

Configuration Manual

For

Dynamic Resource Allocation in Multi-Cloud Environments Using Reinforcement Learning

Hardware:

- Used a GPU in the Google colab toolbar and then changed runtime option
- No specific configurations have changed. Normal google colab with 12GB RAM| 90+ GB storage
- 2-CPU for training each model default distributed computing settings of RayRL Library

Software:

- Python for coding and included libraries such as boto3, matplotlib, plotly, pandas, Gymnasium, random
- RL algorithm such as PPO and DQN are used to train model
- AWS Services used are EC2, CloudWatch, IAM, S3, Kinesis, Lambda

Description:

- The project implements a dynamic resource allocation system across multiple cloud environments using reinforcement learning. It leverages RL algorithms to optimize resource utilization, reducing mean CPU core allocation significantly.
- It combines cloud computing, machine learning, and real-time information to dynamically allocate resources in response to changing demands and workload fluctuations. The approach addresses the complexity of resource allocation in heterogeneous cloud environments by using RL-based task scheduling mechanisms.
- Initially it loads the data from CSV files and display the requested input criteria for the 2 CPU
- Then using RayRL try to implement PPO and DQN to perform resource allocation
- Finally its tested and outputs are visualized in the graph format