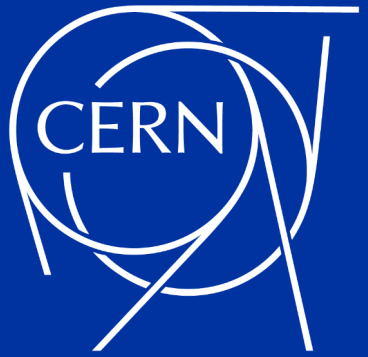


Oracle Cloud: Taking advantage of Hybrid Cloud

Antonio Nappi

Openlab Technical workshop 21/03/2022

Recap: Oracle Cloud Infrastructure and CERN cloud

- **Network connectivity from January 2020**
  - OCI as extension of CERN Cloud
  - 20Gb/s (in two ports) connection

- **Disaster Recovery on OCI**
  - Applications (during 2020)
    - PoC demonstrated that Application Server based on K8s could run in the cloud as it is on premises
  - Database (early 2021)
    - Standby deployment
      - 20 Databases
      - ~800GB of RAM
      - >50 CPU cores
      - >100TB of storage

What happened in 2021

- **Verrazzano**
  - General-purpose container platform to deploy Kubernetes workloads in multi cloud environments
  - Provided feedback and use cases to Oracle
    - WLS Summit(May 2021)
    - Github issues
    - Oracle Developer Live (August 2021)
    - Dedicated sessions with developers

- **Running physics jobs on OCI**
  - 128 Batch nodes
    - 2048 cpus
    - 16GB memory per cpu
  - Configured via Puppet (thanks to network setup)

What happened in 2021

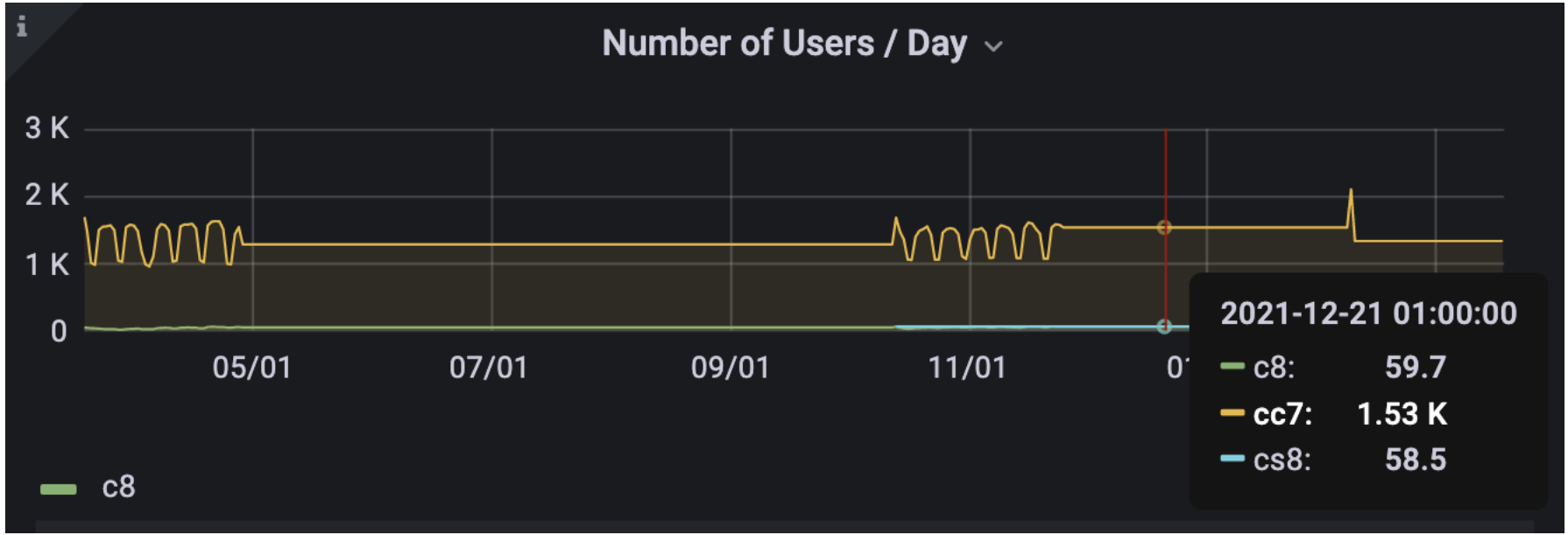
- **Exadata cloud at customer**
  - Integration in CERN datacenter (2021 the control plane in OCI)
  - Want to consolidate and improve performance of production DBs (to be validated in 2022)
  - Challenges
    - Encryption
    - Testing switch over

- **ARM machines available for whole CERN**
  - Gitlab runners to build Docker ARM base image
  - Linux software building tools to facilitate software packages for ARM VMs / Docker images
  - Lxplus interactive logon service across all of CERN

ARM

```
anappi[redacted]:~$ host lxplus8-arm
lxplus8-arm.cern.ch is an alias for oci-lxplus-arm-001.cern.ch.
oci-lxplus-arm-001.cern.ch has address [redacted]
```

- **Lxplus**:
  - Interactive logon service to Linux for all CERN users.



Service mesh: Problem

- **IT infrastructure is moving towards Service Mesh**
  - Independent services, each of them implements a particular process
  - Based on network communication
  - Increase reliability, scalability, code reusability
  - Different teams working on different microservices

- **Challenges**
  - Distributed system (multi-cloud, hybrid cloud)
  - Upgrade on a component may affect other (that we don’t know)

- **How to make sure that a new component or new version of a component doesn’t break the others ?**

Service mesh: Proposal

- **Service Mesh Checker**
  - Tool to apply strong typing to service mesh to facilitate static analysis of service dependencies
  - Use of Go Programming language and CUE (Codify Unify Execute) tool.
  - Integrate with declarative Infrastructure as code such as Terraform, Open Application Model (e.g. Kubevela), Crossplan etc.
  - Easy to integrate with GitOps approach

- **Not only microservices**
  - Not only micro services talk with each other. Any distributed system could profit (even if components are monolithic).
  - Versioning of SQL schemas to manage automatically via Git

Conclusions

- **Hybrid Cloud and Multi Cloud has been proven beneficial**
  - Good integration allows easier access to hardware/software that otherwise would more complicated (e.g. ARM machines)
    - Reduce
      - Workload due to configuration and setup
      - Provisioning time
  - Usage of standard technologies and tools enables multi cloud

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External collaborator: Elliot Swart

Thank you!

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ARM

- **Gitlab runners**
  - Build Docker ARM base image

Pipeline Needs **Jobs 30** Tests 0

Status	Name	Job ID	Coverage
Build			
passed	build_jdk_devel_adoptopenjdk_11_11.0.13_8_el7_x86_64	#18214867	00:02:01 3 months ago
passed	build_jdk_devel_adoptopenjdk_11_11.0.13_8_el8s_aarch64	#18214873 db-runner-docker-arm aarch64	00:03:52 3 months ago
passed	build_jdk_devel_adoptopenjdk_11_11.0.13_8_el8s_x86_64	#18214870	00:01:43 3 months ago
passed	build_jdk_devel_adoptopenjdk_11_11.0.6_10_el7_x86_64	#18214865	00:01:57 3 months ago
passed	build_jdk_devel_adoptopenjdk_11_11.0.9_11_el7_x86_64	#18214866	00:01:53 3 months ago
passed	build_jdk_devel_adoptopenjdk_17_17.0.1_12_el7_x86_64	#18214868	00:01:57 3 months ago
passed	build_jdk_devel_adoptopenjdk_17_17.0.1_12_el8s_aarch64	#18214874 db-runner-docker-arm aarch64	00:03:57 3 months ago

ARM

- **Linux software building**
  - Software that needs to be installed on ARM VMs/Docker Images

Task	build (jeedy8s, cerndb-adoptopenjdk-11-11.0.13_8-1.el8s.src.rpm)
Extra	{'source': {'original_url': 'cerndb-adoptopenjdk-11-11.0.13_8-1.el8s.src.rpm'}}
Tags	jeedy8s-qa
	jeedy8s-stable
	jeedy8s-testing
RPMs	**src**
	cerndb-adoptopenjdk-11-11.0.13_8-1.el8s.src.rpm (info) (download)
	aarch64
	cerndb-adoptopenjdk-11-11.0.13_8-11.0.13_8-1.el8s.aarch64.rpm (info) (download)
	cerndb-adoptopenjdk-11-generic-11.0.13_8-1.el8s.aarch64.rpm (info) (download)
	x86_64
	cerndb-adoptopenjdk-11-11.0.13_8-11.0.13_8-1.el8s.x86_64.rpm (info) (download)
	cerndb-adoptopenjdk-11-generic-11.0.13_8-1.el8s.x86_64.rpm (info) (download)