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Metrology for
THz Communications

METERACOM

Technische Universität Braunschweig

C2: THz Networks with Intelligent Control and Digital Twining

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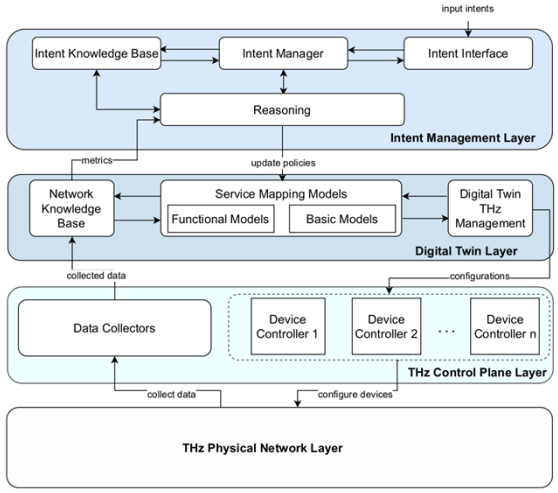
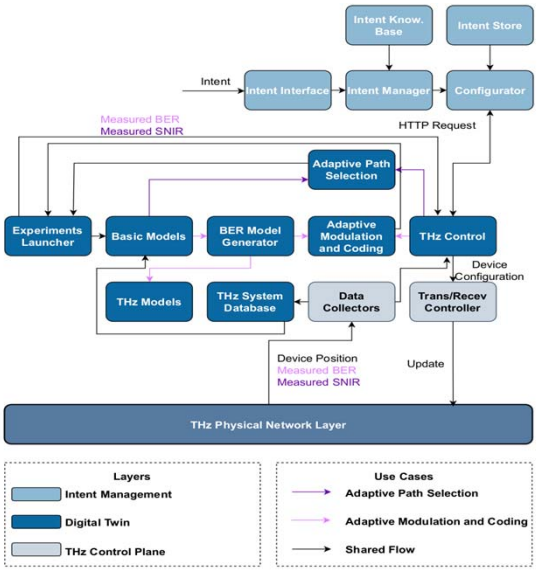
Motivation

- What are challenges integrating **Network Digital Twin (NDT)** with THz physical layer network?
- NDT enables intent-based control to interact with the DT and refine its **decision-making process**.
  - Adaptive configuration with **channel variations**.
  - Improving **throughput and fault tolerance**.

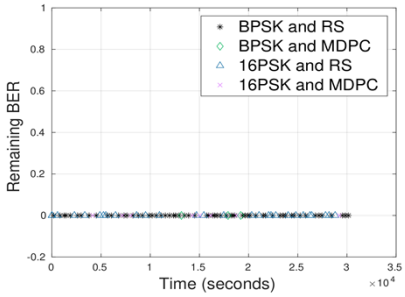
NDT Architecture



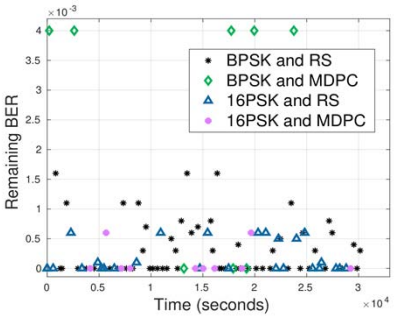
Schematic workflow



NDT use cases: Adaptive coding modulation

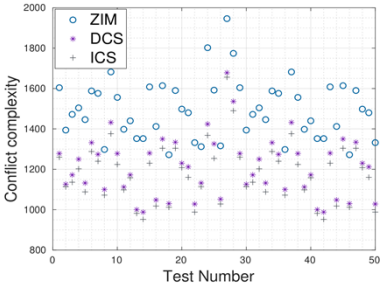


Correct application of BER models: optimal performance.



Incorrect application of BER models: unoptimal performance.

NDT use cases: Adaptive path selection



Method of building interference graph: ZIM (naive solution), **DCS/ICS** (considering SINR and compare them with threshold).

Findings

- We analyze 6G Campus Networks integrated NDT.
- This approach provides adaptive network control.
- Adaptive control is engineered to evolve and optimise performance with dynamic conditions in THz links.
- THz network with NDT enhance efficient & reliable system.