



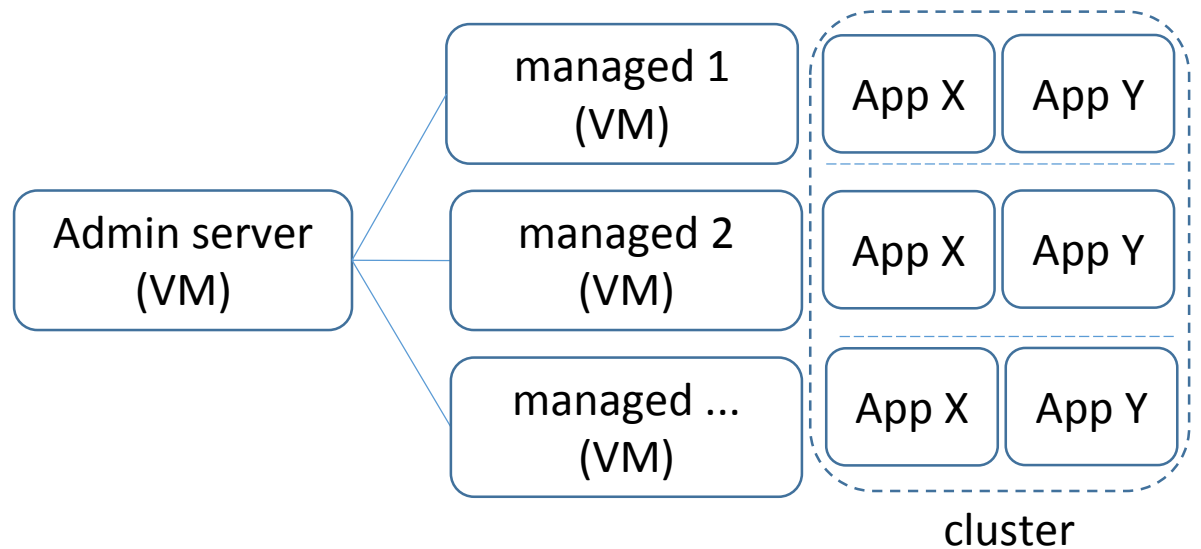
CERN openlab projects with Oracle part II.

Viktor Kozlovsky

Openlab Technical workshop (2021.03.09-11)

Challenges in 2016

- **80+** applications
 - Highly available (x3)
 - Different environment (x4)
- Multiple hosting platform
 - Mostly WebLogic
 - But others Tomcat, WildFly, etc.
- Complications
 - New stable environment + proper testing
~1 week
 - Operations were a time consuming



Basic WebLogic architecture

Connecting the dots

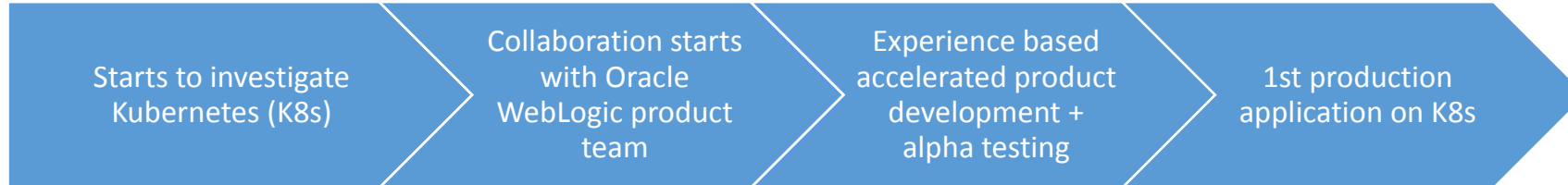


2016.Q1

2017.Q4

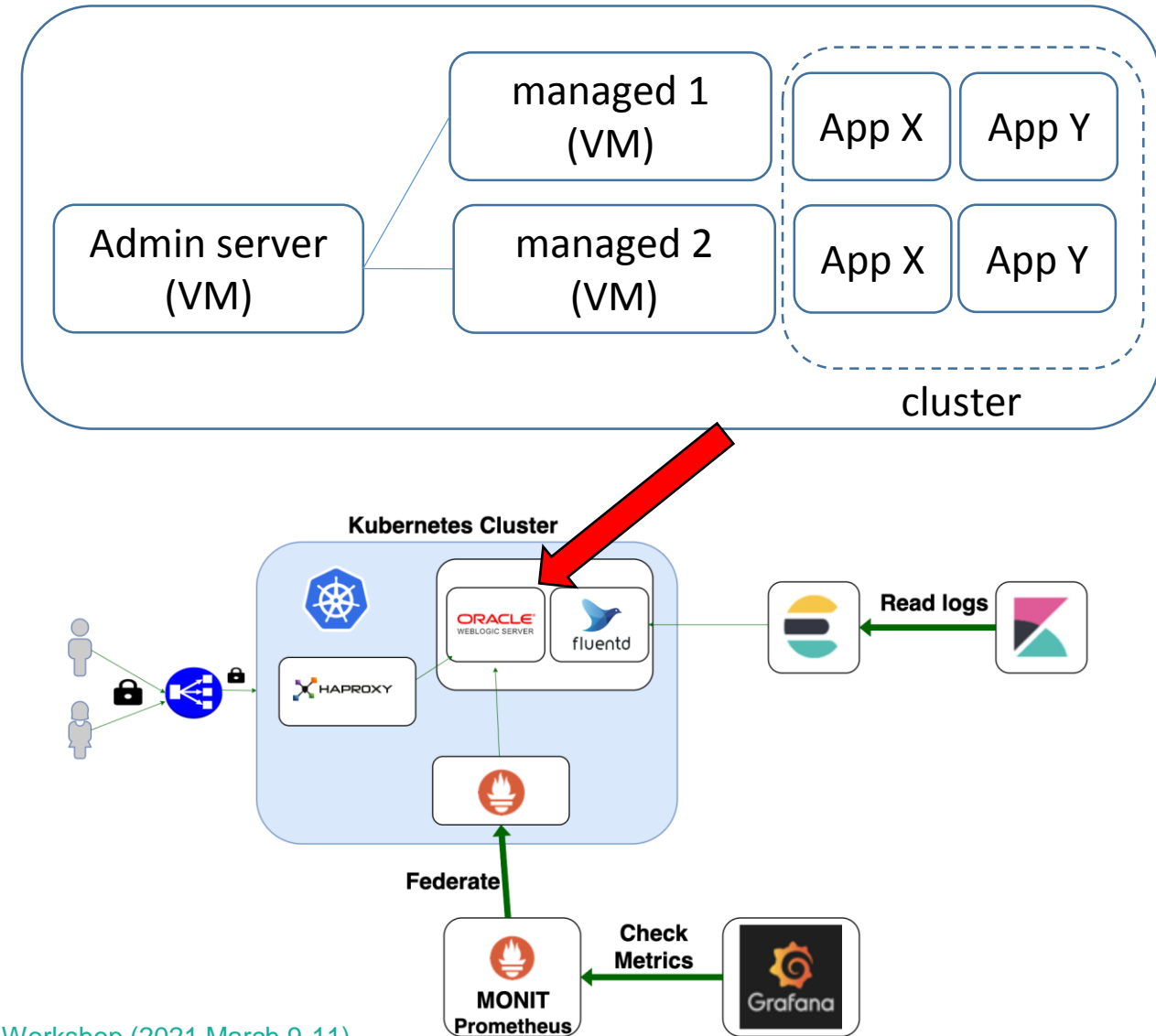
2018

2019.Q3



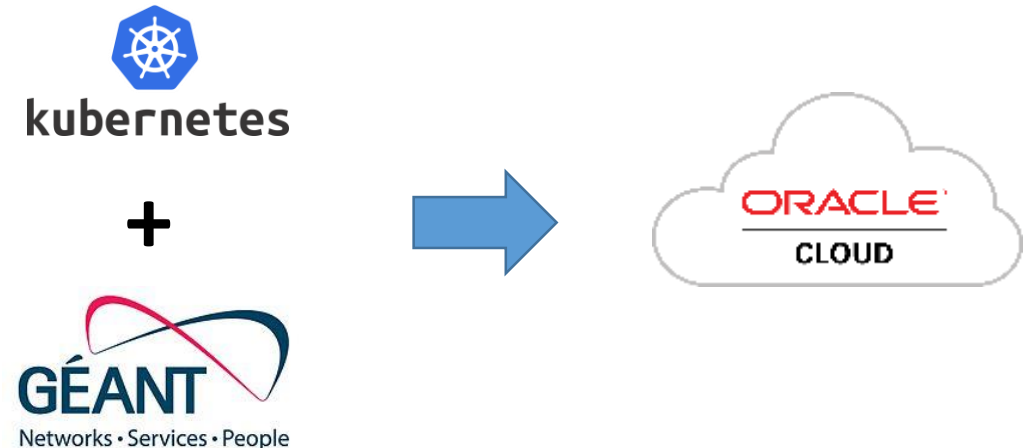
JEEDY project progress

- Technology shift (2016=>2019)
 - Enormous work by JEEDY team and Oracle WebLogic product team
- WebLogic on K8s migration became a success story
 - **20+** Worldwide Oracle-CERN joined presentations (2019-2020)
- 2020.Q4 - 80 % of IT-DB application hosting infrastructure got migrated
 - **20** Kubernetes clusters
 - **~400** total node machines

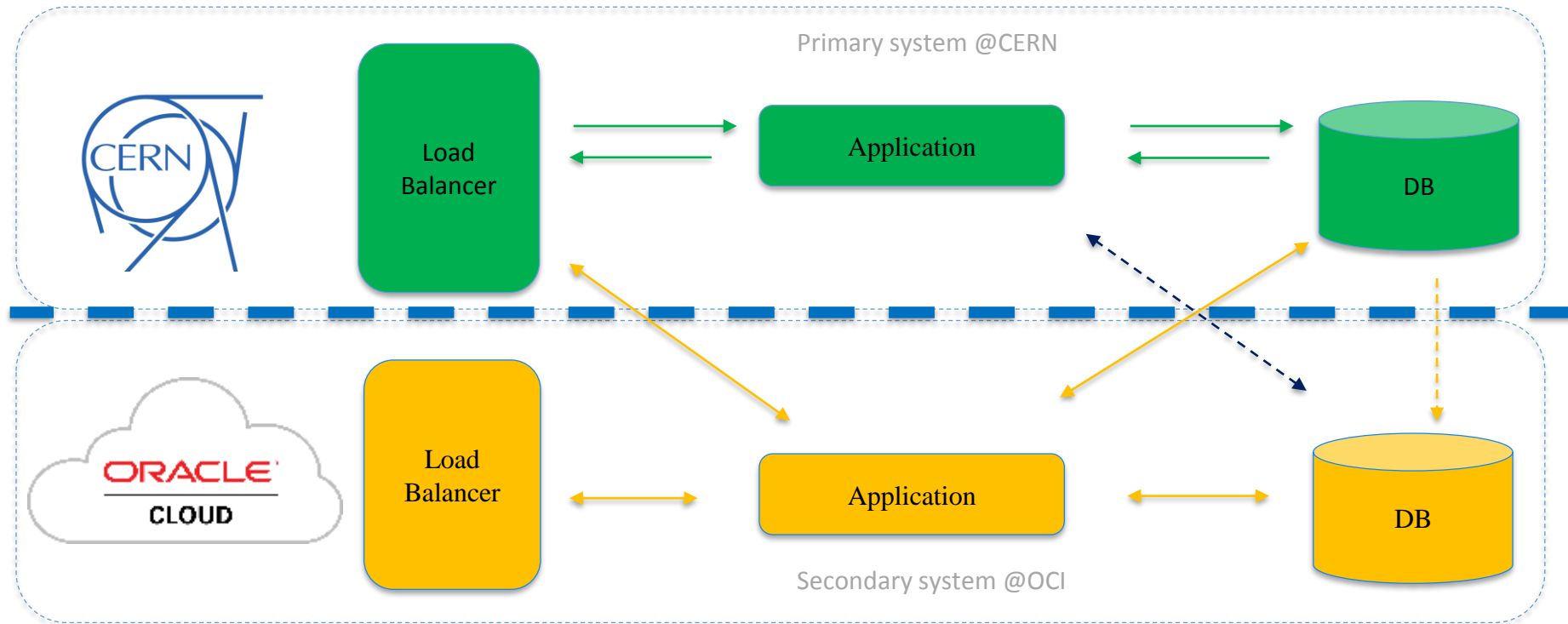


Getting back to the present

- Infrastructure innovations of K8s
 - Enormous work optimization
 - 1 week => 0.5 day
 - **Portable solutions**
 - **Fast provisioning**
 - Self-healing
- Hybrid cloud evaluation
 - Environment with independent resources
 - Infrastructure budget comparison



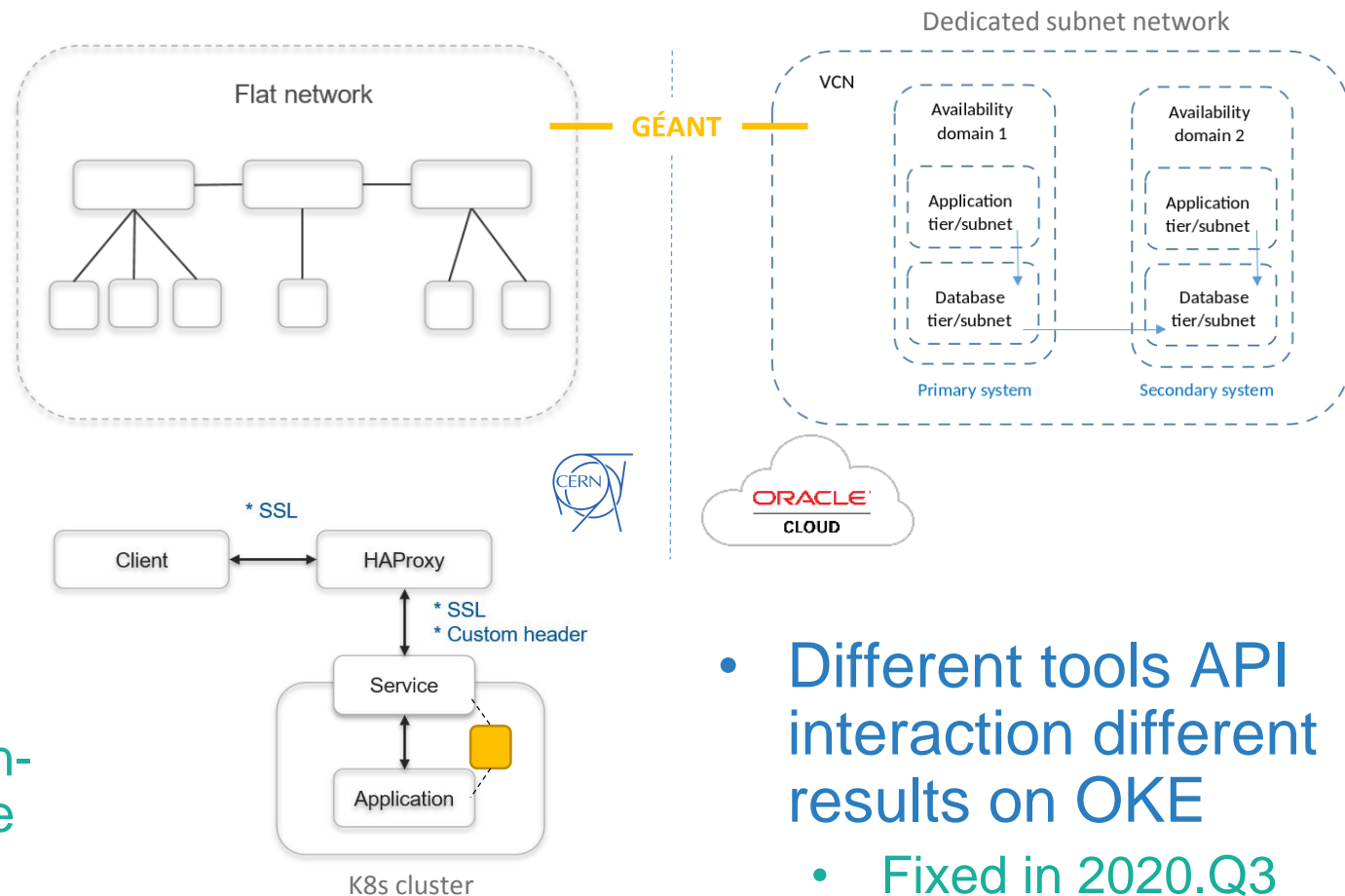
Hybrid cloud (CERN IT Disaster Recovery POC project)



Architectural challenges of a hybrid system

- Network

- Packet size
- Design



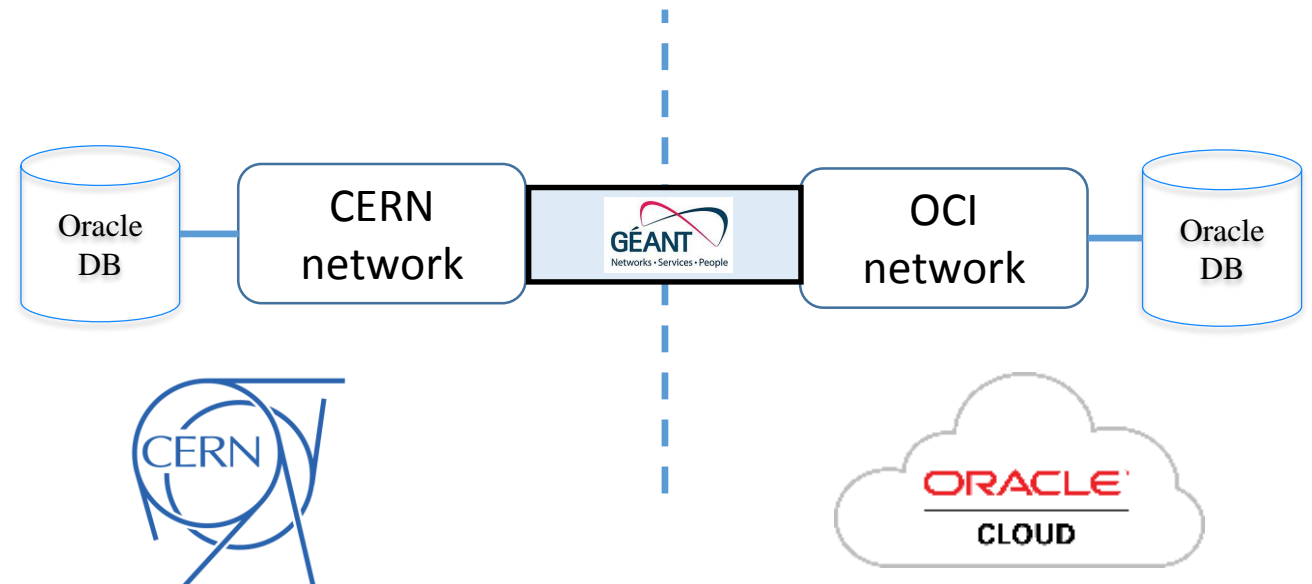
- Traffic forward / load balancing

- Re-engineer current on-premises solution to be compatible

- Different tools API interaction different results on OKE
 - Fixed in 2020.Q3

Stability and performance challenges

- Multiple components / different technologies
- Factors of successful data sync
 - Active usage of the sender
 - Benchmarkable
 - Latency (distance)
 - Bandwidth (size)
 - Used resources at both side (CPU, storage, etc.)



Achievements of DR POC project

- POC delivered and benchmarking started
- Smooth cloud integration with on-premises
 - Networking, virtual machines, application servers, database, etc.
- Multiple production databases deployed in standby mode
 - In total: 100+ TB; 50+ cores; ~800 GB RAM
- Implemented automated way to deploy CERN applications to commercial cloud and on-premises

Takeaways from phase VI

- Openlab collaboration with Oracle since 2003
 - Improve developer and user communities' life
- Help to advance software/product/services
 - combining different technologies
 - share knowledge and experiences

Upcoming openlab phase project drafts

- Java and middleware
 - Application in-memory caching in Kubernetes
 - Continuous deployment of applications
- Data analytics
 - Exadata
 - Machine Learning
- Hybrid cloud
 - High performance computing
 - Continuation of DR
 - ML model registry in the cloud
- Quantum computing simulations



QUESTIONS?

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