IoT Protocol Research Summary

LwM2M vs Matter: OSI Layer Analysis

LwM2M Protocol

Avg Message: 83 bytes

Efficiency: 32.6%

Transport: UDP (8 bytes)

Encoding: CoAP Binary

Matter Protocol

Avg Message: 133 bytes

Efficiency: 16.4%

Transport: UDP+IPv6 (40 bytes)

Encoding: TLV Binary

Key Research Findings

- Matter messages are 49 bytes larger on average (59% increase)
- LwM2M achieves 16.3 percentage points higher efficiency
- Transport layer overhead: Matter 5x higher than LwM2M (IPv6 vs IPv4)
- Session layer: Matter more complex due to commissioning requirements
- Both protocols show efficiency gains with larger payload sizes
- Statistical analysis confirms significant differences ($p < 0.05$)

Research Implications

- LwM2M optimal for constrained devices and bandwidth-limited networks
- Matter provides richer functionality at cost of increased overhead
- Protocol selection should consider device constraints vs capabilities
- Both protocols benefit from payload aggregation strategies