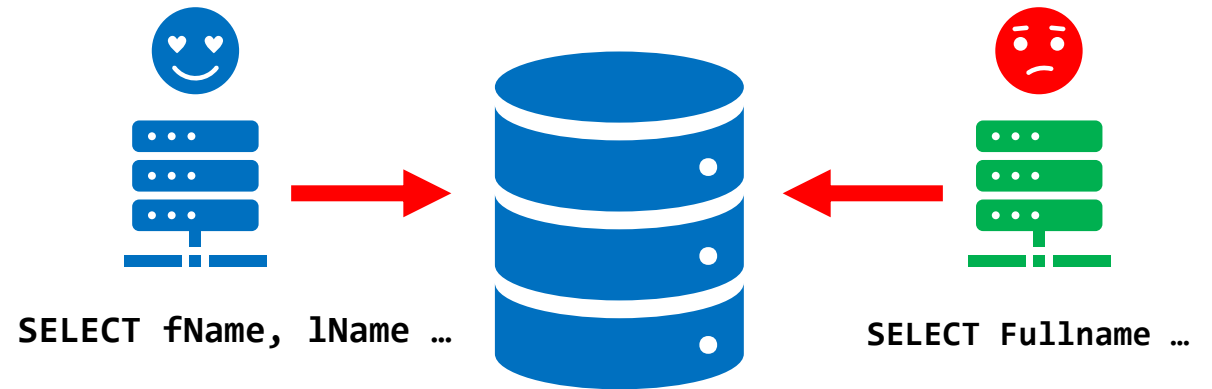
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Splitting a column



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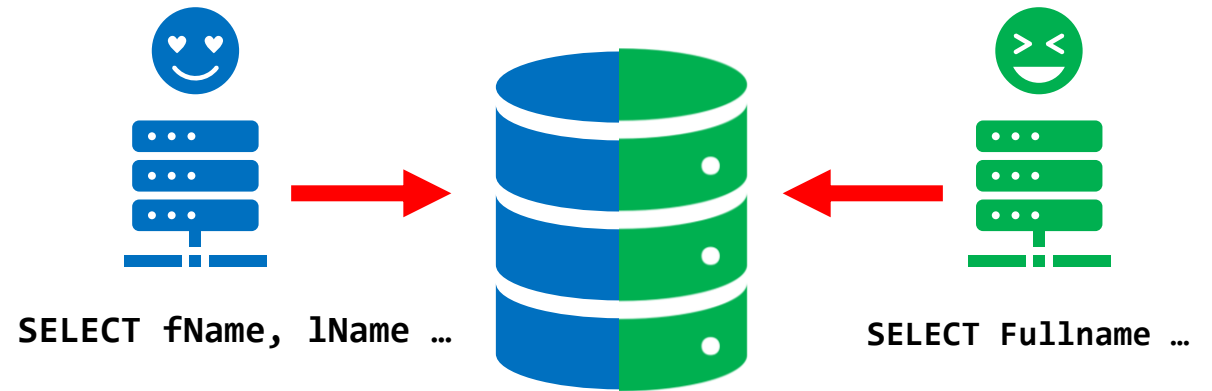
Splitting a column



fName	lName
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Danilo	Sato

Zero Downtime Database Deployments

Splitting a column



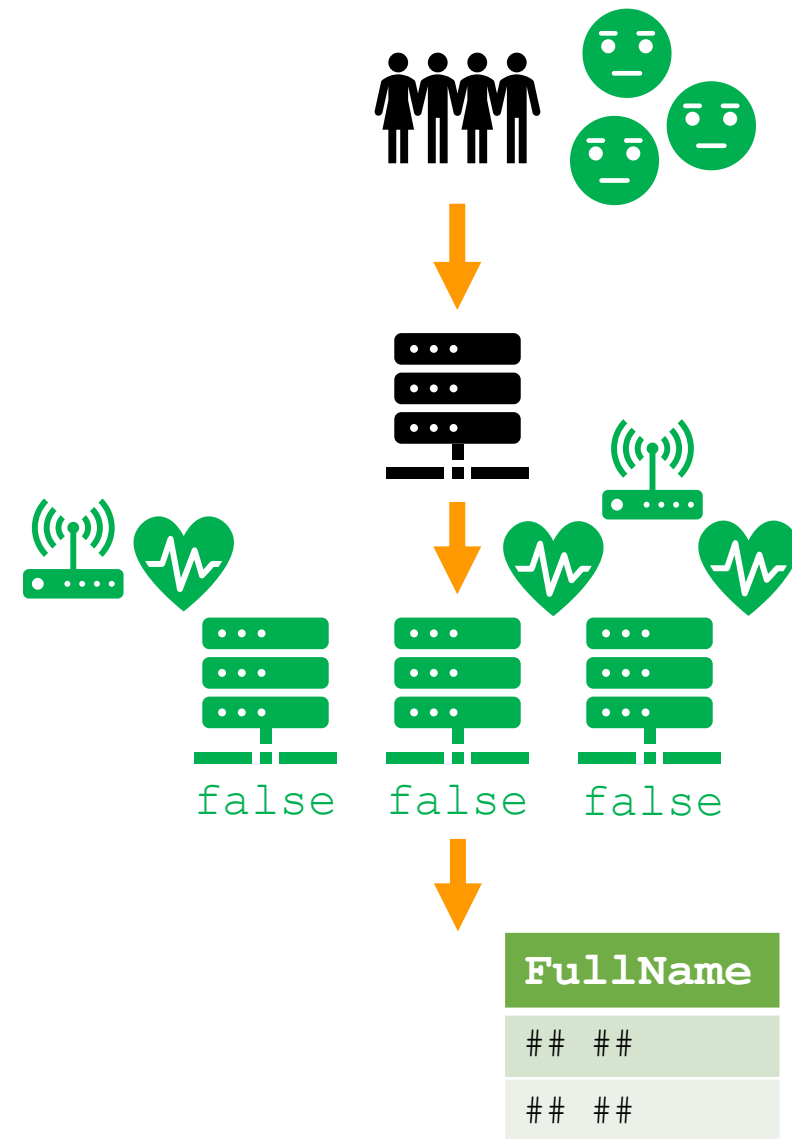
fName	lName	FullName
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Pete	Hodgeson	Pete Hodgeson
Danilo	Sato	Danilo Sato

Zero Downtime Database Deployments

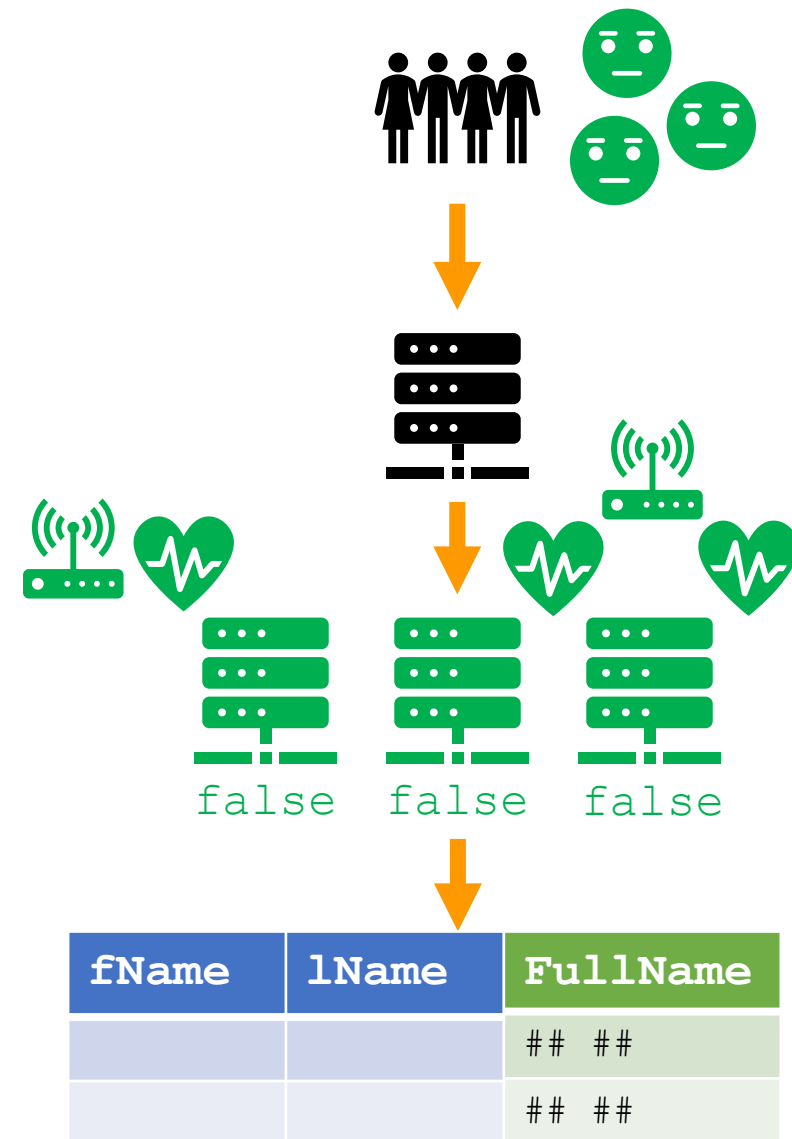


Let's put it all
together...

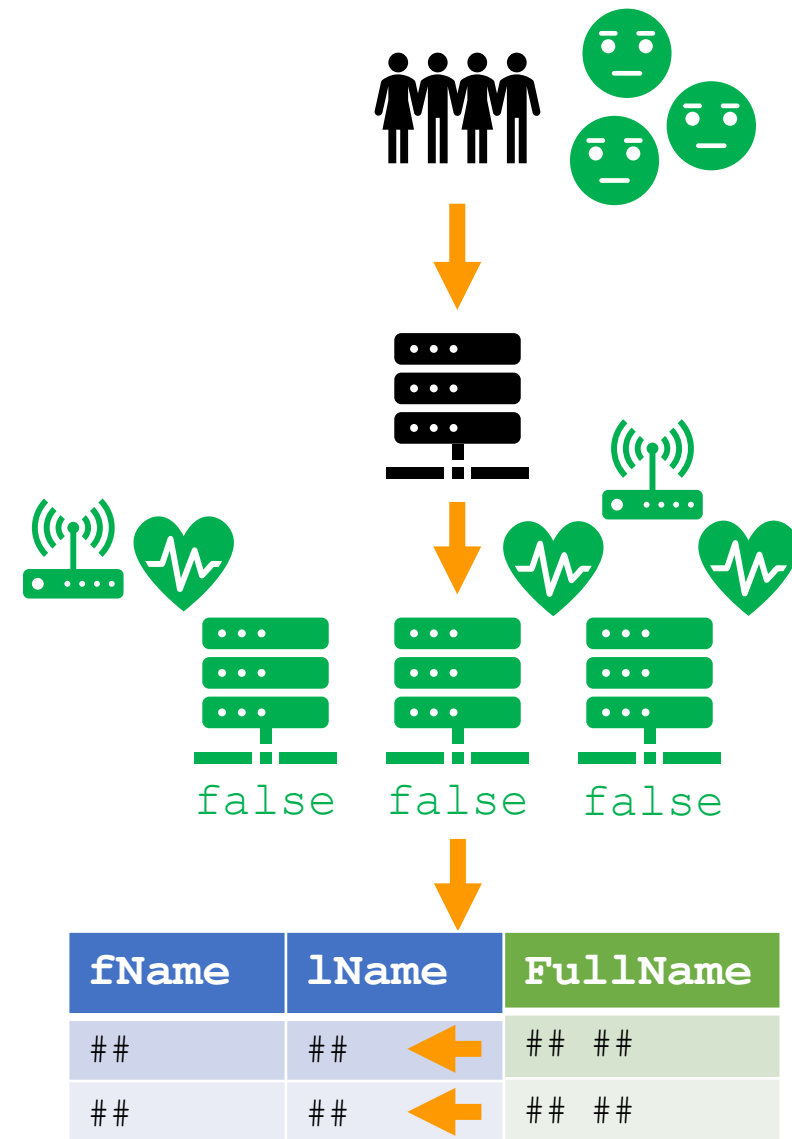
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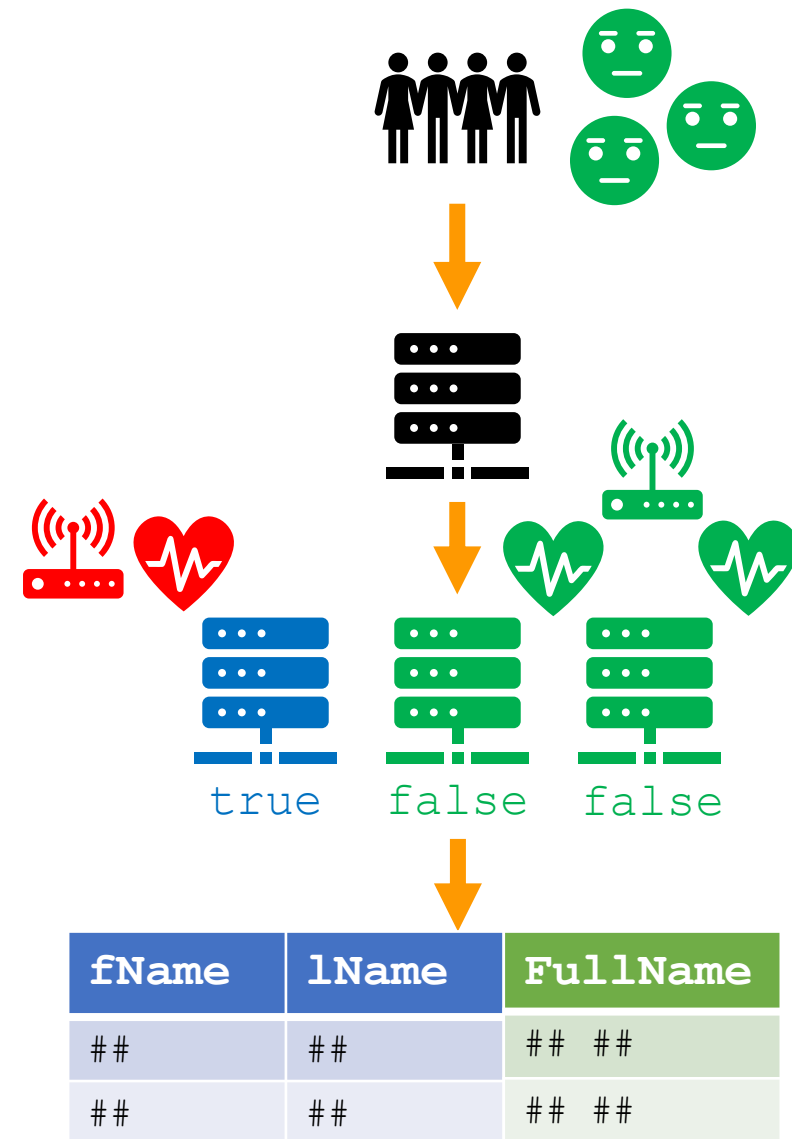
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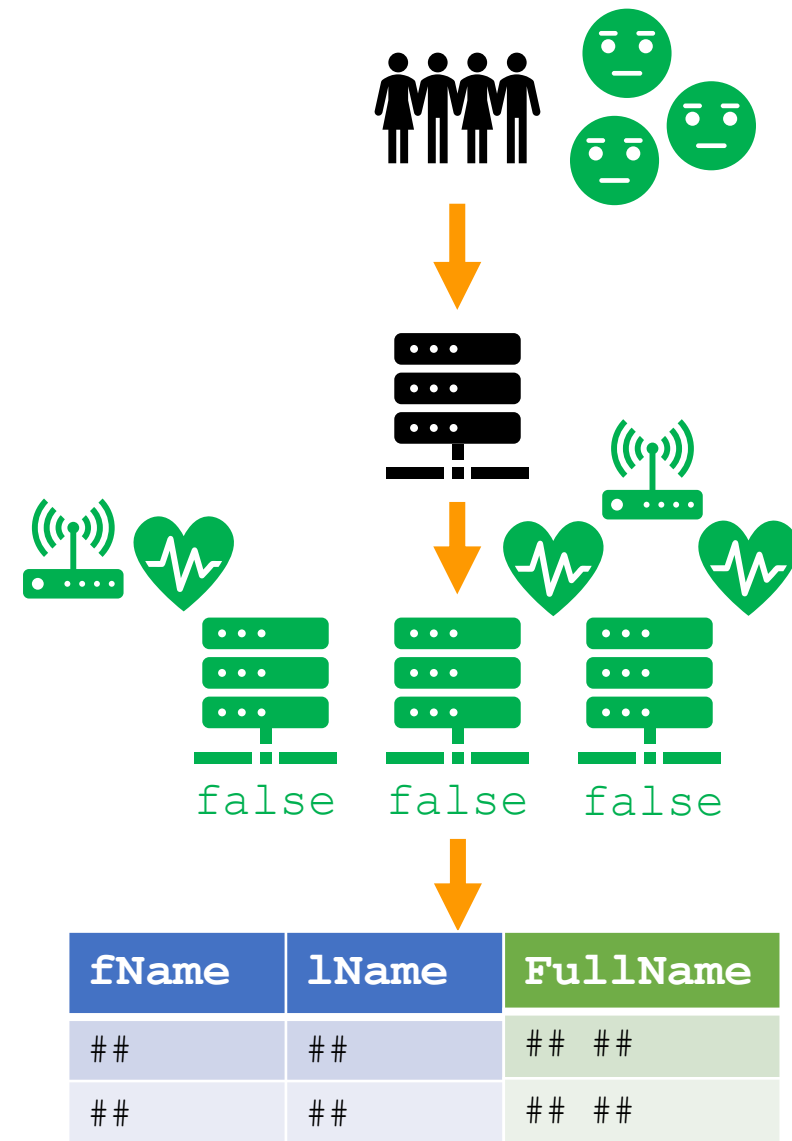
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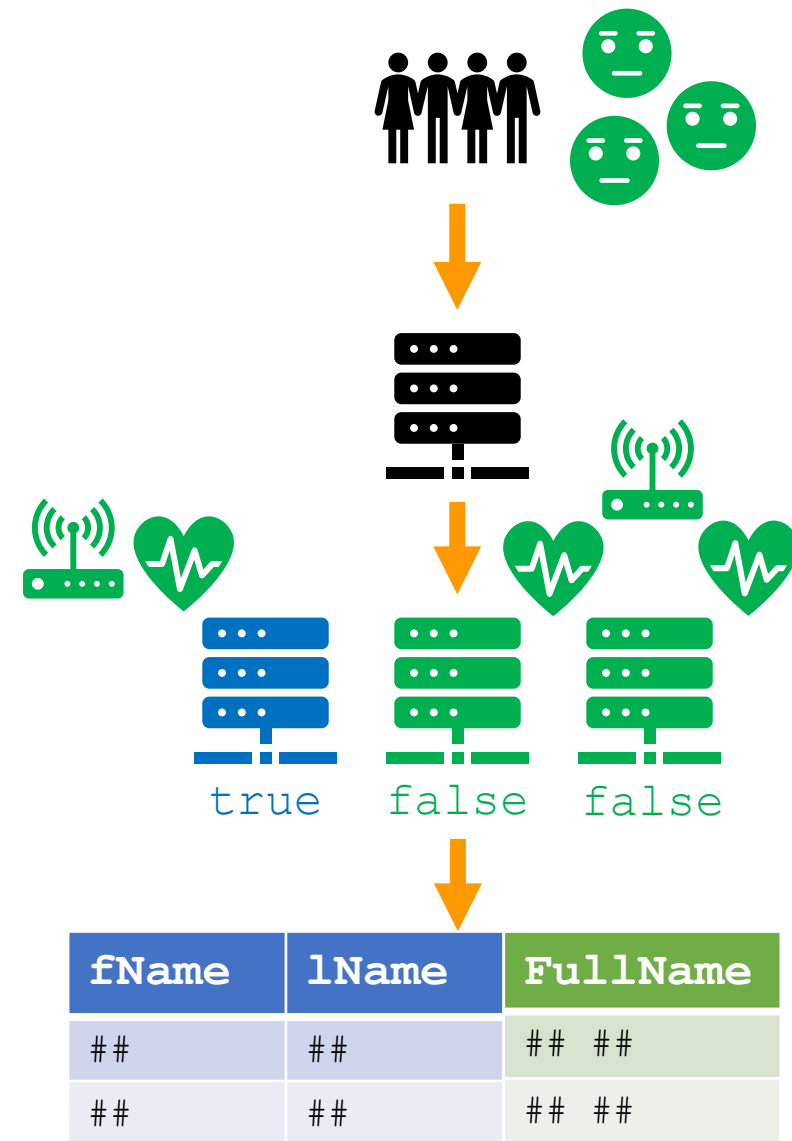
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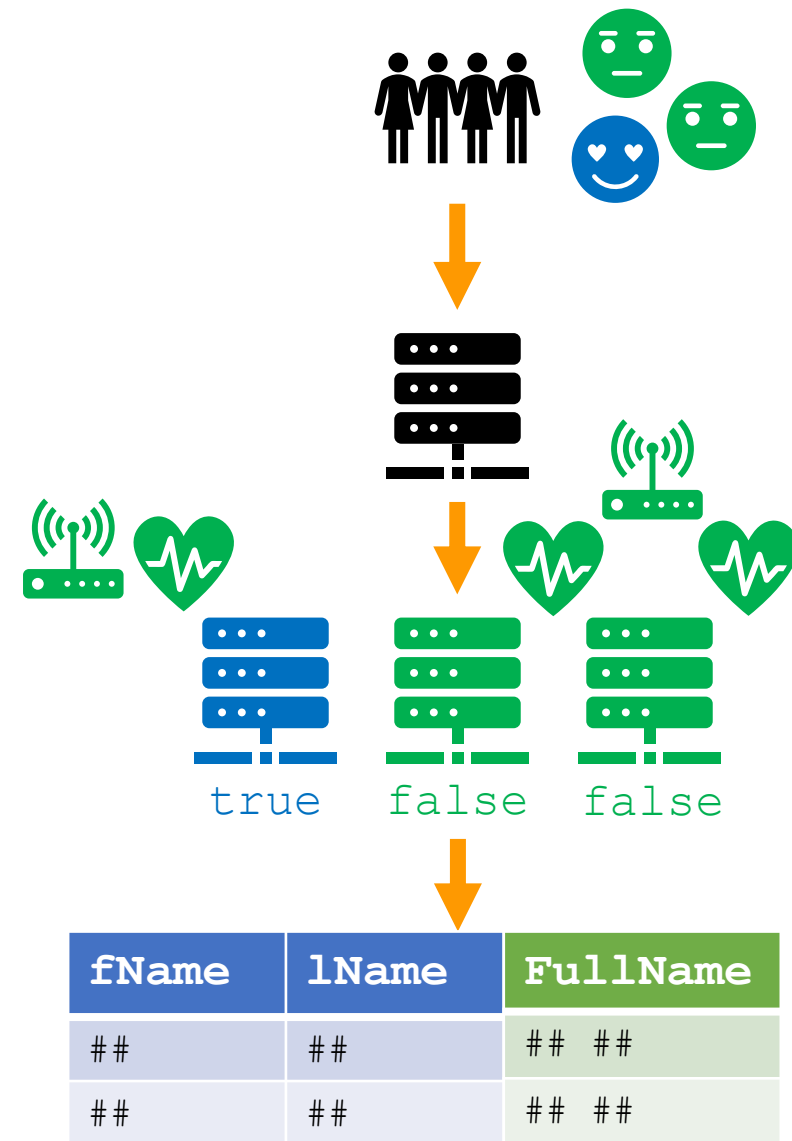
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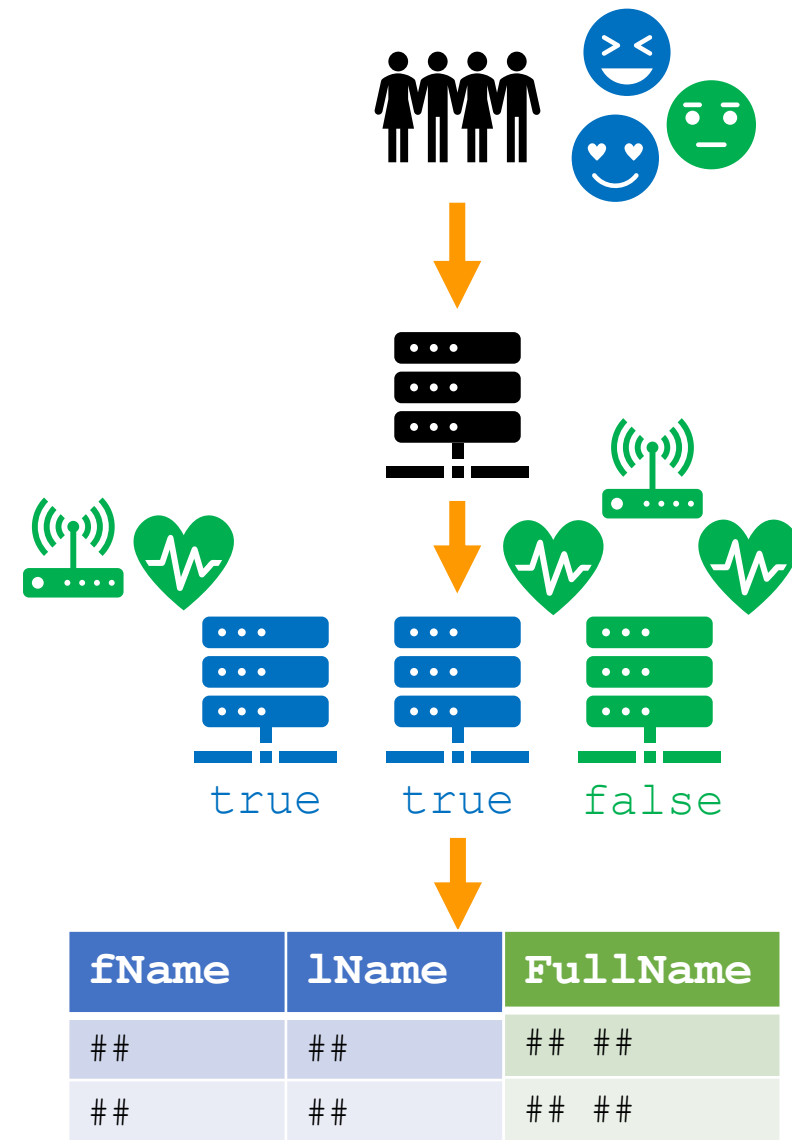
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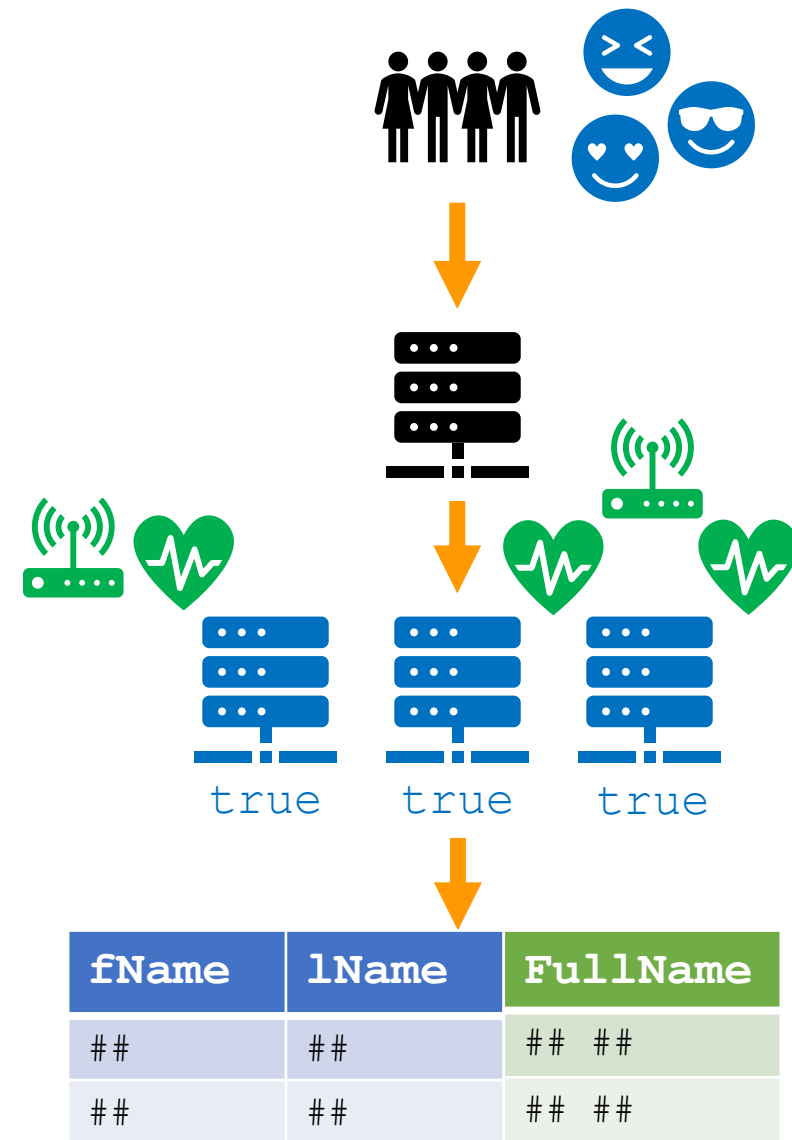
Zero Downtime Database Deployments



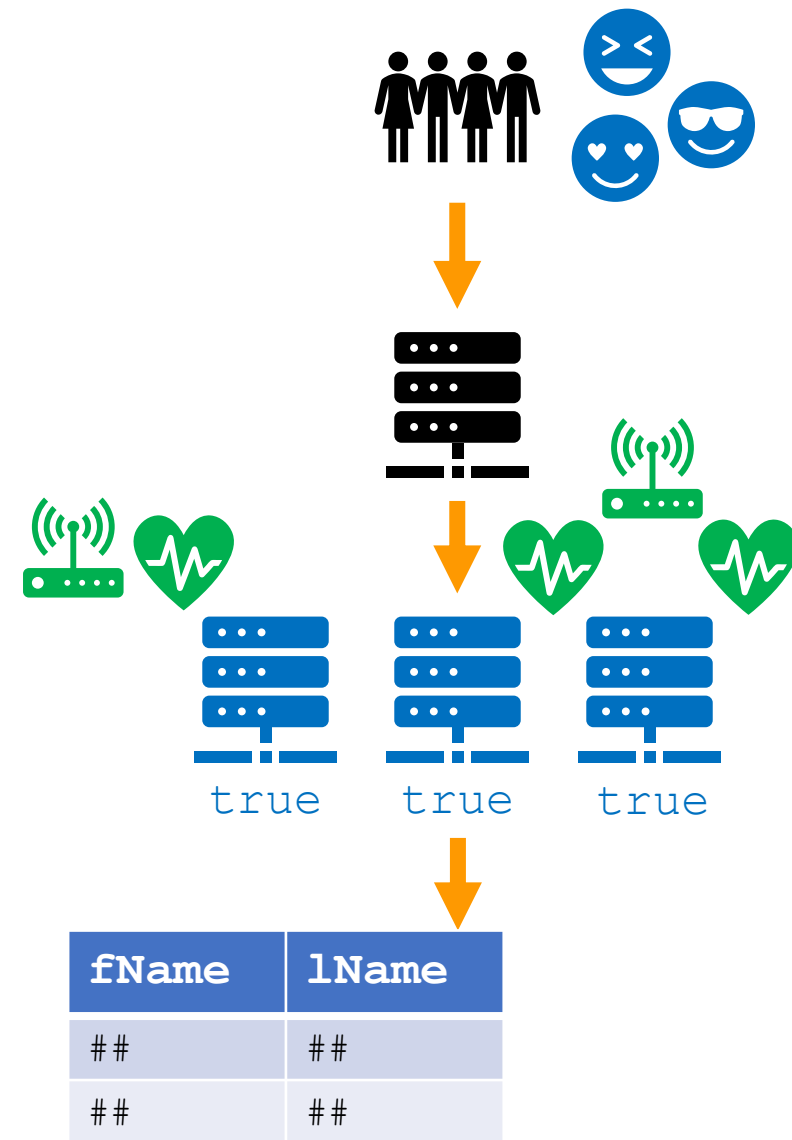
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Zero Downtime Database Deployments



Zero Downtime Database Deployments



Zero Downtime Database Deployments



Demo time!

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Further reading...

Blog posts:

- Deploy != Release (Art Gillespie)
blog.turbinelabs.io/deploy-not-equal-release-part-one-4724bc1e726b
- Feature Toggles (Pete Hodgeson)
martinfowler.com/articles/feature-toggles.html
- Parallel Change (Daniel Sato)
martinfowler.com/bliki/ParallelChange.html

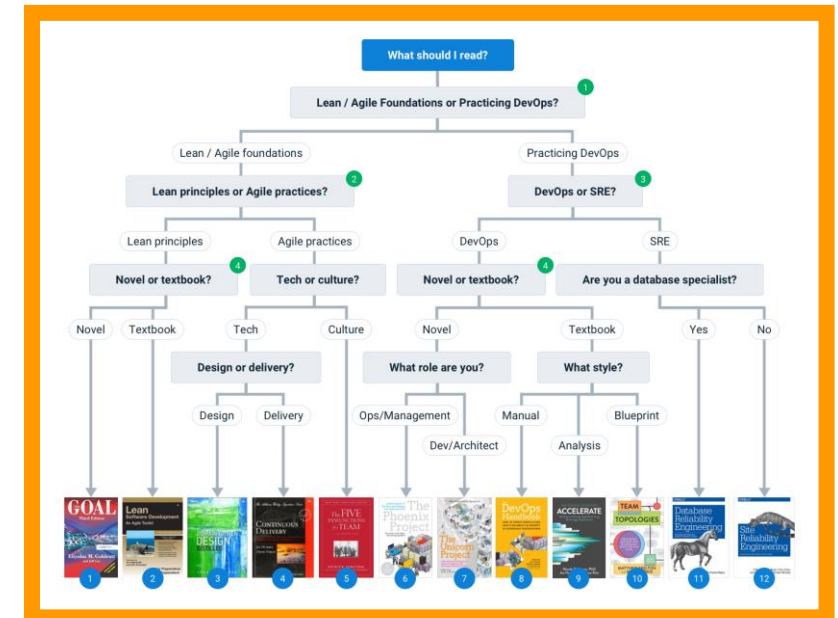
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Further reading...

The DevOps Reading List:

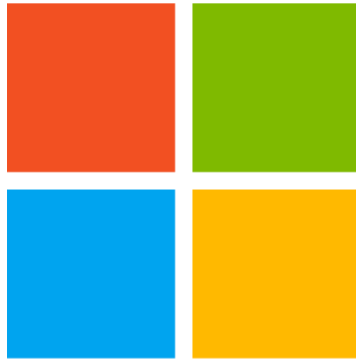
Choosing your next DevOps book

<https://octopus.com/blog/devops-reading-list>



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Special Thanks To



Microsoft

for supporting

DataPlatformGeeks & SQLServerGeeks

Community Initiatives



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Thank You

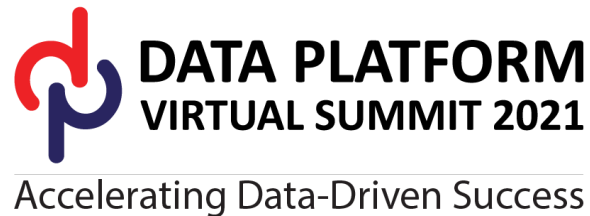
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alex.yates@dmlmconsultants.com
@_AlexYates_

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