

# Amadeus Technology Journey

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A user driven Open Source  
roadmap experience



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Security & Communication Systems

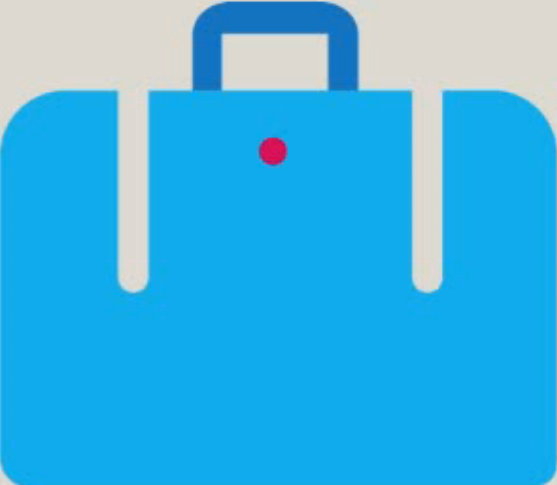
# Amadeus in a few words

Amadeus is a technology company dedicated to the **global travel industry**.

We are present in **195 countries** with a worldwide team of more than 12,000 people.

Our solutions help improve the **business performance** of travel agencies, corporations, airlines, airports, hotels, railways and more.





# Amadeus Products example



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# Amadeus Constraints

High volume

July 2015:

- At peak: **~300 000 queries per second**
- Average: **~210 000 queries per second**

Thousands (and thousands) of application servers

**100000+ GB** of compressed data logged every day



# Robust global operations

**1.6+**

**billion**

data requests  
processed per day

**525+**

**million**

travel agency  
bookings  
processed in 2014

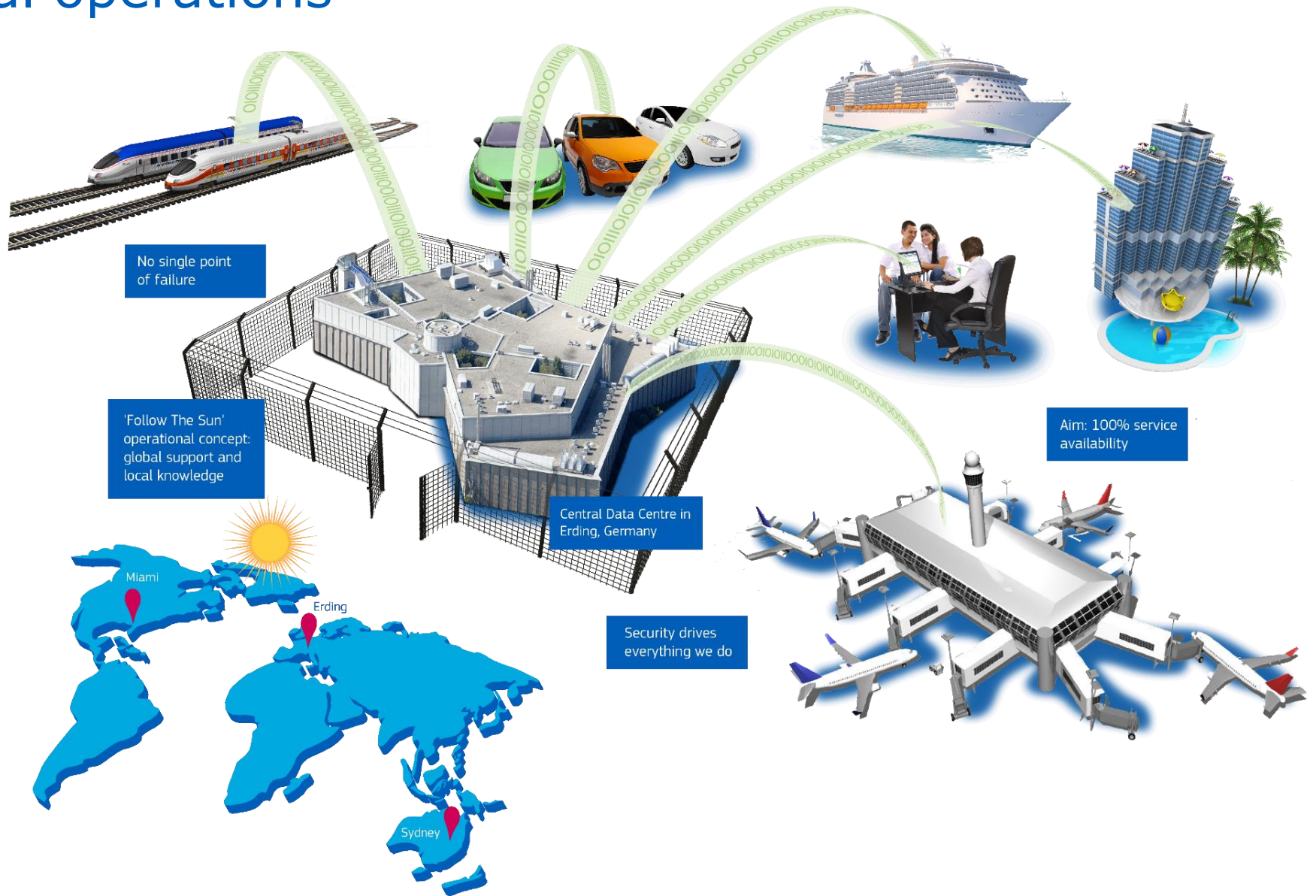
**695+**

**million**

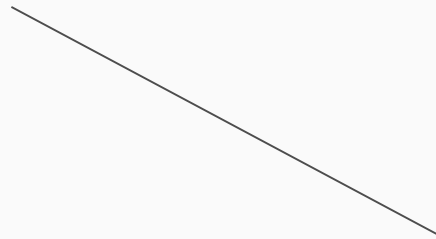
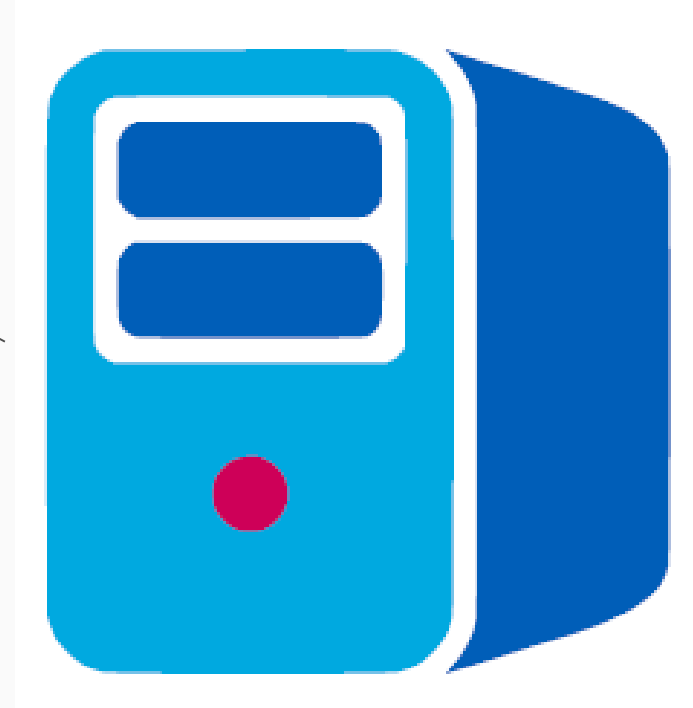
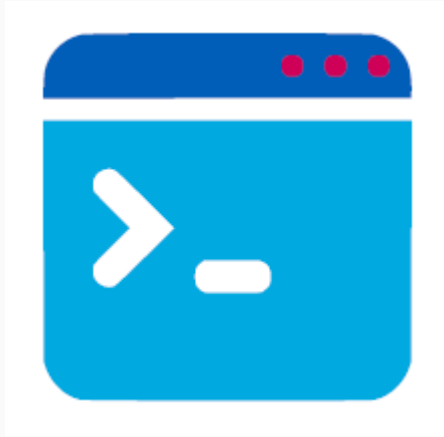
Passengers  
Boarded (PBs)  
in 2014

**95%**

of the world's  
scheduled  
network airline  
seats



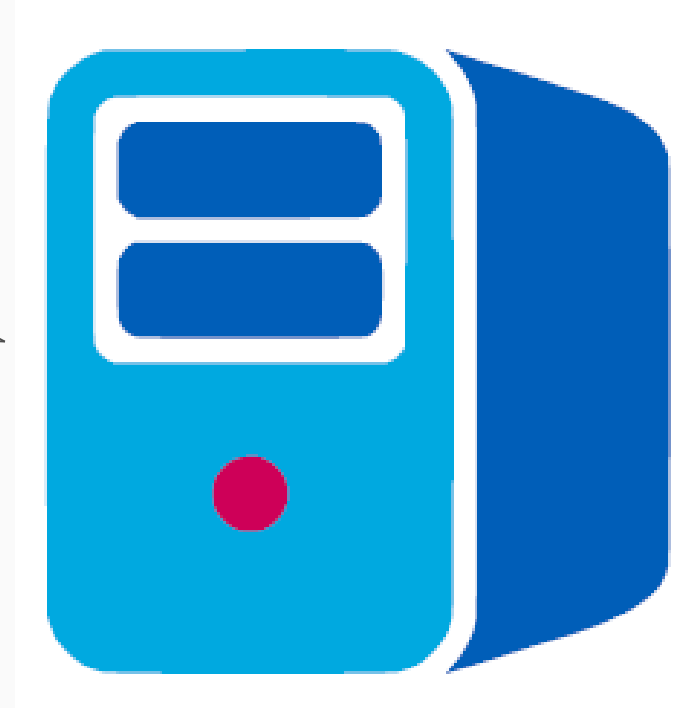
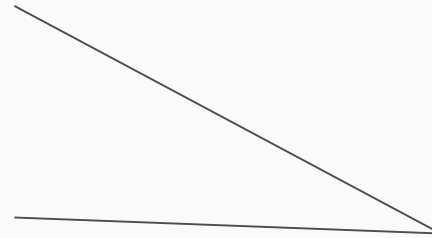
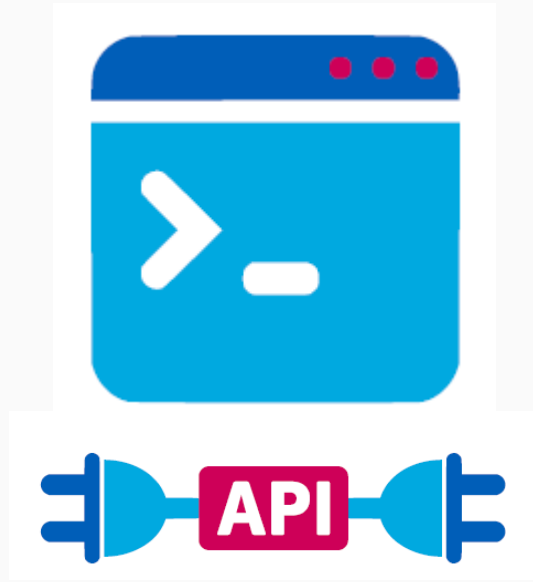
1987 - 2006



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1987 - 2006

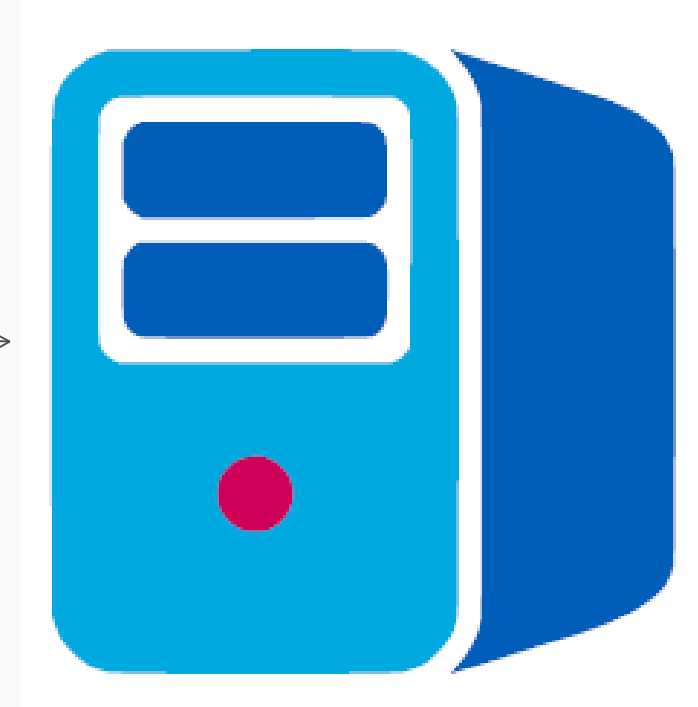
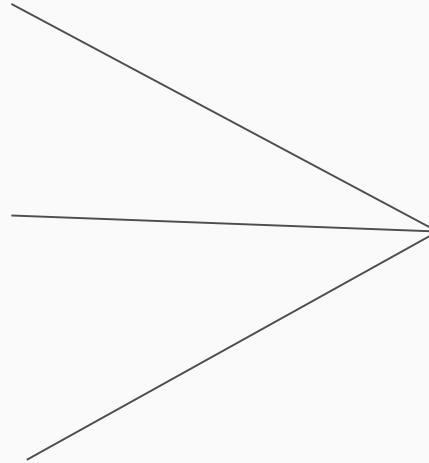
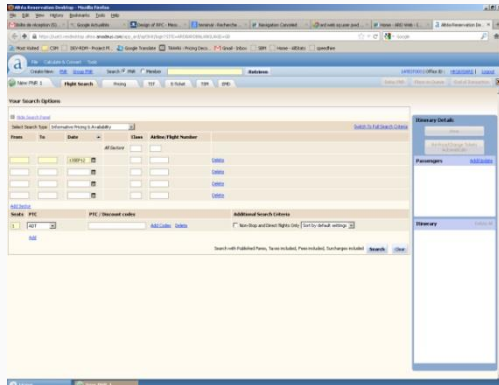
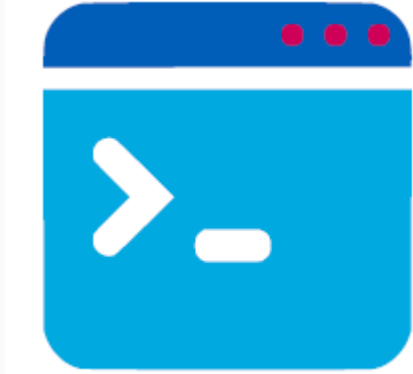


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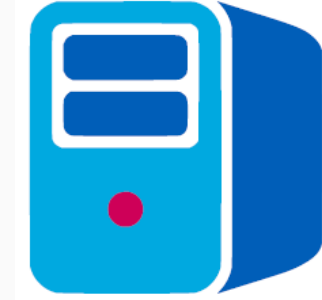
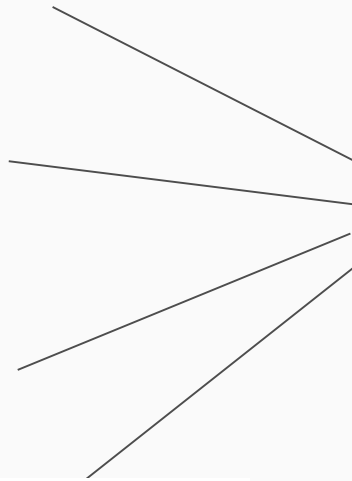
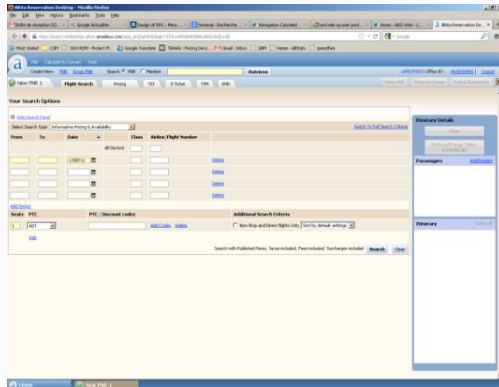
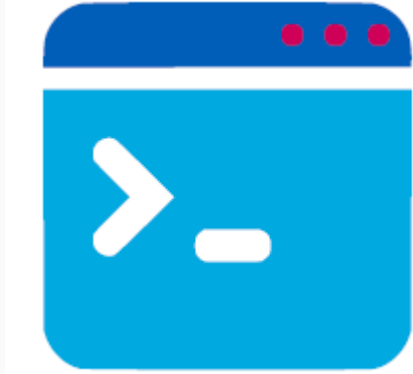
# 1987 - 2006



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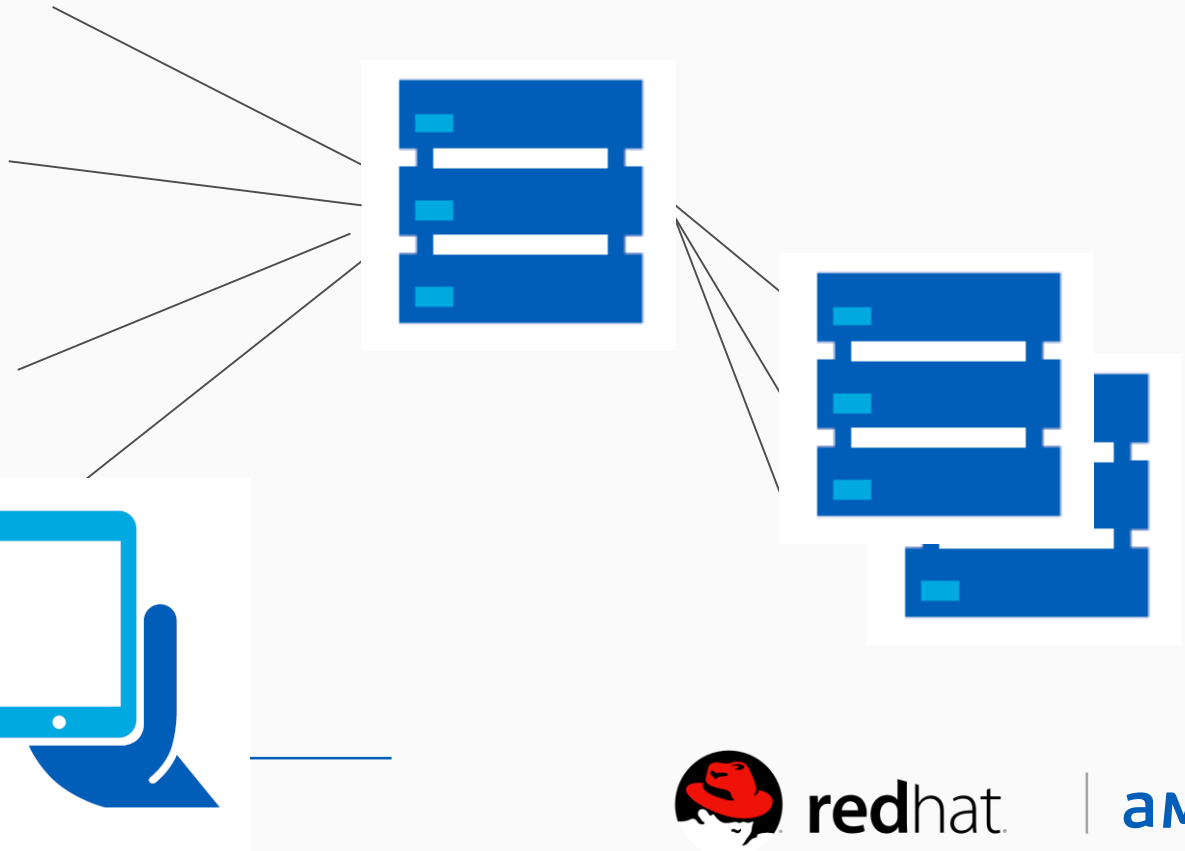
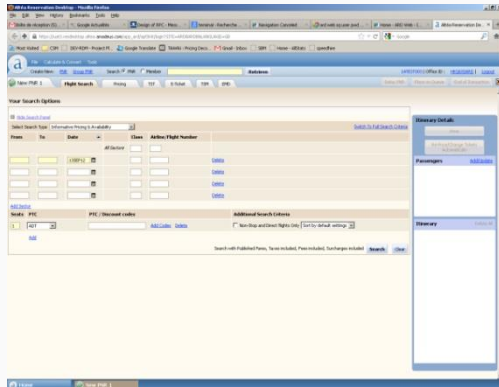
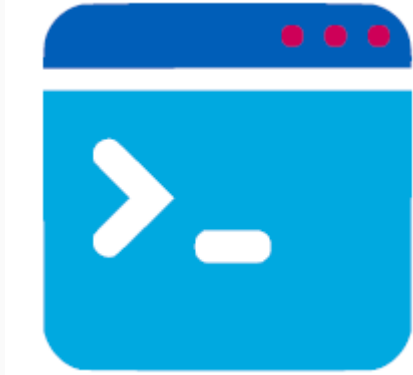
# 2006 - 2014



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# 2006 - 2016



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# Amadeus System

## Where we are

- Large distributed system (SOA)
  - 5000+ “micro” services
- One data-center + disaster-recovery site
- Thousands of servers
  - x86-64 Linux servers
  - Pre-configured upfront for specific tasks
  - N+x model as servers can't be replaced quickly
  - Servers Roles cannot be changed



# Amadeus System

Where we are

— Large dis

- 5000+ "r

— One data

— Thousand

- x86-64 L
- Pre-confi
- N+x mod
- Servers P

**170\_APE**  
(ngiap170.muc.amadeus.net)

**051\_APE**  
(ngivp051.muc.amadeus.net)

**437\_RES**  
(sbrap437.muc.amadeus.net)



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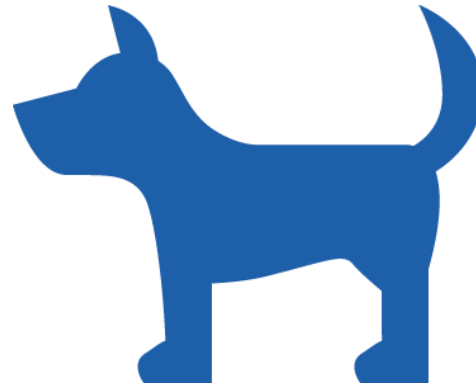
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# Amadeus System

Where we are

- Large
  - 500
- One
- Tho
  - x86
  - Pre
  - N+
  - Ser

Despite the number of servers  
largely managed as pets



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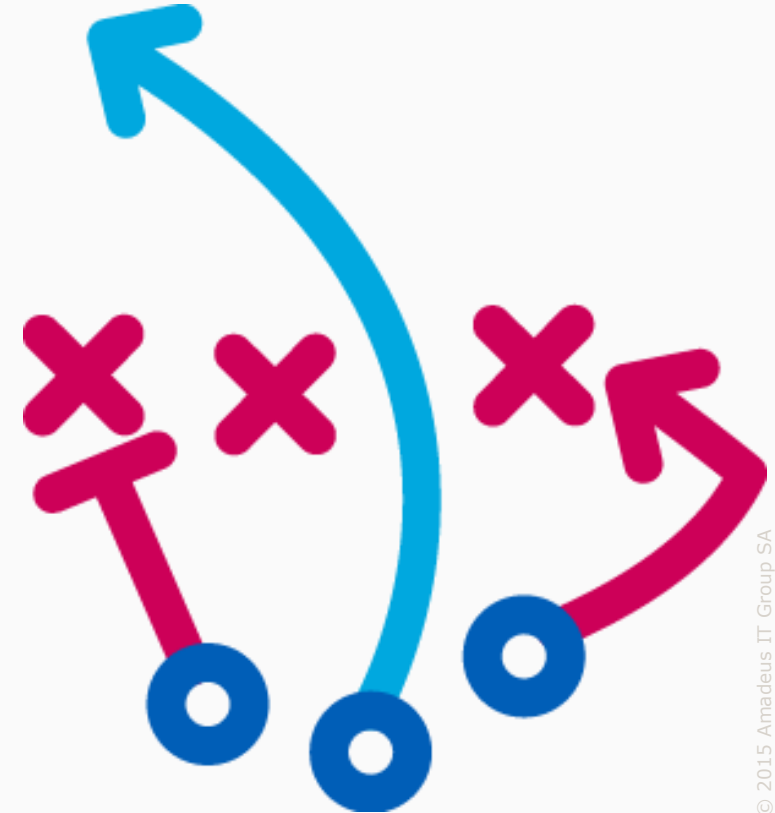
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# 2015 - ...

## Where we are going

### — Move away from traditional data-center model

- Better use of resources
- Flexibility/Agility
- Higher availability
- Multiple data-centers capability
- Public/Private Cloud capability
- IaaS Agnostic



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# 2015 - ...

Where we are going

— Move

- Bet
- Flex
- Hig
- Mul
- Pub
- Iaa

## Paradigm Shift



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# Paradigm Shift

Application centric deployment

— Deploy the application **as a whole**  
With **all** its dependencies

- ✓ Reproducibility
- ✓ Technology agnostic
- ✓ Homogeneity
- ✓ Simplify operations



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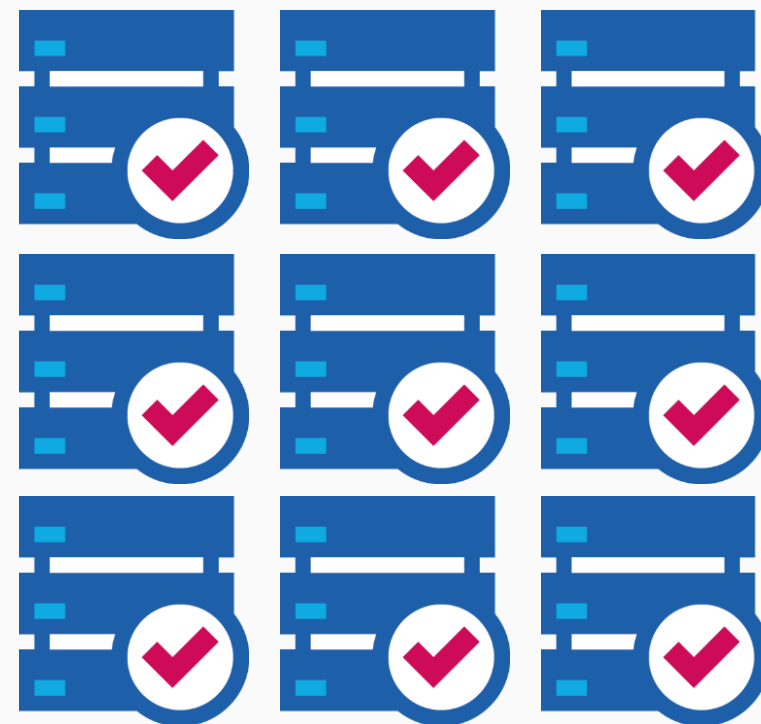
# Paradigm Shift

Instances anywhere

— Manage a cluster **as a whole**

- ✓ Any task on any server
- ✓ Start tasks in the cluster

Decouple **what** should run  
from **where** it should run




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**Partnership**



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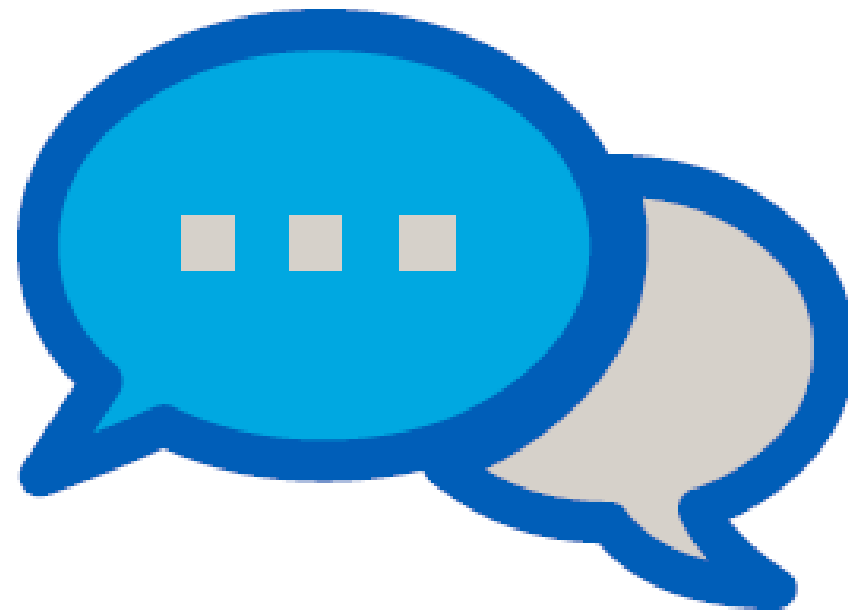


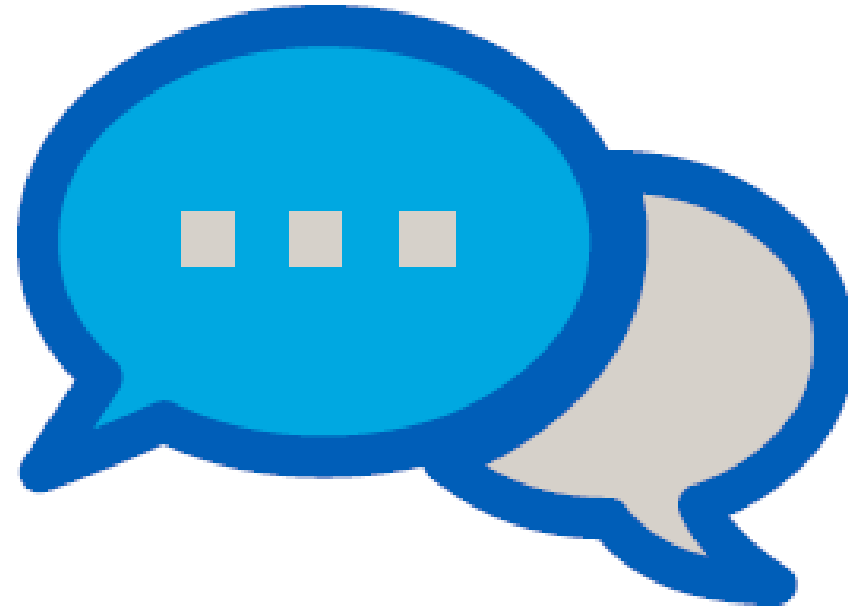
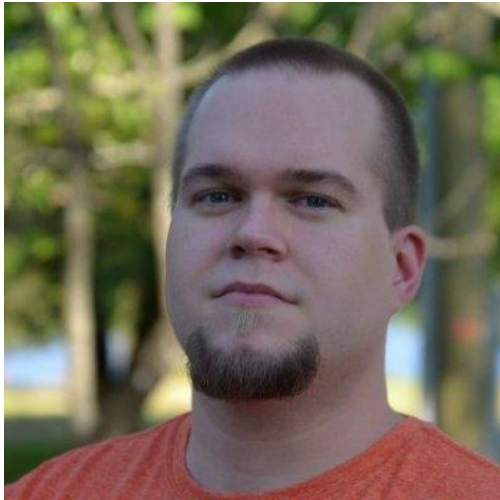
 redhat.

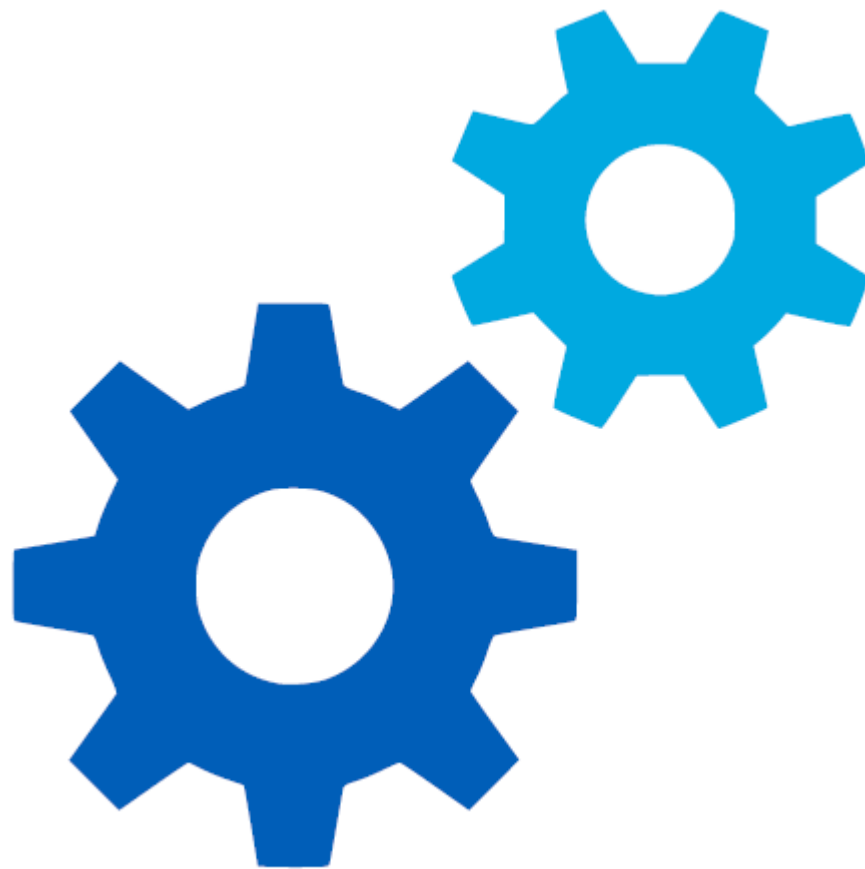
**RED HAT  
SUMMIT**

SAN FRANCISCO, CA  
APRIL 14-17, 2014









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# Amadeus' Benefits

- \_ Contribute to the community
  - \_ Passion
- \_ Benefit from the community
  - \_ Internal Adoption
- \_ Exchange with the community
  - \_ Understand, knowledge



# Red Hat's Benefits

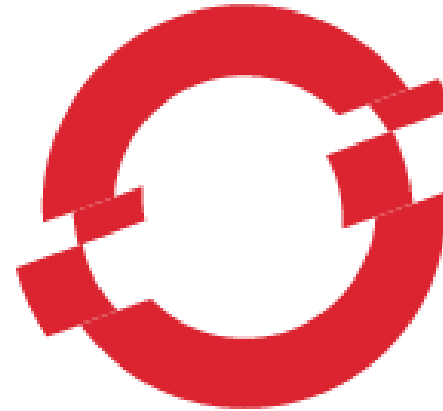
- \_ User Driven roadmap
- \_ Early adopters





# Status on our Deployment

# Technological Stack



**OPENSIFT**



redhat |

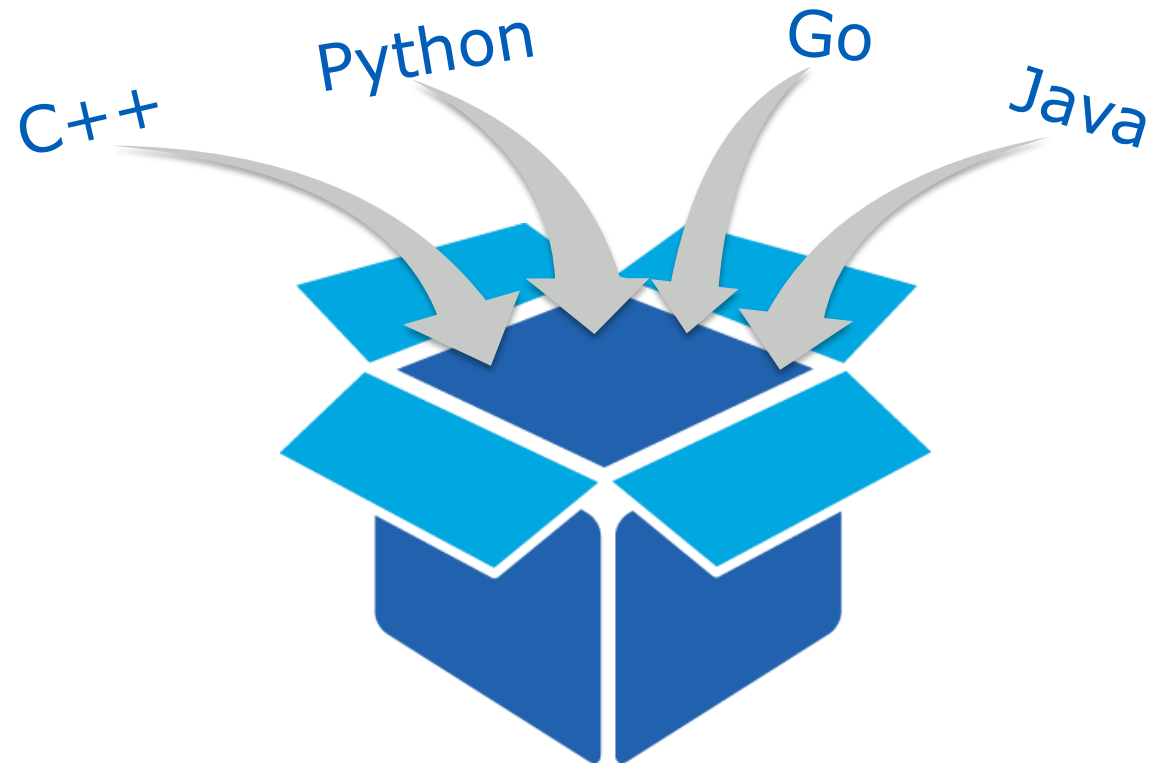
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What **OPENS**HIFT does for us

# Operational Model

— Homogenization: everything looks the same !



# Extensible – Few constraints

- Not just HTTP
- We use our own protocol over TCP
  - Kind of HTTP/2 but before it was invented
- What we needed to keep:
  - Low latency
  - Keeping connection open
  - Multiplexing

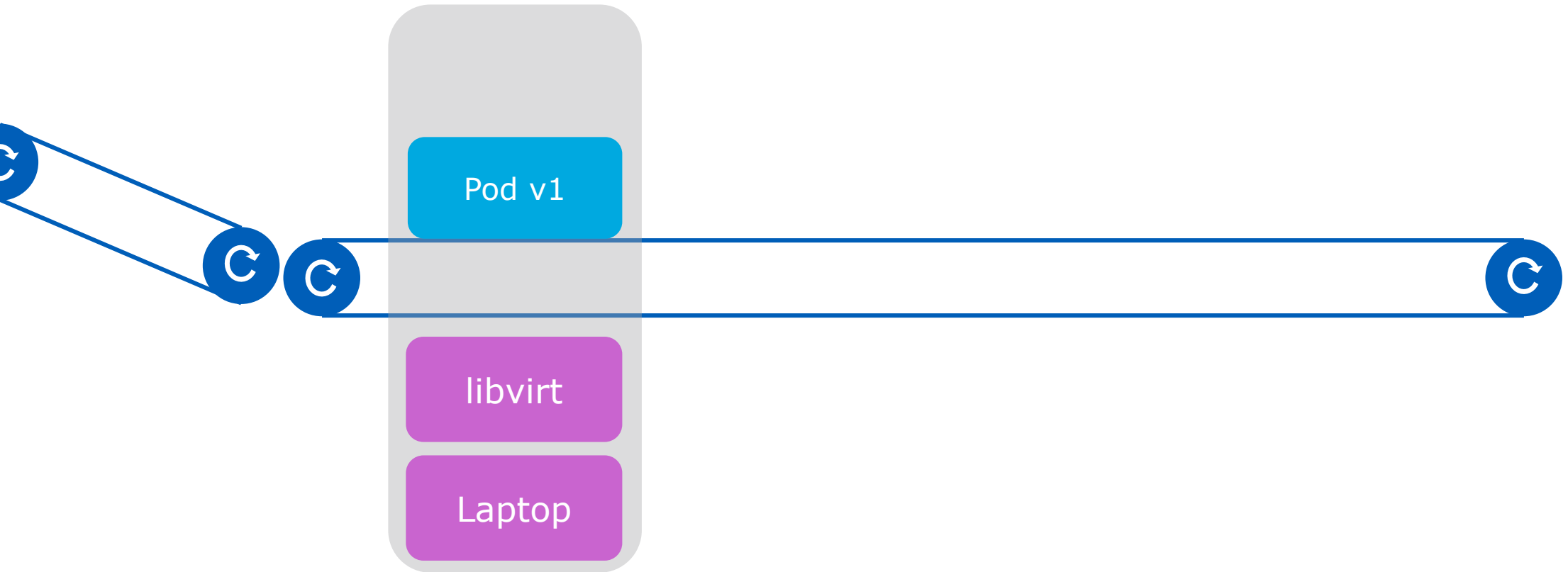


# Easy deployment

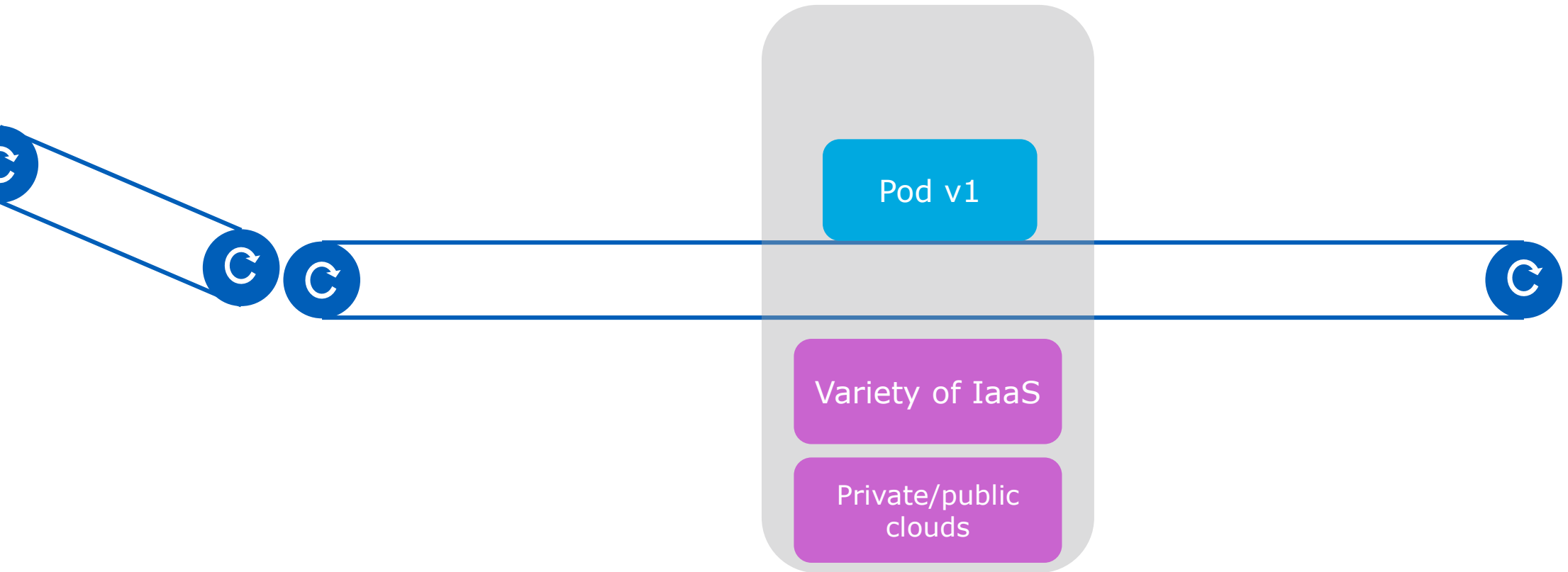




# Easy deployment



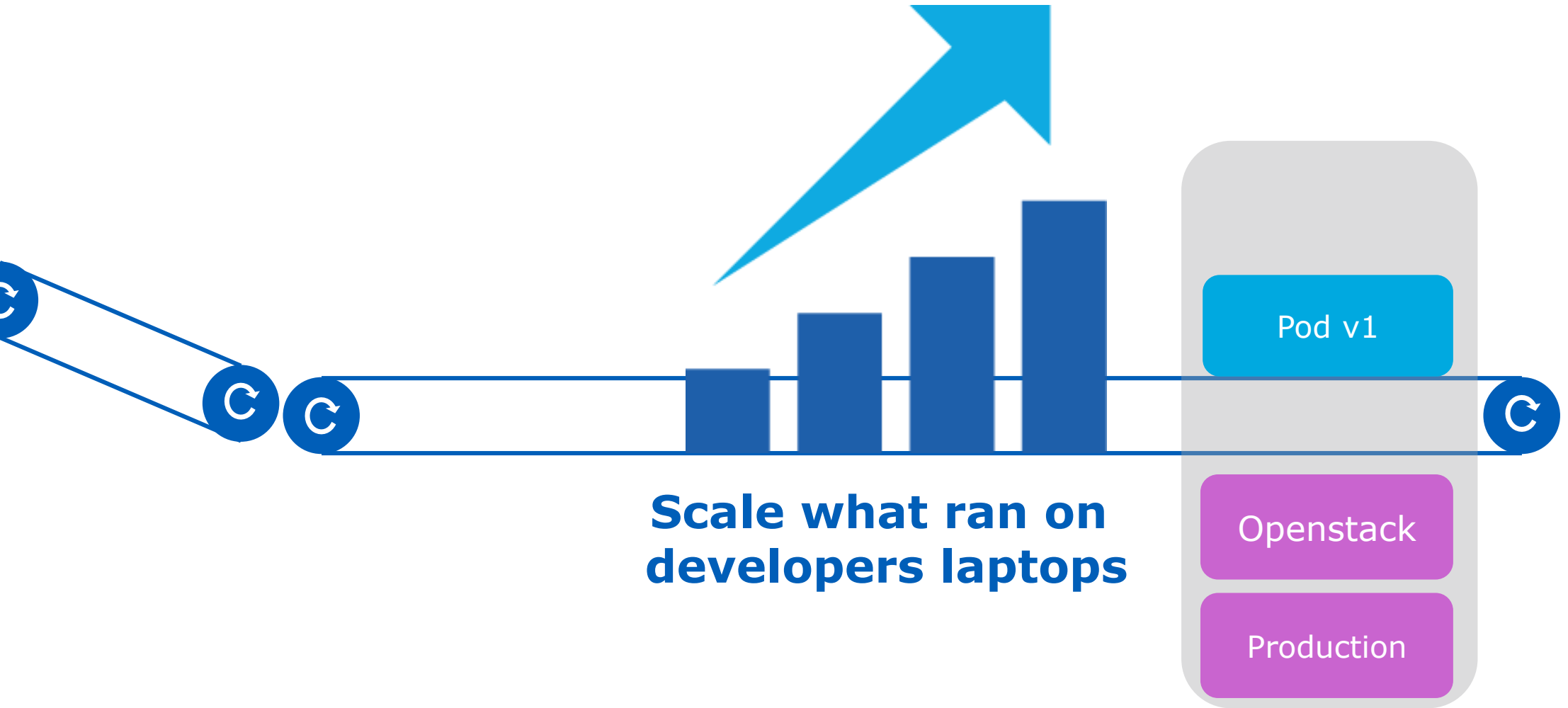
# Easy deployment



# Easy deployment



# Easy deployment



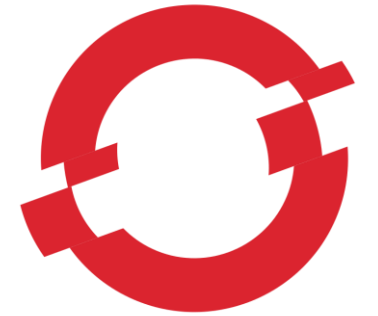
**Scale what ran on  
developers laptops**



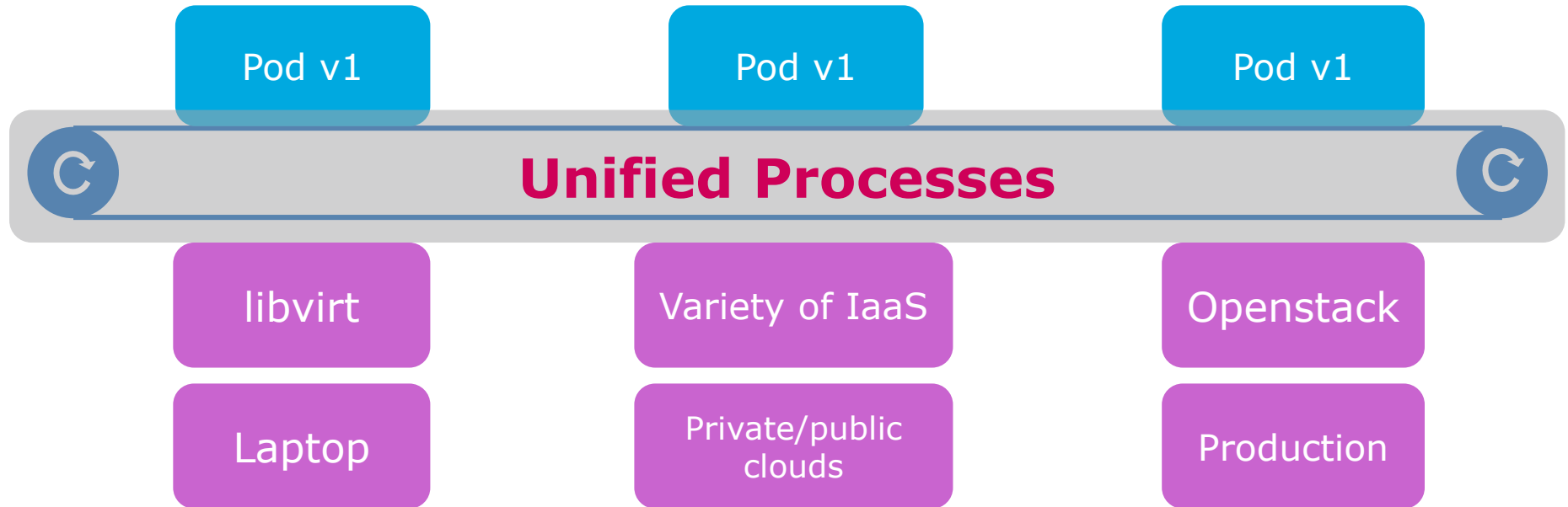
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# Easy deployment



**OPENSIFT**



# Key takeaways

## — Building a cloud-ready system with **OPENSHIFT**

- Macro-management
- Self-healing / resiliency
- Multi-cloud/data-center capability

## — Uniform operations

- Simplification
- Reduced operational burden
- Enable transition to DevOps model

## — Great collaboration with Red Hat !

- Participation in Product Roadmap
- New way of working
- Power of the community

