CASE STUDY: ADAPTIVE TEST AUTOMATION FOR TESTING AN ADAPTIVE HADOOP RESOURCE MANAGER
HADOOP MAPREDUCE ARCHITECTURE

COPING WITH BIG DATA

MAP Phase

REDUCE Phase
SYSTEM UNDER TEST

PROPERTIES

- Indeterminism
- Ever-changing Environment
- Intense Interaction
- Interleaving Mechanism
OUR OFFER

1. Self-Aware Test Automation
2. Adaptive Test Strategies
3. Learning Test Automation
4. Implementation for an Adaptive Hadoop Resource Manager
Self Awareness
SELF-AWARE TEST AUTOMATION: RUN TIME MODEL

SELF-AWARENESS

- We Close the Loop of Model-Based Testing
- We Need
  - Run Time Models
  - Reflection
Self Adaptive
SELF-ADAPTIVE

- Having Flexible Test Cases
  - Fuzzy Preconditions
- Multi Purposes
- Having an Intention with Open Spaces
- Adaptation is defined by Patterns of Run Time Behavior
LEARNING TEST AUTOMATION: DIVERSITY OPTIMIZING PLANNER

SELF-LEARNING

Activation("TooFewServers", selectedServer="auto")
[Persistent] class CannotExecuteQueries : Fault {
public void AddQueries(List<Query> queriesToExecute) {

- What Test Step should be executed if more than one is possible?
- Which Node(s) should be selected?
- When is ToFewServer fulfilled?
The instantiation of the Test Cases maximizes the Diversity of the executed Test Suite

- Neural Network is used for Learning the Diversity Metric
- Planner instantiated on that Basis
- Planner is further Parameterized by the Test Engineer
EXPERIENCES

- Abstraction
- Coupling
- Reflection
- Effort