

**ISO/IEC JTC 1/WG 7**  
**Working Group on Sensor Networks**

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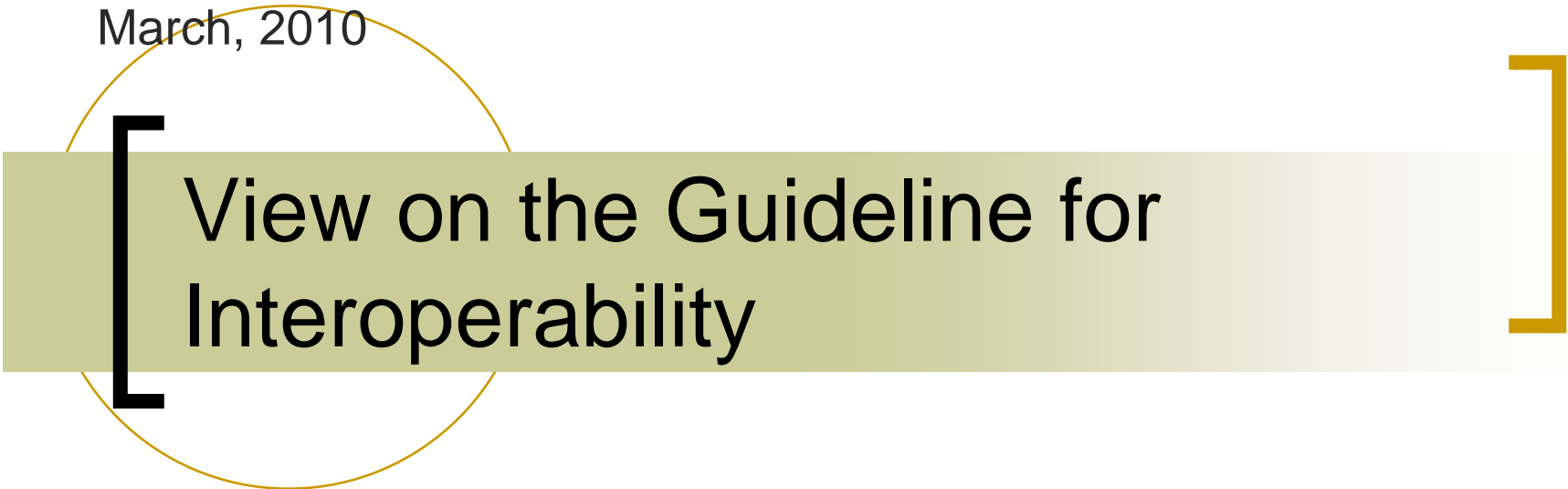
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# View on the Guideline for Interoperability

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# [ Guidelines for Interoperability ]

- Task of Working Group 7
  - 1) In the area of generic solutions for sensor networks, undertake standardization activities that support and apply to the technical work of all relevant JTC 1 entities and to other standards organizations. This would include activities in sensor networks such as the following:, ...:
    - d) Development of guidelines for interoperability.....**

# [ Interoperability of sensor node and gateway ]

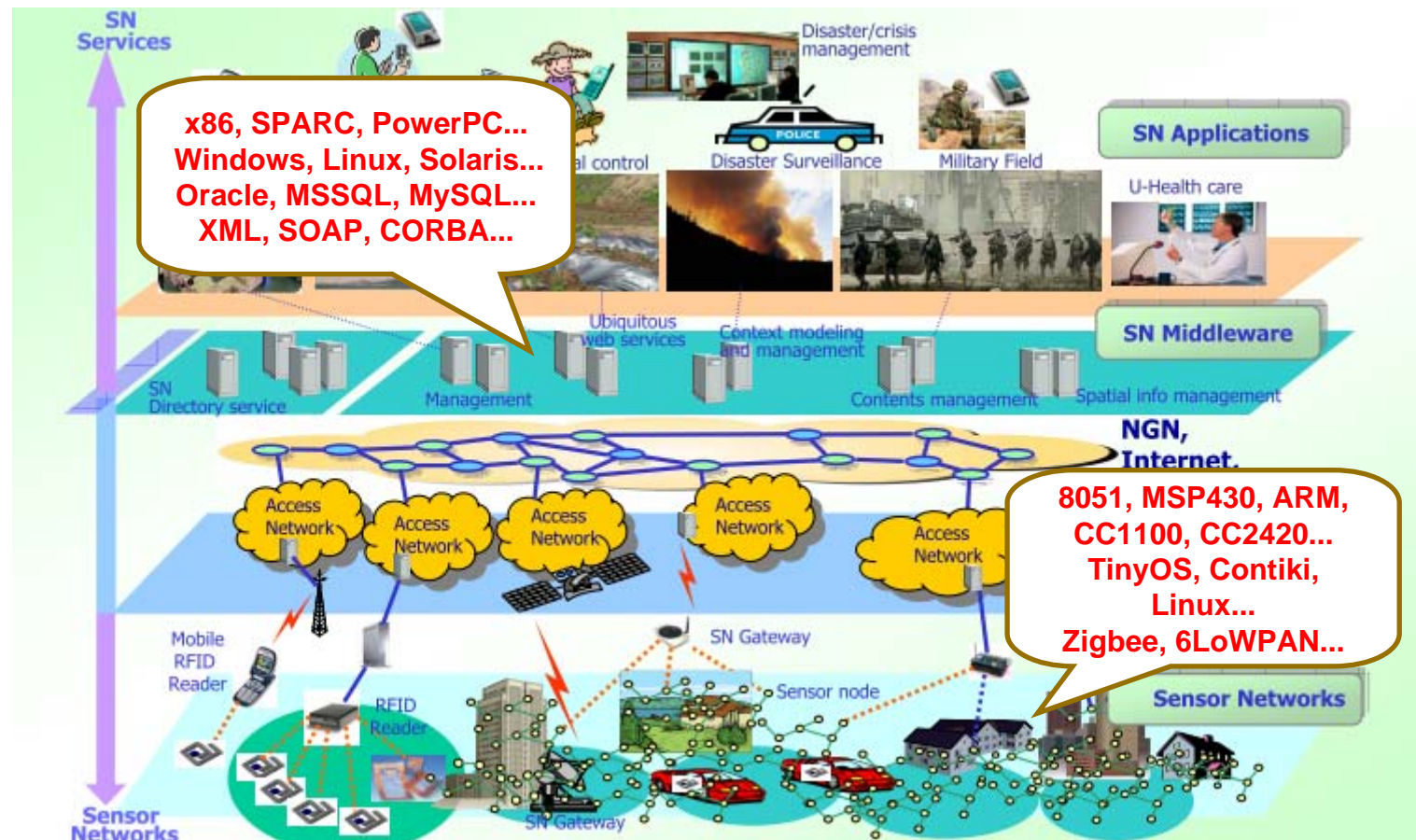
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- Heterogeneity of Protocol: Zigbee, 6LoWPAN, ISA100, WIA-PA...
- Interconnection between application/management platforms and sensor networks
- How to handle the heterogeneity of both?
- **How to interoperate?**

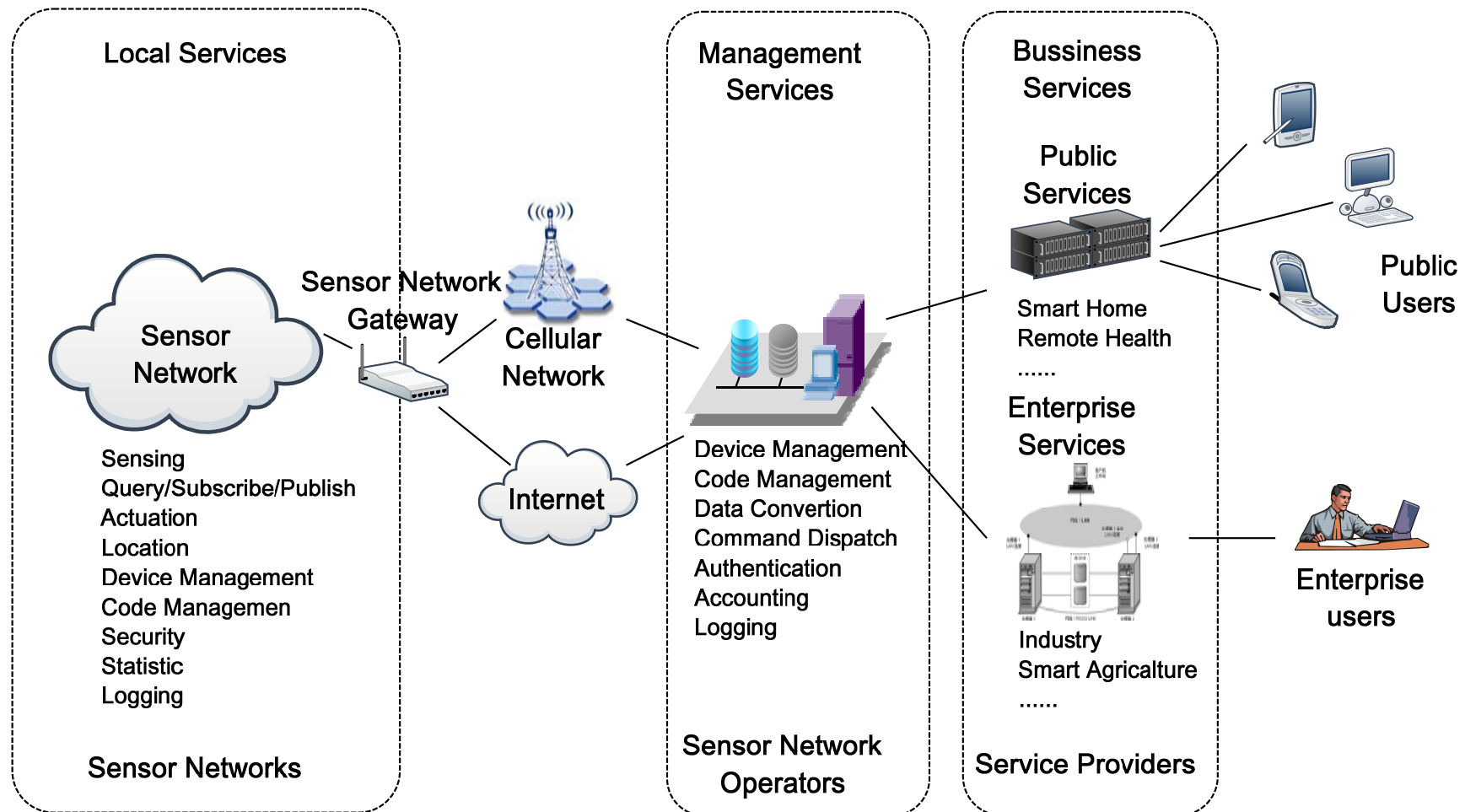
# [ Interoperability of Application/Management Platform ]

- Heterogeneity of hardware and software:
  - x86, SPARC, PowerPC,
  - Windows, Linux, Solaris,
  - Oracle, MSSQL, MySQL
  - .....
- **How to interoperate?**
  - Service Oriented Architecture?
  - Variety of technologies: XML, SOAP, CORBA...
  - Adoption of traditional technology? Or ,
  - sensor network specific technology?

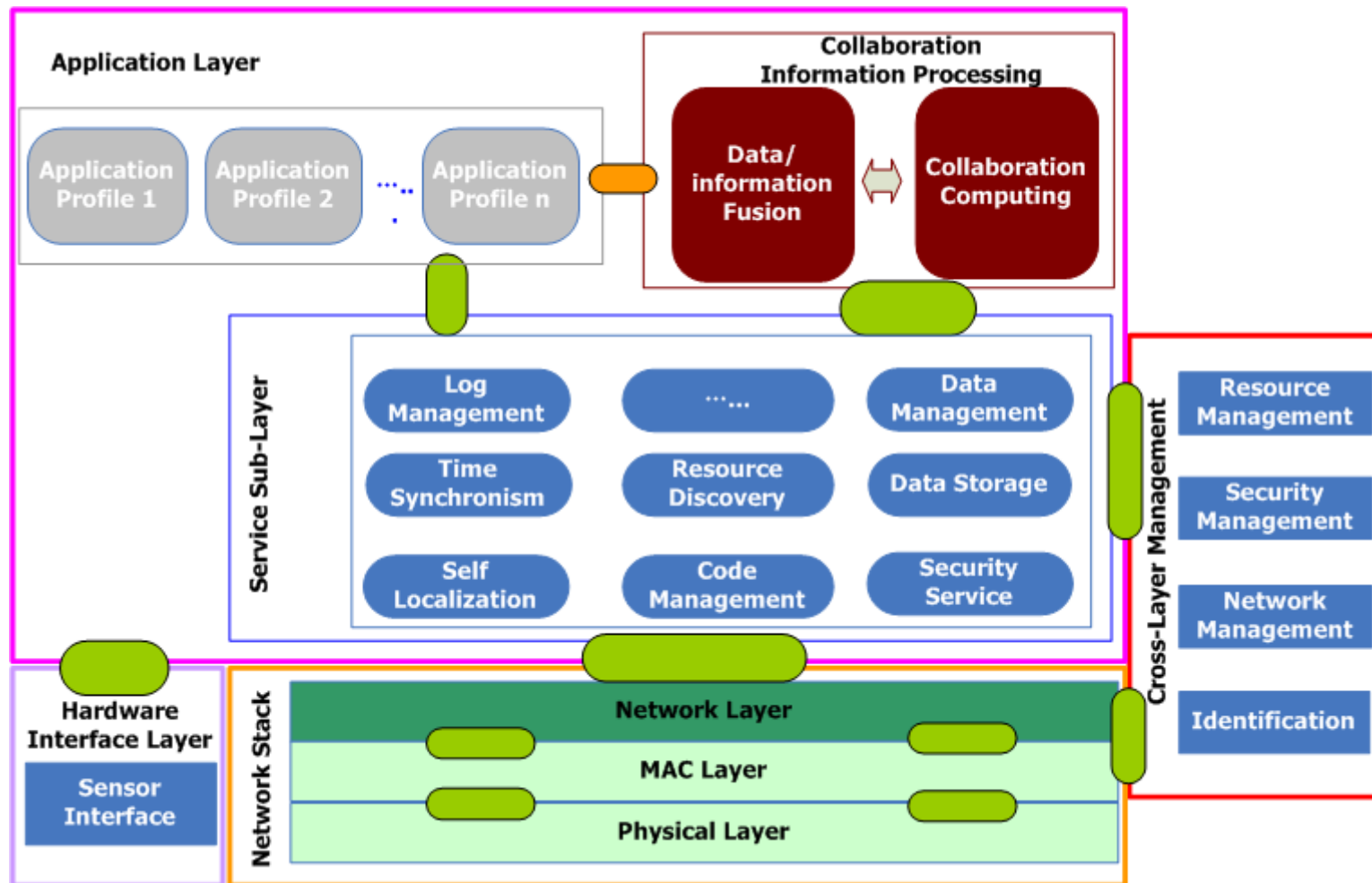
# How to coordinate ALL of them?



# Suggested Interoperation Architecture: Service Oriented



# Suggested middleware approach from ISO/IEC JTC1 SGSN





# Suggestions on middleware standardization of sensor network(1): Principles

- Layered architecture
  - Sensor node level
  - Gateway level
  - Application/Management Platform level
- Standardization of middleware should not depend on specific implementation, but focuses on:
  - Definitions
  - Interfaces
  - Workflows

# [ Conclusion ]

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- Middleware is an essential solution to meet challenges and requirements from sensor-network based systems.
- The implementation of middleware in sensor networks is an urgent and challenging work
- Standardization activity on middleware is strongly suggested in order to develop guidelines for interoperability of sensor-network based systems.

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**Q & A**  
**Thank you!**