Crypto and the Trusted Key Entry Workstation: Is a TKE In Your Future

Share 12686

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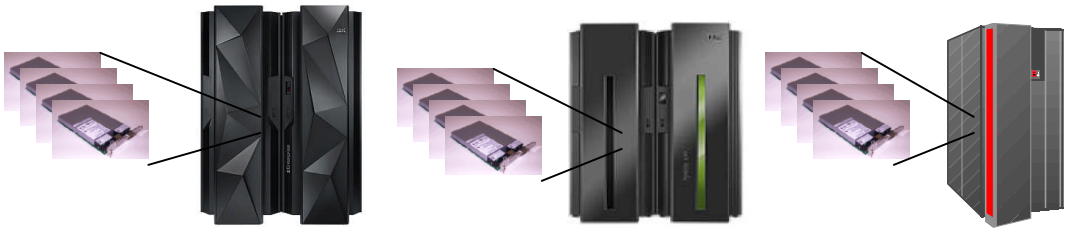
Agenda – TKE In Your Future

- **What is it? What does it do?**
- **How It Works**
- **Some Terminology**
- **Smart Cards**
- **TKE History**
- **TKE Exclusives**

TKE – What does it do?

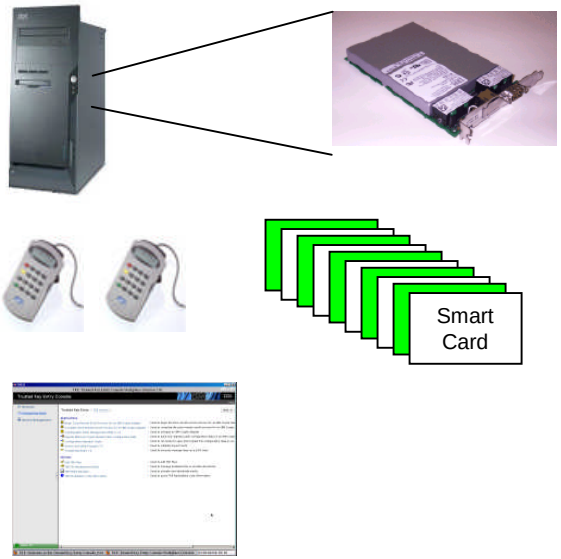
- **Provides secure key entry**
  - Key material is generated in hardware and never exists in the clear outside of the tamper hardware (security)
  - Can provide dual control (integrity)
- **Provides utilities for configuration management of the host crypto**
- **It doesn't do**
  - Crypto for applications
  - Key storage



TKE – What is it?

TKE workstation with a Crypto Coprocessor

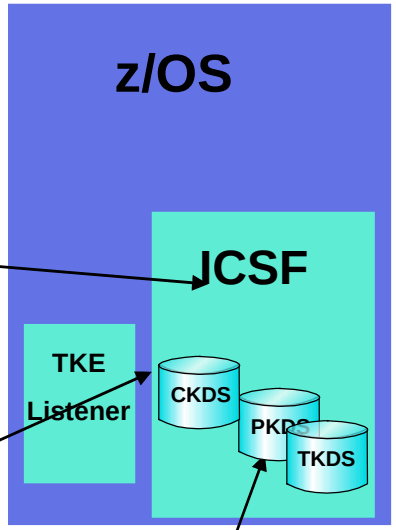
- Intel Workstation (FC 0841) with an embedded operating system
- Cryptographic coprocessor
- Optional TKE smart card support
  - Readers and 20 smart cards (FC 0885)
  - 10 Additional smart cards (FC 0884)
- A TKE application (Java) (FC 0850)



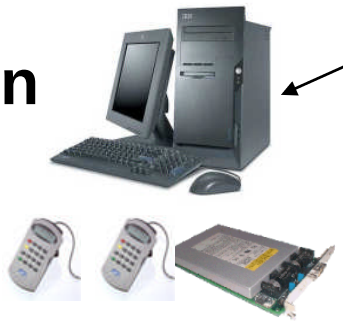
TKE – Trusted Key Entry Workstation

Host w/ Secure Crypto HW

TCP/IP



Trusted Key Entry Workstation



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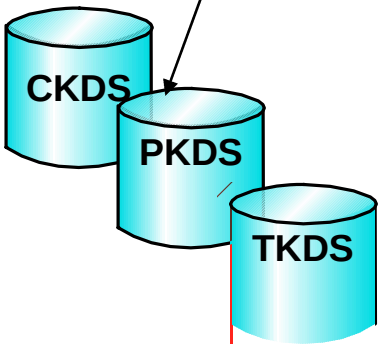


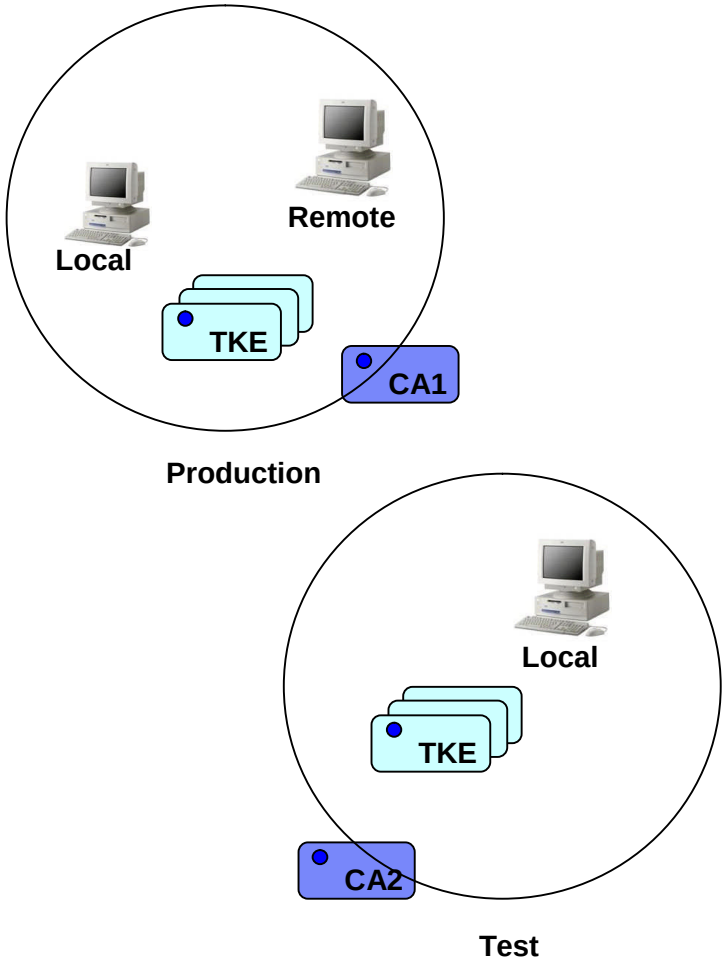
TKE Zone

A TKE zone is a set of Smart Cards and TKE local Crypto Adapters that share a common CA (Certificate Authority) Smart card.

A security concept ensuring that only members of the same zone can exchange key parts. It is established by a CA smart card, and is made up of entities:

- **CA Smart Card**
- **TKE Smart Card**
- **TKE Cryptographic Adapter**

Key material can ONLY be passed between Smart Cards or Smart Cards and the TKE's local crypto adapter, when the Smart Cards and/or TKE local crypto adapter are in the same TKE zone.

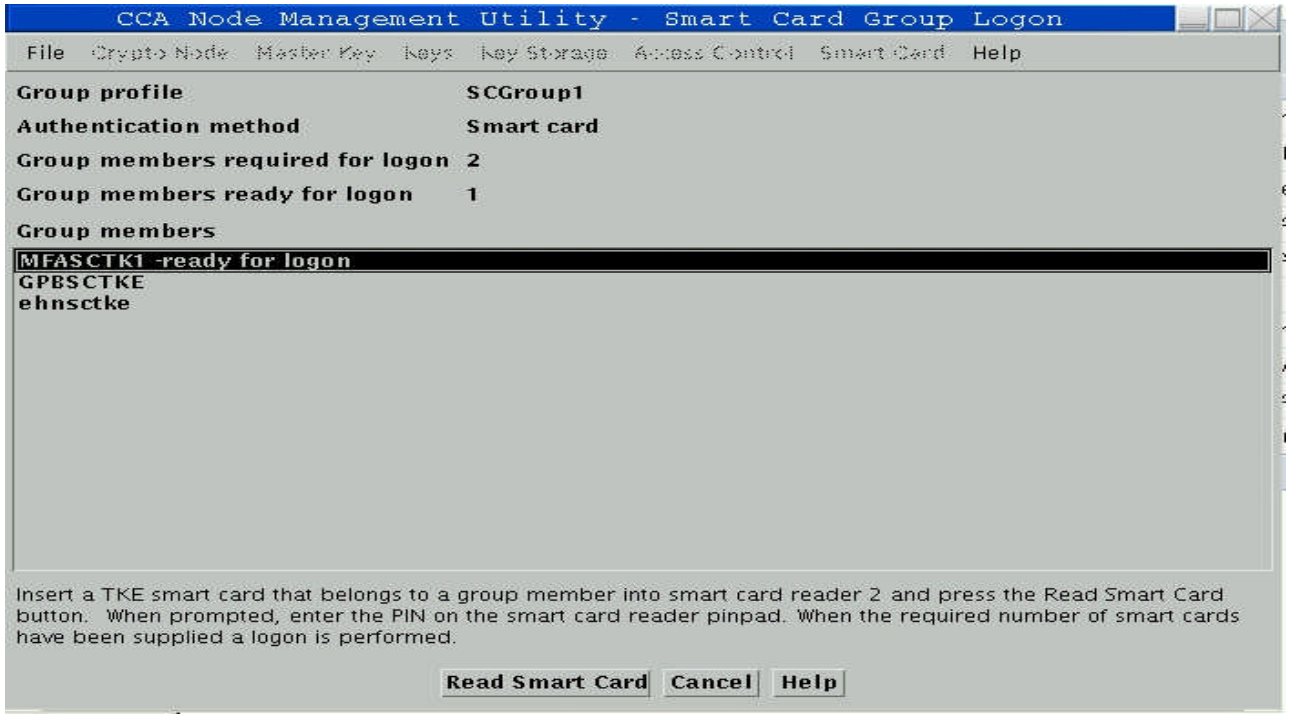


Security across the connections

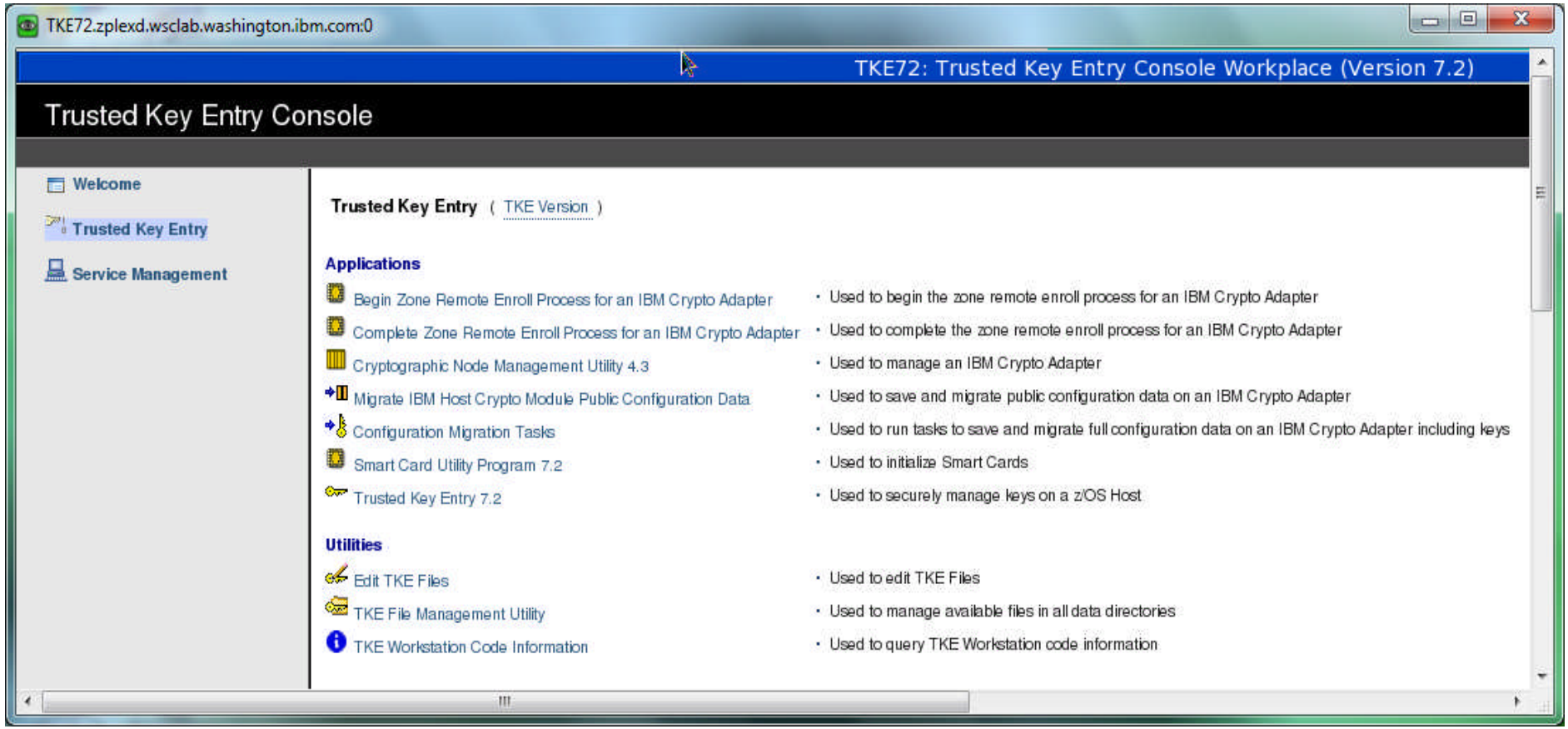
- **TKE Workstation Crypto Adapter**
  - Profiles
  - Roles
- **Host Crypto Adapter**
  - User/Authority
  - Roles

Group logon feature

- **Enables dual and multiple control of workstation commands by requiring a certain number of users to authenticate to the TKE as members of a group.**



TKE Main Menu

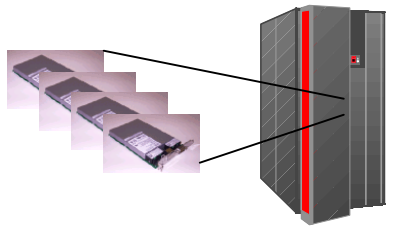


Management of Host Adapters:

Load master keys (Also supports loading of many operational keys)

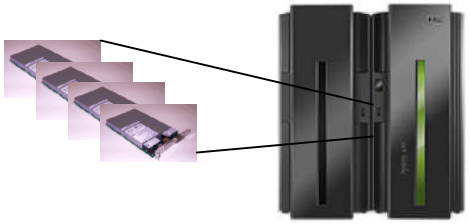
- Dual controls
- Hardware bases *
- Optional smart cards * – key material never in the clear outside a crypto engine

  * Required by laws, regulations and/or standards



Migration of Host Adapter information from one adapter to another

- Public information
- Card cloning
- Cross LPAR/Cross CEC
- Information moved to equal or newer adapter

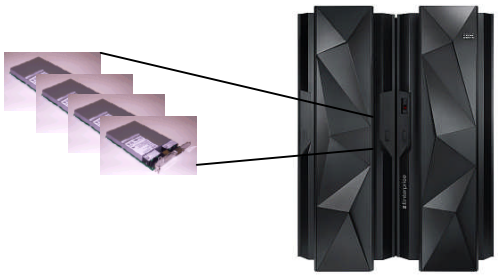


Host adapter has 16 domains (each with set of master keys)

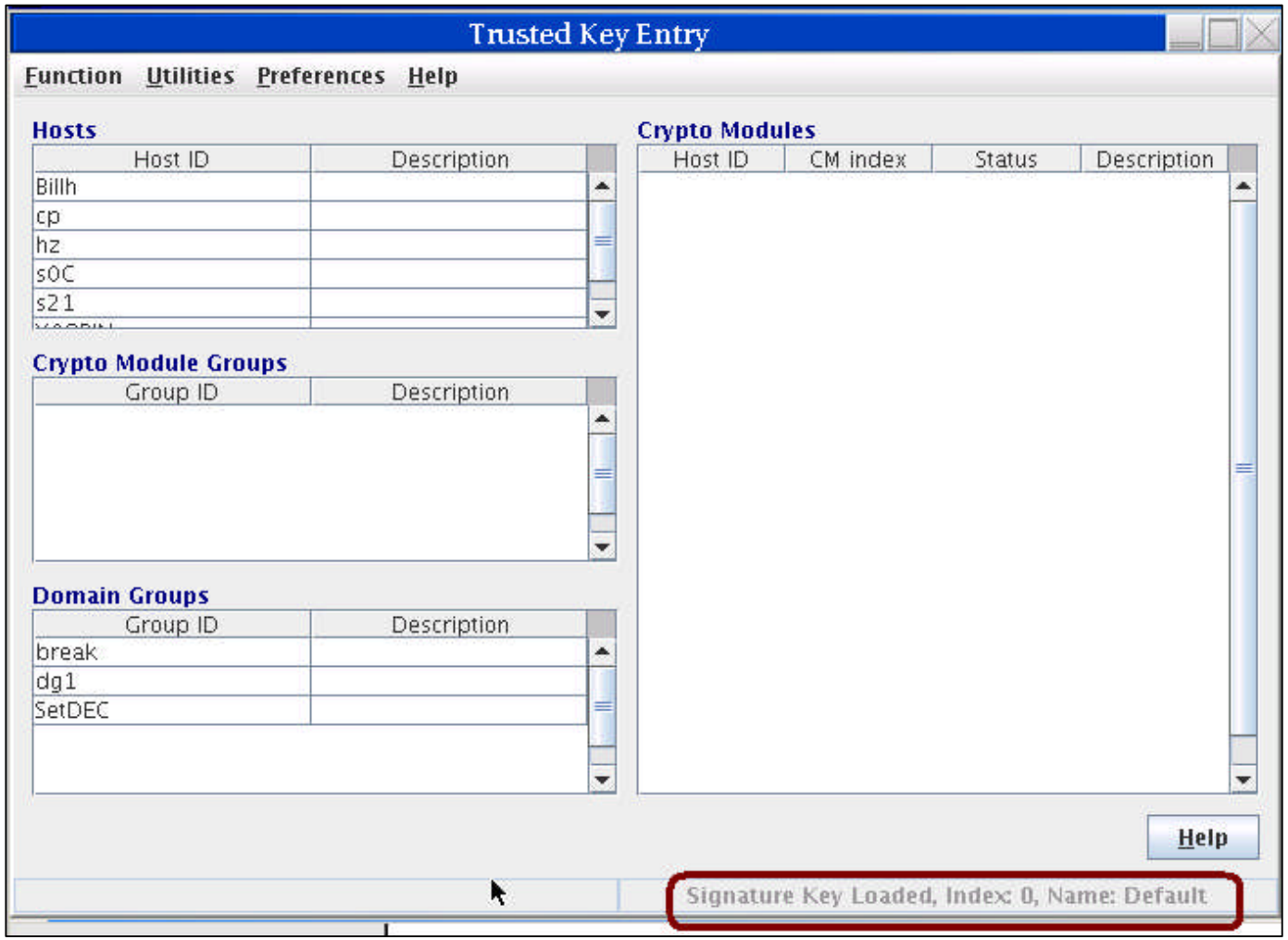
- TKE allows domains to be grouped and managed as 1

Manage access to adapter services

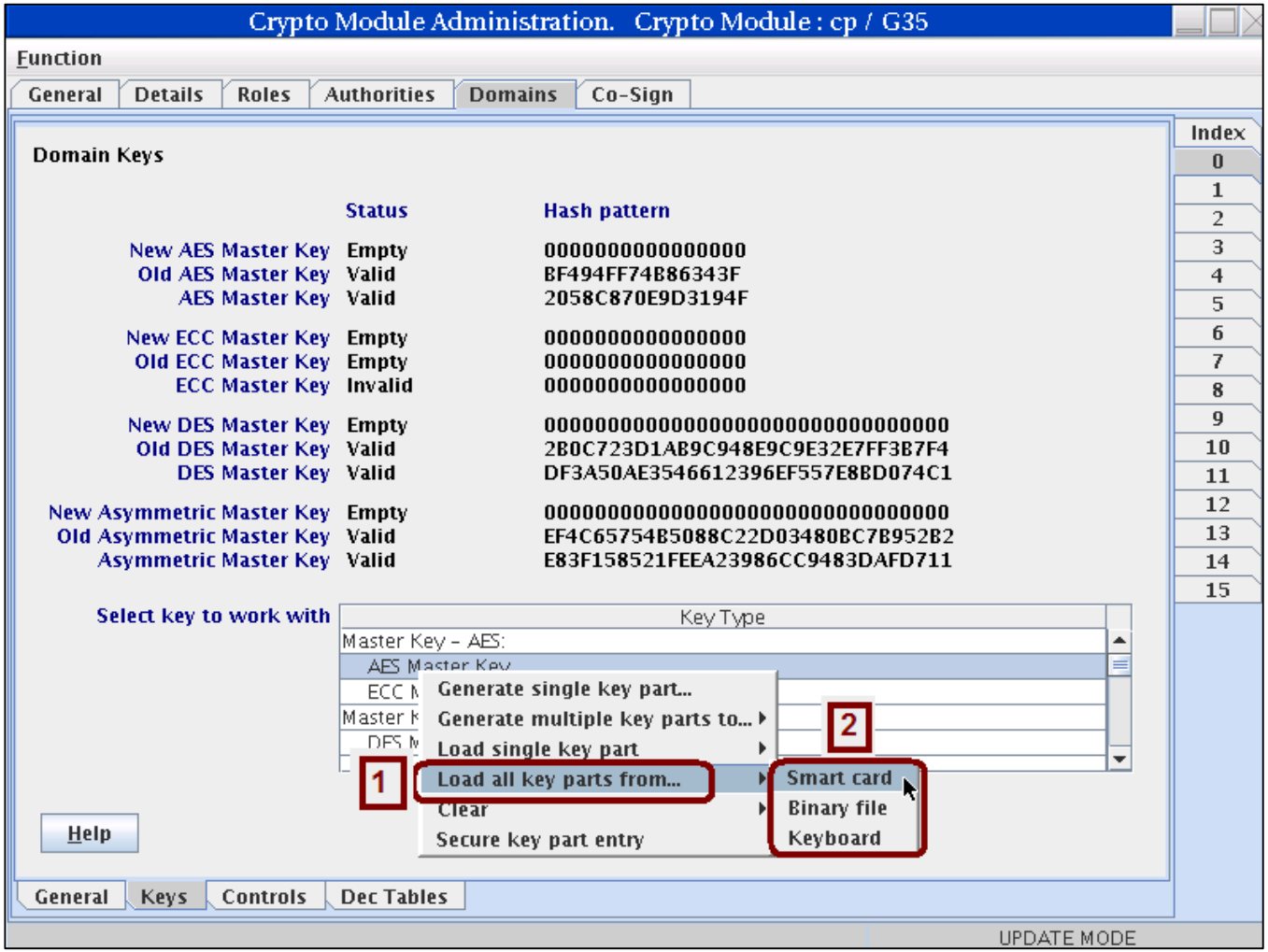
- What crypto services can be used
- What pin decimalization tables can be used
- Some default adapter settings



TKE Groups



Crypto Module Notebook



Smart Card part 74Y0551

- Smart cards used to:
  - Hold credentials
  - Hold key material
  - Perform encryption functions.

Smart Card Support – TKE Zones

- **Certificate Authority (CA) Smart Card – Establishes the zone (two, 6 digit PINs)**
- **TKE Smart Card – Used for storing keys & key parts (6 digit PIN)**
  - Generates, stores and uses a TKE crypto adapter logon key
  - Store Key Parts
    - ICSF (host) key parts, both master and operational keys
    - Optionally, store TKE crypto adapter workstation master key parts
  - Generates, stores and uses a TKE authority signature key
- **EP11 Smart Card – Required for loading P11-MK and storing keys & key parts**

Smart Card Support - Configuration Migration

- MCA (Migration Certificate Authority) - for defining zones associated with the migration wizard
- Key Part Holder – for holding parts of a master key being transported
- Injection Authority – for injecting master keys into new adapters

TKE Version History

- **TKE 5.3 (2008)**
  - Auditing – Added security relevant event Audit Log with hundreds of auditable events
  - AES support
  - USB readers and new smart card
- **TKE 6.0 (2009)**
  - Domain Grouping
    - Domain scoped operations (e.g. key loads) are broadcast to all domains in the group in a single operation
    - Adapter scoped operations (e.g. create authority) are broadcast to each adapter in the group in a single operation
  - Migration Wizard – capture configuration data from the adapters on the host and push that to another card
- **TKE 7.0 (2010)**
  - Full-function host cryptographic adapter migration wizard includes capturing key material

TKE Version History (cont.)

- **TKE 7.1 (2011)**
  - New wizard for loading/generating keys
  - New ACPs for TKE applications
  - Migrate roles utility
  - New AES operational keys
  - PIN Decimalization Table support
  - Host cryptographic module status
  - Support for up to 50 key parts
  - Display active ids on the TKE console
  - Use of Elliptic Curve Diffie-Hellman (ECDH)
  - Enhancements to full-function migration wizard

TKE Version History (cont.)

- **TKE 7.2 (2012)**
  - EP11 (IBM Enterprise PKCS #11) support
  - Support CEX4SC
  - New DES operational keys (associated with CipherTextTranslate API)
  - New AES Cipher key attributes
  - Allow creation of corresponding keys
  - Support up to 4 smart card readers

TKE Exclusives

- **Secure loading of master keys**
- **Migration Wizard**
- **Loading MKs for inactive LPARs**
- **Enabling/Disabling ACPs**
  - 24-Byte DES-MK
- **Loading PIN Decimalization Tables**
- **Loading P11-MK**

Questions …

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