

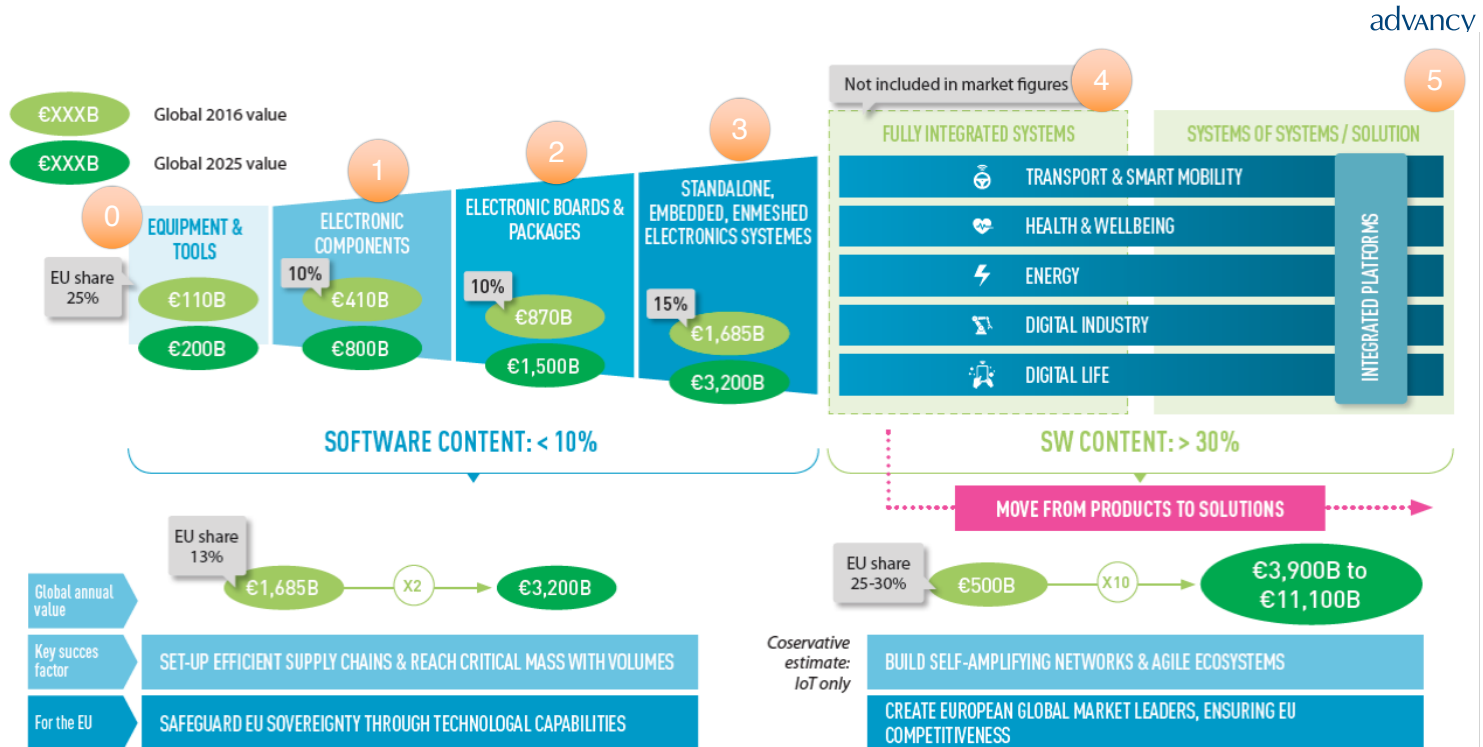
Eclipse Arrowhead

An integration platform for
System of Systems solutions

Value is shifting across the CPS value chain

Today value is concentrated at 75% upstream

By 2025, 2/3rd of the value will be captured downstream



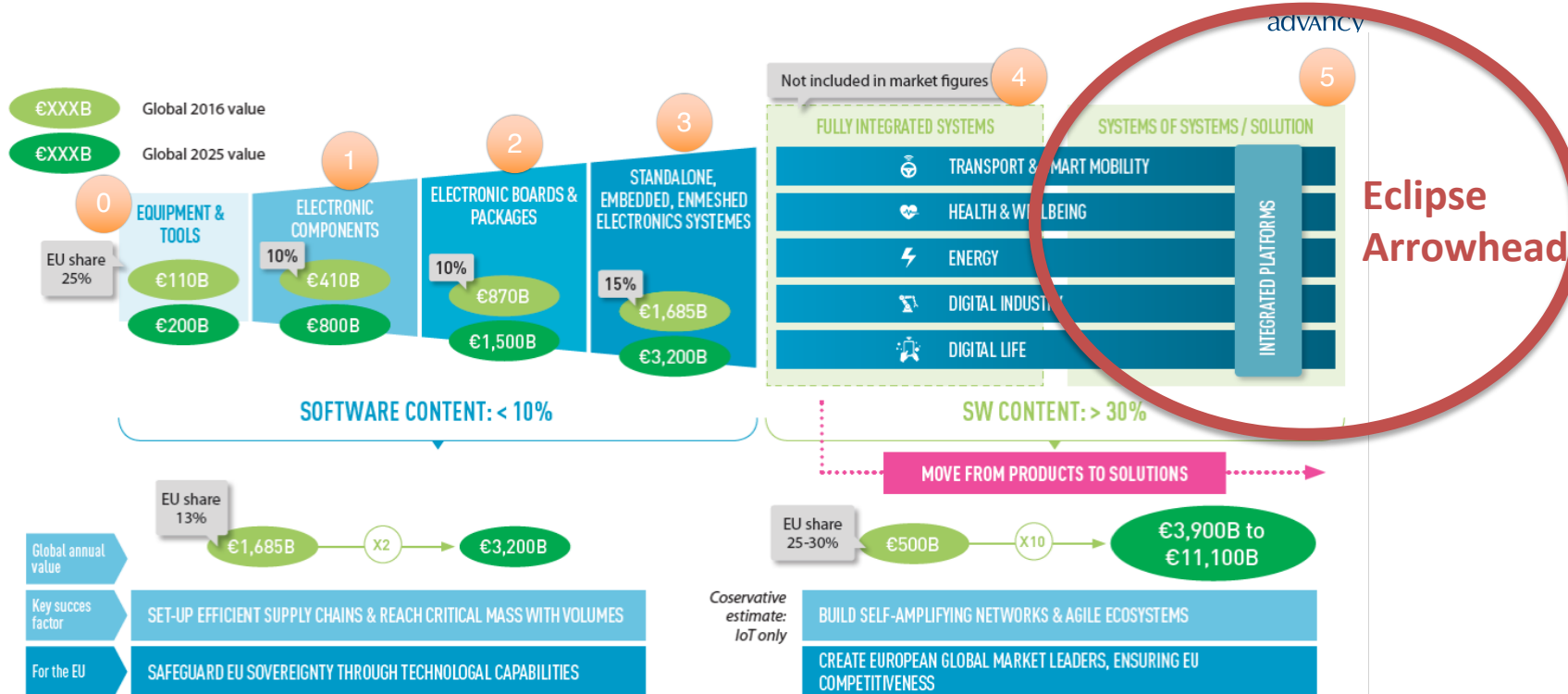
Note: rounded figures. (1): 2025 estimate value potential for the Internet of Things, not the full potential for ECS end-applications.

Source: Decision, IDC, MGI, Advancy research & analysis

Value is shifting across the CPS value chain

Today value is concentrated at 75% upstream

By 2025, 2/3rd of the value will be captured downstream



Note: rounded figures. (1): 2025 estimate value potential for the Internet of Things, not the full potential for ECS end-applications.

Source: Decision, IDC, MGI, Advancy research & analysis

Eclipse Arrowhead addresses critical industrial requirements

Interoperability

Real time data

Scalability

Security

M2M business transaction

Solution engineering efficiency

Model based engineering

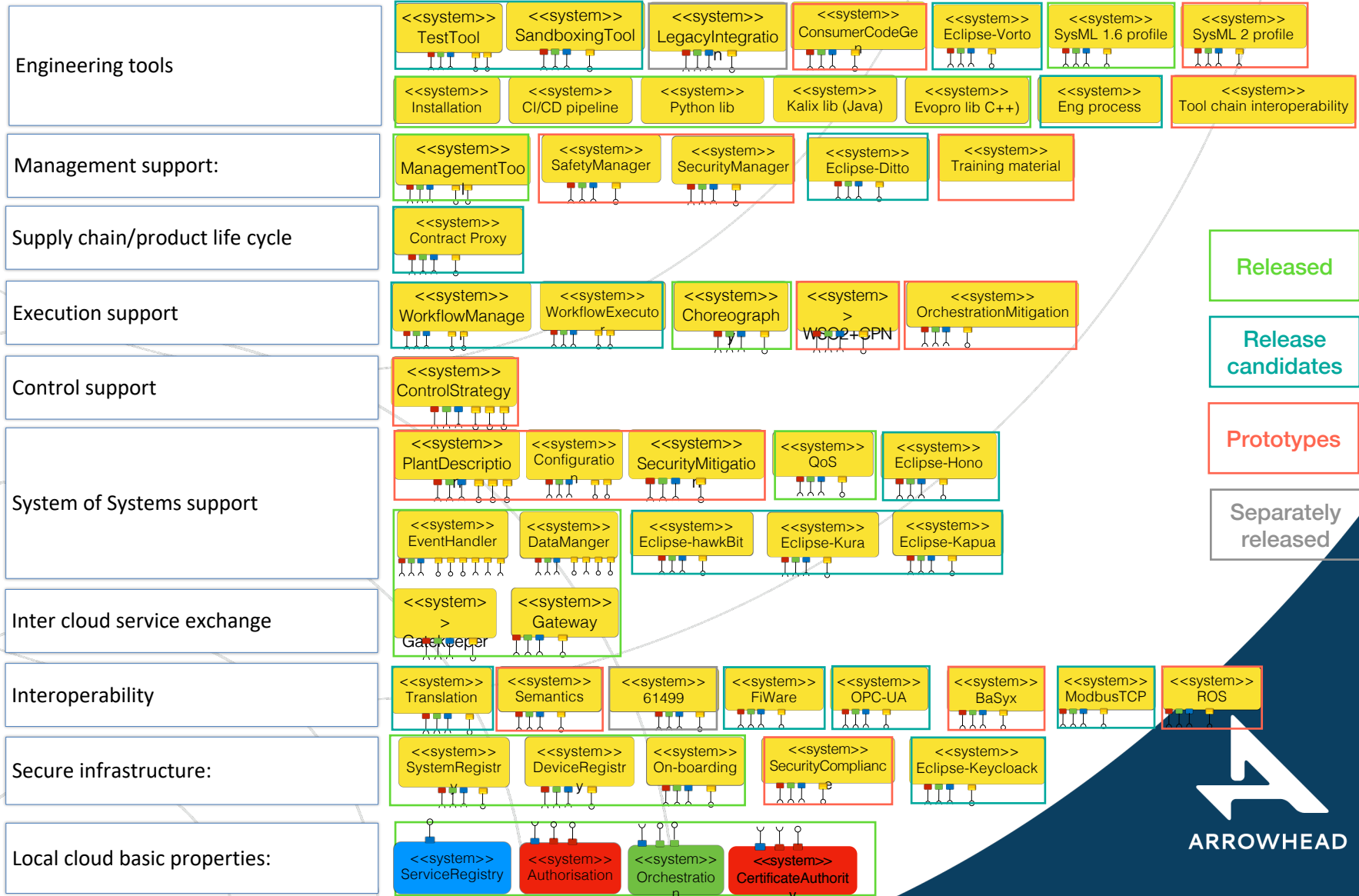
Open source software

A comparison of IoT-SoS Architectures & Platforms

Features	Arrowhead	AUTOSAR	BaSyx	FIWARE	IoTivity	LWM2M	OCF
Key principles	SOA, Local Automation Clouds	Runtime, Electronic Control Unit (ECU)	Variability of production processes	Context awareness	Device-to-device communication	M2M, Constrained networks	Resource Oriented REST, Certification
Real-time	Yes	Yes	No	No	Yes (IoTivityConstrained)	No	No
Run-time	Dynamic orchestration and authorization, monitoring, and dynamic automation	Runtime Environment layer (RTE)	Runtime environment	Monitoring, dynamic service selection and verification	No	No	No
Distribution	Distributed	Centralize	Centralize	Centralize	Centralize	Centralize	Centralize
Open Source	Yes	No	Yes	Yes	Yes	Yes	No
Resource accessibility	High	Low	Very low	High	Medium	Medium	Low
Supporters	Arrowhead	AUTOSAR	Basys 4.0	FIWARE Foundation	Open Connectivity Foundation	OMA SpecWorks	Open Connectivity Foundation
Message patterns	Req/Repl, Pub/sub	Req/Repl, Pub/sub	Req/Repl,	Req/Repl, Pub/sub	Req/Repl, Pub/sub	Req/Repl	Req/Repl
Transport protocols	TCP, UDP, DTLS/TLS	TCP, UDP, TLS	TCP	TCP, UDP, DTLS/TLS	TCP, UDP, DTLS/TLS	TCP, UDP, DTLS/TLS, SMS	TCP, UDP, DTLS/TLS, BLE
Communication protocols	HTTP, CoAP, MQTT, OPC-UA	HTTP	HTTP, OPC-UA	HTTP, RTPS	HTTP, CoAP	CoAP	HTTP, CoAP
3rd party and Legacy systems adaptability	Yes	Yes	Yes	Yes	No	No	No
Security Manager	Authentication, Authorization and Accounting Core System	Crypto Service Manager, Secure Onboard Communication	--	Identity Manager Enabler	Secure Resource Manager	OSCORE	Secure Resource Manager
Standardization	Use of existing standards	AUTOSAR standards	Use of existing standards	FIWARE NGSI	OCF standards	Use of existing standards	OCF standards

C. Paniagua and J. Delsing, "Industrial Frameworks for Internet of Things: A Survey," in *IEEE Systems Journal*, doi: 10.1109/JSYST.2020.2993323.

Arrowhead v4.1.3



Released

Release candidates

Prototypes

Separately released



ARROWHEAD

Resources

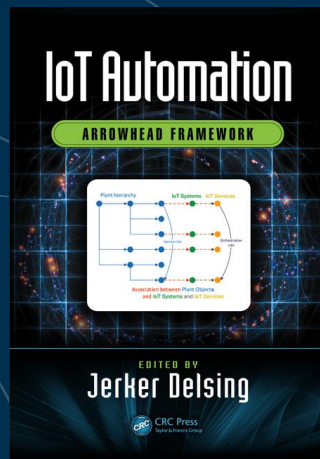
Web

www.arrowhead.eu/arrowheadframework

Github

www.github.com/arrowhead-f

Book



www.arrowhead.eu