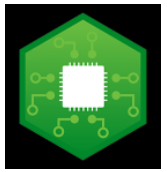
AKM Node Creation, Provisioning, and Physical Device Communication ASR

The AKM Network Management Module (NMM) creates a set of AKM Provisioning Security Credentials between itself and the target node (in this case, Edge Node A)



Edge Node A

AKM Network Management Module (NMM)

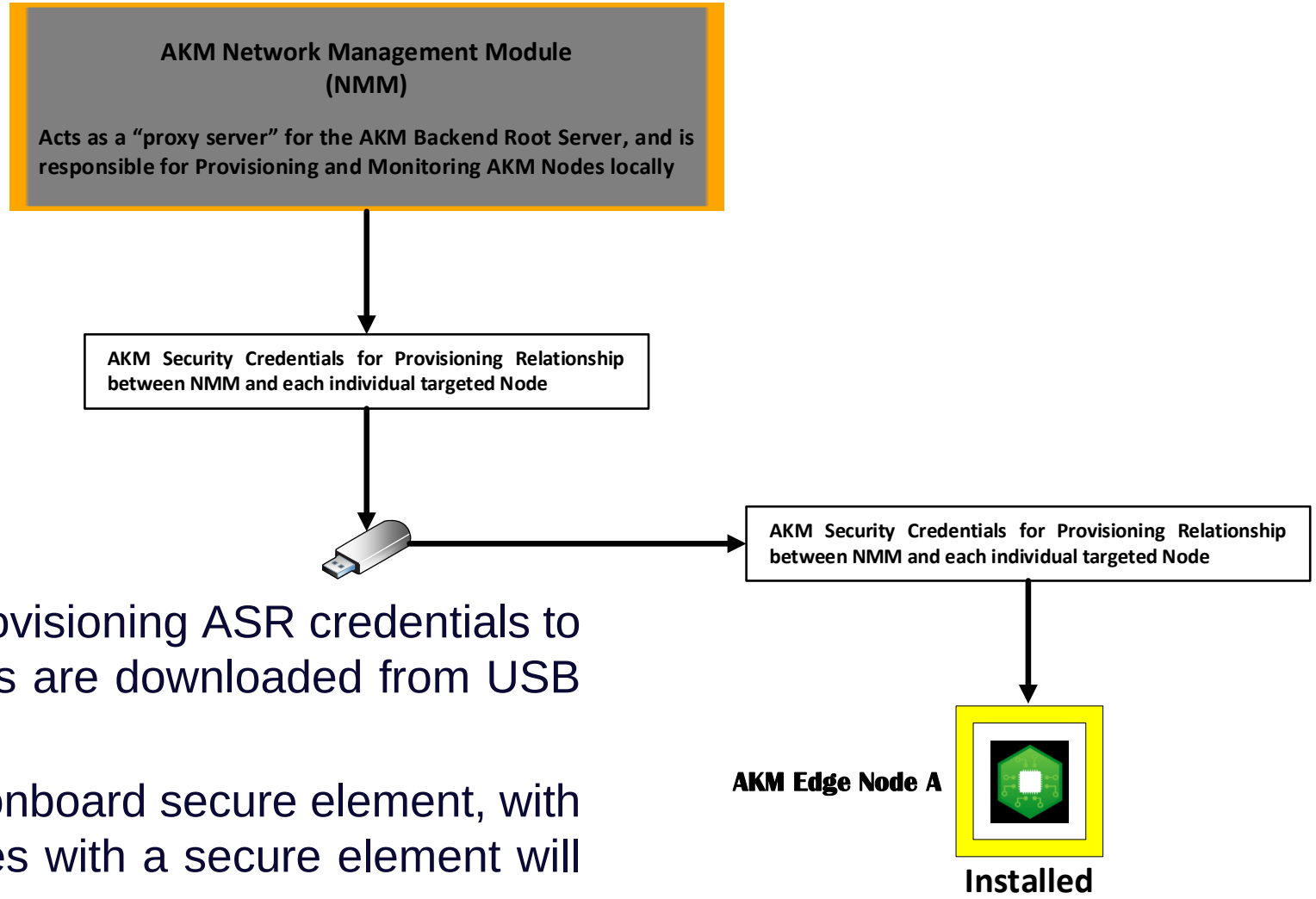
Acts as a "proxy server" for the AKM Backend Root Server, and is responsible for Provisioning and Monitoring AKM Nodes locally

AKM Security Credentials for Provisioning Relationship between NMM and each individual targeted Node

NOTE: ASR is the abbreviation for AKM Security Relationship

Step 1: Create a Physical Device Provisioning Relationship

AKM Node Creation, Provisioning, and Physical Device Communication ASR



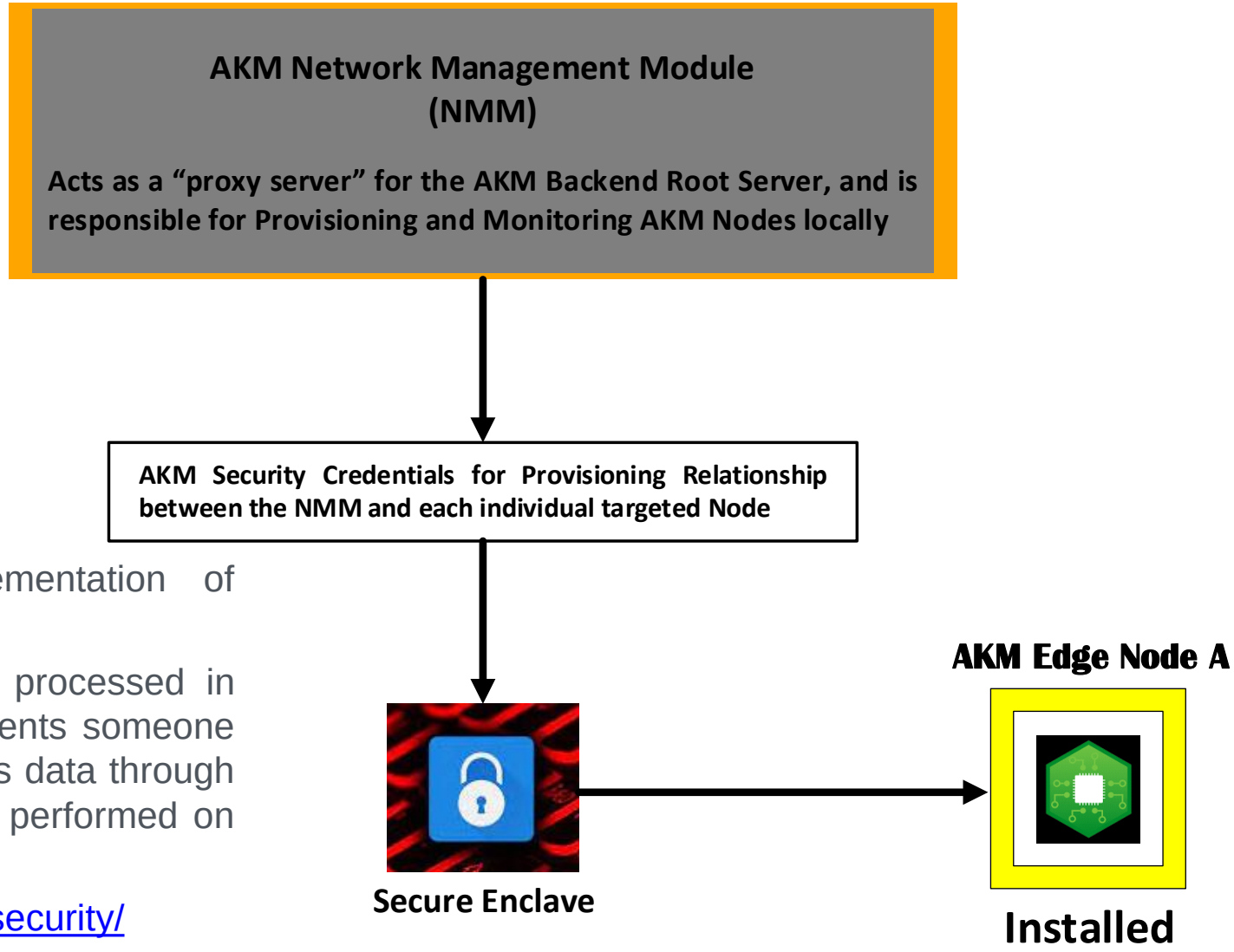
In this example, the NMM saves the provisioning ASR credentials to a USB drive and then those credentials are downloaded from USB drive into the targeted AKM node.

This process works with or without an onboard secure element, with the obvious conclusion that AKM Nodes with a secure element will be far more secure than those without.

Step 2: Save the newly created ASR security credentials (Example 1)

AKM Node Creation, Provisioning, and Physical Device Communication ASR

In this example, the NMM saves the provisioning ASR credentials to a *secure enclave*[1] and then the *secure enclave* is installed/inserted/affixed into the targeted AKM node.



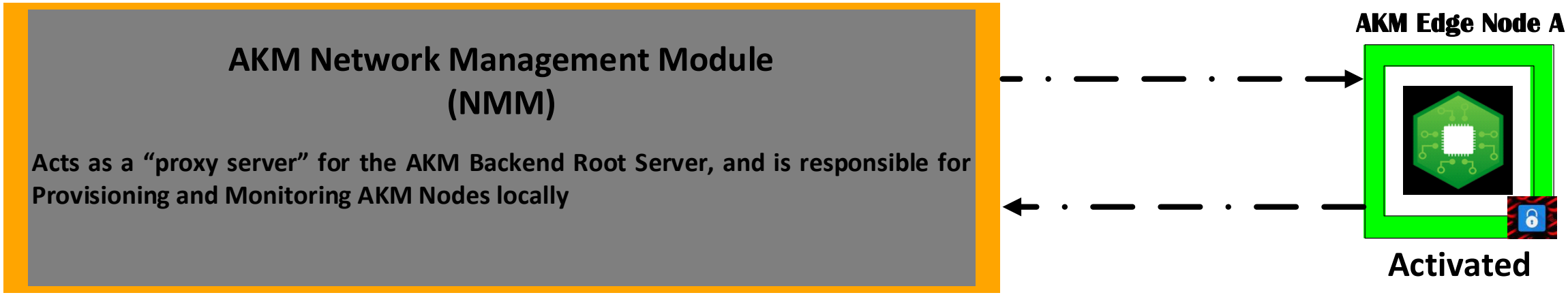
1) ***Secure enclaves*** are a hardware-based implementation of *encryption in use*.

   Encryption in use protects data when it is being processed in memory. Practically speaking, encryption in use prevents someone who has access to a server from being able to access data through a memory dump or memory forensics, which can be performed on any process running on a server.

   https://redis.com/blog/secure-enclaves-future-of-data-security/

Step 2: Save the newly created ASR security credentials (Example 2)

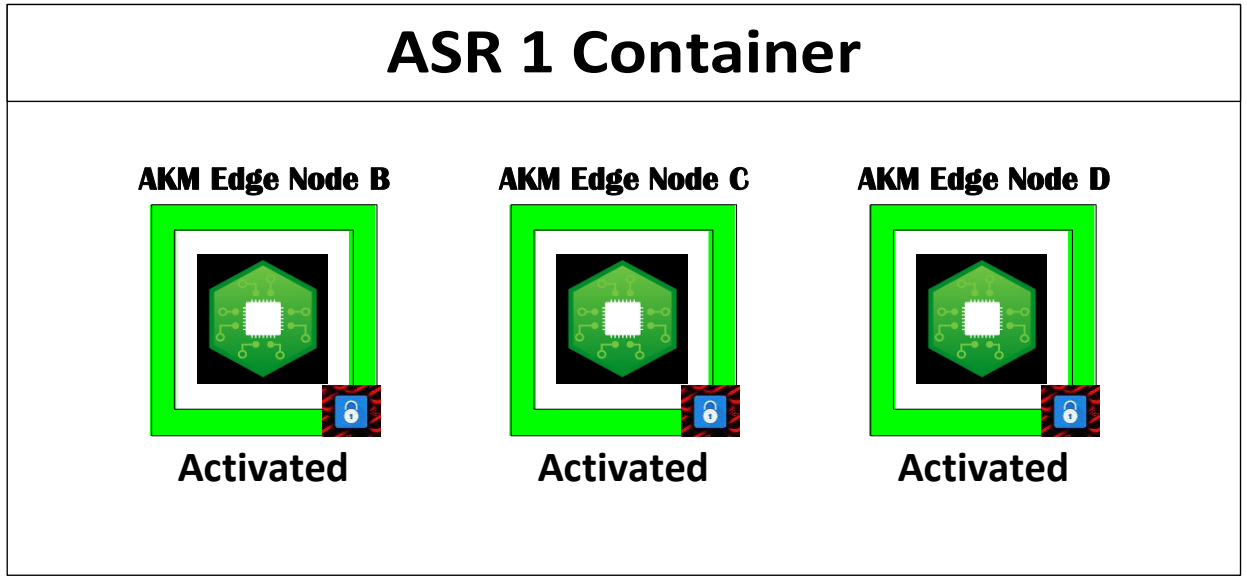
Activation of AKM Edge Node A results from a sequence where AKM Edge Node A attempts to securely communicate with the NMM for the initial activation sequence and gets a positive response from the NMM.



Step 3: Activate AKM Edge Node A via Secure Direct Connection with NMM

AKM Node Creation, Provisioning, and Physical Device Communication ASR

Update the AKM Security Relationship credentials for ASR 1:



with the addition of AKM Edge Node A

AKM Network Management Module (NMM)

Acts as a "proxy server" for the AKM Backend Root Server, and is responsible for Provisioning and Monitoring AKM Nodes locally

Update ASR Credentials for ASR 1

AKM Security Relationship ID #1

Security Credentials for AKM Security Relationship #1, between AKM Edge Nodes A-D

Step 4: Add AKM Edge Node A into existing ASR via the NMM (Step-1)

AKM Node Creation, Provisioning, and Physical Device Communication ASR

AKM Network Management Module (NMM)

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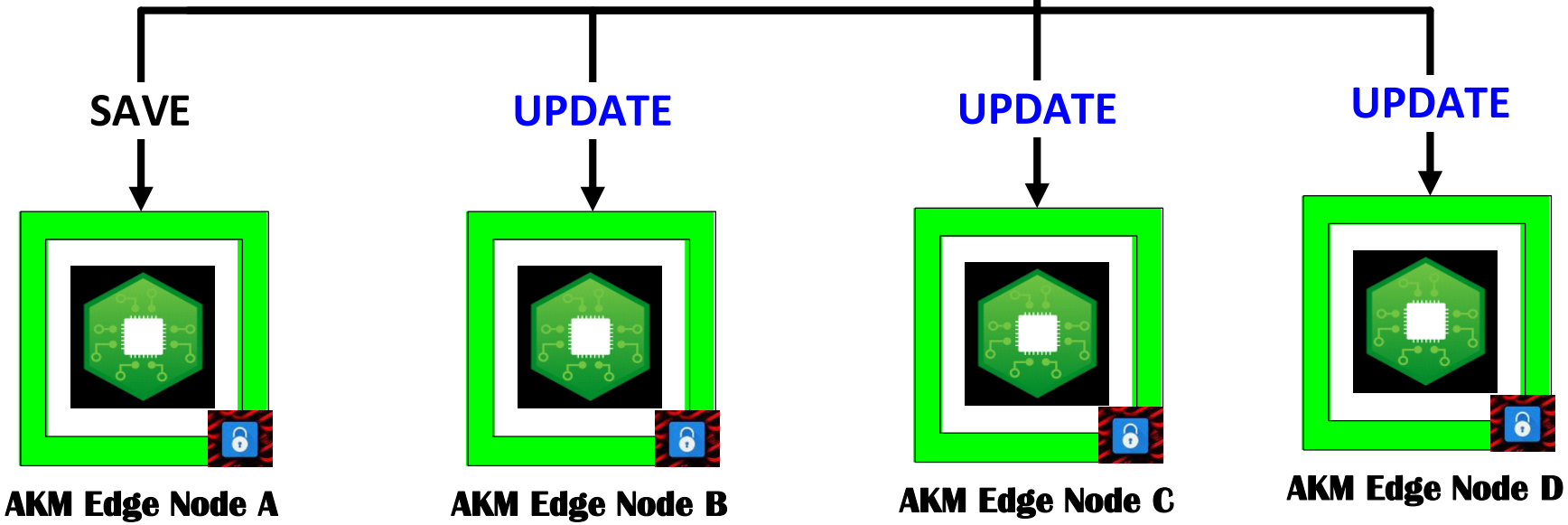
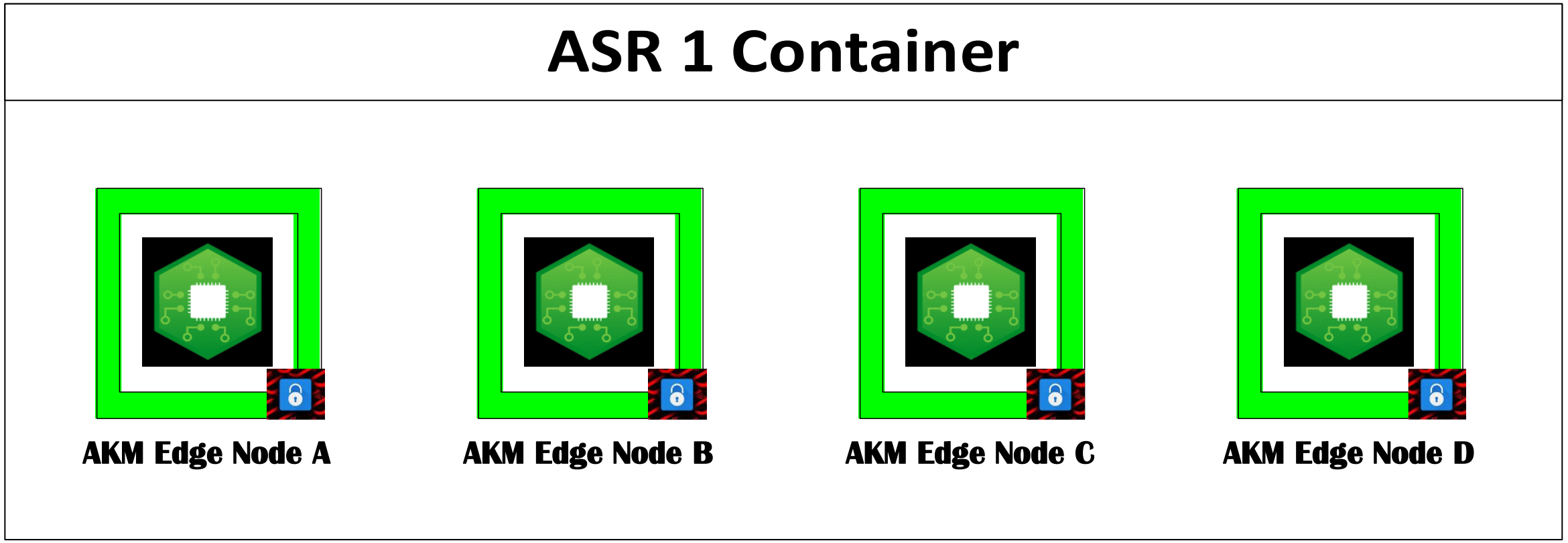
AKM Security Relationship ID #1

Security Credentials for AKM Security Relationship #1, between AKM Edge Nodes A-D



Step 5: Save ASR 1 Security Credentials in all ASR 1 Members



Step 6: Data Structure Representation of ASR 1