Cryptech HSM – Preparation Phase

Sprint demo – 14th May 2019

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(on behalf of the Alphas Cryptech HSM team)

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Cryptech HSM – Objectives and Activities

Investigate Cryptech HSM modules capability and applicability to a variety of HSM use cases gathered within GÉANT and the wider community and identify opportunities for HSM as a Service

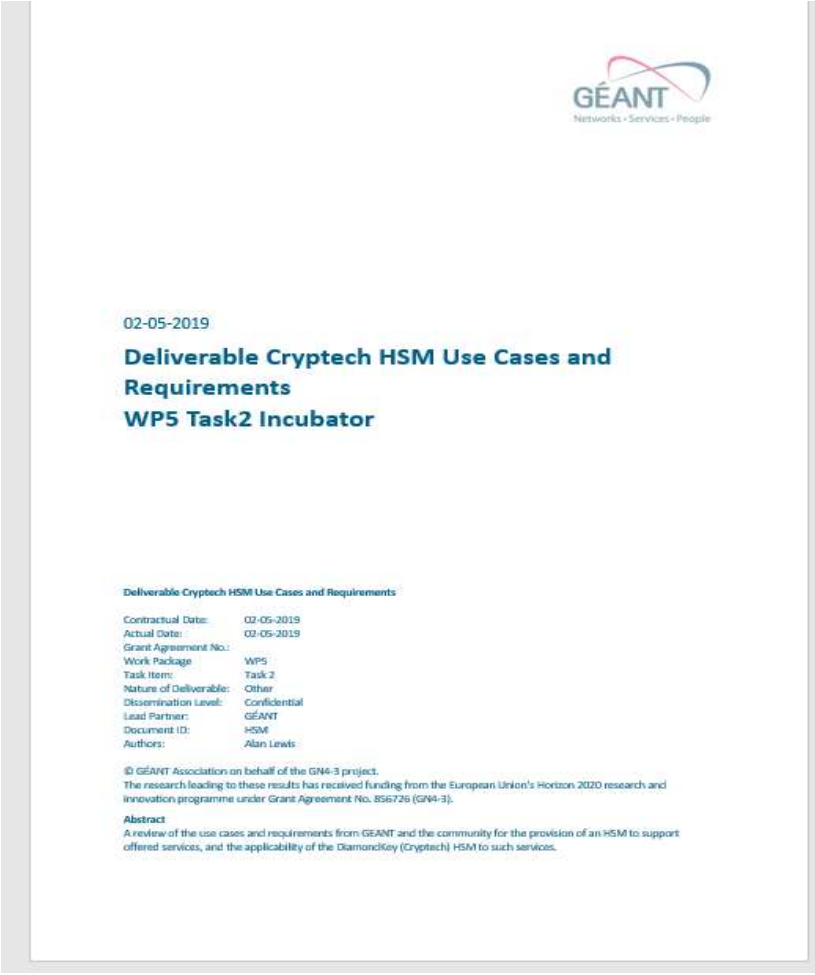
Name	Role
Brook Schofield	Magnum
Leif Johansson	P.I.
Niels van Dijk	Mentor
Michael Schmidt	Scrum Master
Branko Marovic	Team Member
Alan Lewis	Team Member

- Identify locations for Diamond Key Appliances
- Install the Diamond Key appliances
- Determine Diamond Key Capabilities
- Initial Community engagement for use cases
- Document use cases and map to capabilities

Activities undertaken

Achievements

- Discussions held with Cryptech
- Requirements for GEANT services tabulated
- Engagement via eduGAIN with community
- Use cases and requirements document created
- Discussion and conclusions of study
- Locations for Diamond Key installation identified
- Make Diamond Key appliances available for testing



02-05-2019

Deliverable Cryptech HSM Use Cases and Requirements
WP5 Task2 Incubator

Deliverable Cryptech HSM Use Cases and Requirements

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Actual Date:	02-05-2019
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Abstract
A review of the use cases and requirements from GÉANT and the community for the provision of an HSM to support offered services, and the applicability of the DiamondKey (Cryptech) HSM to such services.

Results and Conclusions (so far)

DiamondKey HSM suitability

- Most requirements are for signing
- Many requirements supported but two key omissions
  - Asymmetric performance for longer key lengths
  - FIPS certification
- Inertia for services already using an HSM
- Costs vs. benefits for service with no HSM
- Track record and sustainability

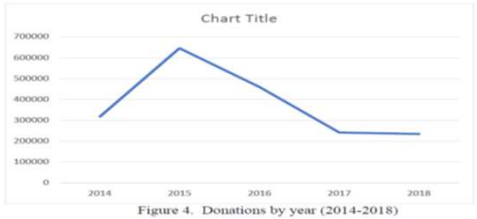
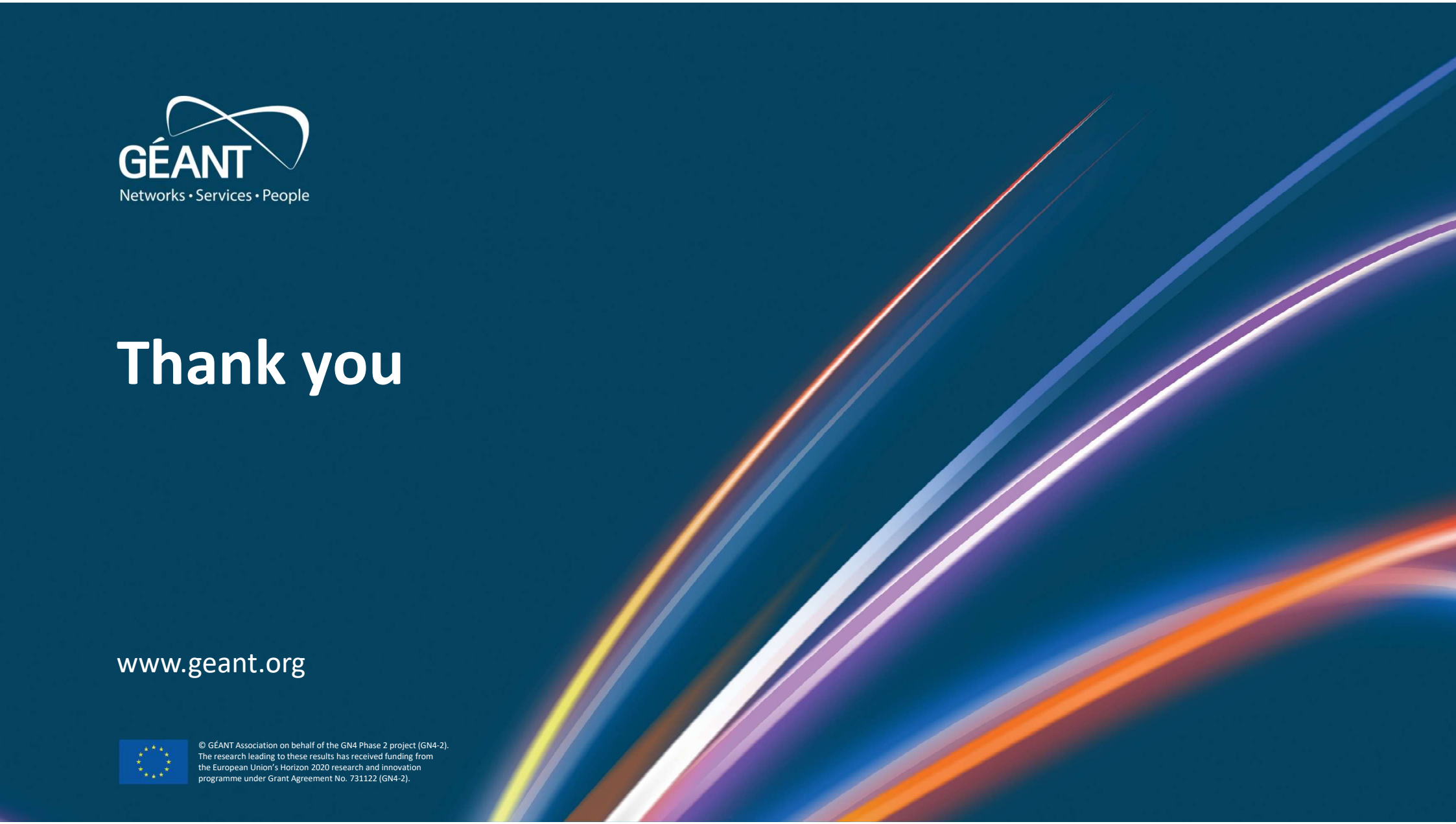


Figure 4. Donations by year (2014-2018)

HSM Requirements Matrix

Use case / Requirements	Requirement Id	Generic	eduroam Managed IdP Root Certificate and signing key storage	eduroam Managed IdP Intermediate Certificate storage	eduroam CAT signing key	eduGAIN MDS signing key	eduGAIN MDQ signing key	eduGAIN FaaS MDS signing key	IdP-as-a-Service	Cryptech
Cuurent Security			Raspberry PI	None	Gemalto Safenet	None	None	Gemalto Safenet	None -	
Use Case ID			A	B	C	D	E	F	G	
Performance	1									
Asymmetric Signature Freq.	1.1		1/--	11/hr (av)	10/sec (peak)	1/hour (av)	10k- 6M/day	100/hour (av)		1024 (20/sec), 2048 (6/sec), 4096
Symmetric Freq.	1.2									
Cryptographic algorithms	2									
RSA	2.1		4096	4096	4096	4096	4096	4096		1024, 2048, 4096
DSA	2.2									
ECDSA	2.3		384	384	384	521	521	521		ECDSA P-256, P-384, P-521
3DES	2.4		NR	NR	NR	NR	NR	NR		
AES	2.5		NR	NR	NR	NR	Nr	NR		
Hash algorithms	3									
MD5	3.1		NR	NR	NR					
SHA	3.2		SHA-512	SHA-512	SHA-512	SHA-2	SHA-2			SHA-1,2,224,256,384,512
Key storage capacity (no of pairs)	4		1	1	1	100s				1023 key pairs
Code execution	5		NR	NR	NR	NR	NR	NR	NR	No
Management interface	6									Propriatary i/f using TLS
Connectivity	7									Ethernet
API support	8		PKCS#11	PKCS#11	PKCS#11	PKCS#11	PKCS#11	PKCS#11		PkCS#11
Form factor	9									1U Rackmout appliance
Key Management	10					Ext. key gen.,				
Redundancy	11									Yes failover with dual Alphas
Physical security	12					Tamper				Tamper detection
Logical security	13									Limited
FIPS certification	14		NR	NR	FIPS140	FIPS 140-L3	FIPS 140-L3	FIPS 140-L3		No (under investigation)
Common Criteria	15		NR	NR	NR	NR	NR	NR		No
Service offering	16									
Costs	17	50 - 10k								TBC (est. c.56k)

Over to you…… Questions??



Thank you

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