Event Detection in Wireless Sensor Networks

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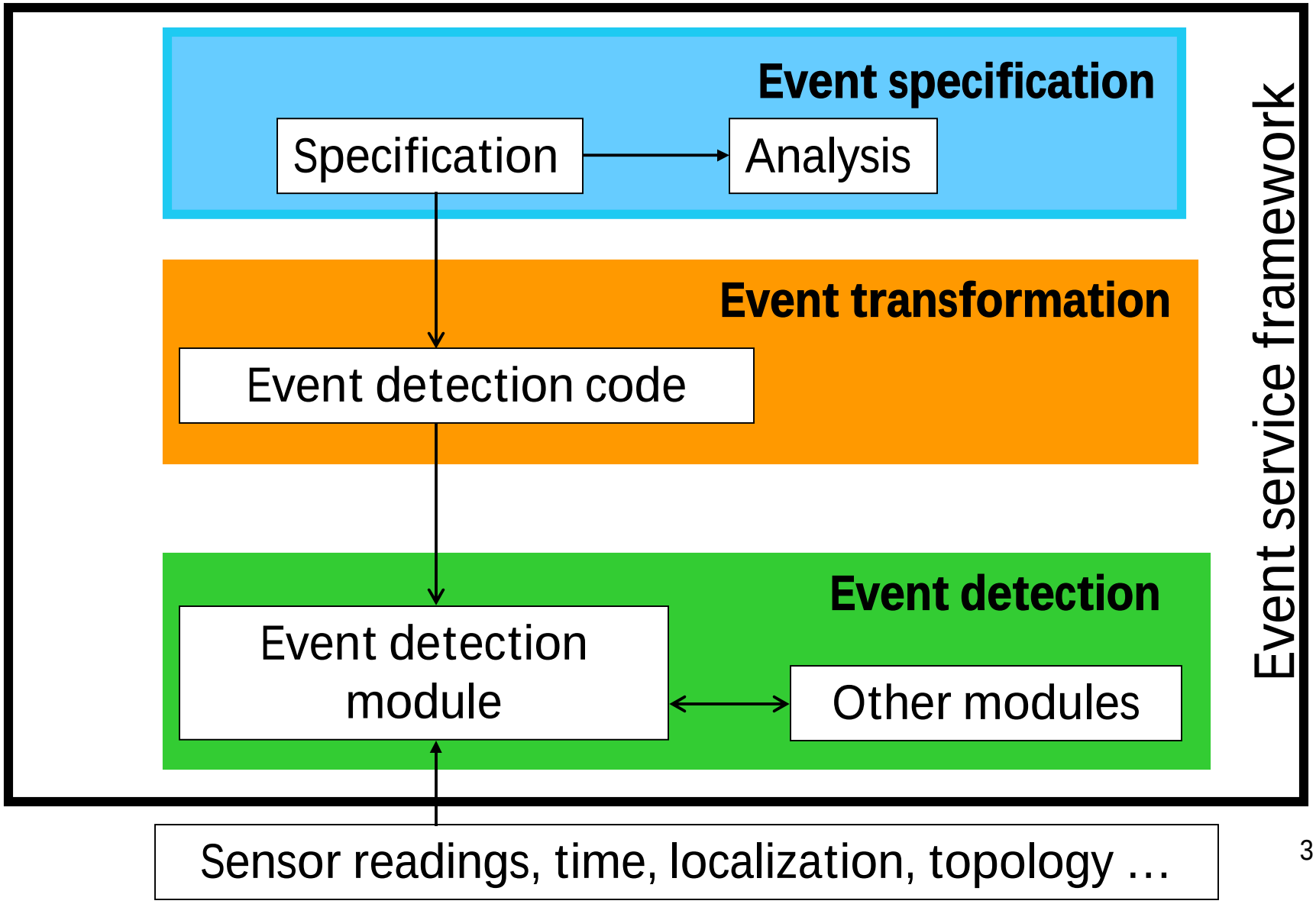
Key Ideas

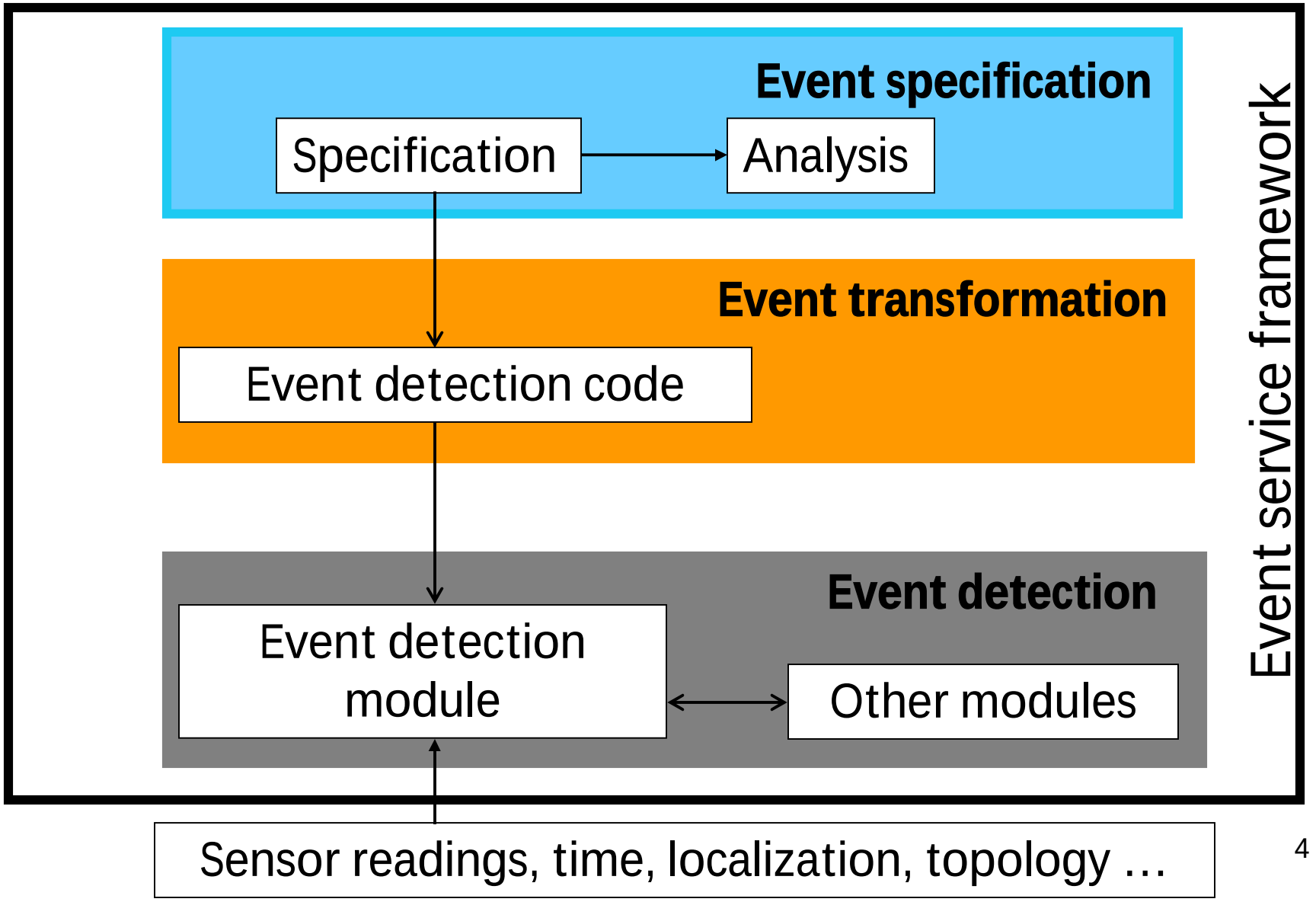
First steps to providing robust real time WSN event detection:

- Support the specification of complex events
- Facilitate the translation from specification to code

Event Service Framework



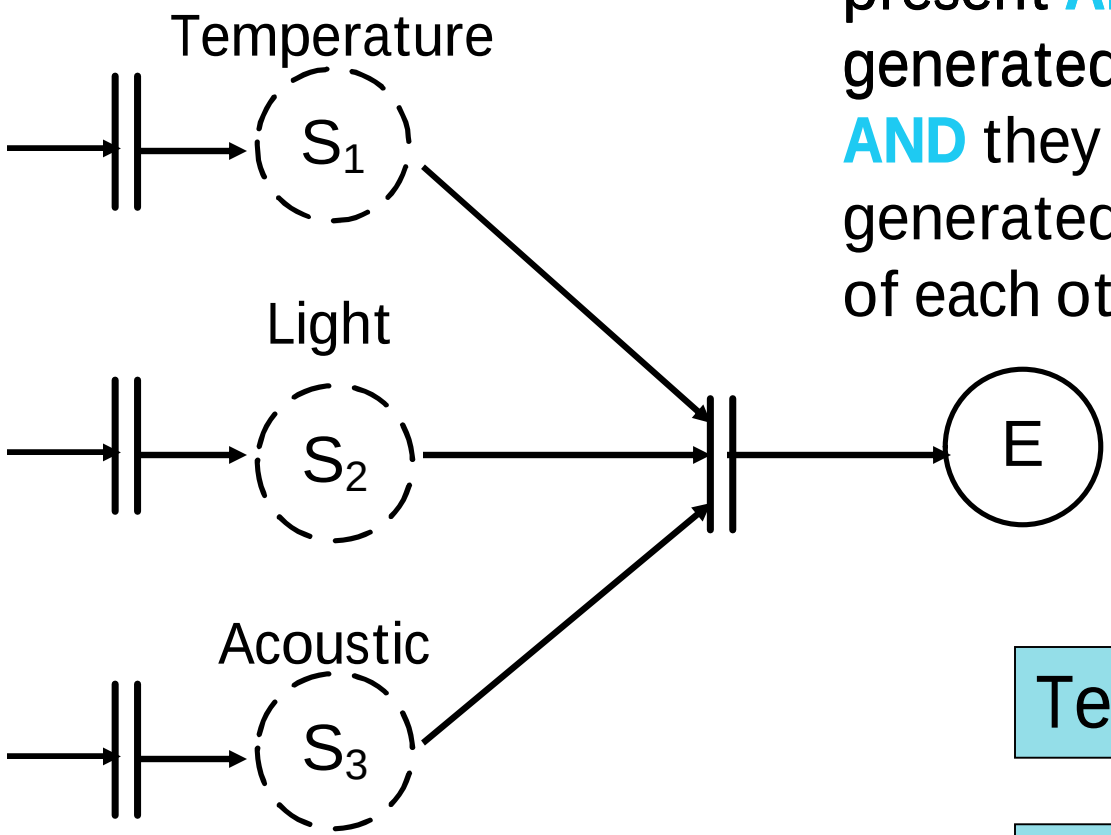
Event Service Framework



MEDAL

- An extended class of Petri nets
- Extended to model additional features of WSNs:
  - communication
  - actuation and conditional events
  - timeliness

Model-Based Application Specification



The three readings are present **AND** they have been generated within 30 seconds. **AND** they have been generated within 5m distance of each other.

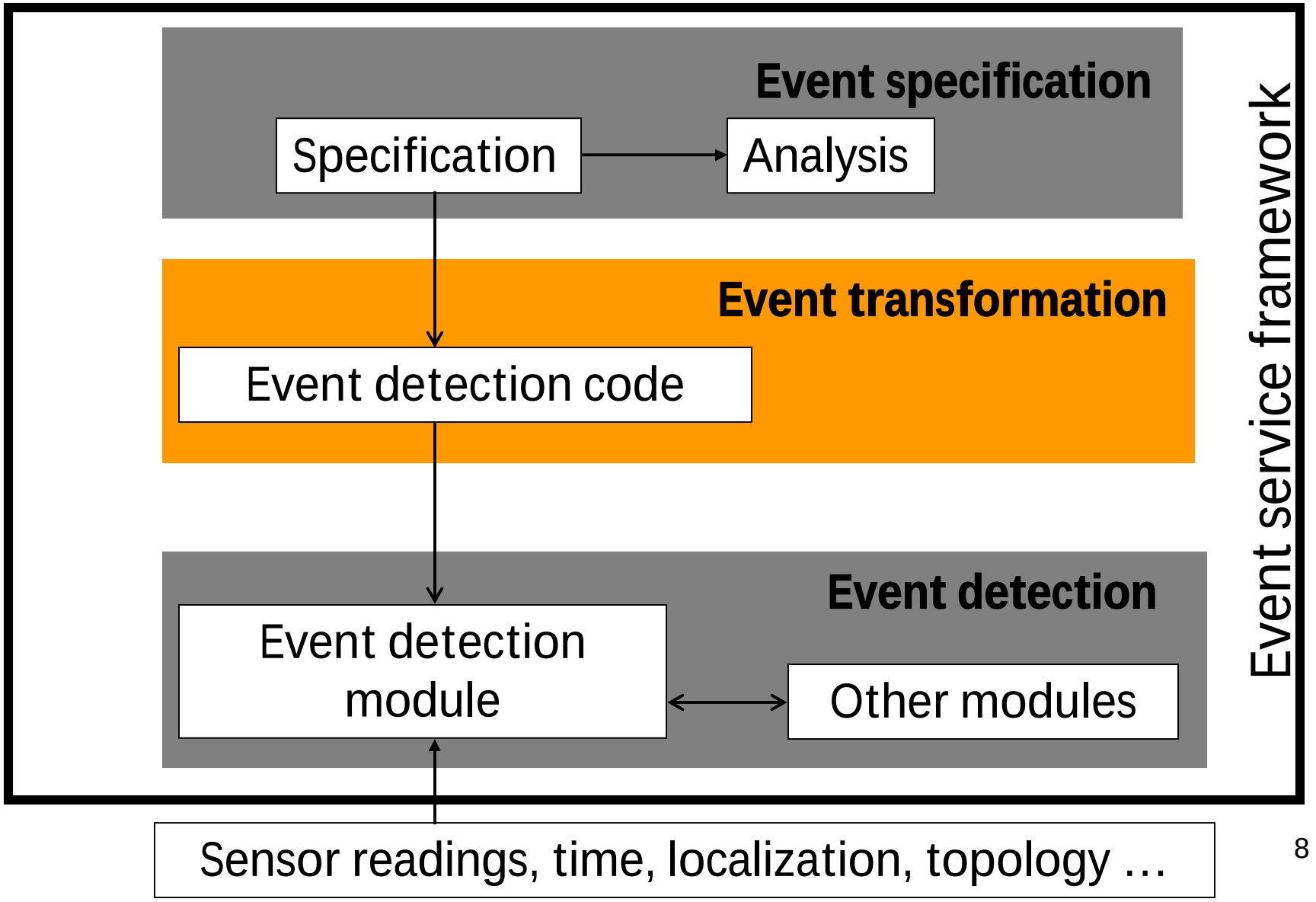
Temporal logic

Spatial logic

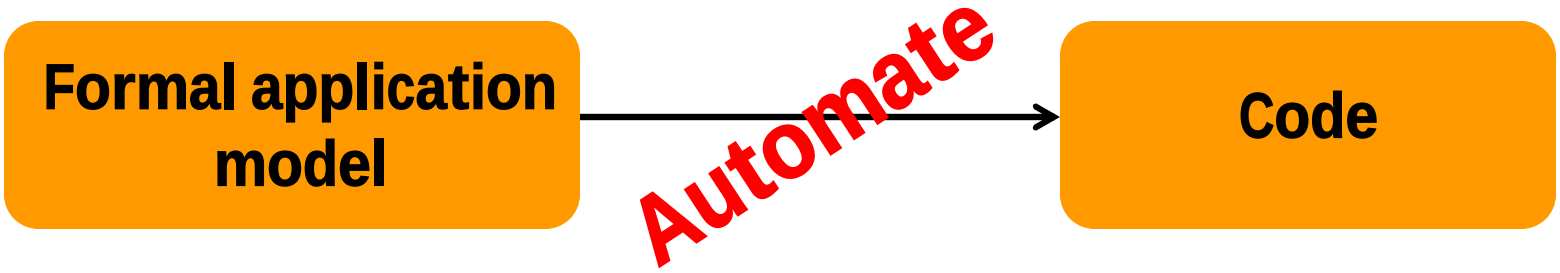
Analysis Capabilities

- Reachability analysis of Petri nets
  - Can events be detected?
  - What input is required for an event to occur?
- Topology analysis
  - Does the topology satisfy the application logic requirements?
- Communication pattern
- Real-time requirements of the system.

Event Service Framework



Problem Statement



- Ease the burden on the programmer
- Decrease the cost of code development
- Improve code correctness

Automating The Process

- Currently:
  - This was applied for a fire detection application
- Future work:
  - Extend the work to generate the code for more complex MEDAL models
  - MEDAL GUI tool

Thank you