

# A Novel Approach for Fault Diagnosis on Computational Grids

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## ABSTRACT

A grid user should be able to submit a set of tasks for execution in the infrastructure and collect the results in the end, like she would do if using a single machine. In practice, however, this isn't what is happening to users from the largest grid infrastructures. It's not rare to observe high failure rates in the tasks submitted for execution on these infrastructures. Actually, when the user sees a problem in the execution of her application, the process to figure out why the application failed, i.e, pinpointing the root cause of the failure, is extremely complex. The application may fail due to an error in its own source code; or due to a configuration problem in a new grid node used for the first time; or due to a disk failure in some unknown node. The possibilities are simply too many. We propose a new approach to identify fault components within grid software stacks. The idea is to include automated tests and hooks to invoke these tests during production time in the software delivered to the client. Then, these hooks can be used in a collaborative way to pinpoint faulty components in a service (like the grid one's) provided by a chain of (sub-)services. This approach showed a success rate of  $93,99\% \pm 5,63\%$  (95% confidence level) in the identification of fault components on a real grid infrastructure [1] and can be easily generalized and applied to other domains where services are provided by compositions of other (sub)-services.

## BODY

*The automatic tests written during software's development phase can also be used to identify faulty components during its production stage.*

## REFERENCES

- [1] "Alexandre Duarte". *Uma Abordagem Baseada em Testes Automaticos de Software para Diagnostico de Faltas em Grades Computacionais*. PhD in Computer Science, Universidade Federal de Campina Grande, Brazil, 2010.

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