

# **ANOMALY DETECTION IN CLOUD SYSTEMS USING MACHINE LEARNING**

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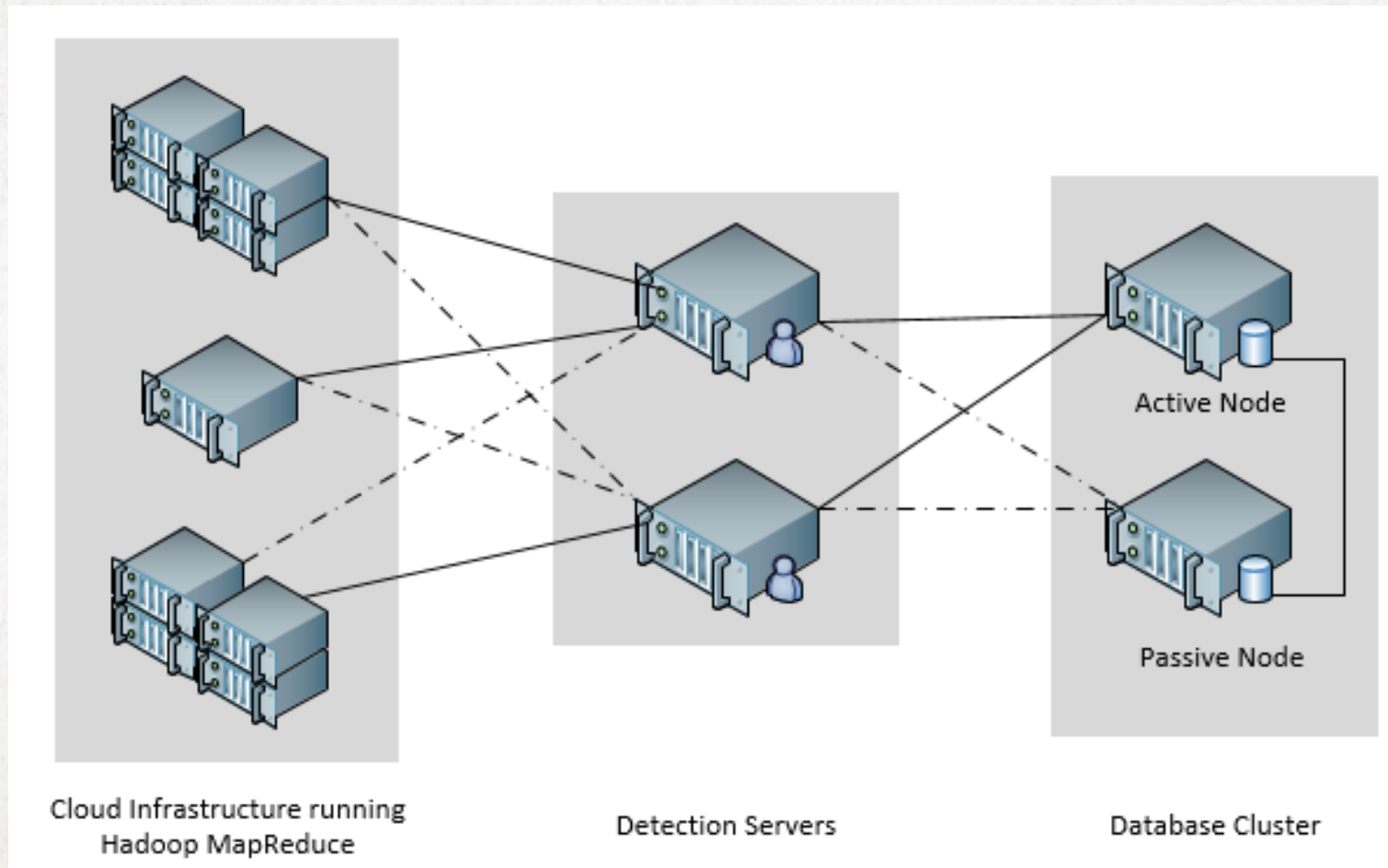
# AGENDA

- Overview
  - Architecture
  - Demo
  - Evaluation
  - Discussion
  - Q & A
-

# PROJECT OVERVIEW

- Anomaly Detection in Cloud Systems
    - Learn optimum performance
    - Monitor the infrastructure
    - Detect anomalies
    - Report it.
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# ARCHITECTURE: PROTOTYPE





File Virtual Machine Help

slohia@ubuntu: ~/Documents/projects/ADS

 2:31 PM slohia

slohia@ubuntu:~/Documents/projects/ADS\$ python ads.py

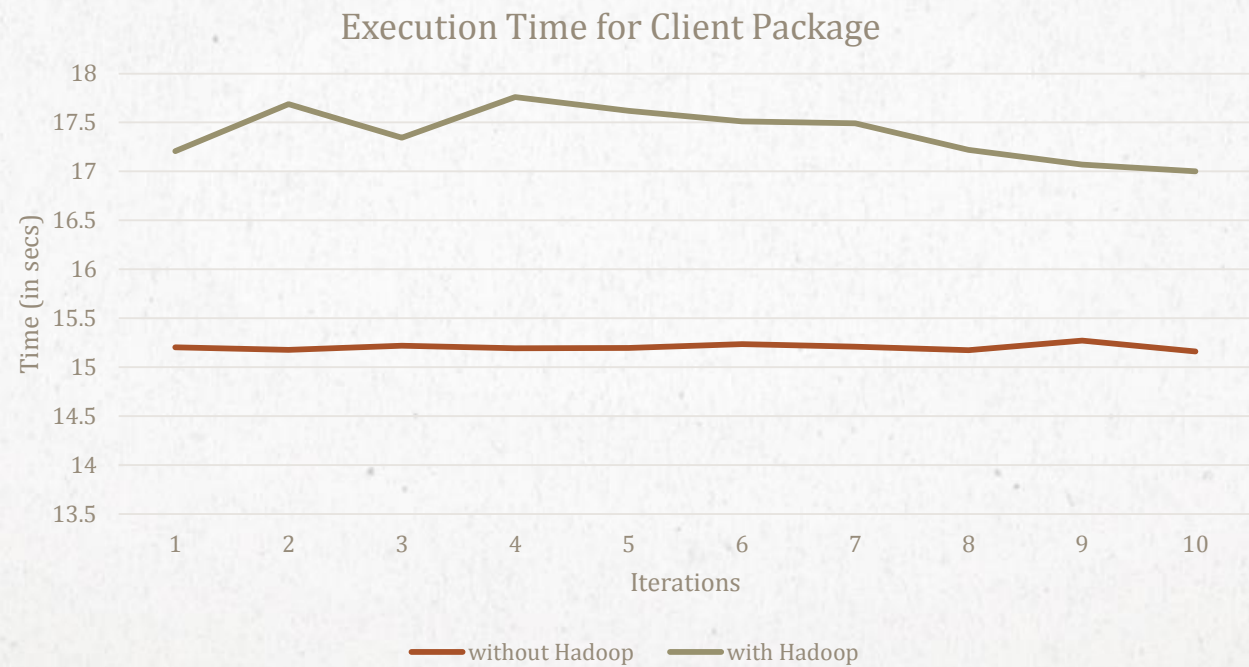
To release input, press Ctrl+Alt

# EVALUATION

- Each node had the following configuration:
    - Dell PowerEdge 2850s with a single 3GHz processor
    - 2 processors
    - 2 GB of RAM
    - 2 10,000 RPM 146GB SCSI disks
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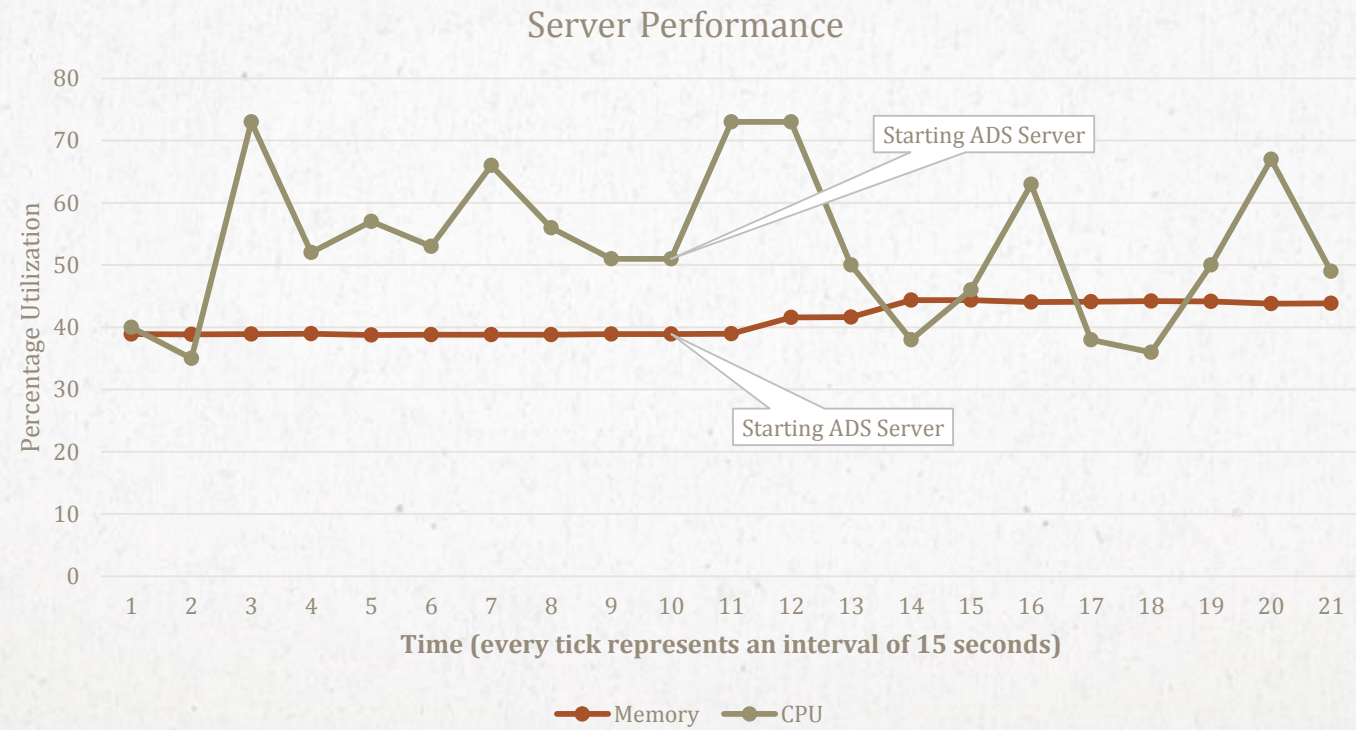
# EVALUATION

- CLIENT PERFORMANCE



# EVALUATION

- SERVER PERFORMANCE



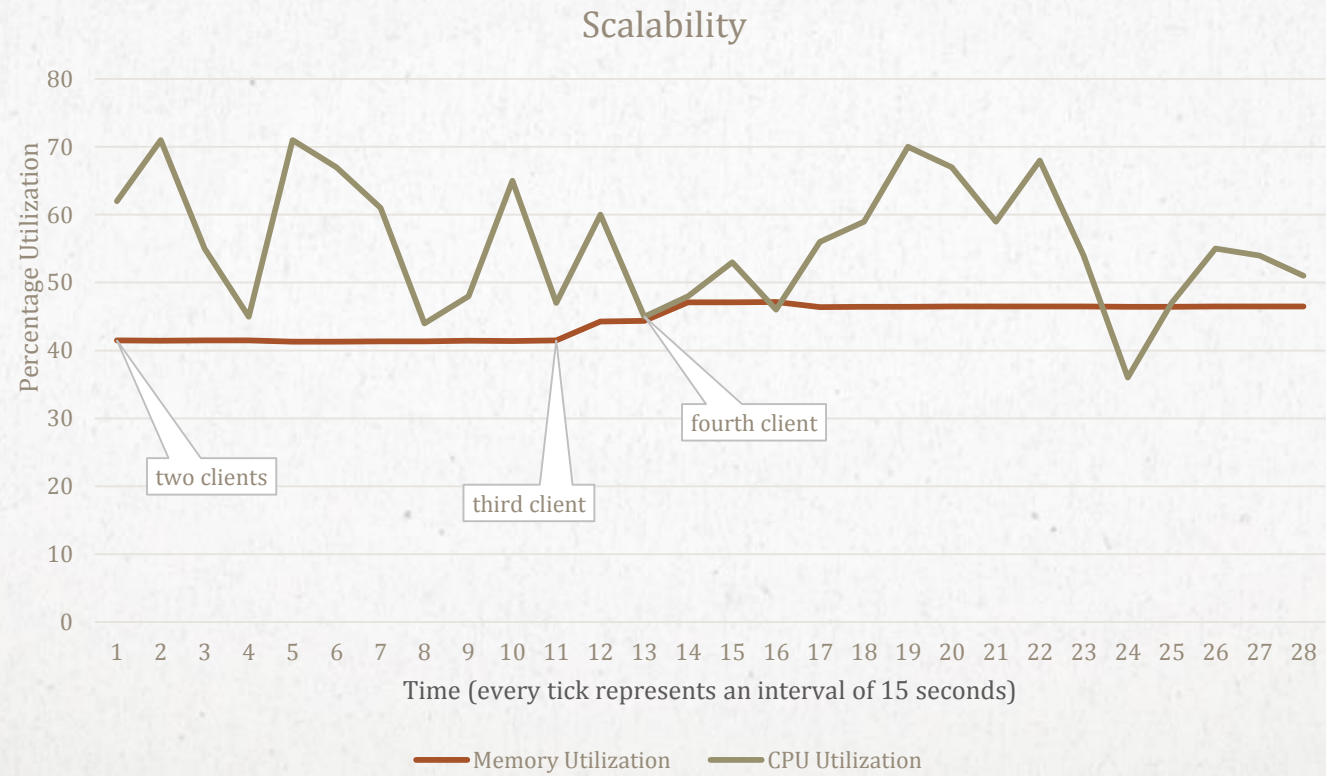


# EVALUATION

- SERVER FAILOVER
  - Failover time is dependent on the configurable timeout period (50 seconds)
  - Additional cost incurred – one RPC call
    - Repo creation
    - Process spawning for learning
    - Time taken: 115 ms

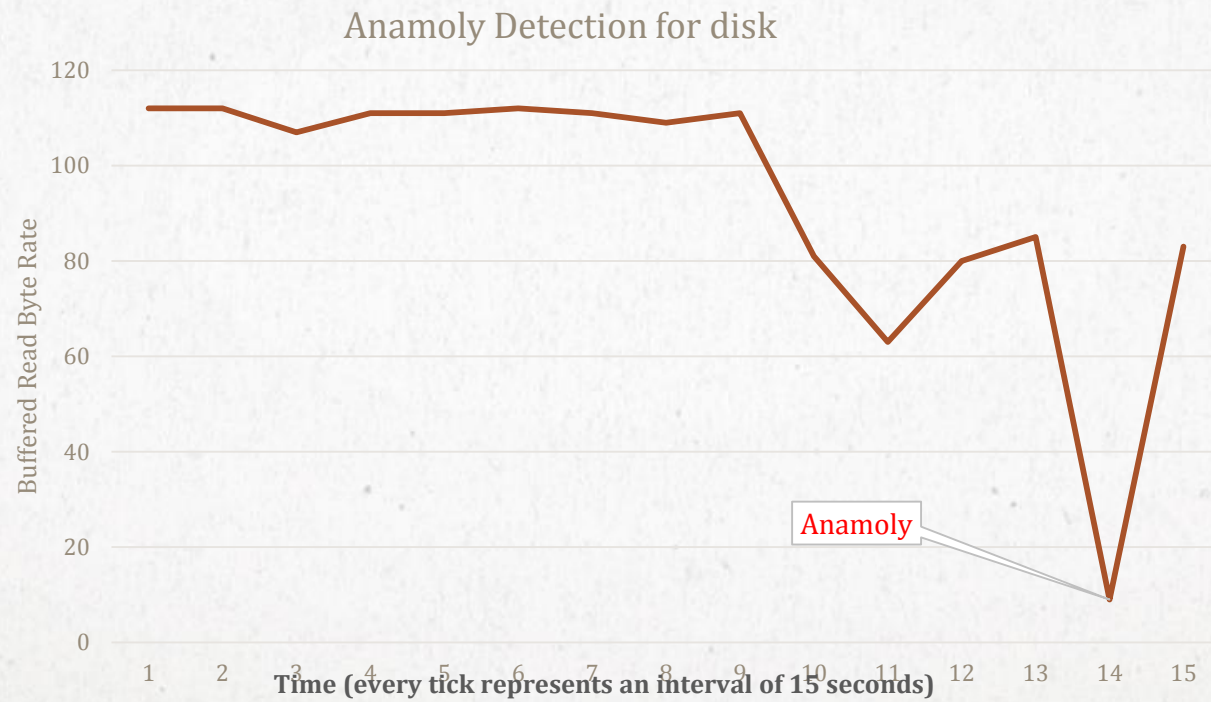
# EVALUATION

- SCALABILITY



# EVALUATION

- ANAMOLY DETECTION





# DISCUSSION

- System built with a prototype cloud infrastructure
  - Fault Tolerance
  - Scalability
  - Correctness
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# FUTURE WORK

- Implement other learning algorithms
  - Perform a comparison study on which learning algorithm performs better
  - Implementation of GUI
  - Ability for administrators to make the system relearn the performance of a particular ADS client
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