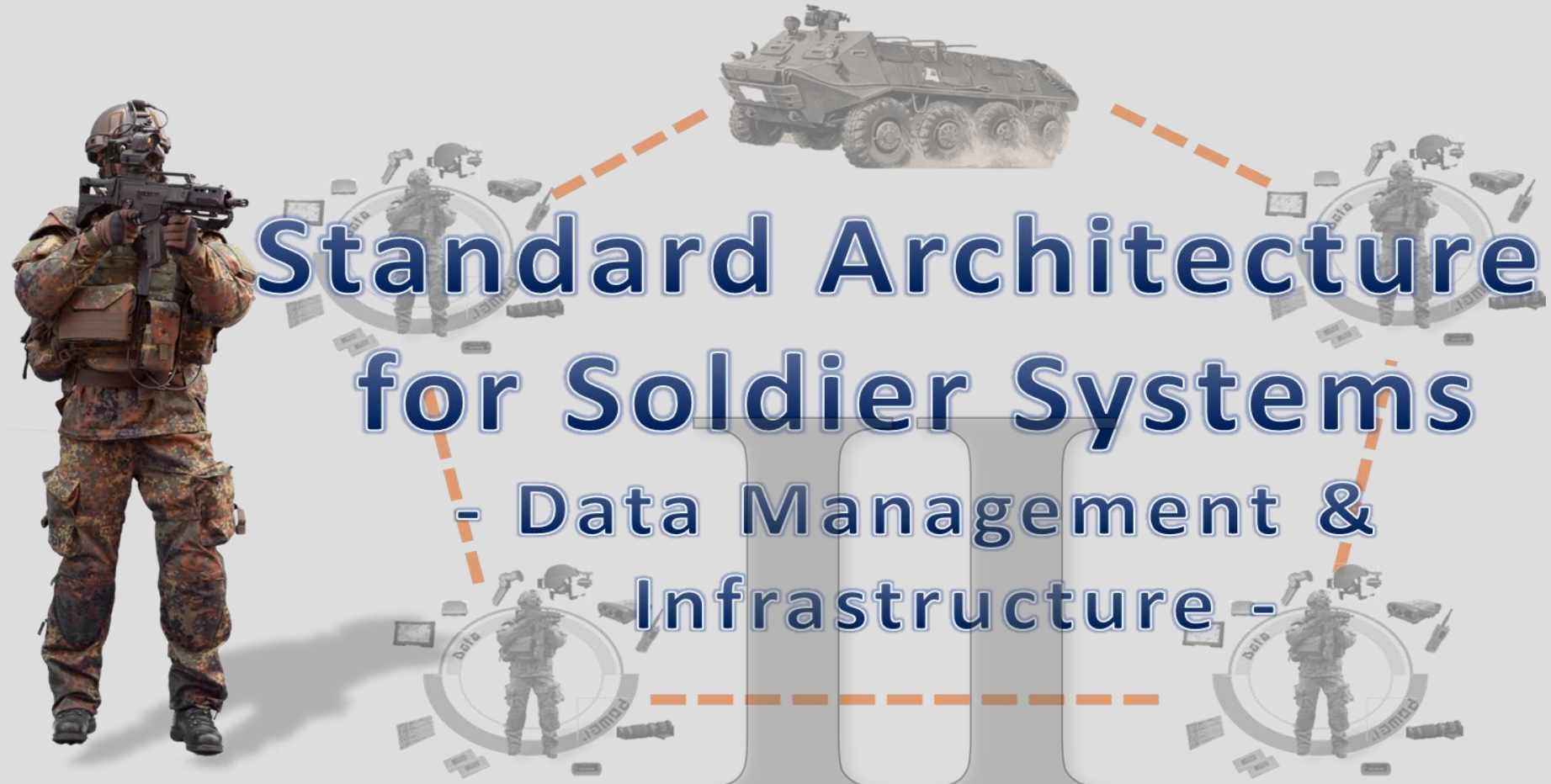
RHEINMETALL DEFENCE | gmv | TNO innovation for life | LARIMART a LEONARDO company | EUROPEAN DEFENCE AGENCY



Standard Architecture for Soldier Systems

- Data Management & Infrastructure -

WP3 Identification and Analysis of Standards

Industry Workshop
16.CAT.OP.131
Brussels, September, 6th, 2017

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WP-3 Identification and analysis of standards (lead: TNO)

WP OBJECTIVES:

The goal of Work Package 3 is to identify and analyse open standards that can contribute to data management, data exchange and infrastructure. Both civil standards as well as open military standards will be taken into consideration. The analysis will be based on a set of criteria that will be defined within this work package so as to be able to make a first (course grained) estimation as to how well the particular standards might function within the chosen architecture. Based on the analysis - the gaps (in protocol's features for chosen architecture) will be identified.

WP INPUTS:

- Tender Specifications. Technical Proposal. Contract.
- T1.3: Identification of typical scenarios/vignettes with data management/infrastructure aspects
- T2.3: Identification of existing standards and technologies
- T2.4: Development of a preliminary system architecture

WP OUTPUTS:

- Chapter for the final report.

WP ACTIVITIES:

1. Definition of criteria. (Feb-Mar 2017)
2. Survey of existing standards (identification and analysis). (Mar-Jun 2017)
3. Identification of standards gaps. (Jun-Jul 2017)

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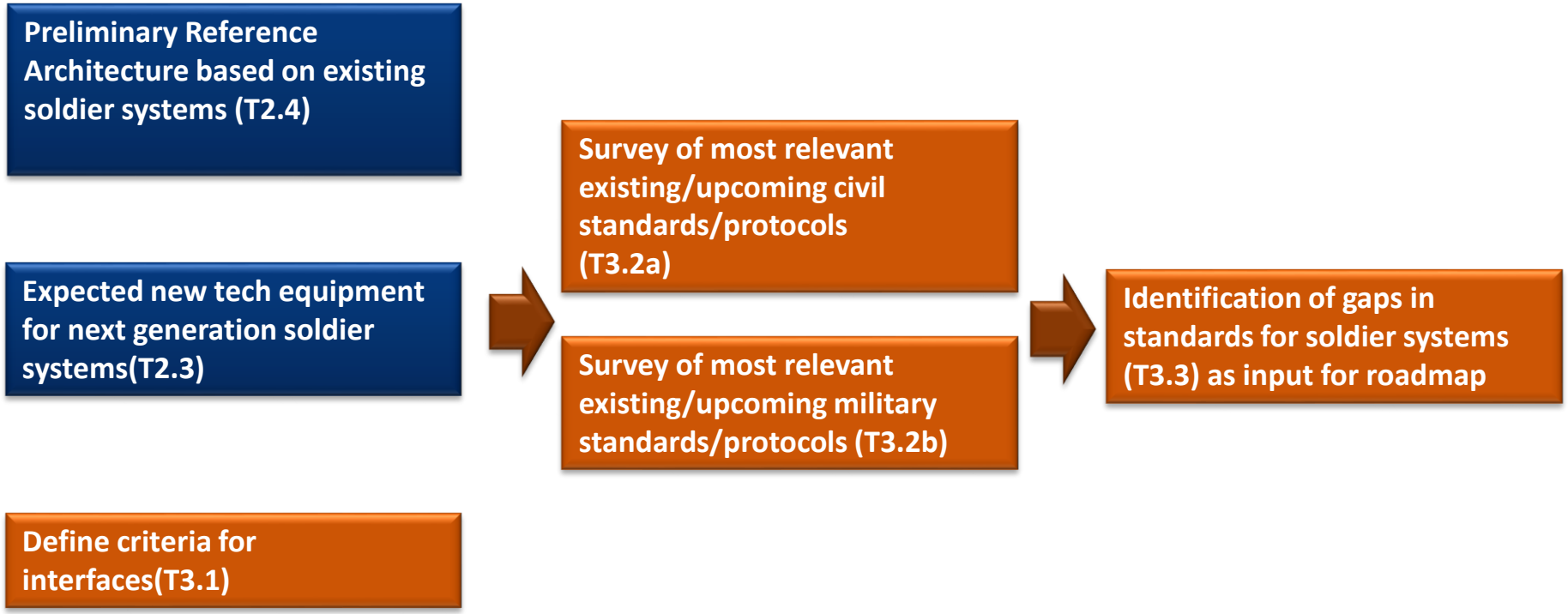
WP 3 APPROACH



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T3.1 Criteria for Interfaces

- **General Criteria**
  - Level of standardisation
  - Acceptance (by industry/installed base/market share)
  - Competing with other protocols
  - Maturity (Availability/expected lifetime/future proofness)
  - Cost
- **Implementation Criteria**
  - Initialization/Set-up time
  - Complexity
- **Technical Criteria**
  - Energy consumption / Protocol energy efficiency
  - Latency
  - Throughput / goodput
  - Reliability
  - Scalability
  - Concurrency (sequential, parallel, event-based)
  - Security

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T3.2 Draft list of candidate protocols for analysis

Military protocols

- STANAG 4677
- AdatP-36/ (former NFFI)
- Multilateral Interoperability Program (MIP)
- VMF
- Cursor on Target
- C2 Core
- NVG (NATO Vector Graphics)
- Imagery (STANAG 4697 PLEVID, STANAG 4545 – NSIF, STANAG 4609 DMIS)
- …

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Continued

Generic Civil protocols

- Network access layer (Ethernet, WiFi, Bluetooth, USB, …)
- Internet Layer (IP)
- Transport layer (TCP, UDP)
- Application layer (HTTP, SSH, SMTP, RTMP, …)

Specific Civil protocols

- Voice transmission (VoIP, …)
- SA-data/map related data (KML, XML, JSON, WMS, AIS, …)
- Multimodal interfaces
- Imagery (GeoTIFF, PNG, MPEG-4, WebM, …)
- Sensor services (…)
- Remote management (VNC, RDP, SSH, …)

Connectors

- Both civil and military

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Overview mapping against criteria

Protocol / Criterion	energy efficiency	complexity	latency	throughput	jitter	security	reliability	initialization time	IPR	interoperability	life expectancy	scalability	cost
Blue Tooth v5.0	+	o	--	++		+	+	--	+	-	-	-	+
HTTP (1.1 / 2)		+		+		o	++	++	++	++	++	++	++
WebSocket		+	o	o		o	++	-	++	++	++	+	++
FLAC	+	o	+	+			+		++	+	++		++
MP3	o	o	-	+			+		+	++	-		+
Opus			++	++			+		++	+	++		++
SSH-2		o	-	-			+	-	++	+	++	++	++
XMPP / Jabber		+	+	o		-	-	o	++	++	o	++	+
Simple Network Management Protocol (SNMP)		++				o	o		++	++	+	+	+
Simple Object Access Protocol (SOAP)		++				o	o		++	++	++	++	+

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Preview on Gaps

Conclusions on gaps in standardisation are scheduled for v3 and need an integrated analysis of the foreseen system view and the available standards and protocols.

1. **A standardised connector which meets power and data requirements that are expected in future dismounted soldier systems.**
2. **A standardised data bus to integrate the various components within a soldier system; In order to be flexible and agile it is foreseen that there is a need to freely add/remove subsystems to the soldier system (such as adding sensors).**
3. **For streaming video a separate data bus might be considered.**
4. **A standardised interface to vehicle electronics equipment (preferably a connection to the NATO Generic Vehicle Architecture)**

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