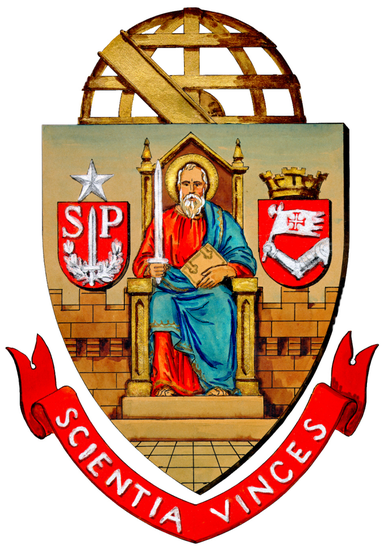
Scalable CEP for Smart Cities

Evaluating Scalability for Complex Event Processing in the Context of Smart Cities

Fernando Freire Scattone

Instituto de Matemática e Estatística - Universidade de São Paulo



Complex Event Processing

- Complex Event Processing (CEP) is a defined set of tools and techniques for analyzing and controlling the complex series of interrelated events . [Luckham 2001]
- Simple events can be anything, from a temperature measure to a specific log on a given system and come as data streams to the CEP engines.
- Complex events are defined by rules which are based on CEP operators.Complex Events can be defined based on the occurrence of single on other complex events.

Scalability

- In a distributed systems 3 resources can become bottlenecks:
  - CPU usage
  - memory usage
  - Bandwidth
- A system is scalable when those 3 resources are balanced while the system is increasing in size.

Smart Cities

- A Smart City is a city in which its social, business, and technological aspects are supported by Information and Communication Technologies to improve the experience of the citizen within the city. [Batista et al. 2016]
- Every time a lot of different measured are being taken everywhere on cities.From mobile phones to humidity sensors spread across the neighborhoods.
- This data, by itself , has little meaning.When combined, correlations not previously thought could be recognized and studied.

Achieving Scalability with CEP

- CEP operators have a great variety of correlation operations that involve joining information from different data streams or data streams and a database with specific conditions that must be met in order to detect complex events.
- Most of the challenges are related to distributing the processing without compromising too much the CEP operators.

Proposal

- Search all scalability technics for Complex Event Processing and find which ones can be combined to lower resource usage.
- Monitor the CPU, memory and bandwidth usage to more easily adapt to the addition or subtraction of available machines for processing
- Discover Smart Cities requirements that may affect the Scalability of the CEP system and try to overcome them.
- Maybe use the city natural disposition and features to improve the processing, based on the correlation between geographical localization and information relevance to people on that place.

References

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