Licensable Technologies

QKarD
Quantum Smart Card

Applications:

- Telecommunications: cell / smartphone; multi-party secure phone calls; videoconferencing; Voice over IP (VoIP)
- Banking and financial transactions: ATM, debit / credit card and e-Commerce
- e-Business; e-gaming; e-books; e-music; e-movies; e-gambling
- Wireless internet
- Electronic voting
- Facility and vehicle access
- Information exchange for government/defense

Benefits:

- Future-proof encryption
- Compact
- Portable
- Wireless
- Low-cost deployment
- Does not require dedicated fiber optics
- Invulnerable to both conventional and quantum computer attacks

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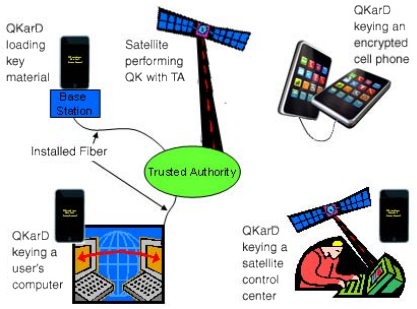
Summary:



The security of present-day encryption techniques for protecting electronic communications and transactions depends on the inability of computer processing power to decipher difficult mathematical problems. With processing power increasing at an exponential rate, eavesdroppers can, in principal, decipher even the most complex mathematical problems. To make matters even more alarming, encrypted communiqués that are secure today could potentially be archived for years until processing power catches up with the computational demands of cracking these mathematical problems.

In response to these problems, Los Alamos National Laboratory (LANL) scientists have developed a revolutionary technology entitled "QKarD" that implements the quantum mechanical laws of physics rather than complex mathematical problems to encrypt information. This technique, known as Quantum Key Distribution (QKD), uses polarized single photons to generate secret keys that can be shared between two or more parties and used to encrypt data to safeguard it from eavesdroppers. Incorporating this method of encryption into QKarD technology provides superior forward security assurances without archival attack concerns, regardless of advancements in processing power.

The QKarD is a compact, portable and wireless device that is simple to use. A user needs only to periodically insert the device into a base station for authentication, requiring both a fingerprint and personal identification number (PIN). The QKarD would then communicate seamlessly with a central trusted authority (TA) via optical fiber, from which cryptographic-quality secret random numbers are automatically uploaded. These numbers are then stored in secure memory on the device, for encryption, authentication, and access control, ensuring secure communication with other devices through the air (free-space) at remote locations. These remote devices also communicate back to the same TA to authenticate a user, provide access control, or set up a multi-party secure telephone call. The QKarD could easily be envisioned as part of an Advanced Encryption Standard (AES) compliant smartphone that uses built-in quantum keys to replace conventional algorithm based encrypted communication. The QKarD system could be incorporated seamlessly into a smartphone or attached by way of a universal port.

Development Stage:

Technology Readiness Level: 4- Component Prototypes Tested in a Controlled Environment

Patent Status:

Title:	ID Number:	Patent/Appl. Number:	Date:
Quantum Key Distribution Using Card, Base Station and Trusted Authority	S-118,973	US Patent Application No. 12/895,720	9/30/2010
		EU Patent Application No. 11829925.4	9/29/2011
		JP Patent Application No. 110001243	9/29/2011
Secure Multi-Party Communication with Quantum Key Distribution Managed by Trusted Authority	S-121,574	US Patent Application No. 12/895,367	9/30/2010

Licensing Status:

Available for exclusive or non-exclusive licensing and collaborative agreements.

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