

# Distributed Systems Debugging

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# Reviewer's Opinion

- Distributed Shared Memory
- Test Coverage
- Predicate Detection Problems
- Further Work -- Details

# Distributed Shared Memory

- DSM is a special case of a distributed memory. In fact, it is implemented using the message-passing approach.
- For example: When Page-Based DSM system requires a word from a page that is currently located on a different node. Request to OS is sent and the page is fetched by exchanging messages.

# Test Coverage

- There is a very large number of tests for distributed programs, e.g.:
  - every potential message race, time-slice setting, each processor type and speed, handling of every type of data sent to every object, etc.
- Thus, there may be always a mistake in a distributed program.
- We can sometimes say for sure that there is not a particular kind of a mistake in the system.

# Predicate Detection Problems

- There is a huge theoretical background in the predicate detection theory.
- Only a few research groups are doing a research in this area.
- NP algorithms for the specified predicate classes exists. Nevertheless, nobody has proved whether there is or is not a possibility to solve it in P.

# Further Work -- Details

- Efficient method that I would like to propose should have low memory consumption and should be fast responding.
- First, I would like to develop a method and test it on a single JVM.
- Second, If it is possible, I will change it in such a way that it will be distributed across multiple JVMs.

# Further Work – The Method

App 1	App 2	App 3
JVM / .NET		
x86/alpha/solaris		

- The method for debugging distributed systems will be platform independent.
- Applications are compiled to the Java Bytecode or .NET Intermediate Language
- **Main idea:** This code will be modified to allow us simulate network delays and errors, observe and analyse the results, and allow a reproduction of an erroneous computation.

# Thank You Again

Thank you again for your attention...