Mobile Read Write Access and Intermittent to Semantic Web (MoReWAIS) Project

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MoReWAIS's Member

Summary

> MoReWAIS Team

Context, Objectives & Executive Suppport

PhD thesis project

Future works and Publications

MoReWAIS Team

➤ **Collaboration:**

- LANI, University Gaston Berger of Saint-Louis (SENEGAL)
- WIMMICS, INRIA Sophia Antipolis

➤ **Scientific Leaders:**

- Moussa LO, LANI, University Gaston Berger of Saint-Louis & Senegalese virtual University (SENEGAL)
- Fabien GANDON, WIMMICS, INRIA Sophia Antipolis

➤ **External Collaboration:**

- LINA (Nantes)
- Accenture Research Dublin
- University of Maroua (Cameroon)

➤ **Members (2018):**

UGB	Wimmics
Moussa LO	Fabien GANDON
Cheikh Talibouya DIOP	Olivier CORBY
Fatou Kamara SANGARE	Catherine FARON ZUCKER
Seydina Moussa NDIAYE	Isabelle MIRBEL
Gaoussou CAMARA	Guidedi KALADZAVI
Guidedi KALADZAVI	Mahamadou TOURE
Mahamadou TOURE	

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General Context

- **Previous Project:**
  - social and semantic web platform to share and co-construct socioculturel knowledge about Senegalese communities
  - Two objectives:
    1. provide a user-friendly framework for communities to collaborate and update data
    2. provide tools enabling the querying and visualization of these data

- **Two Main Observations**
  1. Limited Internet Access
  2. Proliferation of mobile phones

- **Proposition**
  - develop and use mobile services to enhance access to social semantic web platform even with the very limited Web access

Objectives

- Explore the specificities (advantages and constraints) of mobile-enabled knowledge sharing platform

- Design and develop algorithms, methods and tools for mobile devices:
  - Co-construct locally and on the road linked data representing the sociocultural shared knowledge
  - Access and visualize in context relevant sociocultural shared knowledge
  - collect, host and make available sociocultural shared knowledge even in technological degraded contexts

Executive support

➢ **Ph.D thesis:** Mobile Access for the Web of data (Underway)

➢ Two (2) Post-Doc Positions

➢ Ten (10) Scientific Mobilities

➢ Four (4) Publications

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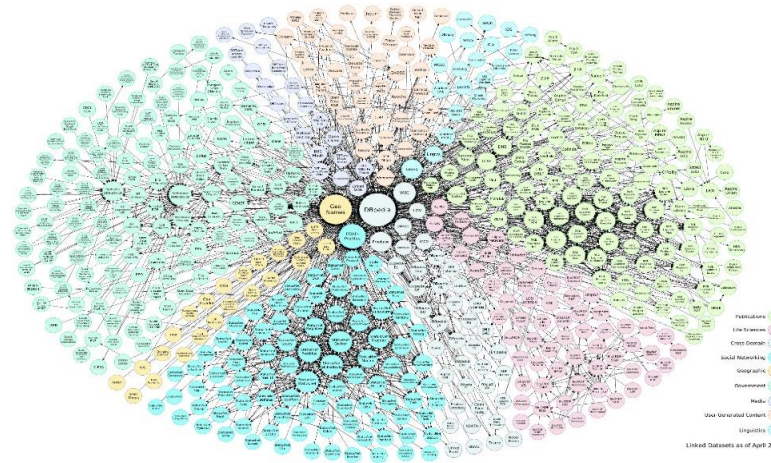
Mobile Access for the Web of Data

➢ **General Context**

  o Data Access

  o Mobility

  o Limited Internet Access

  o Limited Resources

➢ **Scenario**

  o Exchanges of information about sports events, cultural events or local businesses and services, in a restricted area.

➢ **Constraints**

  o Need to consult and contribute locally

  o Unreliable and limited internet connection

  o Mobility of contributors: arrivals and departures

  o Limited material resources

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Generalities

➢ **Objective :**

  o Models, protocols and algorithms: access, share and publish data in an environment where hardware resources are limited

  o Shared socio-cultural knowledge base: co-construct locally and automatically RDF triplet data warehouses

➢ **Problem Statement :**

  o How to set up a decentralized peer-to-peer topology allowing data exchange in Semantic Web formats with limited Internet access?

  o How to facilitate research and contribution access to users from limited mobile terminals?

  o How to maintain a good availability of relevant data locally despite the arrival, departure and disconnections of the peer network and Internet connection?
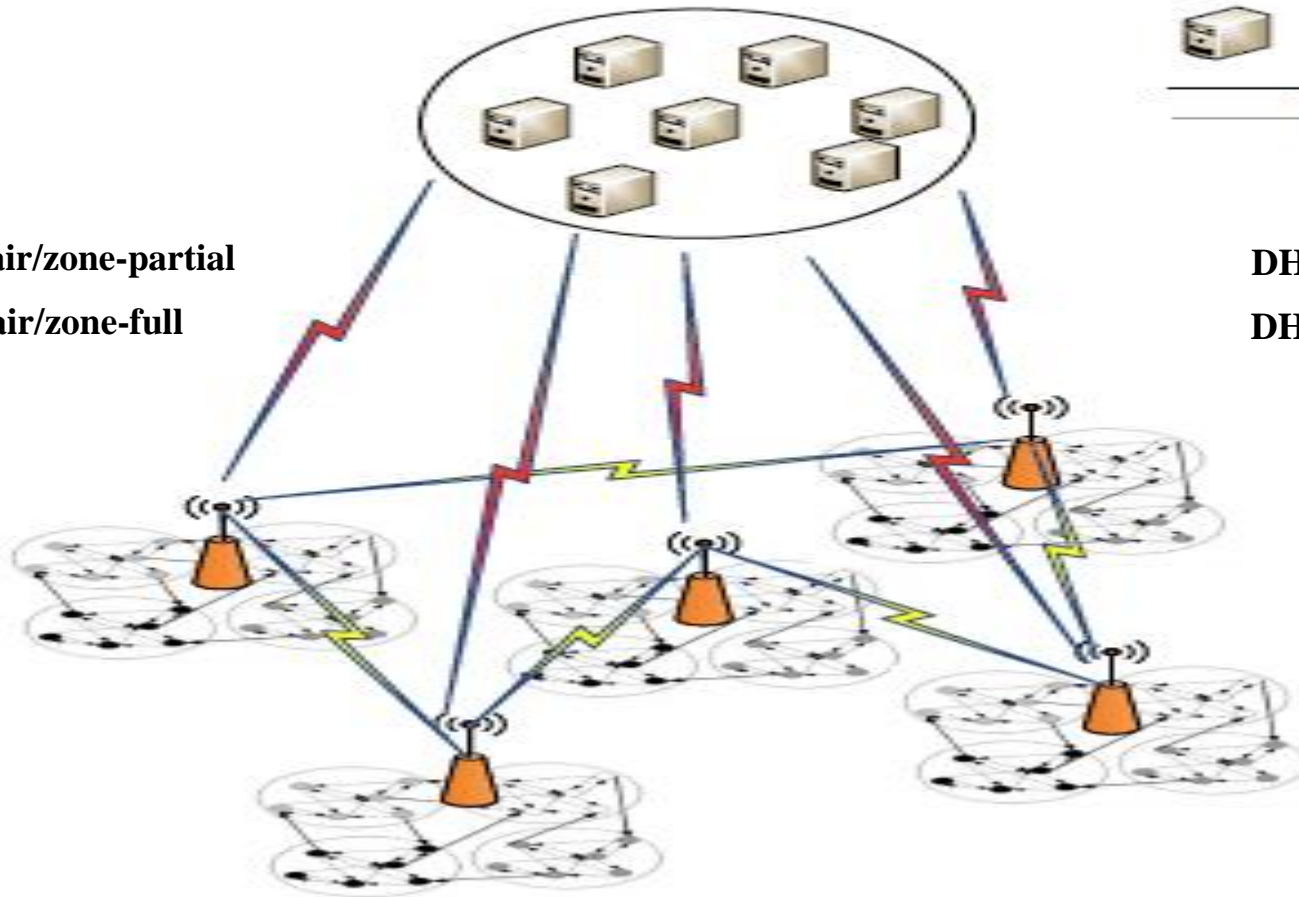
➢ **Methodology :**

  o State of the art on collaborative sharing and modification approaches for RDF graphs in mobile, local and restricted access

  o Synthesis

  o Proposition of models, protocols and algorithms

  o Implementation, tests and validation

Synthesis

➢ Build a decentralized architecture of sharing and contribution:

- based on a "gossip" protocol with a hierarchical adhesion mechanism that takes into account the location of peers.

- have an effective and consistent data replication mechanism

- and a model for automatically building a decentralized cooperative cache for fast and efficient query processing.
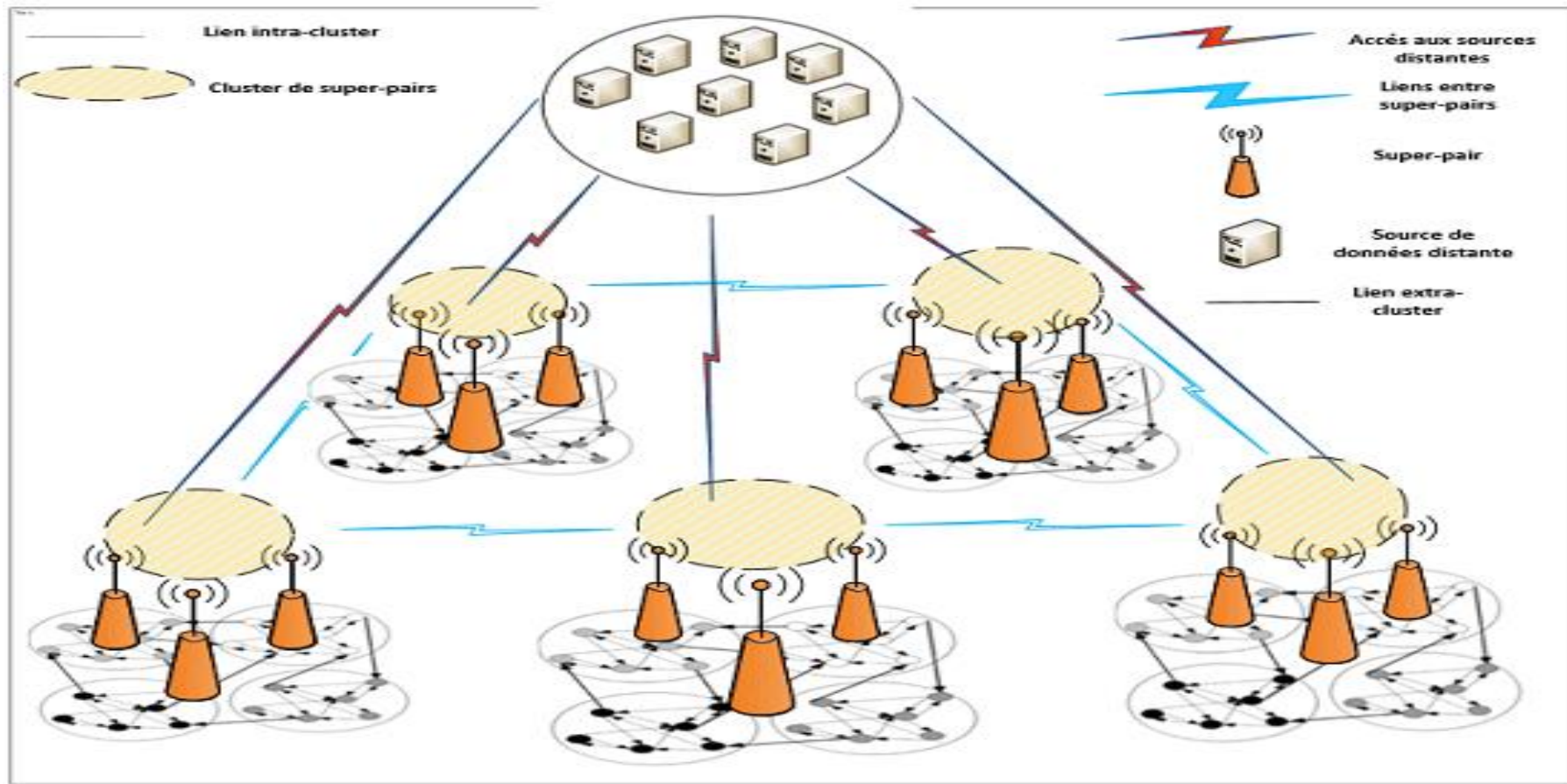
Architecture 1

Architecture 2

DHT-cluster/zone-partial:partial   DHT-cluster/zone-partial:full   DHT-cluster/zone-full:partial
DHT-cluster/zone-full:full   Non structured-cluster/zone-partial:partial   Non structured-cluster/zone-partial:full
Non structurée-cluster/zone-full:partial   Non structurée-cluster/zone-full:full

Analysis

	1.A	1.C	2.A	2.B	2.E	2.F
Extensibilité	+	+	+	+	+	+
Résistance aux échecs	-	-	+	+	+	+
Haute Disponibilité	+/-	+/-	+/-	+	+/-	+/-
Latence	+	-	+/-	+	-	+/-
Charge réseau	+	+/-	+	+	+/-	+/-

General summary table of the different architectures. **1.A** : « DHT-superPair/zone-partial », **1.C** : « non structured-superPair/zone-partial », **2.A** : « DHT-cluster/zone-partial:partial », **2.B** : « DHT-cluster/zone-partial:full », **2.E** : « non structured-cluster/zone-partial:partial », **2.F** : « non structured-cluster/zone-partial:full »

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Future works

- Implementation and Evaluation of the architectures (Underway)

- Comparaison to alternatives

- Test our solution in a real application scenario

MoReWAIS Project SWOT analysis

Strengths	Weaknesses
• Excellent complementarity between Wimmics and UGB • Scenarios and context available for testing in Senegal	• Need of cooperation on low level network questions
Opportunities	**Threats**
• Real application cases with local festival • Clear societal impact in case of success	• Complexity and time/ resources needed for real-world experimentation

Publications/valorization

- Papa Fary Diallo (2016): Aspects socioculturels et temporels dans les ontologies pour les communautés virtuelles - Ph D thesis defended at September 16th 2016 at University of Nice, Co-supervisors : Isabelle Mirbel and Moussa LO.

- P. F. Diallo, O. Corby, I. Mirbel, M. Lo, S. Ndiaye (2016), *Ontologies-Based Platform for Sociocultural Knowledge Management, Journal on Data Semantics*, pp. 1-23, Juin 2016, Springer.

- G. Kaladzavi, P. F. Diallo, Kolyang, M. Lo (2016), *Towards a Spatial Domain Ontology: the Case of the Sociocultural Infrastructures*, Proceedings of The Tenth International Conference on Advances in Semantic Processing (SEMAPRO 2016), October 9 - 13, 2016 - Venice, Italy.

- Mahamadou Toure, Fabien Gandon, Kaladzavi Guidedi, Christophe Guéret, Moussa Lo, Pascal Molli. Comparaison des Modèles et Architectures pour un Accès Mobile Restreint et Local au Web de Données : Un état de l'art des architectures et solutions envisageables. [Rapport de recherche] RR-9121, INRIA Sophia Antipolis. pp.81, December 2017.

Thanks for your Kind attention. .