Redefining travel industry tech

How software defined networking and data centers move millions of people every day

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Change is in the air...

Sharing Economy

Wearables, IOT

Geopolitical Landscape
14,000 people
195 countries
4.47B 2016 revenue

Among the world’s top 10 software companies
Forbes 2016 global rankings
Powering the biggest names in travel in North America...
...and Globally!

- 709 airlines
- 580,000 hospitality properties
- 110 airport operators
- 90 rail operators
- 100 ground handlers
- 233 tour operators
- 43 car rental companies
- 90,000 travel agencies and corporations, online and worldwide
- 16 insurance provider groups
- 50 cruise and ferry lines
- 90 airline operators
- 100 travel agencies
- 43 car rental companies
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595M bookings in 2016

4M peak bookings some days

1.4B passengers boarded in 2016

≈2,600 passengers boarded every minute
Research & Development

Leading

The travel technology industry

20
R&D centers

4B+
Invested since 2004

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5,000 Micro services

1,500 databases

80,000 user transactions per second
6,300+
Infrastructure changes per month

19,000+
Physical infrastructure devices

600+
Application software loads per month
From pets..
..to cattle
Data Center as a Computer

Decouple what should run from where it should run
Step 1: IaaS

Linux

openstack™
CLOUD SOFTWARE
SDN in IaaS

- **API**
- **VIO**
  - Openstack Components
  - Neutron-NSX integration
  - Nova Integration
    - vCenter Instance 1
      - Target: 2000 ESX hosts
      - Availability Zone 1
    - vCenter Instance 2
      - Target: 2000 ESX hosts
      - Availability Zone 2
    - vCenter Instance 3
      - Target: 2000 ESX hosts
      - Availability Zone 3
    - vCenter Instance n
      - Target: 2000 ESX hosts
      - Availability Zone n*

- **NSX**
  - Management Components
  - API
  - NSX–Transformers
  - Edge Cluster
  - Rest of Network

**VIO Instances**
- Single VIO Instance
- VIO Instances
  - instance 1, instance 2, ...
  - instance m*

**Target:** 2000 ESX hosts

**Keystone**
- IAM integration
SDN gave us

- Time-To-Market
- Distributed Logical Routing
- Security, Quality of Service
- Visibility & Monitoring
Worked fine in dev..

..Ops problem now
300 NoSQL databases

1M transactions per second
Deploy the application as a whole with all its dependencies

instances anywhere
Manage a cluster as a whole
From customization
to standardization
Step 2: PaaS
Kubernetes

“Manage a cluster of Linux containers as a single system”

CONTAINERS

POD

BLUEPRINT

5 instances of my POD
SDN in PaaS

Each pod instance gets its own IP address
Pod addressing

Overlay Network: 10.0.0.0/16

Virtual Switch

Piloted by the master

Network: 192.168.0.0/24
Service addressing

Overlay Network: 10.0.0.0/16

Virtual Switch
iptables → Proxy
10.0.0.5:1234

Virtual Switch
iptables → Proxy
10.0.0.5:1234

Virtual Switch
iptables → Proxy
10.0.0.5:1234

Service “S1”
IP/port: 10.0.0.5:1234
Service addressing

Overlay Network: 10.0.0.0/16

Virtual Switch
iptables
10.0.0.5:1234

Proxy

 iptables
10.0.0.5:1234

Virtual Switch

Proxy

 iptables
10.0.0.5:1234

Virtual Switch

Proxy

 iptables
10.0.0.5:1234

Service “S1”
IP/port: 10.0.0.5:1234
Overlay Network:
10.0.0.0/16

Virtual Switch
iptables
Proxy
10.0.0.5:1234

Virtual Switch
iptables
Proxy
10.0.0.5:1234

Virtual Switch
iptables
Proxy
10.0.0.5:1234

Service addressing

Service “S1”
IP/port: 10.0.0.5:1234
PaaS gave us

1. Homogenization
   - C++
   - Python
   - Go
   - Java

2. Open Source Contribution

3. Businesses Continuity

4. Hybrid Cloud
Amadeus Cloud Services

Applications

Containers  Auto Scaling  Self Healing  Monitoring

IaaS Adapter layer

Amadeus world wide network

Software as a Service

Platform as a Service

Infrastructure as a Service

(Private)

(public)

(public)

(public)
Amadeus Airline Cloud Availability

Shopping volumes growing exponentially - massive browsing by connected travellers worldwide

Real time synchronization

Amadeus Airline Cloud Availability

Amadeus Data Centre

Shopping Platform

Remote infrastructure

Accuracy and consistency in airline offer
Local availability computation

Powered by Amadeus Cloud Services PaaS
Parting Thoughts..

“Do or Do Not”

Nurture Curiosity

A Brave New World

Remember the “Why”
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