The Internet of Things for Environment: Ontology-based Decision Support System (DSS) coupled with a Wireless Sensor Network (WSN)

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The Internet of Things for Environment

Ontology-based Decision Support System (DSS) coupled with a Wireless Sensor Network (WSN)

Agriculture and environment Context-aware System

Design and implementation of a Ontology-based DSS which measurement data are mainly provided by WSN for:

▪ Context Acquisition, Modeling, Reasoning and Distribution over the whole system (DSS and WSN)
▪ Heterogeneous data integration
▪ Regulated energy consumption at the level of the wireless sensors
▪ Internet of Things (IoT) and Linked Open Data (LOD) paradigms considered

Use Case

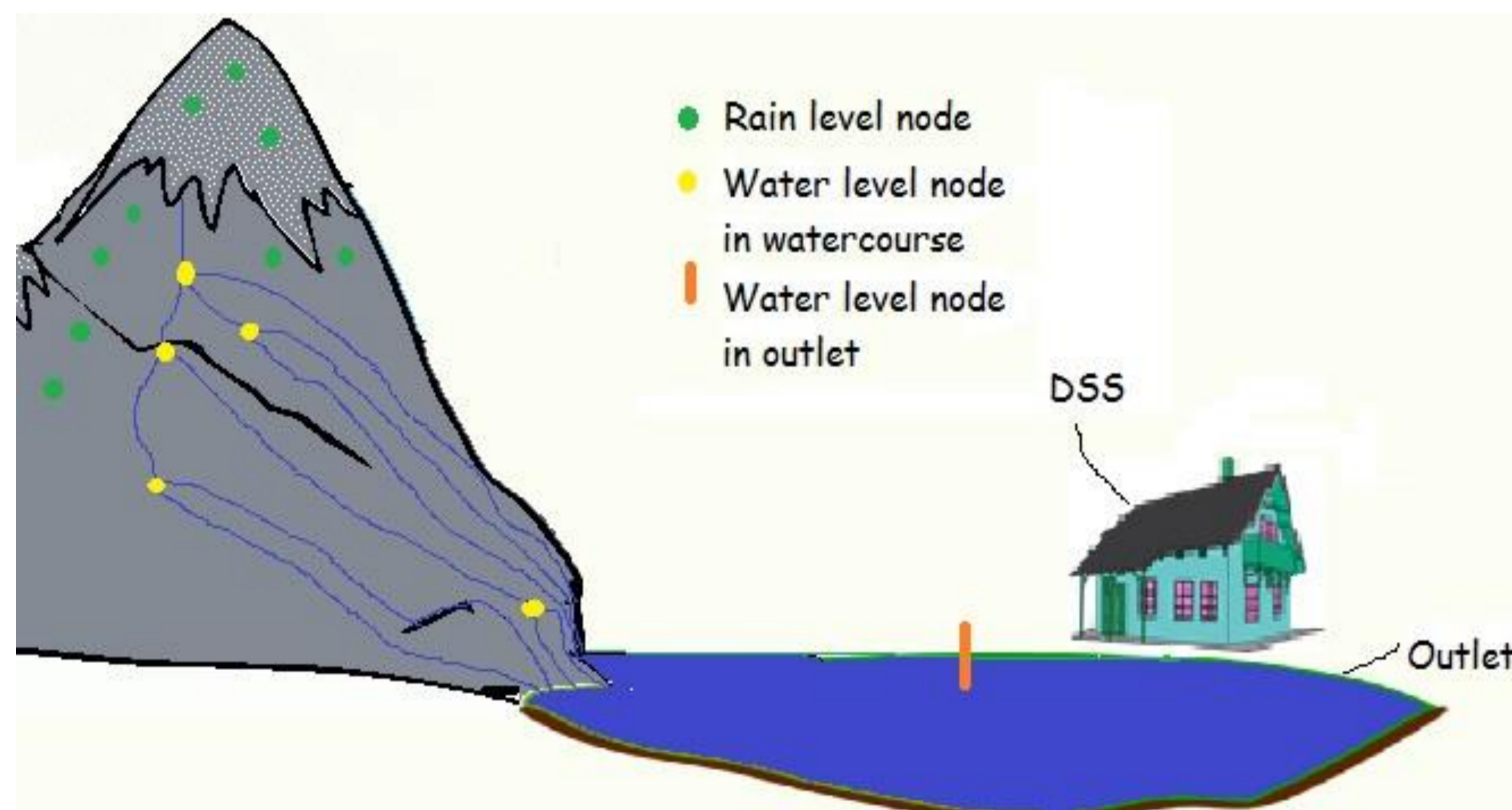
Figure 1 : Example of WSN configuration to monitor watershed

Figure 2 : Data flow Processing of the Context Aware System fed by a WSN
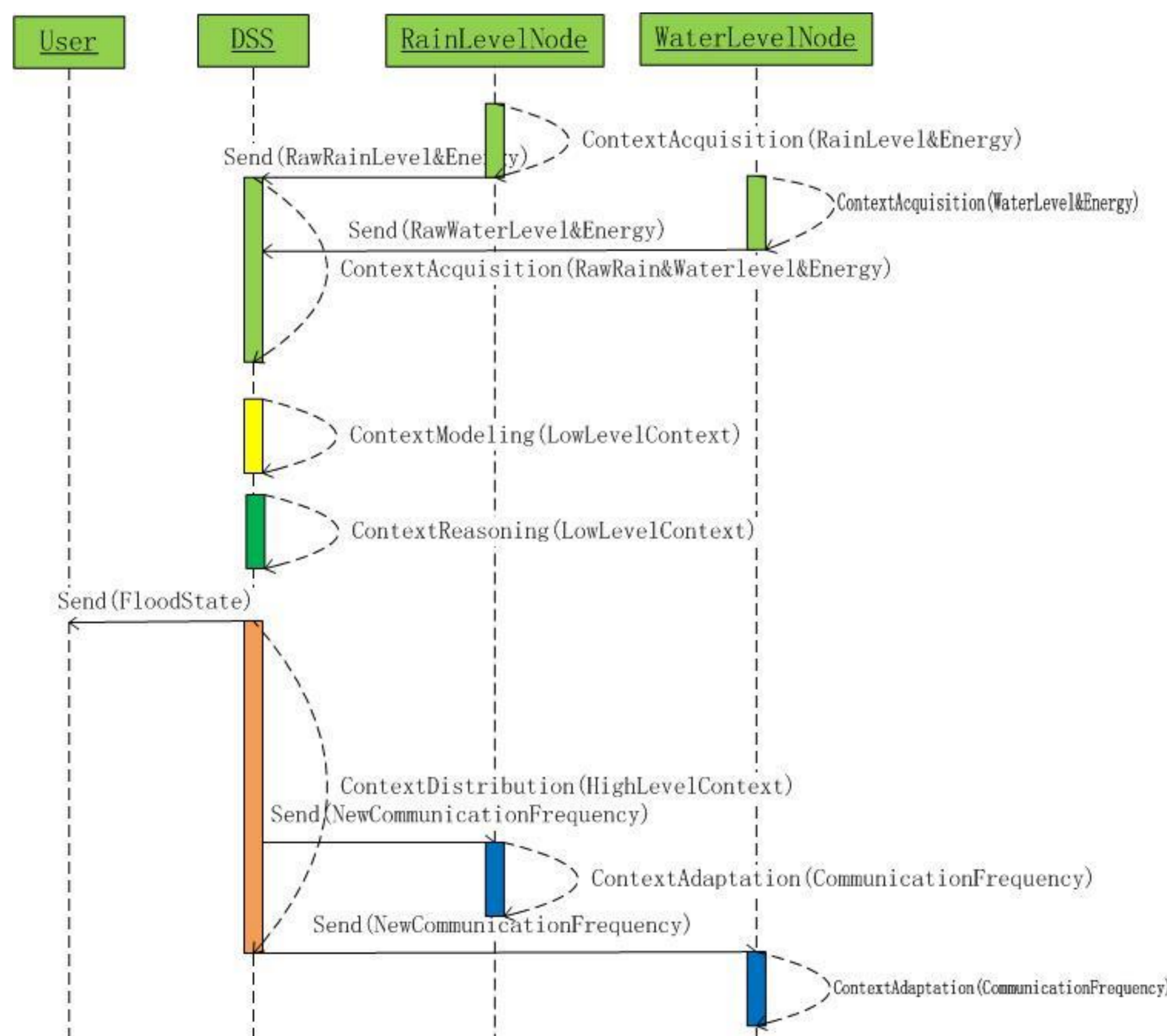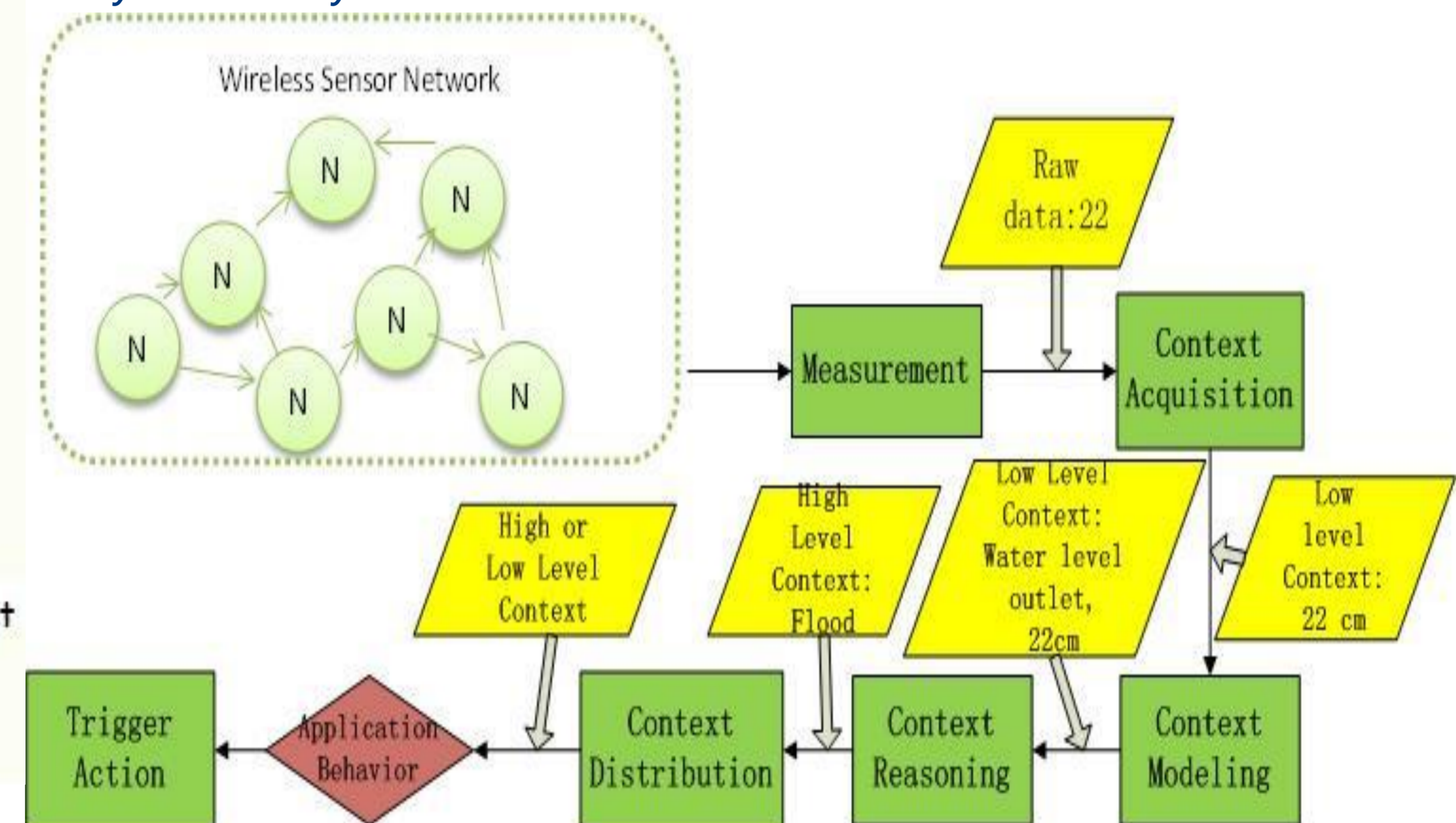

. *Figure 3 : Sequence Diagram of scenario 3 of use case in a watershed*

Case of study "Flood risk detection in a Watershed"

• Monitoring a watershed with two kind of wireless nodes:
  • Rain level.
  • Water level in water courses and outlet
• Several parameters to take into account:
  • State: A qualitative data which change over time representing a set of quantitative data acquired.
  • Context: Low level context or high level context depending on the different entities.
• Aim of DSS:
  • Deduce high level context (e.g. flood risk, etc.) and send alert if necessary
• 4 scenarios in case of study.
  • Scenario1: Sensors send only measurements to DSS; DSS sends alert to users if flood is detected; Sensors don't change their communication frequency.
  • Scenario4: Sensors send only measurements to DSS; DSS sends alert to users if flood is detected; DSS sends phenomenon state to sensors; Sensors can adapt communication frequency based on phenomenon and energy states.

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