IBM zServer Cryptographic Update

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Agenda

- Z9-109 Current (inherited) features
- z9-109 Enhancements
- SE/HMC changes
- TKE changes
- z9-109 Requests

Challenges

- Protecting the data from unauthorized access
  - RACF
  - Identification
    - PIN
    - Certificates
- Guarding the integrity of the data
  - Message authentication
  - HASHING
- Protecting disclosure of the information
  - Encryption

Inherited Features

- CPACF
  - DES/TDES
  - SHA-1
- Crypto Express 2 (CEX2C)
  - RSA
  - PIN
  - DES/TDES
  - EMV2000

IBM System z9 109 (z9-109)

Enhancements

- TKE V5
  - Redbook SG24-7123
- AES-128
- PRNG
- SHA-256
- CKDS Sysplex Coherency
  - SYSPLEXCKDS(YES|NO,FAIL (YES|NO))
    - **SMF Record Type 82 (Subtype 21)**

IBM System z9 109 (z9-109)

IBM z9 BC

Enhancements

- Configure CEX2C/ CEX2A
- PKI Services
  - Become your own Certificate Authority
  - Exchange certificates and encryption keys
  - Provide secured path from client to server
- RACF and Vanguard products

IBM System z9 109 (z9-109)

zSeries and S/390 Crypto Hardware

Crypto Coprocessor Facility (CCF) $e_{mk}(k)$

PCI Crypto Coprocessor (PCICC) $e_{mk}(k)$

PCI Crypto Accelerator (PCICA)

CP Assist for Crypto Functions (CPACF)

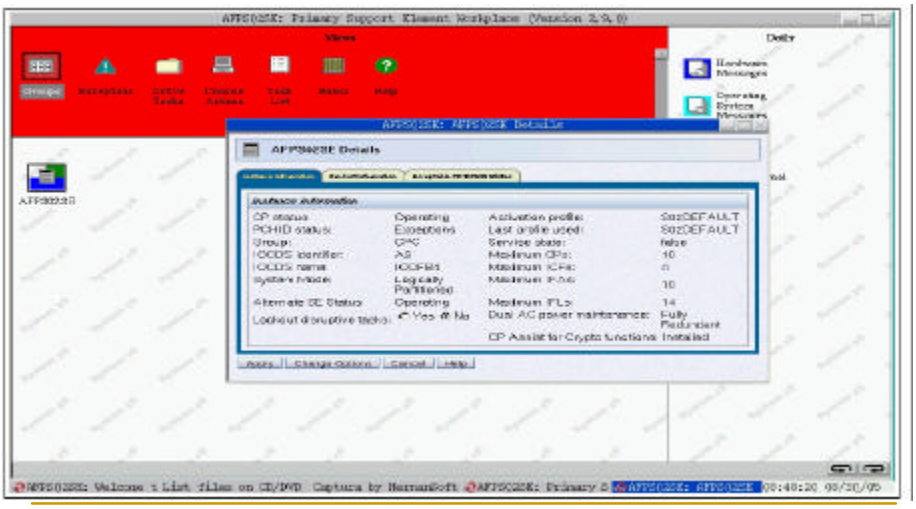
Crypto Express2 (CEX2) $e_{mk}(k)$

PCI X Cryptographic Coprocessor (PCIXCC) $e_{mk}(k)$

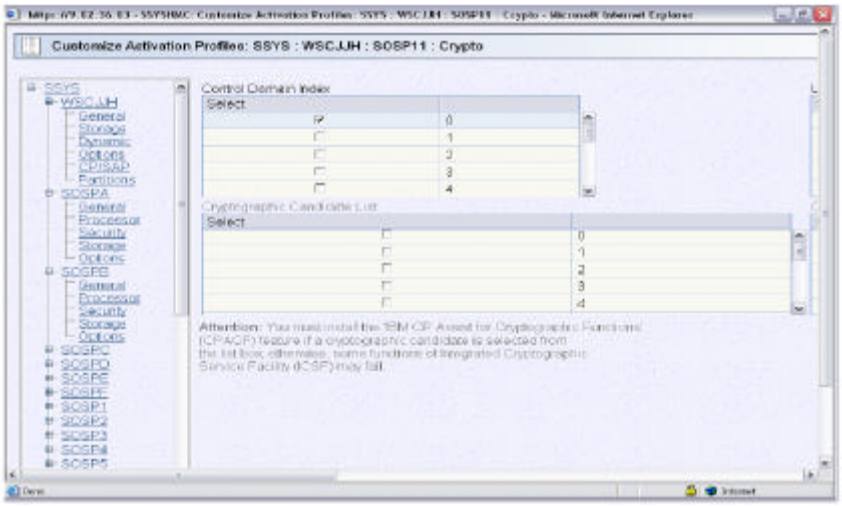
PCI Crypto Accelerator (PCICA)

Multiprise 2000, Multiprise 3000, 9672 G3-G6, z800/z900, z890/z990 z9-109

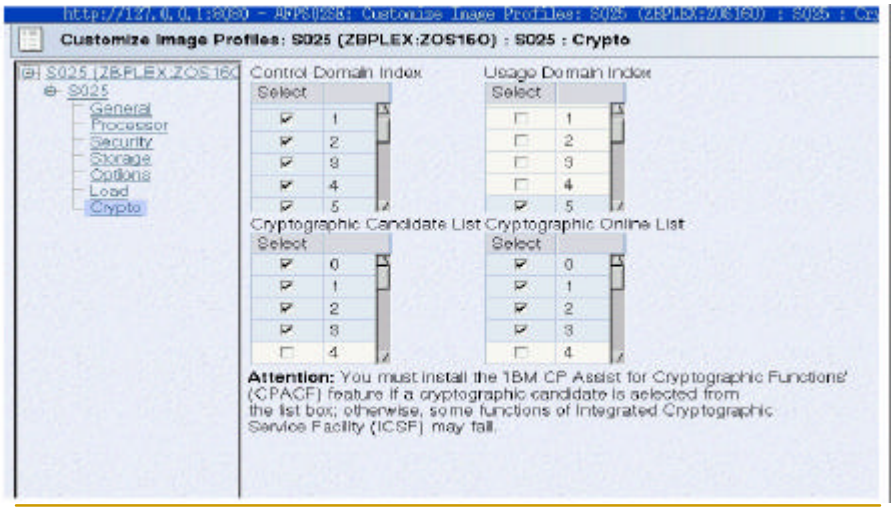
FC 3863 Installed



Crypto Definitions



Crypto Definitions



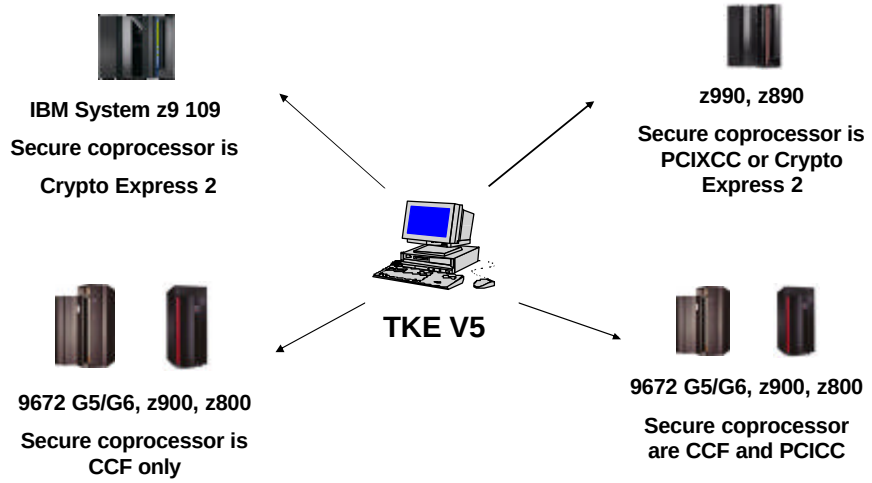
TKE (Trusted Key Entry) Workstation Overview

- Priced feature, designed for highly secure management of secure coprocessors Master Keys and operational keys
  - Optional Smart Card reader
  - Embedded closed OS
- Encrypted and signed communications over TCP/IP
  - Listener is ICSF
  - End point is the coprocessor
  - Every command is signed and encrypted
  - Ethernet access only (V5)
- Operational Key Entry
  - Key parts are loaded into crypto coprocessor card from TKE workstation
  - Any key type
  - User defined control vectors
  - Single, double and triple key lengths

TKE (Trusted Key Entry) Access Control

- Access to secure cryptographic coprocessors is done through
  - Authorities (security officers) identified by their password and digital signature
  - Option to require multiple signatures before performing a crypto function
  - smart card support at TKE V4.2 and above
- The TKE implements an access control mechanism that uses the *roles* and *profiles* concept
  - When necessary, these roles and profiles are defined by the TKE administrator using the Crypto Node Management (CNM) software facility and according to customer security policy

TKE Support



TKE (Trusted Key Entry) Version 5

- No desktop
  - Now there is a framework with two main branches for TKE (includes Applications and Utilities related toTKE) and System Management (includes Service Applications, Configuration, and Maintenance for configuring and maintaining the TKE workstation)
- No command prompt
  - Any command line task has now been replaced by a GUI interface.
- No access to directory paths
  - Now provide TKE related data directories for accessing files (via a File Chooser) and access to floppy and CD/DVD-RAM.
  - To edit a file in these data directories or on media you'll use the new Edit TKE Files task.
  - To manipulate these files (copy, rename, or delete) you'll use the new TKE File Management Utility task.

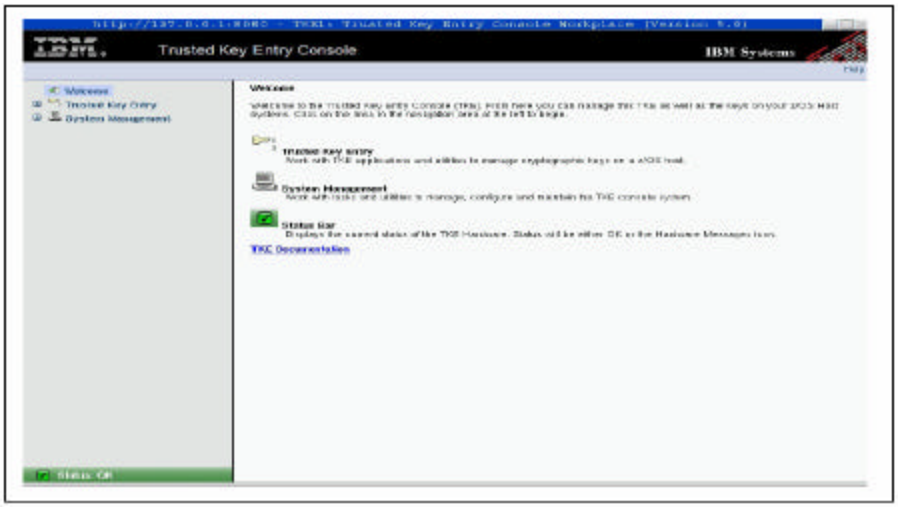
TKE (Trusted Key Entry) Version 5…

- No TKE.INI file
  - Now there is a Preferences Menu on the TKE Task bar (Functions, Utilities, Help still exist).
  - The Preferences menu allows you to enable/disable Blind Key Entry, Floppy Drive Only, Enable Tracing, Enable Smart Card Readers, and Show ECM bits as appropriate
- TKE Media Manager
  - For TKE related tasks to be able to use media (diskette, CD, DVD-RAM) the drive must be activated. Activation is thru the new TKE Media Manager task. If the media is not activated first, it will be automatically done for the user.
  - When the user is done, the drive MUST be deactivated BEFORE the media is removed or any data saved to the media could be lost. Deactivation is NOT automatically done.
  - If changing from one diskette to another, the floppy drive must be deactivated, media removed, new media inserted, and the drive activated again. If this is not performed data on the new diskette will not be recognized.

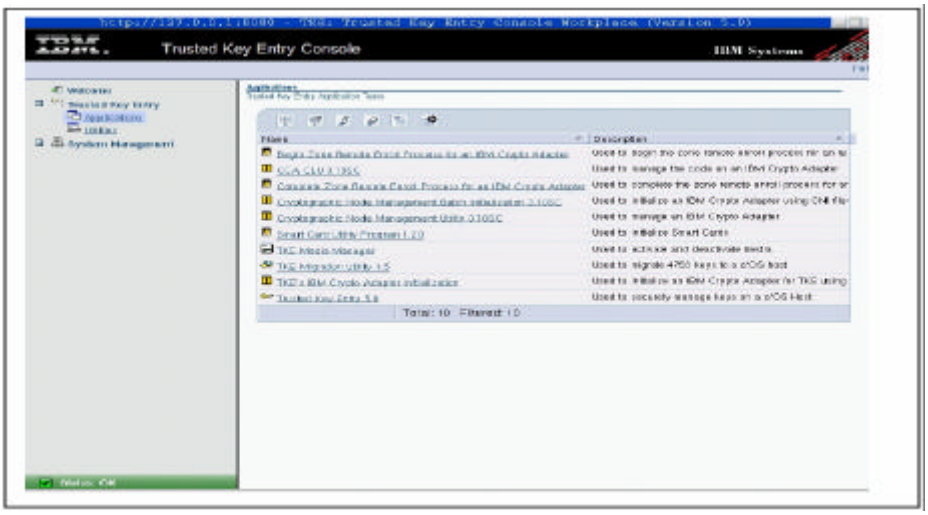
TKE (Trusted Key Entry) Version 5…

- Migrate TKE data from previous TKE versions
  - New task to be used to migrate TKE related data (Host.Dat, Group.Dat, 4758 roles and profiles, TCP/IP info, and emulator session information) from an existing TKE workstation to TKE 5.0.
  - Authority Signature Keys, master key parts, and operational key parts are not directly migrated but can manually be copied to diskette and then restored to the appropriate data directories using the TKE File Management Utility.

Trusted Key Entry



TKE



ICSF Customer Requests

- ISO16609 CBC TDES MAC
  - Strengthen data integrity
- Remote key loading for ATM's and POS
  - More flexible key management and privacy
- Secure key AES
- ANSI TR-31 Key block for DES key exchange

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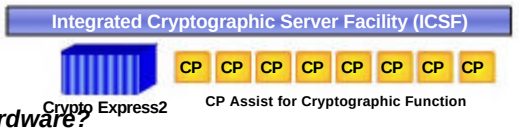
These are a sample of requests by customers. IBM makes no representation as to whether these requests will be addressed.

Mainframe Encryption



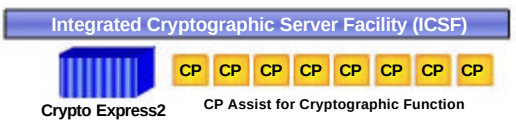
Why IBM Mainframe encryption hardware?

To accelerate encryption and provide Secure Key services

Secure Key

- For Secure Key exchanges
- Master keys in "tamper-resistant" package
- Dual control for Master Key management
- Important for banking functions
  - ✓ ATM support, Triple-DES, Trusted Key Entry
- Designed to comply with FIPS 140-2
- **CP Assist for Cryptographic Function (**z890, z990, z9-109)
- Support high levels of security for demanding applications
- Very high performance TDES, AES -128 (requires z9-109) and SHA-256 (requires z9-109)
  - ✓ SSL/TLS support

Mainframe Encryption



Why z/OS centralized key management?

- Over a decade of production use

Helps to protect and manage keys

- Support of encryption standards
- Generates keys
- Manage based on customer policies
- Provides key recovery capabilities
- Uses tamper resistant hardware for "secure keys"

Provides information for:

- Audit Compliance
- Management Controls
- Access Controls

Integrates with z/OS security features:

- z/OS Digital Certificate hosting services
  - Customer can be their own certificate authority
  - Identrus certified (z/OS 1.5)
- z/OS RACF for authorization, authentication

Additional Information

- http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP100700
- http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS1666
- http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS1601
- Or http://www.ibm.com/support/techdocs
  - search on key words crypto

Questions