

UK Generic Soldier Architecture: developing a tactical soldier middleware implementation

Ric Green, Systems Architect, GSA

A year on and the UK MoD continues to progress the challenge of understanding the most appropriate approach for middleware on the soldier. So far we have completed a commercial architectures and standards study to assess the suitability of four down selected middleware options proposed by the MoD: Message Queuing Telemetry Transport (MQTT), ZeroMQ, Lean Services Architecture (LSA) and Data Distribution Service (DDS).

The evaluation focused on a defined set of criteria bounded across 3 different viewpoints (business, usage and functional) to enable a middleware to be selected for the next phase of the project. The outcome of this evaluation was that MQTT would be taken forward due to its strong governance processes, maturity as a standard and its perceived low barrier for entry for software application developers and integrators. It will also aid international interoperability due to being the preferred standard of GOSSRA and NATO.

Phase 2 is now underway, which consists of developing, testing and refining a prototype GSA Tactical middleware implementation. Having a middleware that is open, built in a modular way and fully owned by the MoD is seen as critical. The initial implementation is being built for android, with future iterations planned to develop the required cross-platform element. The project will deliver an Application Programming Interface and Software Development Kit to enable 3rd party developers with the functions and procedures to develop future components once it has been formally released. Enhancements will be made to MQTT, which will include developing and implementing a structured message format, discovery mechanism and increased support for a variety of message exchange patterns. By doing this we will standardise the way information is exchanged for intra-node and future proof the middleware to enable inter-node communication.

A final decision on this middleware becoming the UK standard will only be taken after verifying the prototype implementation at the end of the project.

GSA white paper series 1:

The MoD alongside Industry experts are now undertaking the first of the 'GSA White Paper Series'. The purpose is to

inform the future direction of soldier architecture by getting industry views on some of the challenges facing soldiers in the near future. The topics selected for Series 1 were chosen from feedback and discussions held with Industry at the GSA Technical Working Group. The first 4 topics are:

Wireless Data Link between the GSA Defined Sub-Systems: By considering areas including power consumption, security, potential solutions and any additional fringe integration benefits such a system may bring (geo-fencing in vehicles for example), this will provide a better understanding of the technical risks and benefits of wireless data exchange around the Integrated Soldier System, including commercial options.

How can we optimise the soldier power supply chain when on operations? Utilising the current and future supply chain elements, power harvesting and scavenging, we are aiming to better understand the potential charging solutions for GSA batteries and exploring the benefits of having chargers/scavengers built into the soldier system. Understanding the potentially viable options for soldier battery charging across bases, vehicles and autonomous platforms is seen as an area that needs immediate clarity.

What is the anticipated power demand in the 2025/2030 timeframe: There is a growing concern that the current 50W GSA power limit will not be enough for future emerging equipment to be integrated on the soldier. Through this study we hope to determine the likely future power draw for the 24hour Integrated Soldier. It will look at both peak and average power demand and propose solutions to meet any increased demand.

Should GPS be mandated across GSA: To understand if it would be technically viable for GSA to mandate GPS as a shared service across the integrated soldier system and if it will provide value for money. ■

Topics for Series 2 of the White Papers are currently being worked up with Industry and will be started next year. For more information on the GSA Middleware or the GSA White Paper Series contact the LOSA office:
Email: DESLELCA-PI-Eng-LOSA@MoD.gov.uk