BCT: A Toolset for Automated Failure Analysis

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Failures in component based systems

- Tomcat Web Application Manager
- WebApp1
- WebApp2
- WebApp3

Faulty components interactions

- Servlet
- Catalina
- Jasper
- Tomcat

A failure in Tomcat 6.0.4

Locating fault is difficult when failure is far from faulty interactions

BCT locates faults in 3 phases

Phase 1: Build behavioral models

- From correct execution traces
- BCT Inference Engine
- To models of correct behavior

Phase 2: Trace faulty executions

- Bootstrap init
- HostConfig start
- HostConfig deployWar
- StandardManager start
- Failure

Phase 3: Locate faults

- From dynamic call tree to anomaly graph for fault localization

Case studies

<table>
<thead>
<tr>
<th>Case study</th>
<th>ID</th>
<th>Connected Components</th>
<th>Inspected CC (false positives)</th>
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Fault location