Introduction to IKeyman Utility and IKeyman Troubleshooting

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Agenda

- SSL Overview
- GSKit Overview
- IKeyman Overview
- IKeyman Troubleshooting
- Common IKeyman Problems
- Questions and Answers

SSL Overview

- SSL (Secure Sockets Layer) is an encryption system used on servers to ensure privacy when transmitting data across internet.

- Server needs a public-private key pair and a certificate. The server uses its private key to sign messages to clients.

- To send its public key to clients, the server needs a certificate issued by a certification authority (CA).

- A certification authority (CA) is a trusted third party that issues certificates.

GSKit Overview

- GSKit (Global Security Kit)
  - GSKit provides SSL (Secure Socket Layer) functions for IBM Products
  - GSKit provides IKeyman (IBM Key Management Utility)
- GSKit packages
  - WAS, IHS, Edge, MQ, Tivoli, etc.
  - Contact product support for IKeyman problems

GSKit Version

- To check GSKit full version, run following command
    - gsk5ver for GSKit 5
    - gsk7ver for GSKit 7

- On Windows – checking from Window registry

  HKEY_LOCAL_MACHINE\SOFTWARE\IBM\GSK7\CurrentVersion

- http://www.redbooks.ibm.com/redbooks/pdfs/sg246325.pdf

IKeyman Overview

- IKeyman (IBM Key Management Utility)
  - Java-based application to manage keys and key databases

- With IKeyman, you can
  - Create a new key database
  - Add root CA to your database
  - Request and receive a certificate from a CA
  - Set default keys
  - Change password

- http://www.ibm.com/support/docview.wss?uid=swg24010275

IKeyman Debugging

- Examples to run GSKit 7 IKeyman debugging
  - `gsk7ikm -Dkeyman.debug=true -Dkeyman.jnitracing=YES`
  - `gsk7cmd -Dkeyman.debug=true -Dkeyman.jnitracing=YES`
- Check log files
  - ikmcdbg.log, ikmgdbg.log, ikmjdbg.log
- http://www.ibm.com/support/docview.wss?uid=swg21202820

Common IKeyman Problems

- Cannot Start IKeyman
- Cannot Load GSKit Lib
- Cannot Create kdb File
- Missing an Intermediate Certificate
- Expired Certificates
- Corrupted Certificates
- No Request Key Error

IKeyman Issues

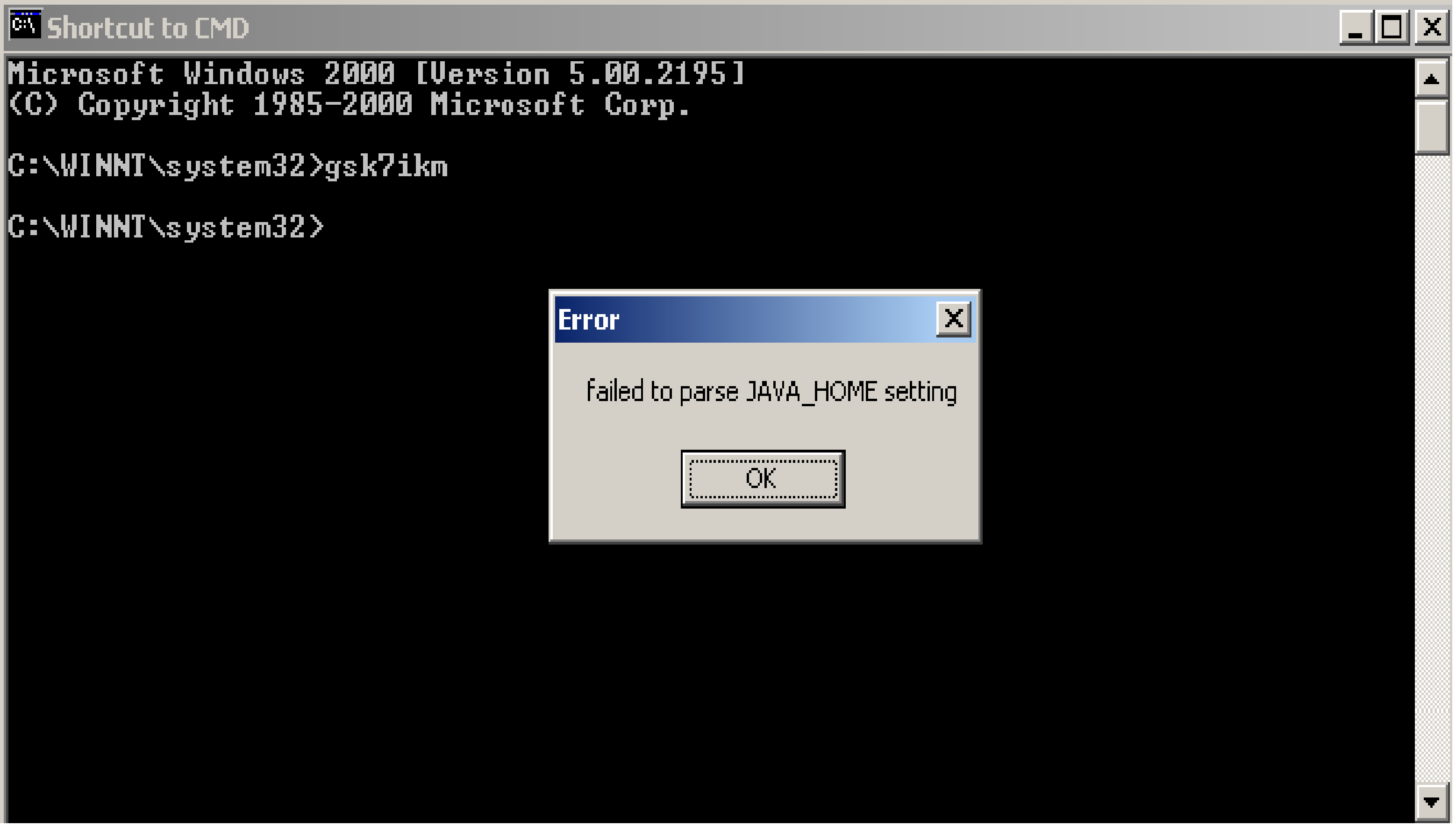
- Upgrading GSKit to the Latest Level
  - Many issues fixed
  - VeriSign root CA expiration
- APAR for the latest GSKit
  - PK09108 - GSKit 7.0.3.17
  - PK02947 - GSKit 5.0.5.97
- http://www.ibm.com/support/docview.wss?uid=swg27005198

Cannot Start IKeyman

- Error Message
    - “Failed to parse JAVA_HOME Setting”
    - Cause: JAVA_HOME is not set
    - Solution: Set JAVA_HOME=C:\java141\jre\

- SDK (JDK)
    - Solaris requires Sun JDK
    - All other platforms require IBM SDK
    - GSKit 5 requires Java 1.3.1
    - GSKit 7 requires Java 1.4.1 or above

Cannot Start IKeyman



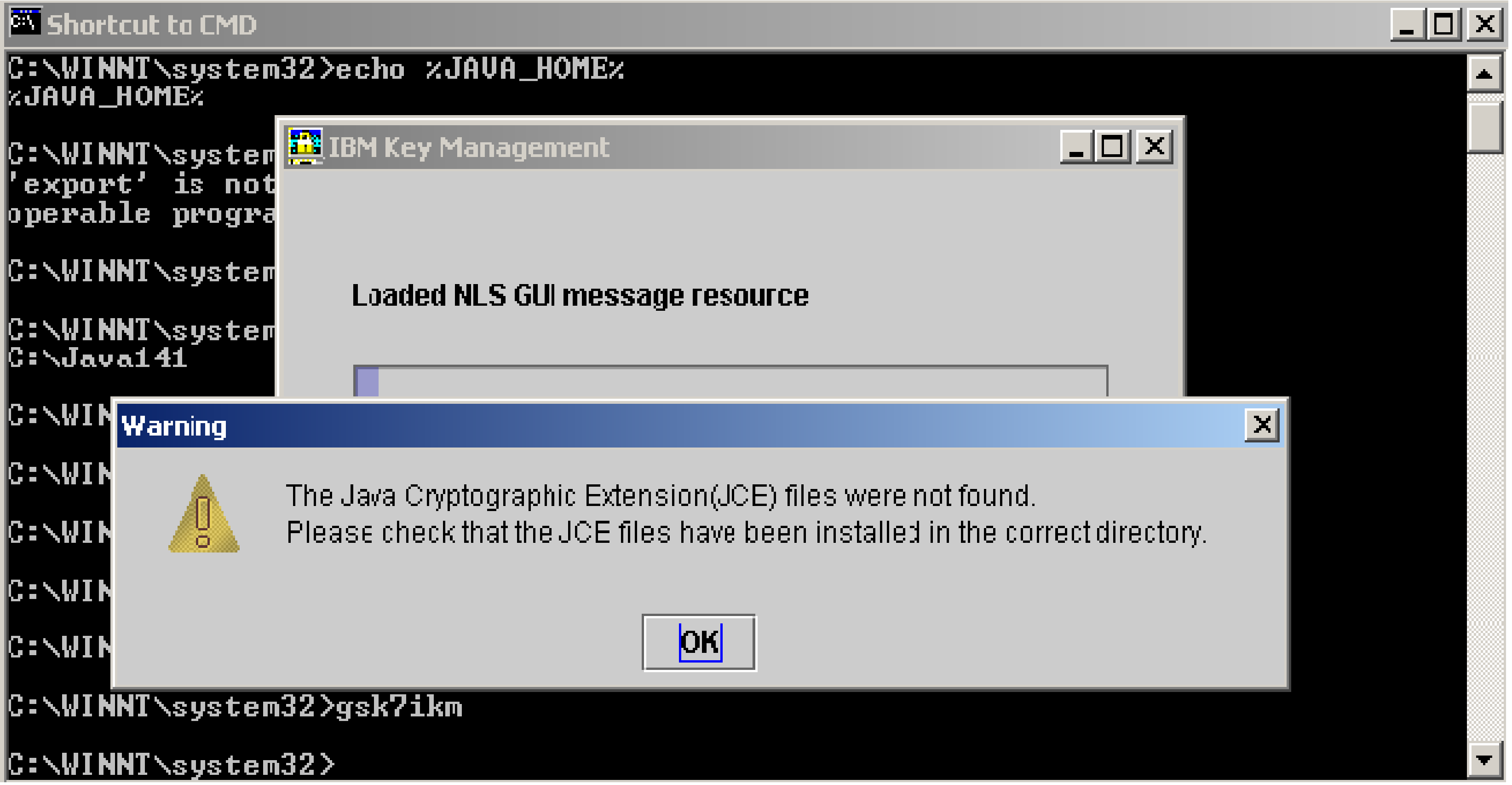
```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\WINNT\system32>gsk7ikm

C:\WINNT\system32>
```

failed to parse JAVA_HOME setting

Cannot Start IKeyman



```
C:\WINNT\system32>echo %JAVA_HOME%
%JAVA_HOME%

C:\WINNT\system
'export' is not
operable progra

C:\WINNT\system

C:\WINNT\system
C:\Java141

C:\WIN

C:\WIN

C:\WIN

C:\WIN

C:\WIN

C:\WINNT\system32>gsk7ikm

C:\WINNT\system32>
```

Loaded NLS GUI message resource

The Java Cryptographic Extension(JCE) files were not found.
Please check that the JCE files have been installed in the correct directory.

Cannot Start IKeyman

- Under JAVA_HOME/jre/lib/ext directory
  - Rename ibmjsse.jar, gskikm.jar and ibmjcaprovider.jar

- Update JAVA_HOME/jre/lib/security/java.security
  - security.provider.1=sun.security.provider.Sun
  - security.provider.2=com.ibm.spi.IBMCMSProvider
  - security.provider.3=com.ibm.crypto.fips.provider.IBMJCEFIPS
  - security.provider.4=com.ibm.crypto.provider.IBMJCE

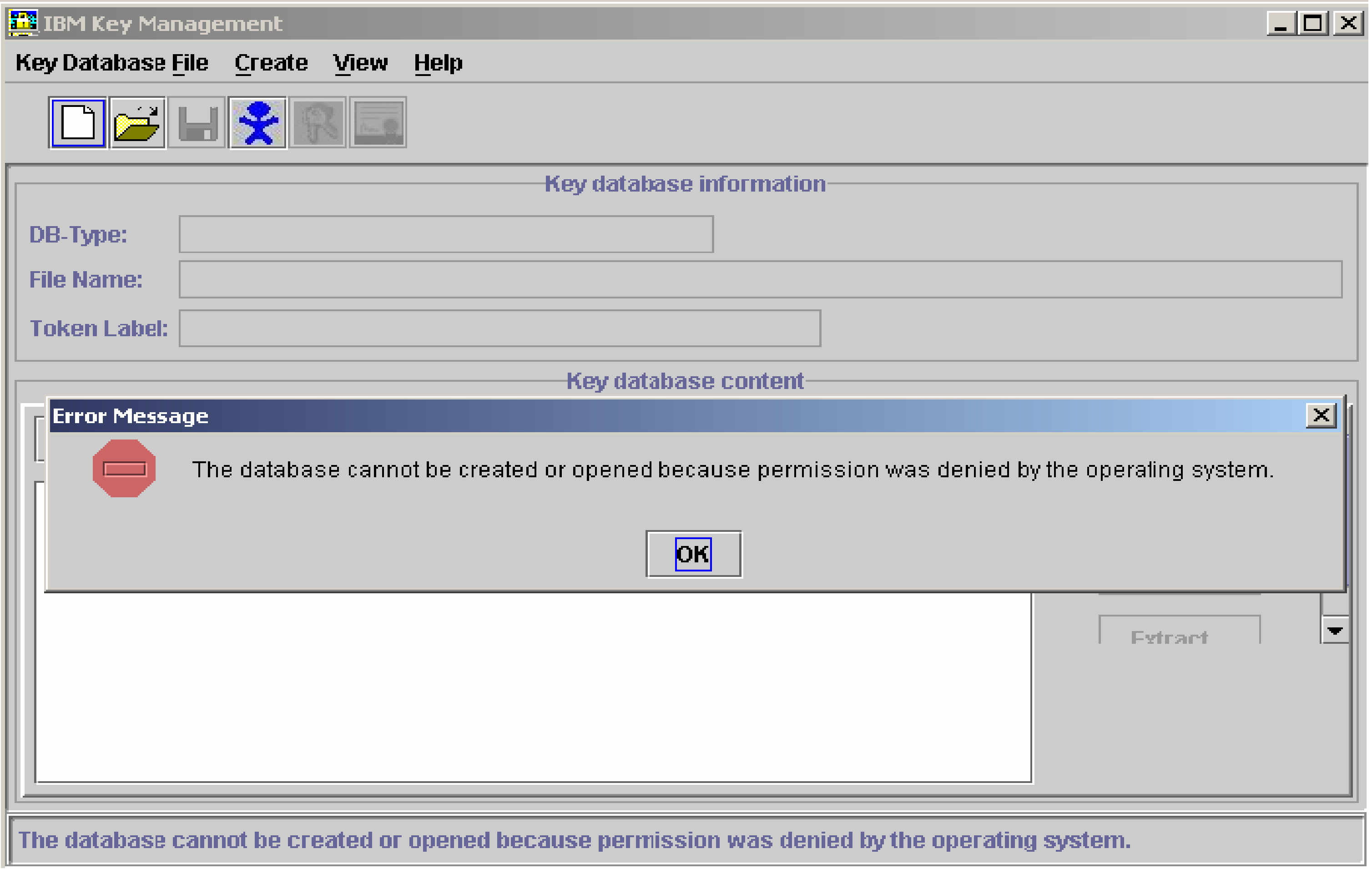
- http://www.ibm.com/support/docview.wss?uid=swg21172447

Cannot Create kdb File

- Problems
    - Cannot create a kdb file
    - No cms option to create a kdb file
- Causes
    - No write-permission
    - Expired Root CA

- http://www.ibm.com/support/docview.wss?uid=swg21166332

Cannot Create kdb File



The database cannot be created or opened because permission was denied by the operating system.

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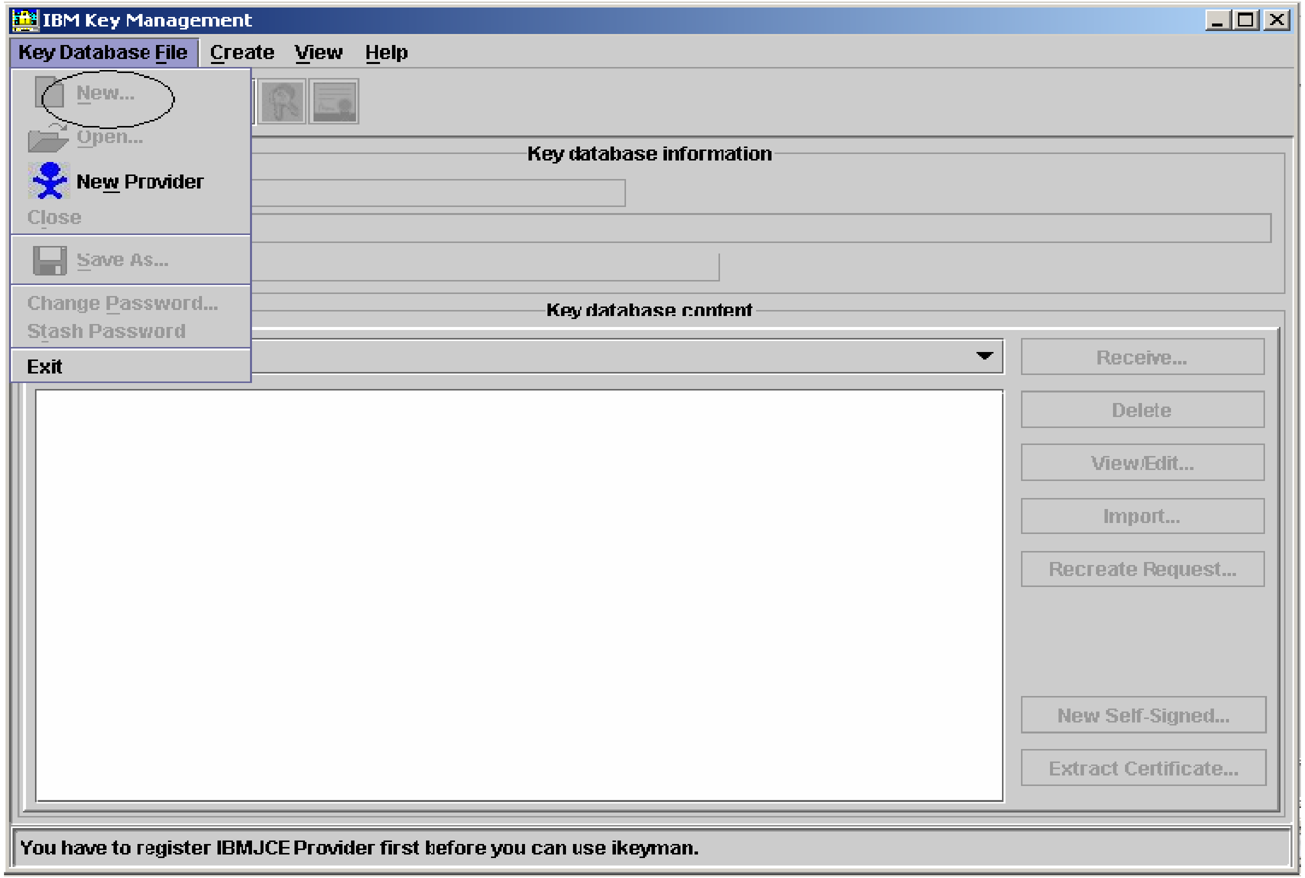
Cannot Create a kdb File



You have to register IBMJCE Provider first before you can use ikeyman.

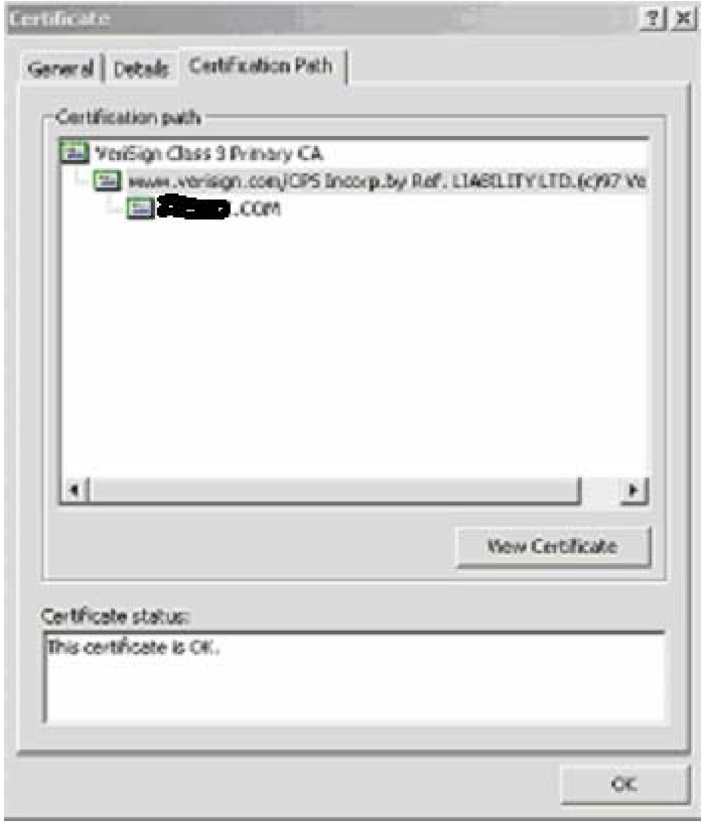
Missing an Intermediate Certificate

- IKeyman error

"An error occurred while storing the certificate from the given file"

- Cause
    - Missing an intermediate CA?
- Verifying
    - Rename certificate as cert.cer file open it in Window Explorer
    - Click the 'Certification Path'
- http://www.ibm.com/support/docview.wss?uid=swg21006397

Certificate with an Intermediate CA



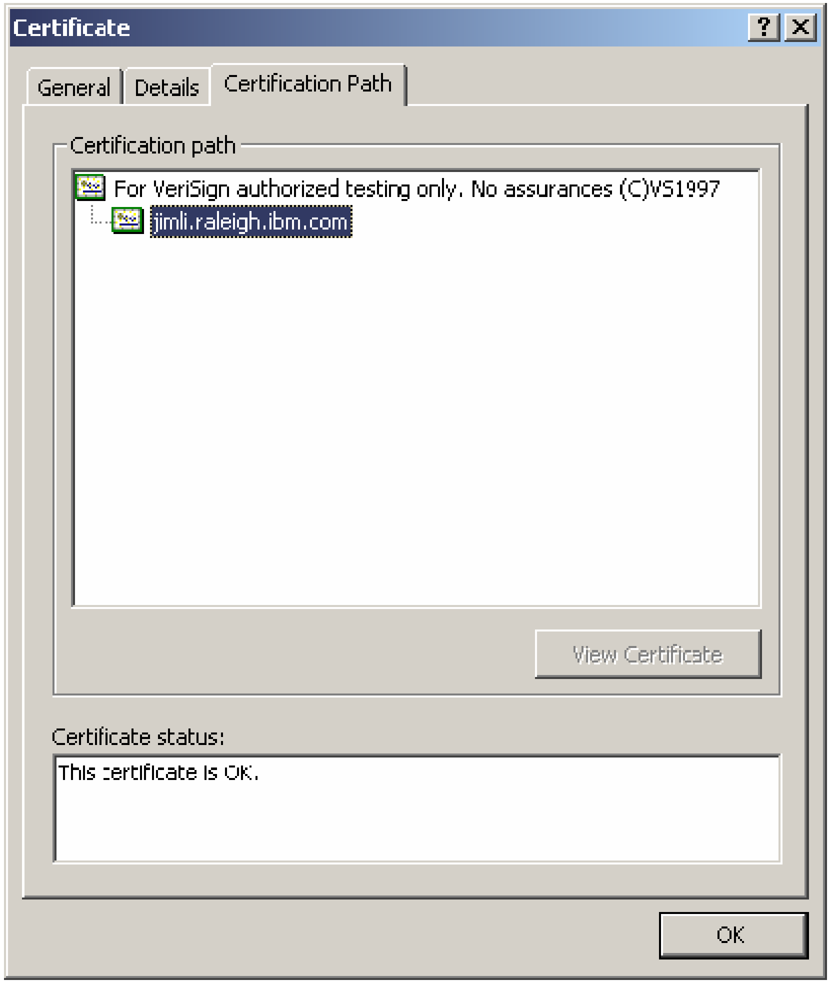
Certification path

VeriSign Class 3 Primary CA
www.verisign.com/CPS Incorp.by Ref. LIABILITY LTD.(c)97 Ve
[redacted].com

Certificate status:

This certificate is OK.

Certificate without an Intermediate CA



For VeriSign authorized testing only. No assurances (C)VS1997
jimli.raleigh.ibm.com

Certificate status:

This certificate is OK.

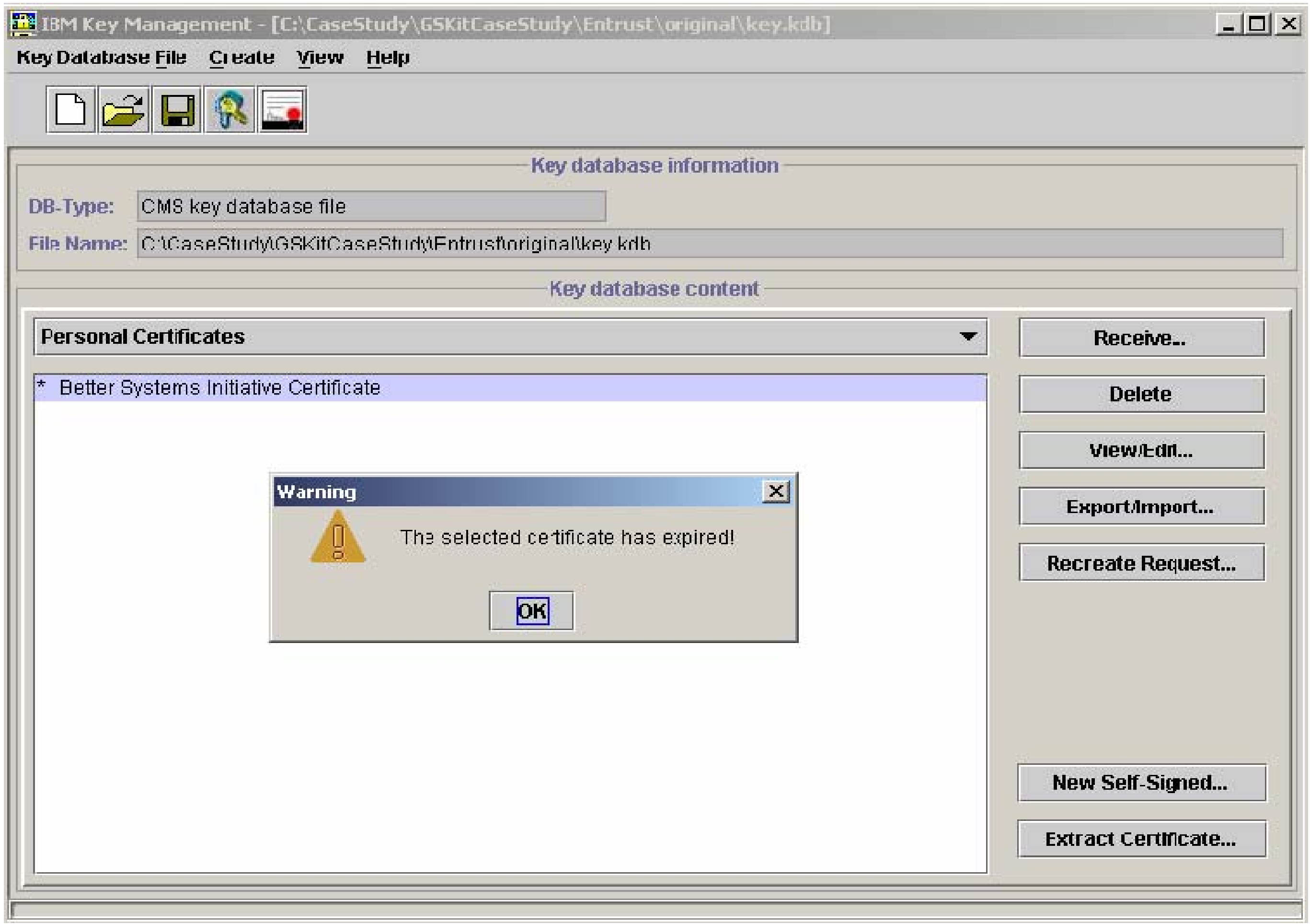
Expired Certificates

- Error message from IHS error log

“[error] mod_ibm_ssl: SSL Handshake Failed, Invalid date.”

- Verifying from IKeyman
  - Open kdb file and highlight the certificate
  - Click View/Edit button
- Verifying from Internet Explorer: double click locker icon
- Renewing an expired certificate
  - http://www.ibm.com/support/docview.wss?uid=swg21045925

Verifying Expiration from IKeyman



IBM Key Management - [C:\CaseStudy\GSKitCaseStudy\Entrust\original\key.kdb]

Key database information

DB-Type: CMS key database file

File Name: C:\CaseStudy\GSKitCaseStudy\Entrust\original\key.kdb

Key database content

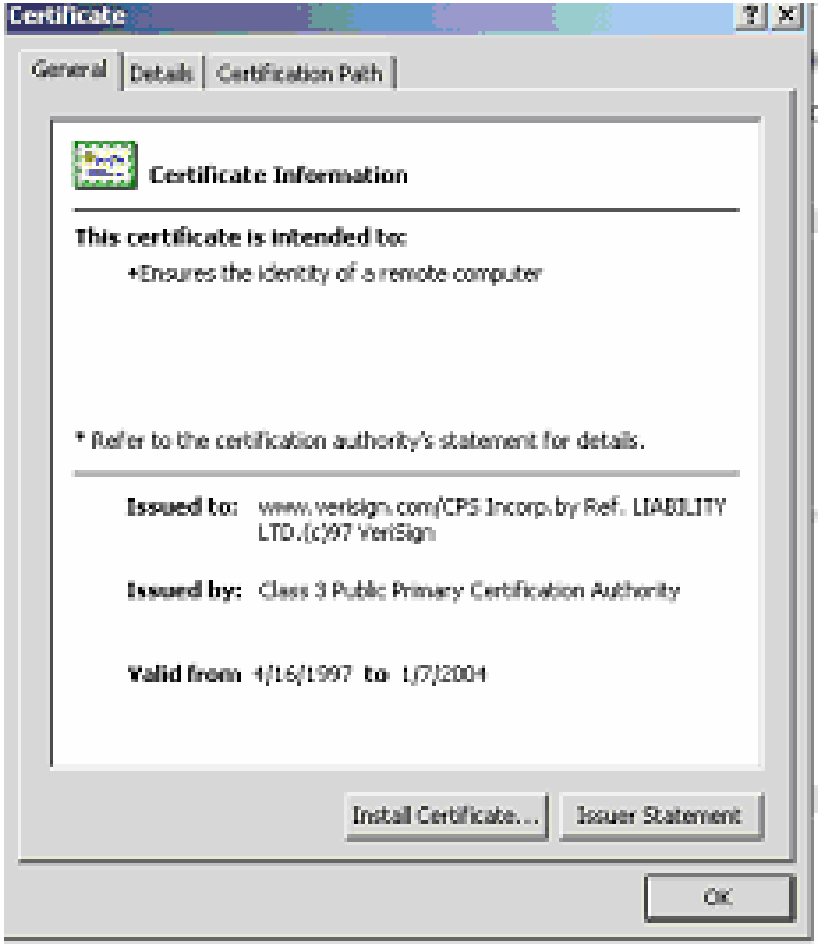
Personal Certificates

* Better Systems Initiative Certificate

Warning

The selected certificate has expired!

Verifying Expiration from IE



Certificate Information

This certificate is intended to:

- Ensures the identity of a remote computer

* Refer to the certification authority's statement for details.

Issued to: www.verisign.com/CPS Incorp.by Ref. LIABILITY LTD.(c)97 VeriSign

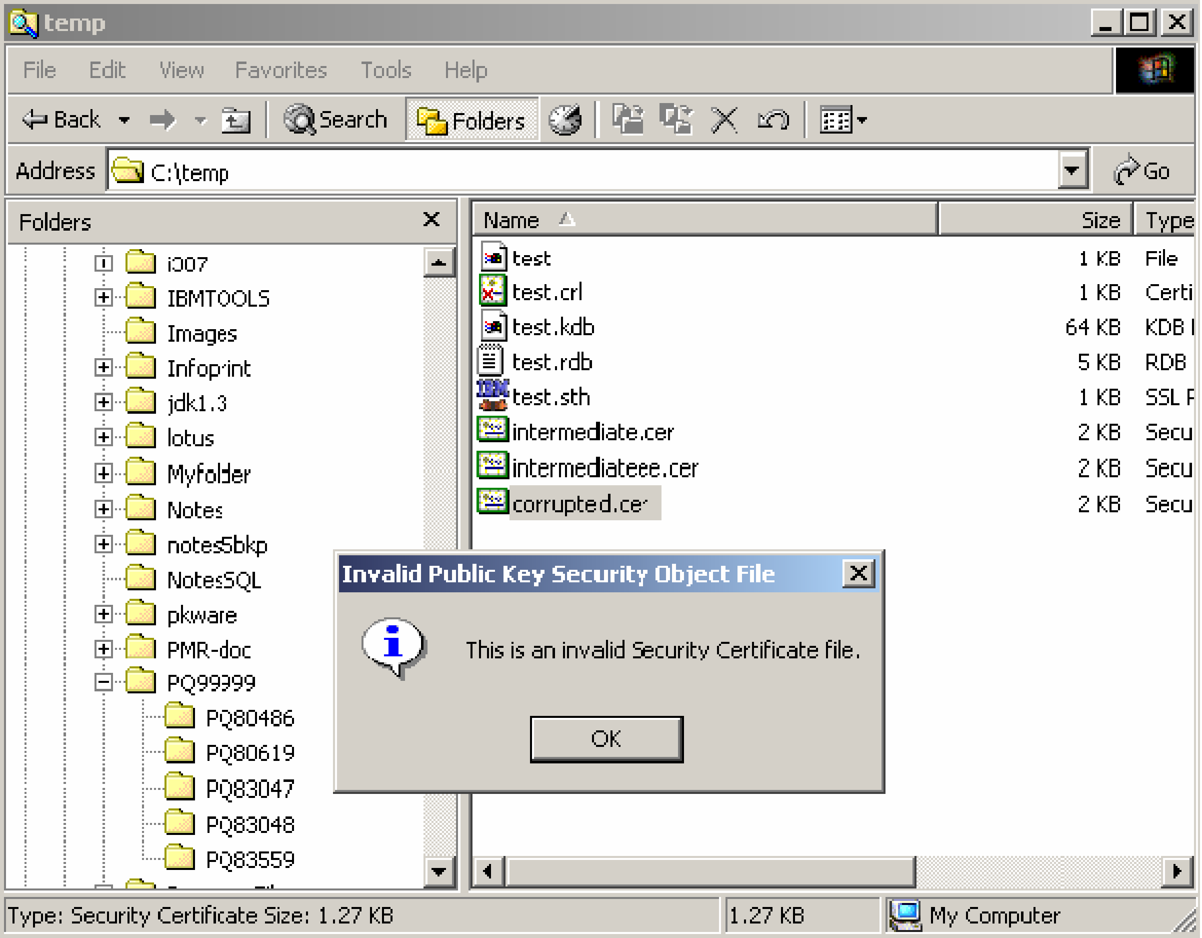
Issued by: Class 3 Public Primary Certification Authority

Valid from 4/16/1997 **to** 1/7/2004

Corrupted Certificate

- Error message from IKeyman
  “The internal database handle table is corrupted”
- Verifying the certificate
  - Rename the certificate as a .cer file
  - Double click cert.cer
- Solution
  - Request a new one

Corrupted Certificate



Address: C:\temp

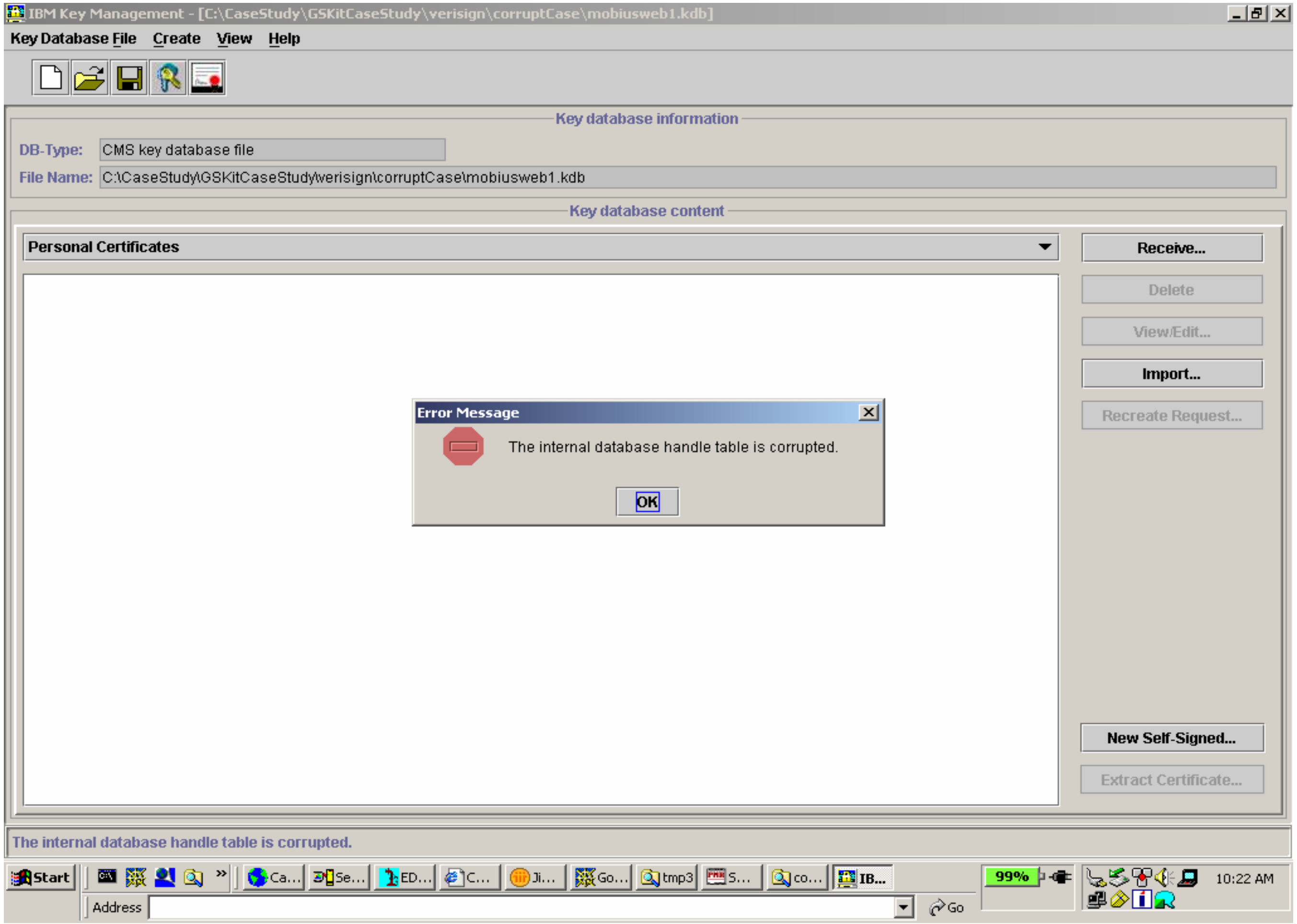
Name	Size	Type
test	1 KB	File
test.crl	1 KB	Certi
test.kdb	64 KB	KDB I
test.rdb	5 KB	RDB
test.sth	1 KB	SSL F
intermediate.cer	2 KB	Secu
intermediateee.cer	2 KB	Secu
corrupted.cer	2 KB	Secu

Invalid Public Key Security Object File

This is an invalid Security Certificate file.

Type: Security Certificate Size: 1.27 KB | 1.27 KB

Corrupted Certificate



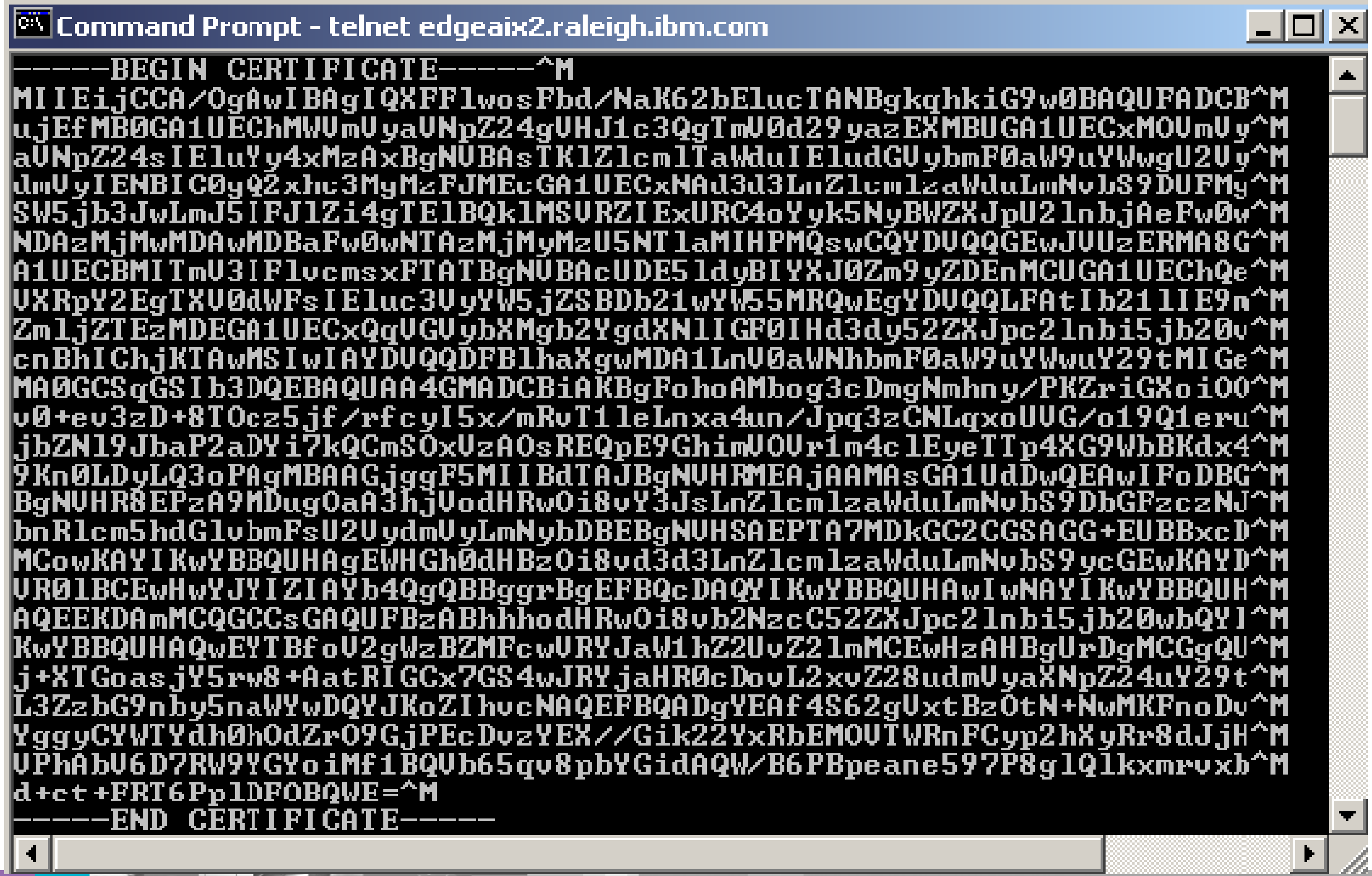
DB-Type: CMS key database file

File Name: C:\CaseStudy\GSKitCaseStudy\verisign\corruptCase\mobiusweb1.kdb

The internal database handle table is corrupted.

The internal database handle table is corrupted.

Corrupted Certificate



```
-----BEGIN CERTIFICATE-----^M
MIIEijCCA/OgAwIBAgIQXFFlwosFbd/NaK62bElucTANBgkqhkiG9w0BAQUFADCB^M
ujEfMB0GA1UEChMWVmVyaVNpZ24gVHJ1c3QgTmV0d29yazEXMBUGA1UECxMOVmVy^M
aVNpZ24sIEluYy4xMzAxBgNVBAsTKlZlcmlTaWduIEludGVybmF0aW9uYWwgU2Vy^M
dmVyIENBIC0yQ2xhc3MyMzFJMEcGA1UECxNAd3d3LnZlcmlzaWduLmNvbS9DUFMy^M
SW5jb3JwLmJ5IFJlZi4gTElBQklMSVRZIExURC4oYyk5NyBWZXJpU2lnbjAeFw0w^M
NDAzMjMwMDAwMDBaFw0wNTAzMjMyMzU5NTlaMIHPMQswCQYDVQQGEwJVUzERMA8G^M
A1UECBMITmV3IFlvcmsxFTATBgNVBAcUDE5ldyBIYXJ0Zm9yZDEnMCUGA1UEChQe^M
UXRpY2EgTXV0dWFsIEluc3VyYW5jZSBDb21wYW55MRQwEgYDVQQLFAtIb21lIE9n^M
ZmljZTEzMDEGA1UECxQqVGVybXMgb2YgdXNlIGF0IHd3dy52ZXJpc2lnbi5jb20v^M
cnBhIChjKTAwMSIwIAYDVQQDFBlhaXgwMDA1LnV0aWNhbmF0aW9uYWwuY29tMIGe^M
MA0GCSqGSIb3DQEBAQUAA4GMADCBiAKBgFohoAMbog3cDmgNmhny/PKZriGXoiO0^M
v0+ev3zD+8TOcz5jf/rfcyI5x/mRvT1leLnxa4un/Jpq3zCNLqxoUVG/o19Q1eru^M
jbZNl9JbaP2aDYi7kQCmSOxVzAOsREQpE9GhimVOVr1m4clEyeTTp4XG9WbBKdx4^M
9Kn0LDyLQ3oPAgMBAAGjggF5MIIBdTAJBgNVHRMEAjAAMAsGA1UdDwQEAwIFoDBG^M
BgNVHR8EPzA9MDugOaA3hjVodHRwOi8vY3JsLnZlcmlzaWduLmNvbS9DbGFzczNJ^M
bnRlcm5hdGlvbmFsU2VydmVyLmNybDBEBgNVHSAEPTA7MDkGC2CGSAGG+EUBBxcD^M
MCowKAYIKwYBBQUHAgEWHGh0dHBzOi8vd3d3LnZlcmlzaWduLmNvbS9ycGEwKAYD^M
VR01BCEwHwYJYIZIAYb4QgQBBggrBgEFBQcDAQYIKwYBBQUHAwIwNAYIKwYBBQUH^M
AQEEKDAmMCQGCCsGAQUFBzABhhhodHRwOi8vb2NzcC52ZXJpc2lnbi5jb20wbQY]^M
KwYBBQUHAQwEYTBfoV2gWzBZMFcwVRYJaW1hZ2UvZ2lmMCEwHzAHBgUrDgMCGgQU^M
j+XTGoasjY5rw8+AatRIGCx7GS4wJRYjaHR0cDovL2xvZ28udmVyaXNpZ24uY29t^M
L3ZzbG9nby5naWYwDQYJKoZIhvcNAQEFBQADgYEAf4S62gVxtBzOtN+NwMKFnoDv^M
YggyCYWTYdh0hOdZrO9GjPEcDvzYEX//Gik22YxRbEMOVTWRnFCyp2hXyRr8dJjH^M
VPhAbV6D7RW9YGYoiMf1BQVb65qv8pbYGidAQW/B6PBpeane597P8glQlkxmrvxb^M
d+ct+FRT6PplDFOBQWE=^M
-----END CERTIFICATE-----
```

No Request Key

- Error message
  "No Request Key was found for Certificate”
- Causes
  - The kdb file is not the original one
  - The request file is deleted
  - The cert is received into the kdb
- http://www.ibm.com/support/docview.wss?uid=swg21138209

Other IKeyman Error Messages

- “GSKKM_ERR_CRYPTOGRAPHIC_TOKEN_NOT_INITIALIZED”
  - http://www-1.ibm.com/support/docview.wss?uid=swg21053361
- Cannot load libikeyman.a
  - export LIBPATH=.:$LIBPATH
  - export PATH=/usr/java131/bin:$PATH
- "The Java Cryptographic Extension(JCE) files were not found. Please check that the JCE files have been installed in the correct directory.”
  - http://www-1.ibm.com/support/docview.wss?uid=swg21166332
- IBM HTTP Server: ikeyman crashes when receiving a personal certificate
  - http://www-1.ibm.com/support/docview.wss?uid=swg21115052
- Configuring SSL and Mustgather for SSL problems:
  - http://www-1.ibm.com/support/docview.wss?uid=swg21179559

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- Access key product show-me demos and tutorials by visiting IBM Education Assistant: www.ibm.com/software/info/education/assistant
- Learn about the Electronic Service Request (ESR) tool for submitting problems electronically: www.ibm.com/software/support/viewlet/probsub/ESR_Overview_viewlet_swf.html
- Sign up to receive weekly technical My support emails: www.ibm.com/software/support/einfo.html

Questions and Answers