COMMUNICATION 2020 AND BEYOND - ON THE ROAD TO AUTONOMIC COMMUNICATION

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ISSUES

- What will the wireless and mobile communication landscape look like 10-15 years from now?

- What are the disruptive technologies? The enabling technologies?

- What is Autonomic Communication?

- What do we foresee on the road to Communication 2020 and Beyond?
THE CORE

Autonomic
Ambient
Persons

MEGA INSTRUCTIONS PER SECOND (MIPS)

1 MIP PC
1k peak MIPS
digital BB
High end PC, 10k MIPS, 2005

Autonomic
Communication?
MIPS PER WATT AND WATTS/MIP

1. Xemics-CSEM CoolRISC processor

BASIC ELEMENT: AUTONOMIC COMPONENT

- An autonomic component:
  - Basic atom for autonomic applications and systems
  - Modular unit with specified interfaces, clear context dependencies and specific mechanisms for self-management
  - Responsible for providing its services according to the system constraints (requirements, resources...)
  - Capable of managing its behavior in accordance with rules, context and policies
  - Capable of interacting with other autonomic components
- Related issues: functional, operational and control aspects
AUTONOMIC COMMUNICATION STRATEGY

- Autonomic elements (components/services)
  - Responsible for policy-driven self-management of individual components

- Interactions between component elements
  - In accordance with policies
  - Following the agreements established by component elements
  - Leading to consistency, robustness and self-management of the system

CONCLUDING REMARKS

- Much more research is required to identify the thresholds and define the requirements on the road to Autonomic Communication

- If we consider the thresholds for Autonomic Communication considered in this presentation as a point of reference, major advances may be required in not only computing, communications and networking, but also in manufacturing and power supply technologies.

- An increased dependency on short range wireless communication is foreseen for interfacing. Physical interfaces to networks and equipment as we know them may disappear.

- The power of today's server and more, in < 100 mm³ package, consuming 1 µW?
  - Computational power for situated and autonomic communications and networking.
  - Precise localisation, sensing, sounding and the ability to adapt to the environment, traffic load, service or even the requested functionality.
  - Ultra lower power consumption, self-sustained operation over years (target: energy scavenging for future wearable and sensor systems)
  - Ultra small size and low cost yet ubiquitous nodes, capable of distributed processing and highly adaptive (target: Smart Dust-like).

  Autonomic Communication at a size we can swallow and...
Thank you