



A Global Resource Management Model (GRMM) for Wireless Sensor/Actuator Network



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1. Introduction

- Sensor Node **Hardware is improving**



Higher applications level on WSN

High Computation is requested

A number of critical issues (Power Expense)

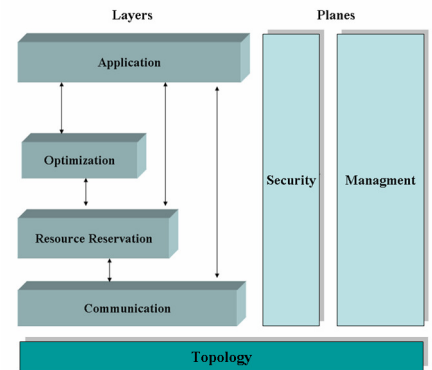
2. Resource Management Model

Layers

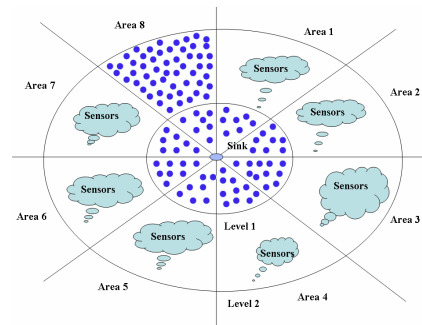
- Communication
- Resource Reservation
- Optimization
- Application

Planes

- Management
- Security



Topology/Logic Organization



2D Architecture

- Area
- Level

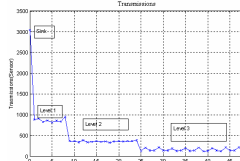
3D Architecture

- Area
- Level
- 3D Level

2.1 Communication Protocol

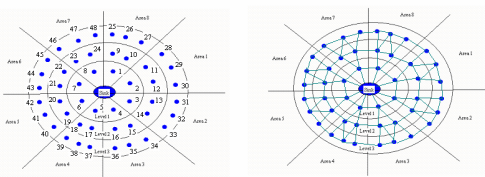
Optimal Routing:

- Performance
- Scalability



Communication in Convergence and Divergence mode

Increasing Scalability → Lower Performance
Higher Number of nodes

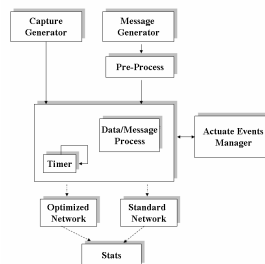


Critical Issue: Divergence Mode Communication

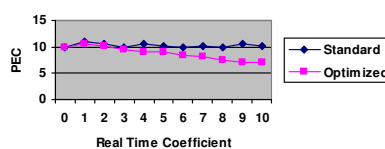
Integration with:

2.3 Resource Optimization

Layer Goal: optimize network resource in function of application characteristics



Standard vs Optimized Network



3. Conclusions

GRMM is a "Framework", composed by mathematical models and protocols, on which high level application can be optimally designed.

2.2 Resource Reservation

Resource:

- Communication
- Capture
- Computation

Reservation

- Re-Configuration
- "Roles"
- Ad hoc Communication Structures
- Capture planes
- Integration and Support for other layers
- Resource sharing

4. Future work

1. Applications designed on this "Framework" and developed on MICAz nodes related with:

- Reliable tourism
- Habitat monitoring
- Security and Alarm systems



2. Simulation of large scale applications
3. Next Generation Applications on WSN
4. Application Layer