FIArch

Principles That Should Be Preserved

Pedro Martinez-Julia

University of Murcia

Preserved Design Principles

- Heterogeneity support,
- Scalability & Amplification,
- Robustness,
- Loose Coupling, and
- Locality

Heterogeneity Support

- In the future, the heterogeneity is expected to be much higher than today.

- Multiple types of terminals/hosts, multiple network nodes, multiple protocols, and multiple applications will exist.

- The capability to support heterogeneity should remain as one of the main design principles.

Scalability & Amplification

- The number of elements connected to the Internet is expected to significantly increase.

- The interconnection of the sensor networks with the legacy Internet will exponentially increase the number of Internet nodes.

- Scalability is among the major design principles that should govern Future Internet, while the amplification principle would definitely remain.

Robustness

- The Future Internet is expected to handle mission and time critical applications (health, energy, transport, financial transactions, etc.).

- The Internet progressively replaces existing application specific networks.

- Therefore, it becomes critical to ensure its robustness: minimizing the malfunction and uninterrupted operation remains unchanged.

Loose Coupling

- Loose coupling is a necessary condition for a well-structured system:

    1) it simplifies testing and troubleshooting procedures because problems are easy to isolate and unlikely to spread or propagate,

    2) combined with high cohesion, it supports the general goals of high readability and maintainability, and

    3) it minimizes unwanted interaction among system elements.

- Threfore, it should be preserved in the Future Internet.

- However, grading coupling level at runtime could be considered for systems with high degree of element interdependence.

Locality

- The locality principle is important in computer design, programming and the Internet.

- Moreover, it will play a fundamental role in self-stabilizing distributed systems.

- Therefore, the locality principle is important and should be preserved.

- Its scope should be extended to cover additional roles in distributed systems and architectures.

THANKS FOR YOUR ATTENTION