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Distributed Complex Event Processing Engine

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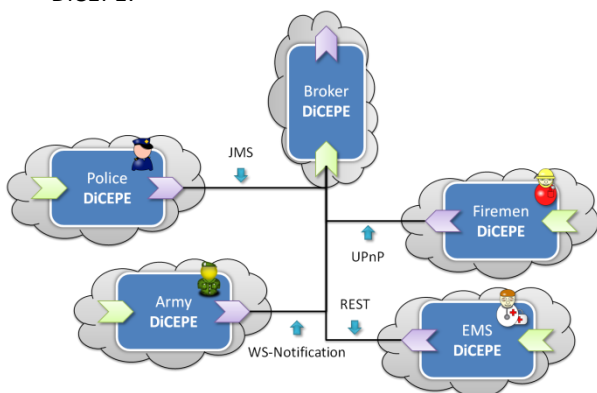
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Introduction

- DiCEPE (Distributed Complex Event Processing) is a platform that focuses on the integration of CEP engines in distributed systems, and which is capable of using various communication protocols.
- It was built using a component-based approach, and inherits the flexibility and adaptation facilities provided by FraSCAti.
- The DiCEPE platform is used to federate complex event processing.

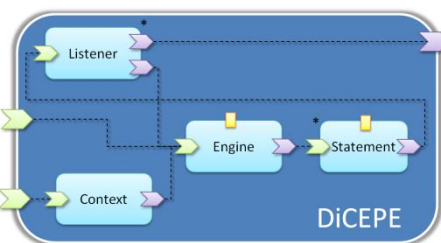
Experimental Deployment

- We developed a solution for a crisis management scenario using DiCEPE .
- This scenario was deployed in a cloud environment using CloudBees, a public Platform as a Service (PaaS) provider.
- Each actor of the scenario runs its own instance of DiCEPE.



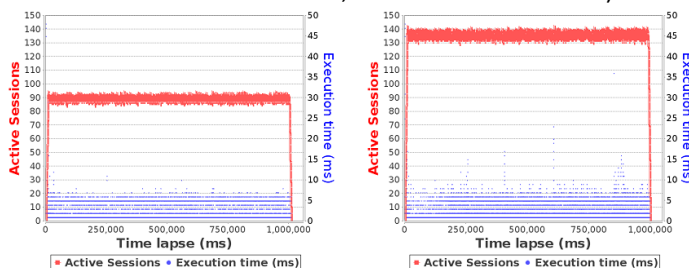
Platform Overview

- The architecture of DiCEPE is composed of four parts:
- Engine:** This component acts as the engine instance, by which Statement components, events, and outputs (Listener component) are registered.
- Statement:** This component is used for querying the inbound event streams. It is registered within the Engine component, which at the same time is connected to one or many Statement components.
- Listener:** This component generates a new complex event when an action is detected.
- Context:** This component collects information of the executing environment, like the number of statement rules deployed in the engine at run-time.



Scalability

- To evaluate the scalability, we used two different datasets of event generators: one with 10,000 and a second one with 15,000 which generated around 500,000 and 750,000 events respectively.
- As shown in the graphs, the processing time for each event remained stable and very low during both benchmarks (around a 10th of a millisecond), despite the fact that the average number of simultaneous sessions had a significant increase of about 50% (from 89 with the first dataset, to 135 with the second).



Integration

- The DiCEPE platform facilitates the integration of complex event processing engines.
- We integrated DiCEPE with the Esper and Etalis CEP engines.



Conclusion

- DiCEPE is a platform that offers interoperability for Distributed Complex Event Processing engines, via federation. It focuses on providing a very flexible component architecture, which supports the interaction of different complex event processing engines simultaneously, while enabling communication among them with a distributed execution and deployment system.

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