Scaling up for the IoT

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Middleware on the Move

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Devices and middleware protocols in the mobile IoT

DPWS CoAP MQTT ZeroMQ XMPP ….

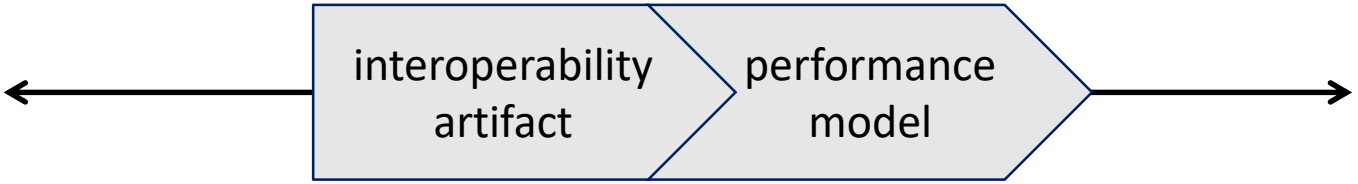
Streaming Async Sync Pub/Sub ….

reliable/unreliable data lifetime mobile connectivity ….

Heterogeneous interconnections in the IoT

traffic light

eco-driving app



CoAP server :		MQTT subscriber:
• push-based • resource	*functional semantics*	• pub/sub • topic
• data feeds lifetime • unreliable	*QoS semantics*	• mobile connectivity • reliable

Interoperability artifact synthesis*:*

- enables functional middleware-layer interoperability.

End-to-end performance modeling & analysis*:*

- evaluates the interoperability effectiveness.

Large scale in the IoT is about…

- … not only big numbers of Things but also high diversity:
  - we enable Things interoperability inside IoT applications.
- … automated solutions:
  - we support automated interoperability artifact synthesis.
- … flexible, lightweight, decentralized architecture:
  - our interoperability relies on a minimal abstract service bus.
- … performance:
  - we model and analyze QoS of heterogeneous interactions.
  - we provide composable model patterns for large-scale IoT applications.

Future work

- Deploy, test and evaluate our interoperability solution in large-scale setups:
  - Deploy or emulate big numbers of Things.
  - Integrate large-scale middleware infrastructures.
  - Evaluate performance under stress testing for various interconnected protocols.
- Introduce resilience and study the effect of large scale.

Thank you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