# Testing Framework for Ensemblemd

Master's Thesis: Suvigya Tripathi

Guide: Dr. Shantenu Jha

## Testing Framework

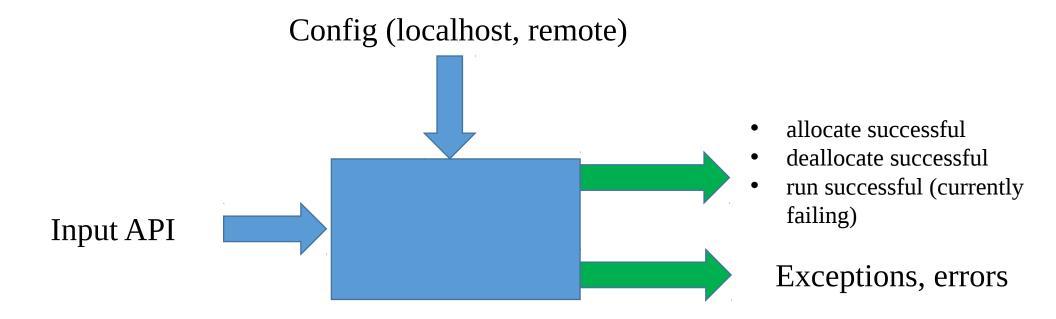
- Blackbox Testing
- EnsembleMD API Testing
- End-to-End Testing

## EnsembleMD API Testing

- Building Block API Test cases
- Pattern API Test cases

#### Building Block API Test

- Execution Context API
  - allocate(), deallocate(), run()



#### Application Kernel API

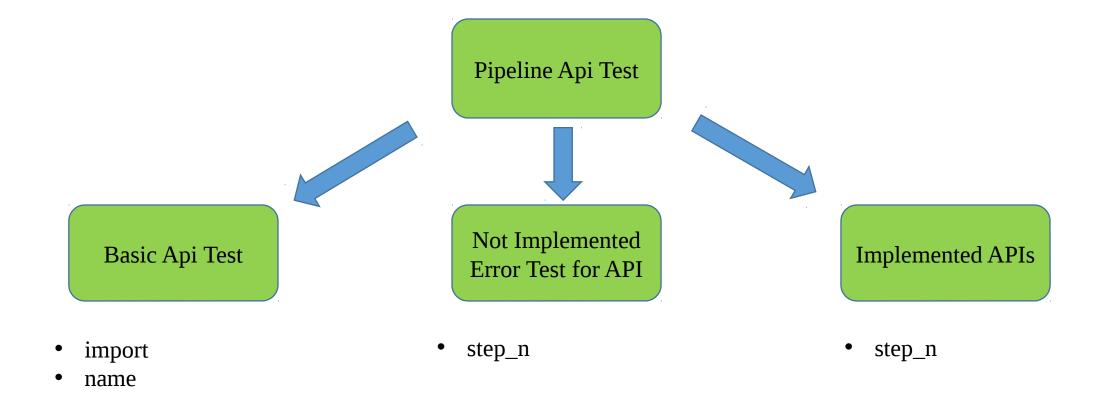
- copy\_input\_data
- copy\_output\_data
- cores
- download\_input\_data
- download\_output\_data
- upload\_input\_data
- get\_arg()
- get\_instance\_type
- get\_raw\_args()
- link\_input\_data()

# Pattern API

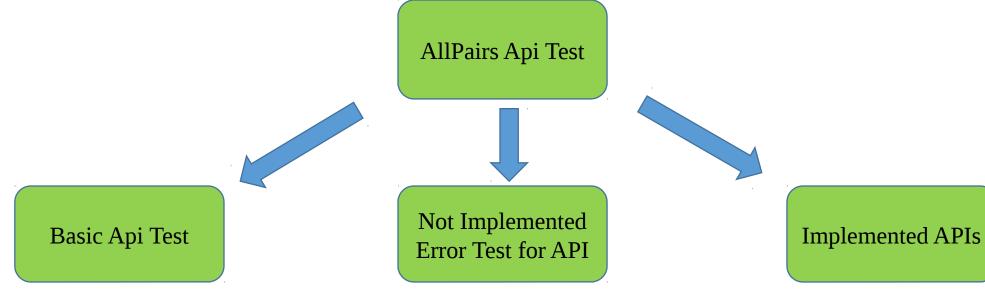
## Pipeline API

instances

steps



#### AllPairs API

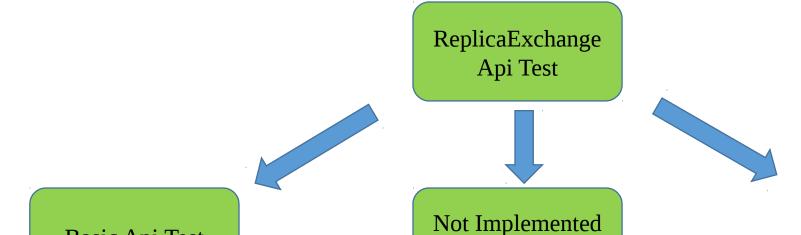


- import
- name
- permutations
- set1\_elements
- set2\_elements

- set1element\_initialization
- set2element\_initialization
- element\_comparision

- set1element\_initialization
- set2element\_initialization
- element\_comparision

#### ReplicaExchange API



Basic Api Test

- import
- name
- add\_replica/get\_replica

- initialize\_replica()
- build\_input\_file
- get\_swap\_matrix
- perform\_swap
- prepare\_replica\_for\_md
- prepare\_replica\_for\_exchange

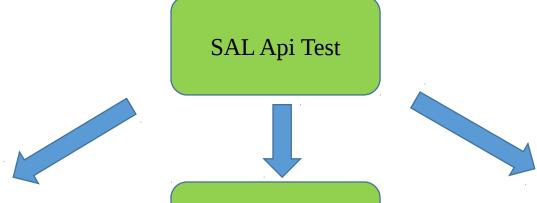
Error Test for API

exchange

#### Implemented APIs

- initialize\_replica()
- build\_input\_file
- get\_swap\_matrix
- perform\_swap
- prepare\_replica\_for\_md
- prepare\_replica\_for\_exchange
- exchange

## Simulation Analysis Loop API



#### Basic Api Test

- import
- name
- iterations
- simulation\_instances
- analysis\_instances
- simulation\_adaptivity

#### Not Implemented Error Test for API

- pre\_loop()
- simulation\_step()
- analysis\_step()
- post\_loop()

#### Implemented APIs

- pre\_loop()
- simulation\_step()
- analysis\_step()
- post\_loop()

## E2E Testing

- Execute each pair with basic kernel on:
  - local host
  - remote host

- Suggestions:
  - Any better idea to execute E2E

## Blackbox Testing

• Tried running coco example but failing on stampede

- Suggestion:
  - How to start?
  - What is expected?

#### **Issues**

- Resolved:
  - allocate() did not return, giving I/O operation fail error
  - failing deallocate()

- Open:
  - run()- successfully executes but does not return anything
  - coco example: execution failed
  - No files are generated when Test cases are executes unlike a normal code

## Road Map

- EnsembleMD APIs:
  - Pattern APIs Completed
  - Execution API To be completed by 1/6/2016

- E2E Testing: To be completed by 1/10/2016
- Blackbox testing: To be completed by 1/20/2016, simultaneously start writing

# Suggestions/ Improvements