# CardaNow – Rapid Infrastructure Caching

Architecture Design

Introduction

This document outlines the architecture and technology stack for a caching service designed to support the infrastructure for DApp development on the Cardano blockchain. The service focuses on creating snapshots for the Cardano node, Kupo, and Cardano DB Sync, allowing developers to quickly provision and maintain the necessary infrastructure.

Architecture Overview
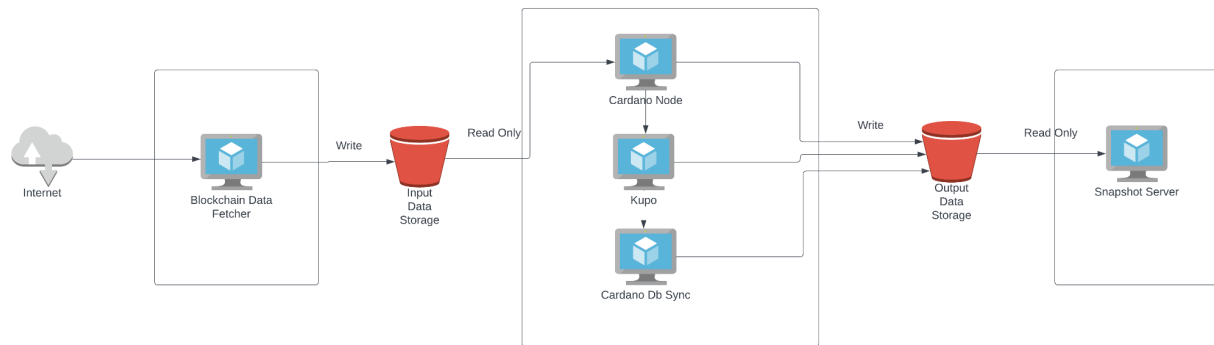
The service is structured into three main network zones: the Inbound Network, the Private Network, and the Outbound Network. Each zone has dedicated roles and responsibilities, ensuring security, isolation, and efficiency.

Inbound Network

Role: Securely fetch and store the latest blockchain data from the internet.

Components:

- Blockchain Data Fetcher:
    - Role: Acquire the latest blockchain data.
    - Technology: Any compute instance capable of running the necessary scripts or applications to pull data from the blockchain network.
- Input Data Storage:
    - Role: Temporarily store the fetched blockchain data.

- Technology: Any blob storage service providing API access for storage operations.

Private Network

Role: Process the fetched data to generate and store snapshots.

Components:

- Snapshot Generators (Cardano Node, Kupo, Cardano DB Sync):
    - Role: Each service processes the blockchain data to create snapshots.
    - Technology: Compute instances tailored to the resource requirements of each service. Instances should be capable of limited networking, only allowing internal communications.
- Output Data Storage:
    - Role: Store the generated snapshots.
    - Technology: Any blob storage service with capabilities for long-term data retention and access control.

Outbound Network

Role: Serve the snapshots to end-users for download.

Components:

- Snapshot Server:
    - Role: Provide access to the snapshots.
    - Technology: A compute resource with a public-facing interface, configured to serve data from the Output Data Storage.

Technology Stack

While the services for generating snapshots (Cardano Node, Kupo, Cardano DB Sync) are fixed, the supporting technologies are chosen for their ability to be replaced or updated as needed.

Compute Resources

Any cloud provider or on-premises solution offering virtual machines, container orchestration, or serverless compute capabilities can be utilized, ensuring the ability to scale and manage workloads effectively.

Storage Services

We will use blob storage services that offer APIs for storing and retrieving large amounts of unstructured data can be employed. These should support secure access policies and have the capability for scaling as data grows.

Networking

We will deploy networking solutions that provide secure, private networking capabilities for the Snapshot Generators, alongside public networking capabilities for the Snapshot Server, will be implemented. These should include features like subnets, network security groups, and routing tables for traffic management.

Automation and Orchestration

We will deploy tools that allow for the automation of deployment, scaling, and management of applications and infrastructure will be integrated.

Backup and Recovery

Backup services will be employed to ensure the resilience and availability of the snapshots and any associated metadata.