QA cluster on CERN Agile structure

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Alice Offline Week

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ALICE Release Validation Plan

- Regular release validation of AliRoot releases using the CERN Agile Infrastructure

- Ingredients needed
  - Virtual machines on CERN Agile Infrastructure
  - Build a cluster overlay
  - Workflow generation
  - Execution of the applications within in the workflow and subsequent QA

CERN Agile Infrastructure

- Cloud infrastructure based on "Openstack"
  - Interaction via native ("nova") or EC2 clients
  - At the moment ALICE has a quota of few hundred cores on CERN/Openstack for the release validation activity allocated

Infrastructure components

- Use CERNVM 3 as compute nodes
  - Come already with "batteries included" e.g. CVMFS, Condor, Makeflow, …
  - Easy to contextualize with cloud-init or amiconfig
- Use EOS for input and output data
- Launch a "head node" from outside
 - Let the head node launch the worker nodes and build the cluster

Creating the Cloud Infrastructure

- First node is launched from outside the agile infrastructure
  - Is contextualized as "condor head node"
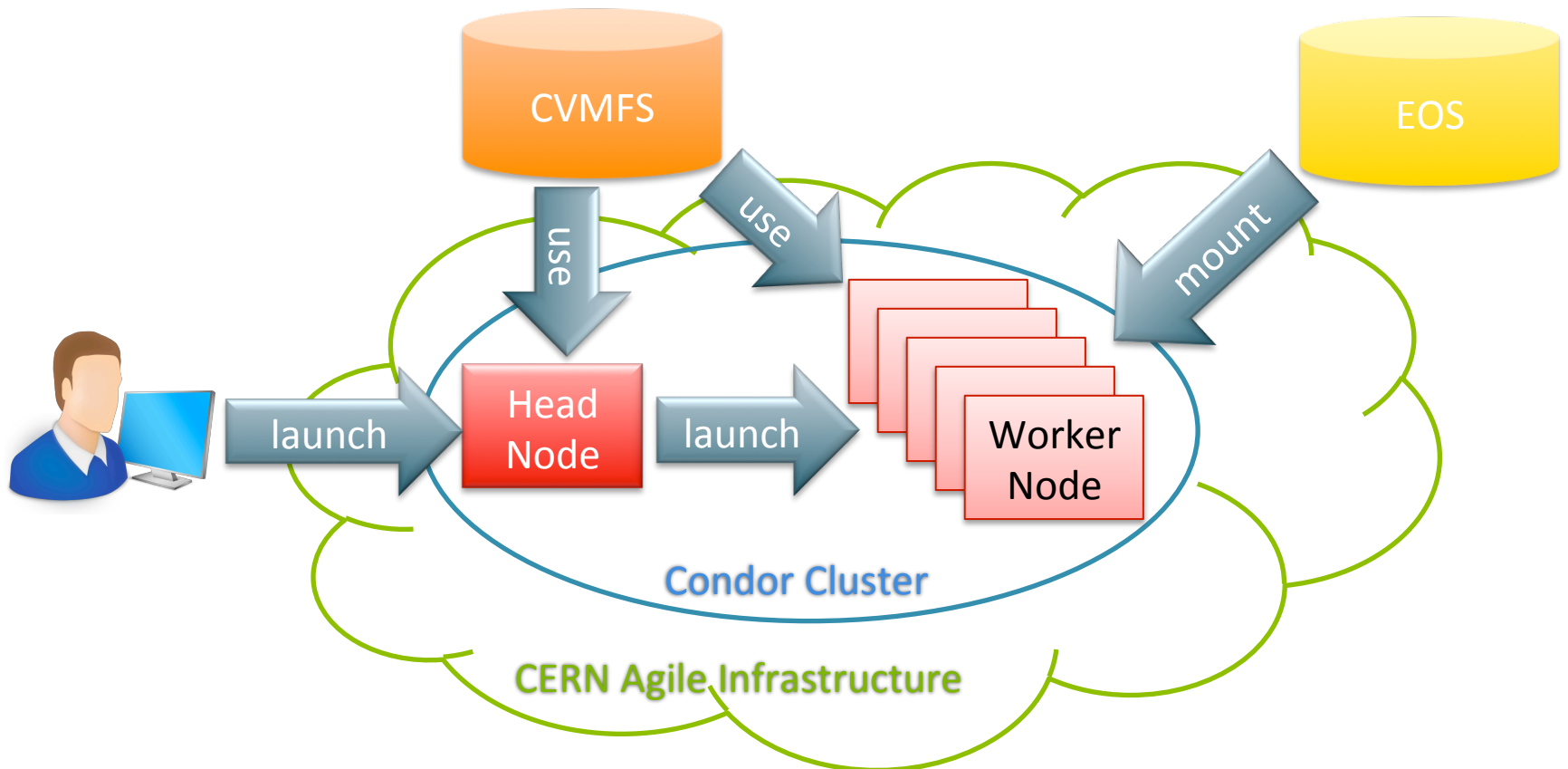

launch → Head Node

CERN Agile Infrastructure
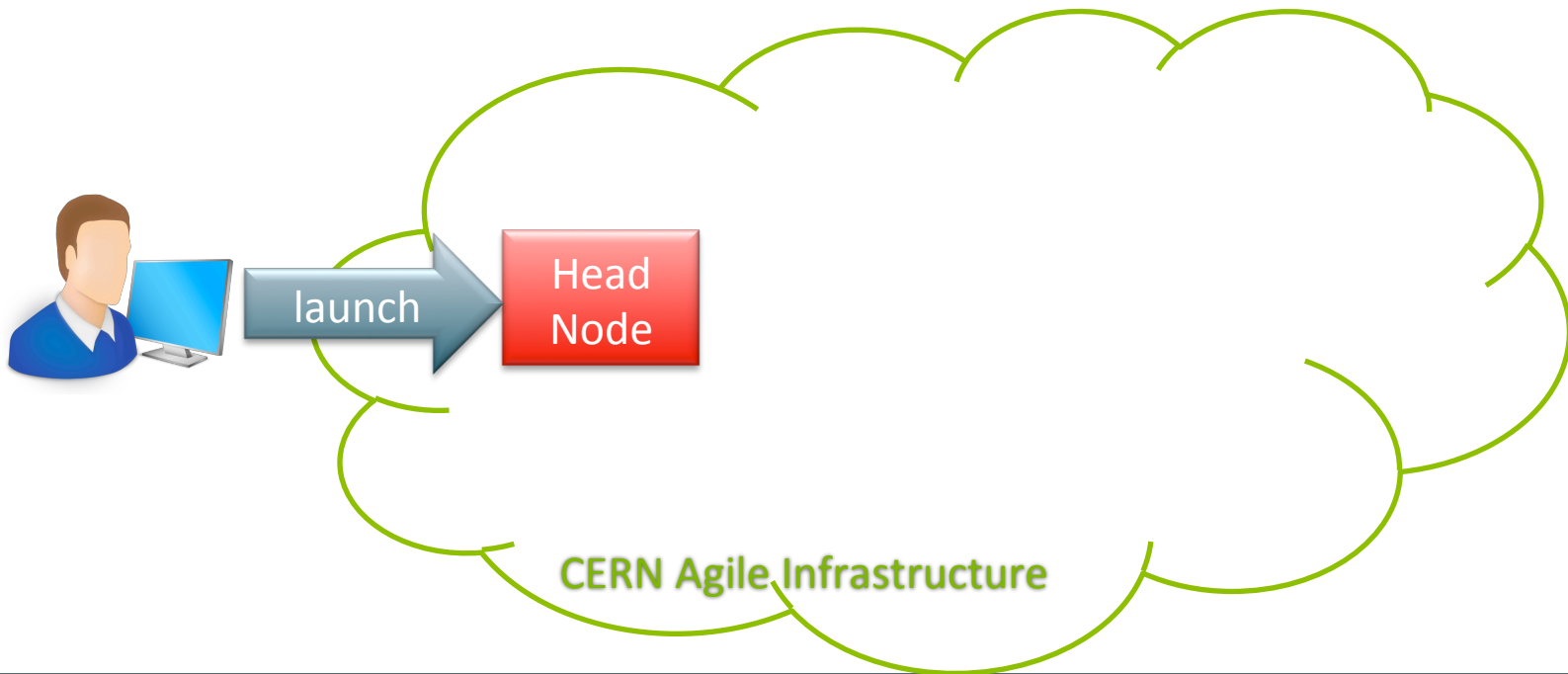
Creating the Cloud Infrastructure

- Head node contains all necessary information to launch and contextualize the worker nodes
  - The worker nodes join a condor cluster
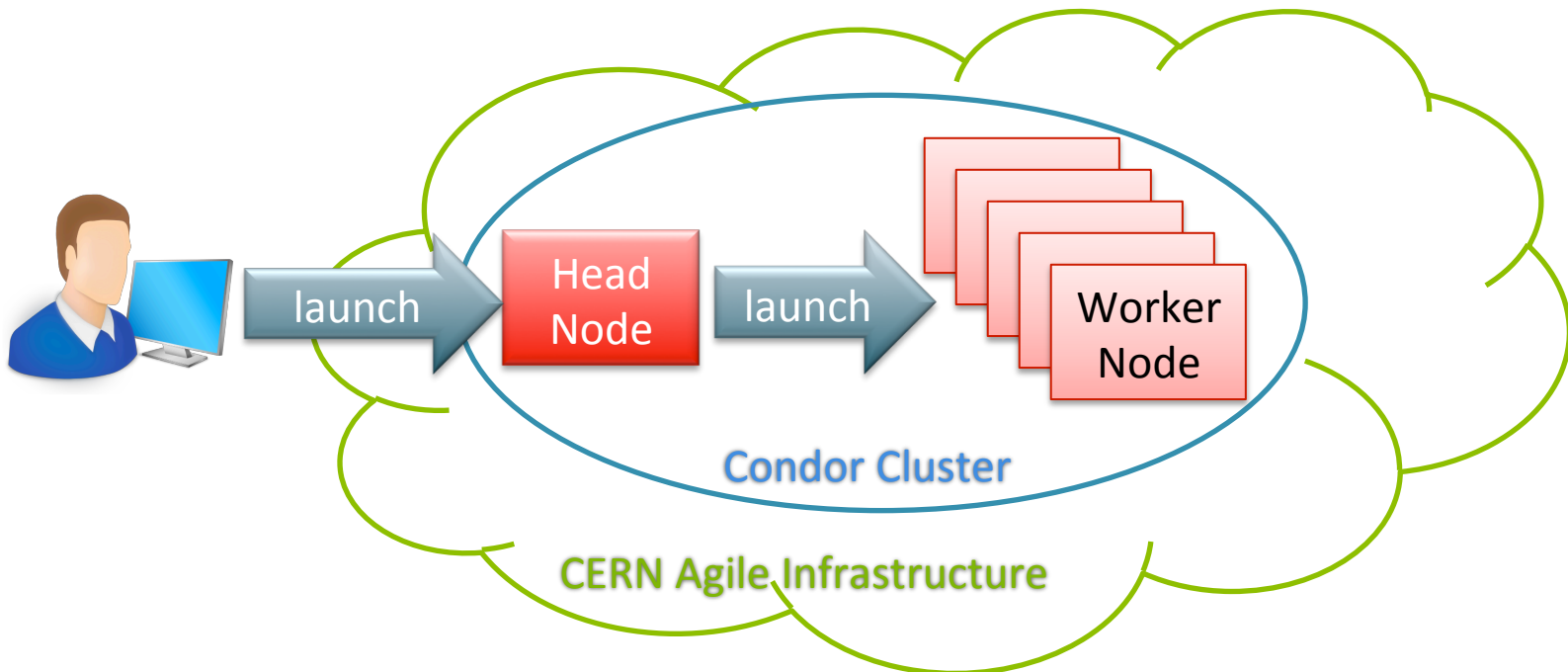
Creating the Cloud Infrastructure

- Each node mounts EOS and CVMFS if needed

First Attempt

- Handwritten contextualisation of the head node

  - Contained also means to dynamically generated contexts for worker nodes at the head node

```
% nova boot --image CernVM3 --flavor m1.medium
--user-data ./head.ctx alice-relval-head
```

Head Context / Worker Context

Second Attempt

- Use CERNVM Online
  - Provide contexts for head and worker nodes at web portal
    - Same infrastructure as above (condor, EOS, CVMFS)
  - "Combined context" for head and worker node(s) provided by the tool
  - Dynamic allocation / deallocation of worker nodes dependent on the load on the condor cluster using "elastiq"

Test Cluster

- Submit dummy jobs to condor
  - Cluster of worker nodes scales up and down as expected
    - Example: Test cluster min 1 node, max 20 nodes, submitting test jobs -> all 20 nodes deployed in ~ 4 mins

Problem: High failure rate of machines fail to boot

Workflow description & Execution

- Using "Makeflow" – executes workflows in "make syntax"
  - Provides a condor backend
  - Idea to describe the release validation workflow and submit it to the condor cluster

- Investigating the usage of a validation script developed by Mikolaj
  - Currently stuck with authentication of input files from EOS

Next Steps

- Problem with VMs that fail to boot
  - Counted against quota, need to be cleaned up
  - Issue discussed with CERN/Openstack team
- Proper integration of QA script into the infrastructure
  - "Makeflow" backend already exists
- Unauthenticated read / write access to EOS needed
  - Alternatively one could use Openstack disks