

Integration of **Oracle Cloud** Resources into CERN IT Business Continuity & Disaster Recovery

2025 CERN openlab Technical Workshop

5th March 2025

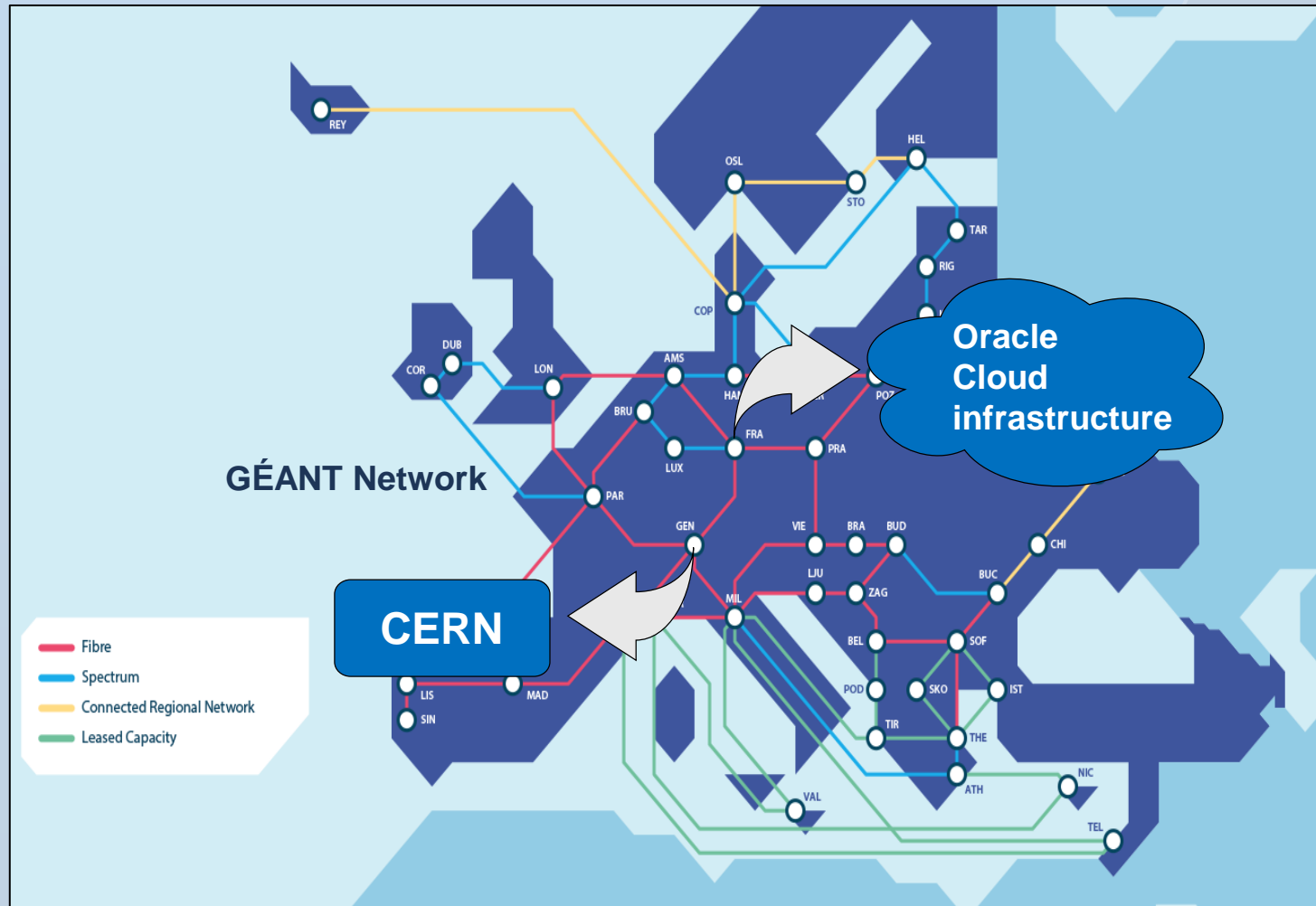
Miro Potocky



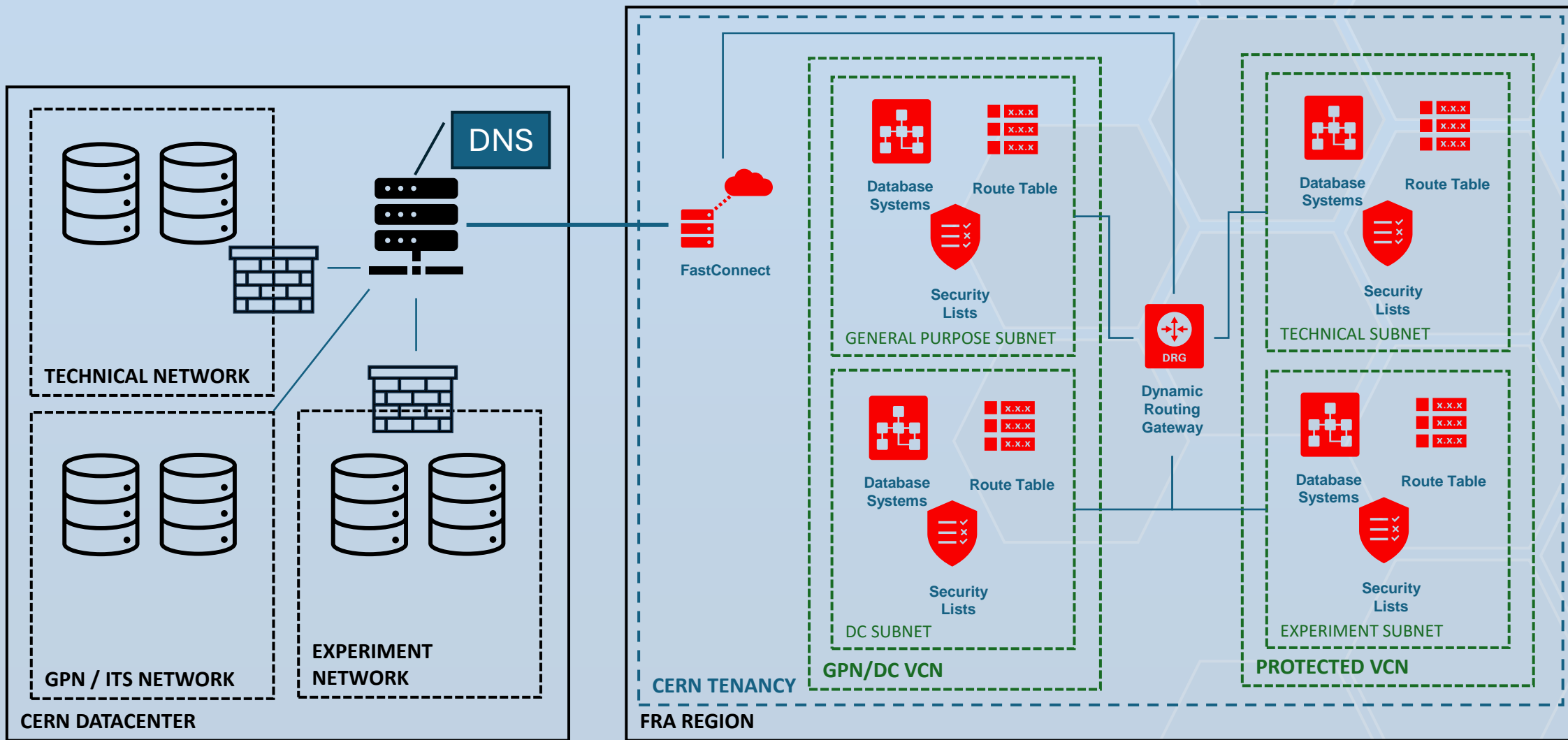
Goals & Milestones

- Build a replica of on-premise DR datacenter in Oracle Cloud
- Create repeatable deployment configuration as code
- Automate replication using Oracle Data Guard
- Collect standardized infrastructure usage details
- Summarize costs of running such infrastructure

Infrastructure / Connectivity



Infrastructure / Network



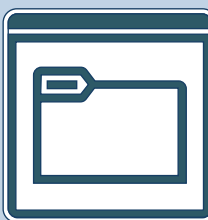
Infrastructure / Hardware



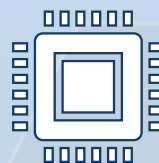
x 7



x 16



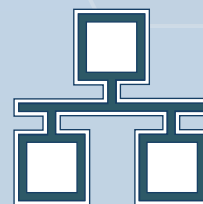
320 TB



x 56



3500 GB

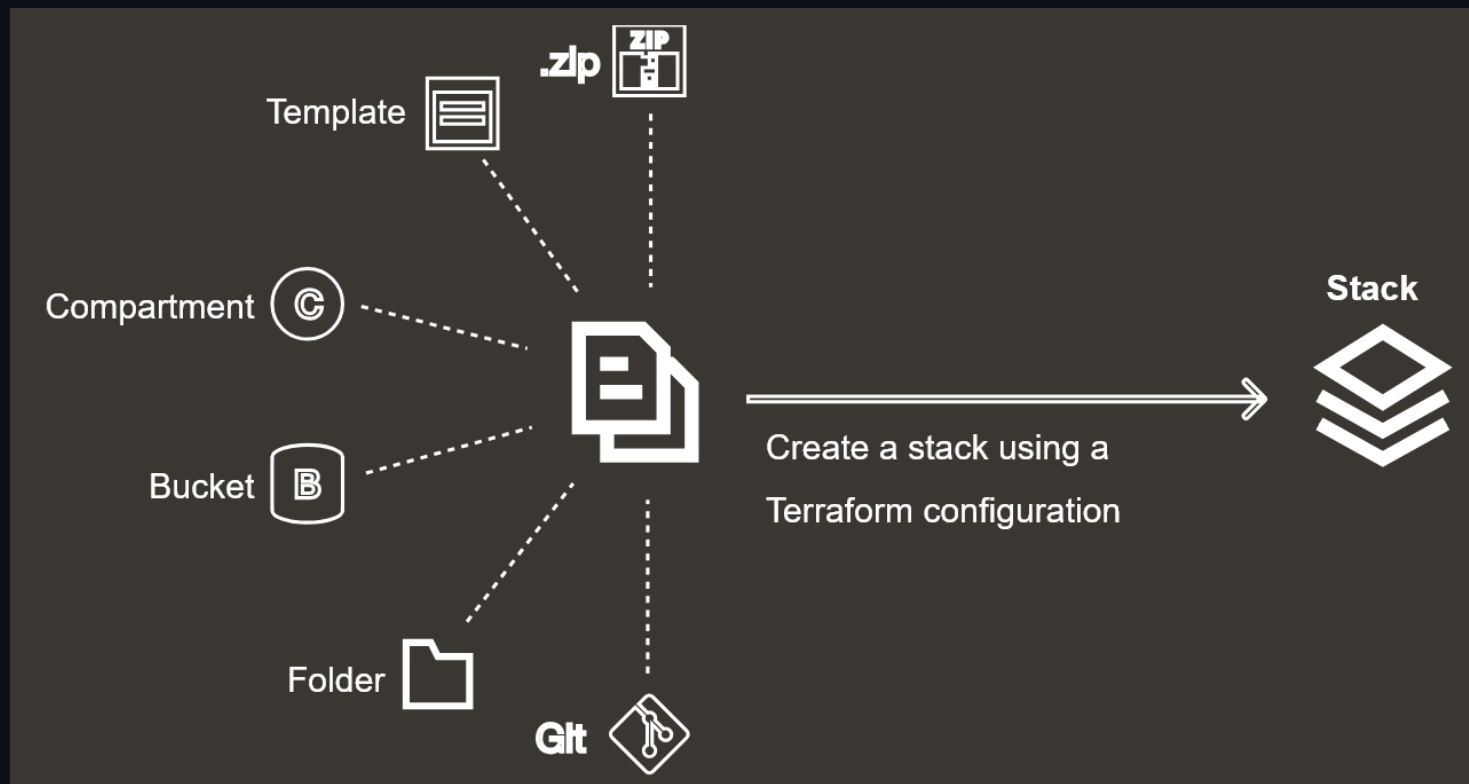


10 Gbps

Configuration / Code

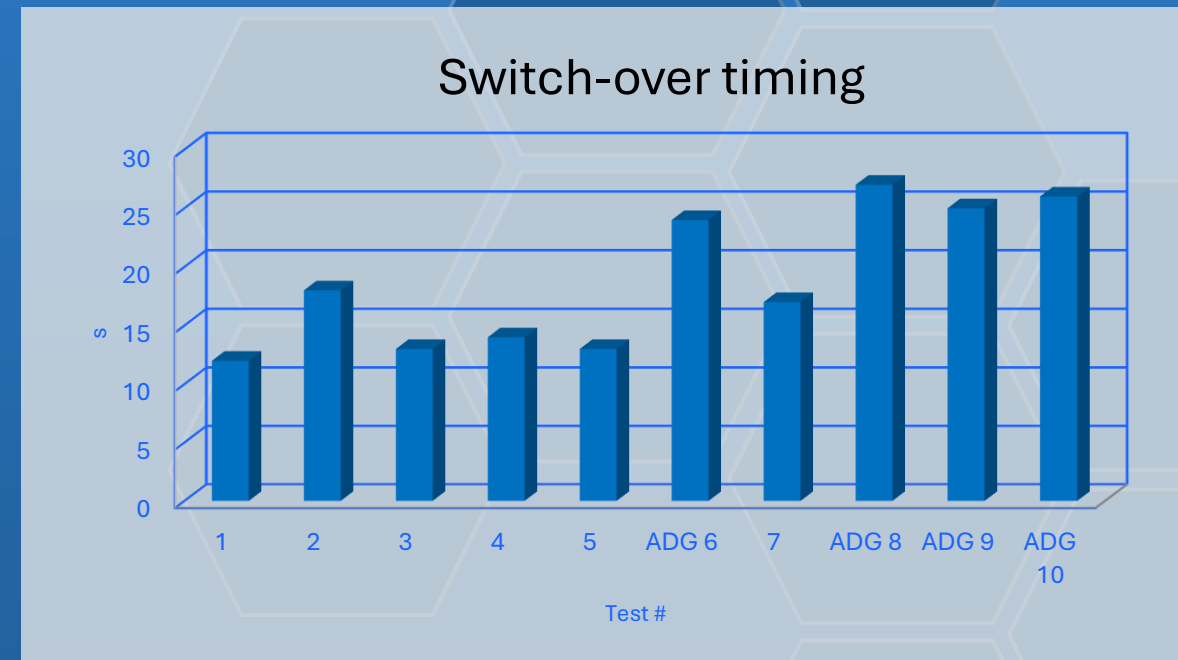
- Oracle/oci terraform provider

```
1 // Copyright (c) 2017, 2024, Oracle and/or its affiliates. All rights reserved.
2 // Licensed under the Mozilla Public License v2.0
3
4 data "oci_identity_availability_domain" "ad" {
5     compartment_id = var.tenancy_ocid
6     ad_number      = 1
7 }
8
9 # Get DB node list
10 data "oci_database_db_nodes" "db_nodes" {
11     compartment_id = var.compartment_ocid
12     db_system_id   = oci_database_db_system.test_db_system.id
13 }
14
15 # Get DB node details
16 data "oci_database_db_node" "db_node_details" {
17     db_node_id = data.oci_database_db_nodes.db_nodes.db_nodes[0]["id"]
18 }
19
20 # Gets the OCID of the first (default) vNIC
21 #data "oci_core_vnic" "db_node_vnic" {
22 #     vnic_id = data.oci_database_db_node.db_node_details.vnic_id
23 # }
```



Data Guard / Replication

- RMAN duplication from backups
 - Bash script automation of cloning
 - Consistent 4TB/h replication speed
- Data Guard broker configuration
 - Failover built in DB connection strings
 - One command switchover
 - Consistent sub 20s switchover time for simple Data Guard

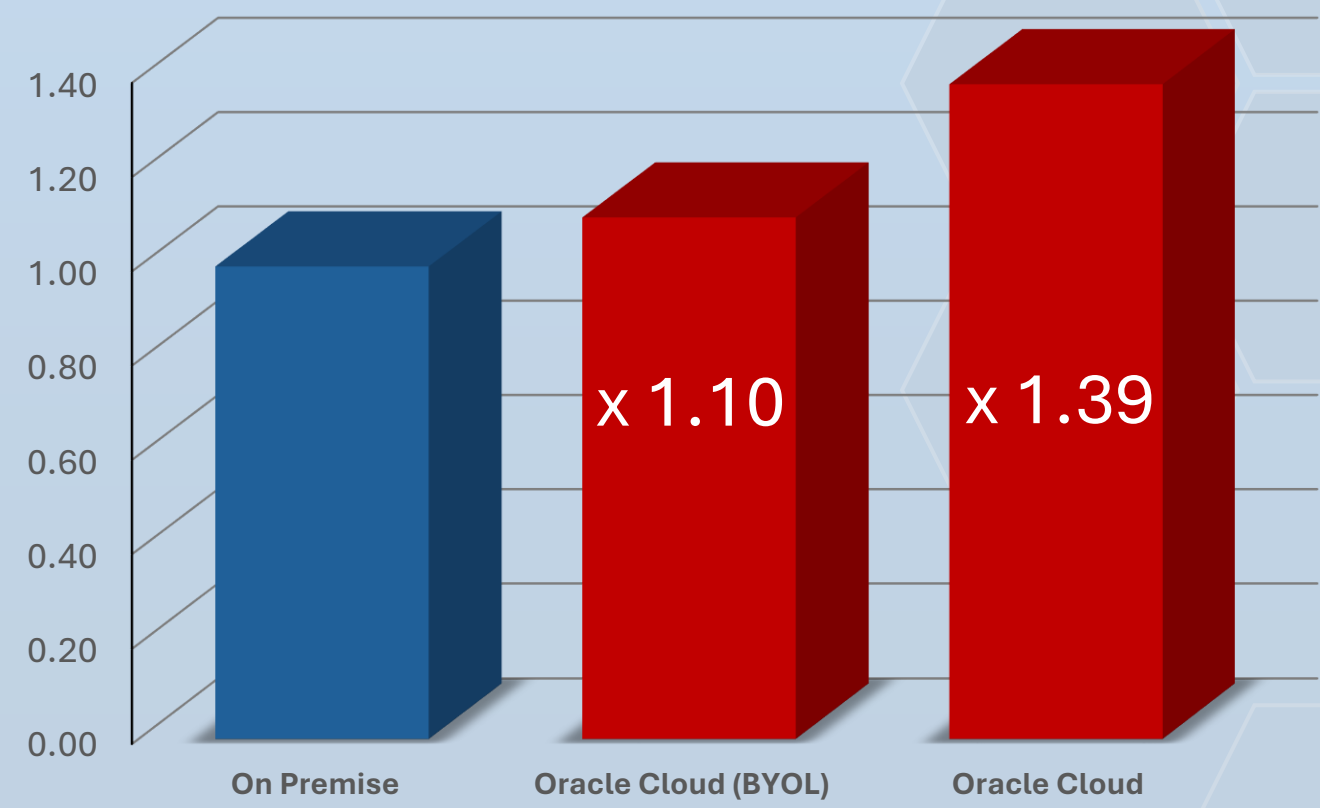


Costs / Caveats

- Collection via OCI FinOps FOCUS reports
- On-premise cost
 - Existing CERN Oracle licensing
 - Measured power requirement
 - HW purchase (5 years deprecation)
 - No manpower
- Cloud cost
 - Same Oracle licensing (or BYOL)
 - No egress/ingress

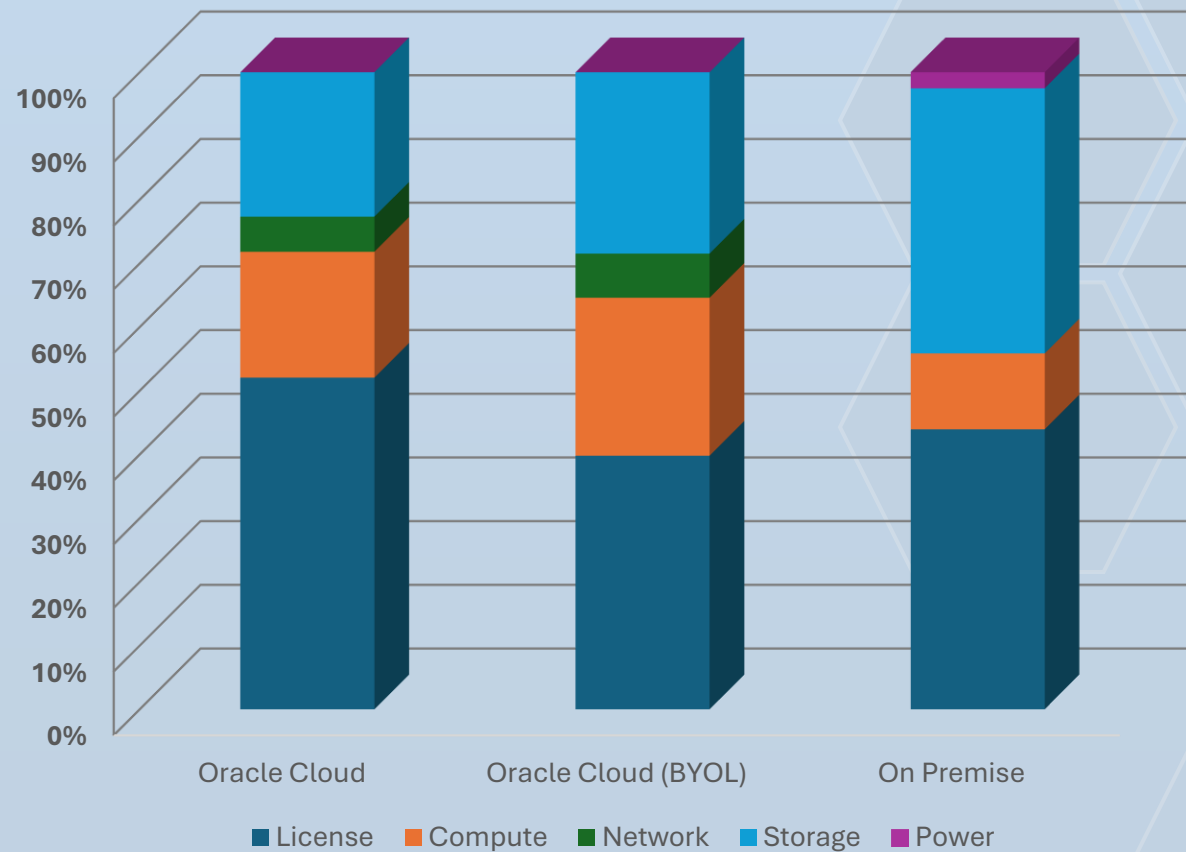
Cost / Comparison

Yearly cost difference



Cost / Comparison

Yearly cost breakdown



Summary / Takeaways

- Disaster Recovery site in cloud can be deployed rapidly once template is created
- Cost of maintaining a Disaster Recovery site in Oracle Cloud is approaching* cost of running it on premise
- Change of approach to resource consumption is necessary to retain cost control
- Further work needs to be done to estimate the cost of Business Continuity use-case

Thank you / Questions

Special thanks to:

Oracle team – Şengül, Sebastien, Audrey, Chris, John and Stefan

CERN Openlab members – Antonio, Alexandros, Adrian

CERN Network support team

