ARQIT | CISCO

Product Sheet

NetworkSecure

NetworkSecure™

Arqit and Cisco VPN Encryption

Integrated, automated, on-demand quantum-safe protection of VPN data communications

Arqit NetworkSecure Adaptor is a lightweight software application that hardens traditional VPN communications against both traditional man-in-the-middle attacks and Store Now, Decrypt Later[1] quantum attacks. Through a simple integration with existing network infrastructure, NetworkSecure allows organizations to easily and costeffectively adopt a defense-in-depth approach, complying with the latest cybersecurity recommendations from standards bodies like NIST and protecting themselves from devastating future breaches.

[1]SNDL attacks – Encrypted data is harvested today and stored by adversaries with the intent to decrypt it in the future when quantum computers reach sufficient maturity.

Challenges

1. Quantum threat to data-in-transit
2. Time, skills and effort to migrate to post quantum-safe cryptography
3. High cost and management burden of many solutions
4. Compliance with industry standards and regulations

Solution

Arqit's NetworkSecure Adaptor is an easy to deploy and manage application that seamlessly integrates with a customer's network infrastructure to provide on-demand quantum-safe shared symmetric keys brokered by Arqit SKA-Platform™, Arqit's symmetric key agreement platform. The keys are requested in realtime using Cisco's Secure Key Integration Protocol (SKIP) and consumed by network devices to provide an additional layer of encryption security, protecting data-in-transit traffic against PKI related attacks and the quantum threat, both of which exploit weaknesses in public key cryptography. The solution improves efficiency, flexibility, and scalability at a lower cost compared to alternative solutions relying on QKD or Post Quantum Algorithms (PQA) alone.

Benefits

- Immediately hardens network communications and keeps data secure, preventing devastating SNDL attacks that carry significant financial, compliance, and reputational risk
- Simple, small-footprint overlay to existing infrastructure, avoiding rip-and-replace by integrating seamlessly with PKI and IPsec
- Minimal management overhead, with data easily exportable to existing SIEMs/XRD solutions
- Enables compliance with National Security Memorandum NSM-10 and NSA CSfC Symmetric Key Management Requirements Annex 2.1
- Conforms to NIST standards for cryptography e.g. AES-256, as well as NSA's recommended use of pre-shared keys to protect against the quantum threat
- Easy-to-use Arqit cloud console for advanced Adaptor configuration management e.g. endpoint logical grouping and endpoint policies
- Negligible performance and latency impact

Deployment

The Arqit NetworkSecure Adaptor is a small footprint Kotlin (Java) application that is deployed, using a simple provisioning process, in a customer provided and maintained Linux Virtual Machine (VM) on COTS server hardware in the same network adjacent to the Cisco SKIP device. It is also available as a Cisco IOx container that can be installed directly on supported Cisco hardware devices. An Adaptor is required per physical or virtual firewall and can be deployed in High Availability (HA) for VM deployments.

The Adaptor registers with an instance of SKA-Platform hosted in a selected data centre which provides the source of random material used to generate quantum safe keys, as well as allows management of the Adaptors through a single, easy to use console.

VM Specifications

- x86 64-bit
- CPU - single Core 2.8GHz / minimum 1 vCPU
- Memory – minimum 2GB RAM
- Disk – minimum 20GB
- Guest Operating System: Ubuntu 24.04 LTS, Oracle Enterprise Linux 8.7, Red Hat Enterprise Linux and Rocky Linux 9.6
- Java Virtual Machine (JVM) (version 17.x)

Cisco IOx container

- CPU - single Core 2.8GHz / minimum 1 vCPU
- Memory – minimum 512MB RAM
- Disk – minimum 1GB

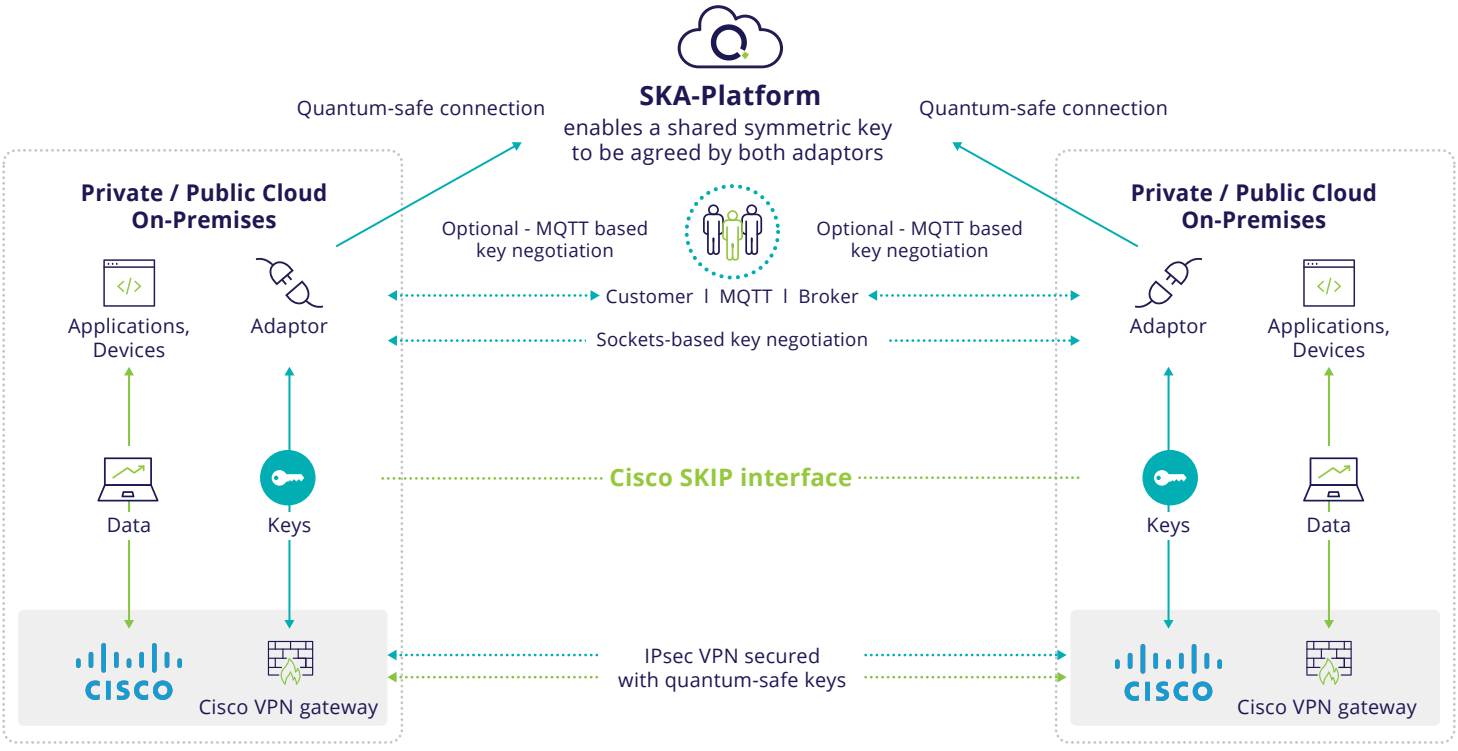
Other Resources

- SKA-Platform Product Sheet

Case study - Cisco and Arqit VPN Encryption

Arqit integrates with Cisco IOS XE router and edge platforms, to enhance the security and manageability of IPsec VPN connections established by Cisco devices.

Figure 1. Arqit NetworkSecure Adaptor integration with Cisco VPN to deliver quantum secure symmetric keys via Cisco SKIP interface



Each Cisco device (physical or virtual) securely connects to its designated NetworkSecure Adaptor using mutually authenticated and encrypted TLS sessions. When point-to-point IPsec VPN sessions are initiated or re-keying of existing tunnels are triggered by Cisco VPN devices, each participating device requests a shared quantum-safe key from its respective local NetworkSecure Adaptor server using the Cisco SKIP network protocol.

The Adaptors agree a shared symmetric key with each other, using Arqit SKA-Platform as the key broker, and the keys are delivered in real-time to the requesting network devices over the SKIP REST interface.

The keys are used by the Cisco devices, specifically the IKE key agreement protocol, in the construction of the IPsec VPN tunnel to deliver enhanced data protection.