Declarative approach for integrated network and data management in wireless multi-hop networks

Programme Blanc 2009

UBIQUEST: Declarative approach for integrated network and data management in wireless multi-hop networks

- Devices with limited resources
- Distributed data (horizontal fragmentation)
- Multi-hop ad-hoc networks
- Complex programming (e.g. routing, data management)

UBIQUEST vision

- Virtual world game

UBIQUEST system

- An example of a data intensive system

UBIQUEST vision

- Data intensive systems
- Programs
- Communication
- Data operators
- Distributed data based management

UBIQUEST prototype and simulation platform

- UBIQUEST VM
- UBIQUEST API
- LDMS
- DLAQL
- Program invocation

UBIQUEST proposal

- Combining declarative networking and distributed data based management
- Declarative and adaptive approach
- Query optimization by learning
- A UBIQUEST Virtual Machine (VM) on each node

Query optimization using Case-Based Reasoning

- Query case retrieval
- Similarity function $\rightarrow$ query family
- Cost function $\rightarrow$ best case
- Query plan generation
- Pseudo-random
- Recursive
- Rule-based programs exploitation
- Learn real resource consumption for query families

UBIQUEST prototype and simulation platform

- Rule Program
- Engine
- Topology Engine
- Communication Module

UBIQUEST VM

- Sensing Engine

UBIQUEST API

- Device Wrapper

UBIQUEST Application

- Cost function
- Similarity function

Optimal query execution cost

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