

Rigorous design of cloud applications

using formal methods



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Context

Cloud applications may require dynamic reconfiguration for maintenance or elasticity purposes



Objectives

- Protocol which reconfigures cloud applications
- Rigorous design of cloud application

Solutions

- Formal specification of the protocol using process algebra
- Verification of the protocol using the CADP toolbox

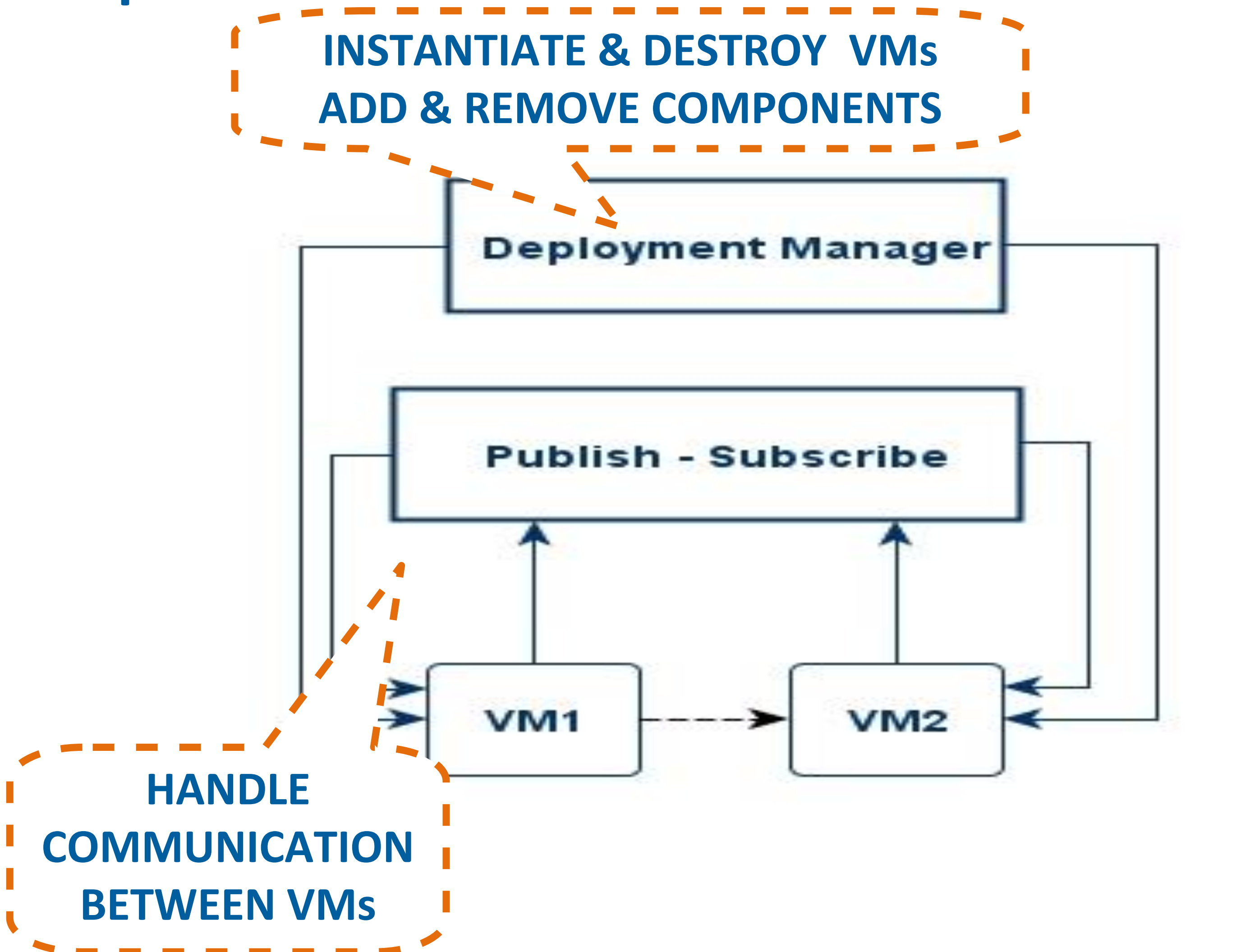


Construction and Analysis of Distributed Processes

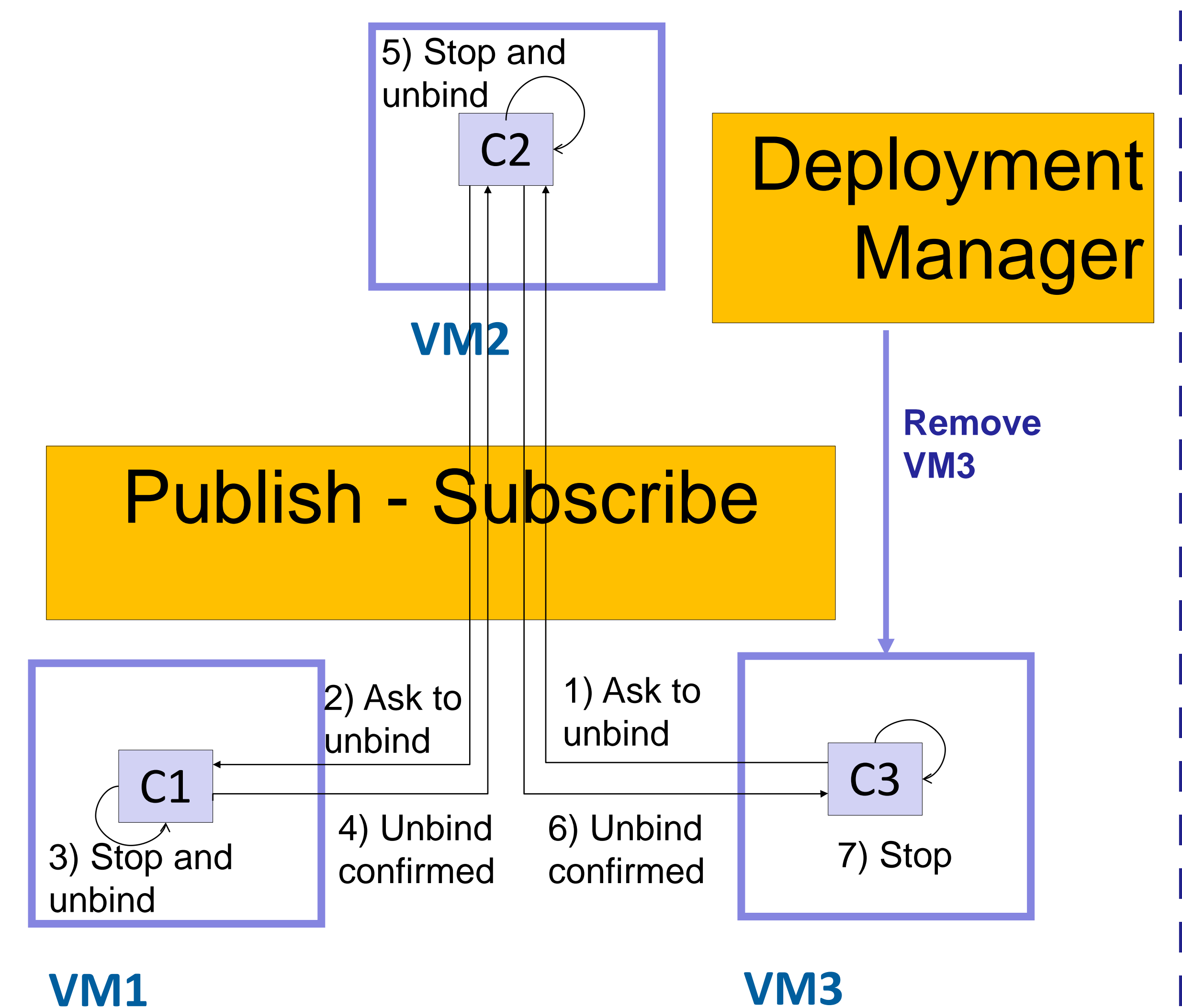


- More than 50 tools
- Modular toolbox for asynchronous systems

Proposed solution



Example of a machine removal



Results

- Several bugs detected using model checking techniques
- Correction of problems found in the Java implementation

References

R. Abid, G. Salaun, F. Bongiovanni, and N. Depalma
Verification of a Dynamic Management Protocol for Cloud Applications. In Proc. of ATVA'13, volume 8172 of LNCS, page 178-192. Springer, 2013

