

# SAVE YOURSELF FROM A DISASTER

REDUNDANCY ON A BUDGET

FABIO CICERCHIA

### Save Yourself From a Disaster

### Redundancy on a budget

### Fabio Cicerchia

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# Introduction

What can we learn from the latest major cloud incident (ie. burning OVH datacenter)? **Do not put** all your eggs in one basket!

The only certain thing is that it's not a matter of IF there'll be a disaster, but rather WHEN so better be not caught off guard.

We should repeat this over and over, until it becomes our mantra: better safe than sorry.



Fire at OVH Strasbourg Site

By having a look at DownDetector¹ you can find plenty of more outages (unfortunately), like:

- OVH in 2021<sup>2</sup>
- Facebook in 2021<sup>3</sup>
- Google in 20204
- Cloudflare & Verizon in 2019<sup>5</sup>
- AWS in 2017<sup>6</sup>

¹https://downdetector.com/

<sup>&</sup>lt;sup>2</sup>https://www.ovh.com/world/news/press/cpl1787.fire-our-strasbourg-site

<sup>&</sup>lt;sup>3</sup>https://www.techradar.com/news/whatsapp-instagram-facebook-messenger-down

<sup>&</sup>lt;sup>4</sup>https://www.semrush.com/blog/google-down-how-users-experienced-google-major-outage/

 $<sup>^{5}</sup>https://blog.cloudflare.com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-offline-today/linear-com/how-verizon-and-a-bgp-optimizer-knocked-large-parts-of-the-internet-of-th$ 

<sup>6</sup>https://www.datacenterknowledge.com/archives/2017/03/02/aws-outage-that-broke-the-internet-caused-by-mistyped-command

# Why this Book?

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### **Convention Used**

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### **Code Examples**

### **Author**

### **Disclaimer**

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### **Cloud as a Saviour**

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### **Distributed Systems**

# **Action Plan**

# **Required Concepts**

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### **CAP Theorem**

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### **Consensus**

# **First Things First**

### **Secure the Database**

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### **Backups**

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### mysqldump

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### xtrabackup

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#### **Rotation**

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### **Remote Storage**

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#### Infrastructure as Code

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### **Local Storage**

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### **Security**

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### **Restore**

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### **Security**

### **Secure the Storage**

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### **Backups**

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### Option #1: Remote VM

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### **Option #2: Cloud-Native Storage**

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### Restore

# **Quick Solutions**

# **Redundancy of Database**

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### Redundancy

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### **SSL Connection**

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### Replica

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### Approach #1: Primary/Secondary (or Primary/Primary)

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### **Approach #2: Group Replication**

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### Spin up multiple nodes

Redundancy of Database 14

### **Approach #1: Primary/Secondary (or Primary/Primary)**

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### **Approach #2: Group Replication**

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### **Security**

# **Redundancy of Storage**

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### **Distributed Storage**

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### **Quick & Dirty: Cross Sync**

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### **Security**

### **Redundancy of Web Servers**

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### **Duplicate VM**

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### **Docker**

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#### **Docker Swarm**

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### Setup

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### **Deployment**

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### **Security**

### **Docker Compose**

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### **Ingress**

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#### **Nginx**

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#### **Traefik**

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### **TLS Termination**

# **Enhancements**

# **Redundancy of DNS**

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### **DNS Round-Robin**

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### **Secondary DNS**

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### **Inspecting TTLs**

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### **Manual Switch**

# **Manual Configurations**

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### **Tools**

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### **Creating VMs**

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### **Provisioning**

# **Billing Impact**

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### **Original Cost**

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### **Upgrade Cost**

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### **Cost Optimization**

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### **Reduce Backup Retention**

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#### **Avoid the Static Clone**

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### **Scaleway Stardust VPS**

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### **Replace DigitalOcean**

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### **DNS Fallback**

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### Sum Up

### **Disaster Recovery Plan**

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### **Plan Ahead**

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### **Possible Failures**

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### **Outline**

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### **DRP Templates**

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### **Scenarios**

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### Your Data Center goes in flame

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### Your environment got compromised

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### Ransomware got your files

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### Ransomware got your database

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#### **Serve Static Website**

# **Play with Providers**

# **Complete Solutions**

# **Redundancy of Storage**

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### **Distributed Storage**

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### **Ad-Hoc Solutions**

### **Redundancy of Database**

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### Replica

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### Approach #3: Galera Replica

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### **Balancing requests**

# **Redundancy of Web Servers**

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### **Kubernetes**

# **Bonus**

# **Redis**

# **ElasticSearch**

# MongoDB

# **Email**

# **Experimenting**

# Logs

# **Passwords & 2FAs**

# **Shared Drive**

# **Version Control System**