



PEOPLE

TEAMS



CORTX: Meet the Architect

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HPC-2.0 2021

HPC-2.0 will be released in late 2021



Cloud-Native and Hybrid Federated Computing

Imagine a computing environment so powerful that it can orchestrate workflows, services, and data while maintaining supply chain integrity from on premise, to cloud, and edge.

Now add to that the ability to support multiple systems and multiple clouds, all federated together into a virtual cloud, where all workloads land based on architecture availability, cost, and data management





Fuzzball, the Pathway to the Federated Cloud

Fuzzball provides the fundamental architecture to build a completely cloud neutral SAAS platform where we bridge all of the cloud services providers with on-premise resources and extending all the way out to the far edge, creating the ultimate in hybrid infrastructure and workload management.

IQ Cloud

The **CIQ Cloud** allows enterprises to utilize all cloud, virtual, and physical resources as if it was a single unified data center while maintaining absolute confidence in supply chain integrity and data security.



The next generation of cloud computing is less than a year away and it will redefine how people are thinking about resources.

The Next Enterprise Linux Operating System

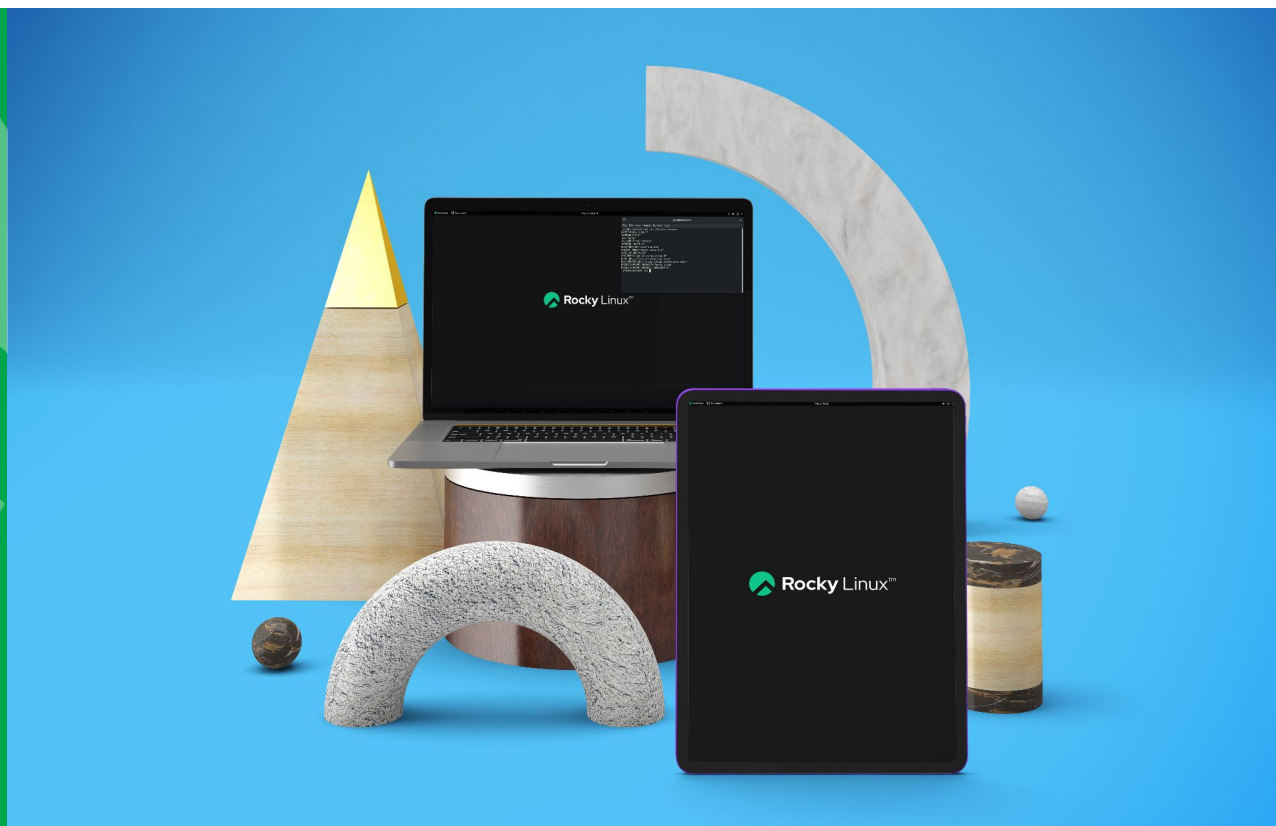
Rocky Linux is the next evolution of enterprise operating systems. With already over two million installs within just a few months, partnerships with **AWS, Google, Azure, and Naver Cloud** as well as hardware and software vendors, Rocky is lined up to be the next major operating system with CIQ being the up and coming OS vendor.

Rocky Linux

Kurtzer founded Rocky Linux as he did CentOS before. The goal however is different with the focus being to create a purposeful, large, sustainable community, to which CIQ does not own, nor control... But we are here when/if people need help. This model is getting an absolute visceral reaction from enterprises and clouds worldwide.

PROJECT RELEASE: 2021.06.21

more than two million installations!



“We are swapping out all of our Red Hat contracts with CIQ because we believe in the vision, integrity, and the future of CIQ.”

-- CTO of a major telecommunications company

Larger Developer Base

Open Sourcing a project many times, but not always, leads to increased awareness and contributions to the project

Unrestricted Usage

By Open Sourcing a project (OSI), there is unrestricted access to the project including competitors and customers.

Open Standards

Projects in the open source community tend to link to one another which then creates standards others can rely on.



Warnings...

**Expect Competitors
to use your open
source offerings!**

**Avoid product
conflict of interest!**

Why Open Source?

Open Source isn't a tool for a marketing department. It isn't a switch that should be toggled to try to get more usage or visibility.

Open Source is a commitment. It is a desire to widen the development base and give IP away. This can be strategic, but be committed to that strategy, because shutting down an open source project for commercial reasons can be worse than never open sourcing it at all.

We need to be thinking about how to manage portable and federated workflows differently than we've been thinking about services and general purpose computing.

The **Fuzzball workflow** is a composable computing environment that provides the appropriate context to the federated orchestration subsystem where and how all workflows should run.

These factors are: resource and architecture availability, cost, and data, with data having the following considerations:

- **Locality of the data**
- **Mobility of the data**
- **Data gravity**
- **Data security**

Based on this, we can properly land this workflow anywhere based on organizational policy.



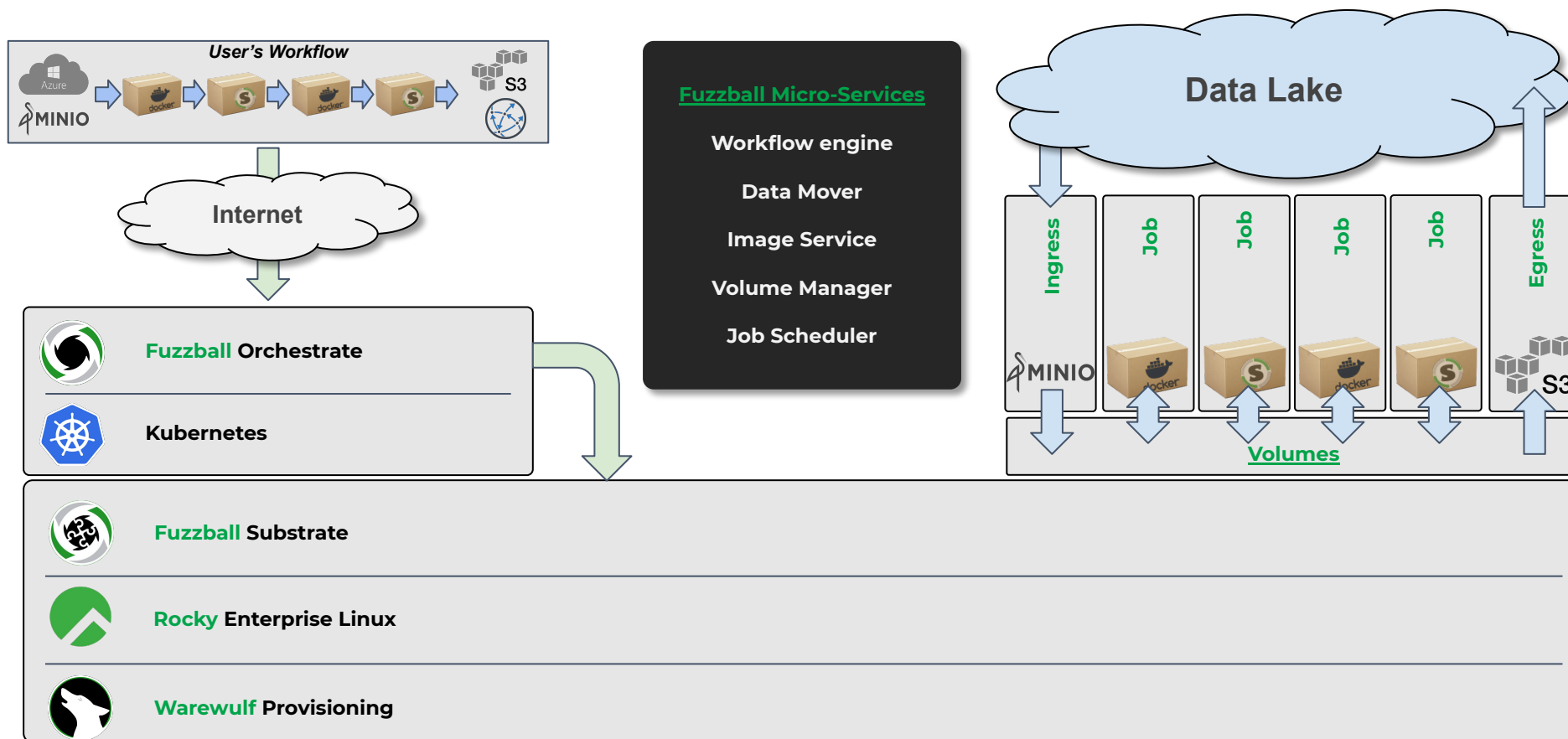
The screenshot shows a terminal window with a workflow YAML file. The file defines a workflow named 'ufs' with volumes, jobs, and dependencies. Below the terminal, there are two global maps. The left map shows a color-coded global temperature or climate distribution, and the right map shows a global distribution of data or resources, both with color-coded legends.

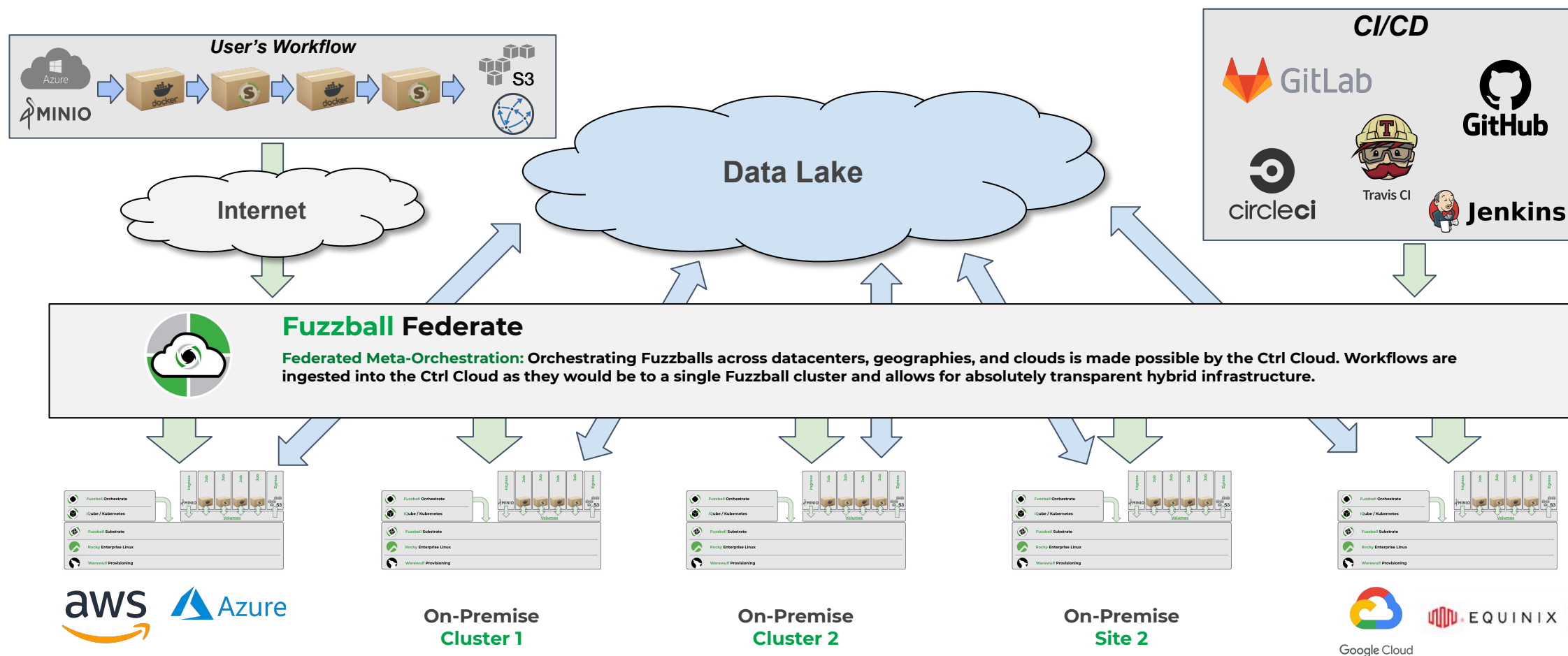
```
version: 0.1
workflow:
  name: ufs

  volumes:
    v1:
      type: EPHEMERAL
      pre:
        - from: "https://ftp.emc.ncep.noaa.gov/EIB/UFS/simple-test-case.tar.gz"
          to: "input.tar.gz"
        - from: "https://raw.githubusercontent.com/wiki/ufs-community/ufs-weather-model/tools/plot_ufs_phyf.ncl"
          to: "plot_ufs_phyf.ncl"
      post:
        - from: "simple-test-case/plot_ufs*.png"
          to: "s3://..."

  jobs:
    untar:
      image: docker://alpine:latest
      command: ["tar", "-C", "/data", "-zxf", "/data/input.tar.gz"]
      volumes:
        v1:
          location: "/data"
    ufs:
      image: docker://omslab/ufs:1.0.0
      command: ["mpirun", "-np", "8", "/usr/bin/ufs_weather_model"]
      cwd: "/data/simple-test-case/run_dir"
      requires: ["untar"]
      volumes:
        v1:
          location: "/data"
    ncl:
      image: docker://bigwxf/ncar-nccl:latest
      command: ["ncl", "/data/plot_ufs_phyf.ncl"]
      cwd: "/data/simple-test-case"
      requires: ["ufs"]
      volumes:
        v1:
          location: "/data"
```

A **Fuzzball cluster** allows users to submit workflows to the **Fuzzball Orchestration services**, which then manages the data, container image management, and volumes and then submits the job graph to the scheduler to reserve resource space on the compute resources. The jobs are run via **Fuzzball Substrate service** which manages those workflows on thousands of compute nodes!





Fuzzball Federate allows us to scale out and unite Fuzzball clusters at massive scale over geographically distributed sites and clouds into a single seamless platform for users and CI/CD to interact with.