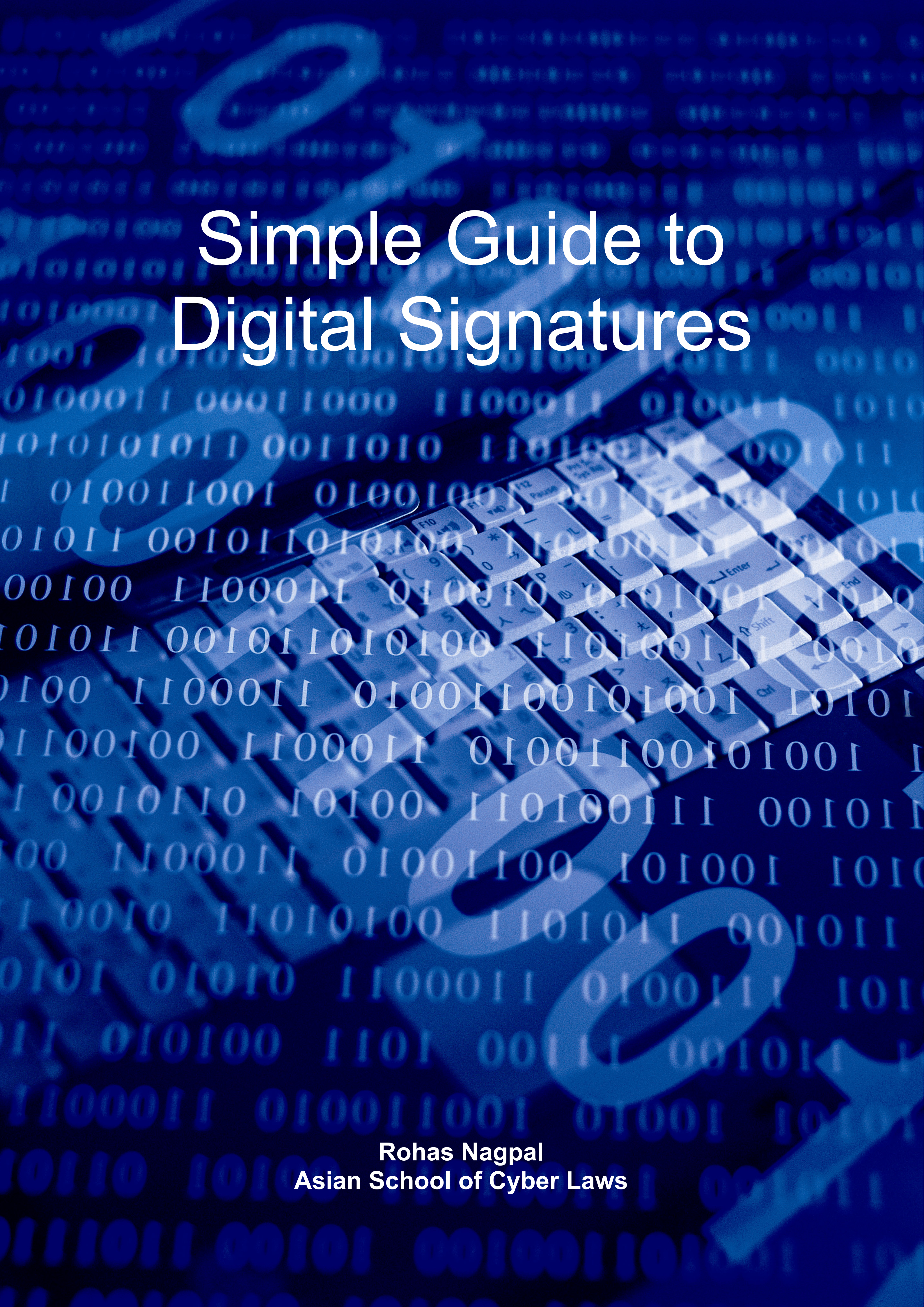


Simple Guide to Digital Signatures

Rohas Nagpal
Asian School of Cyber Laws

About the author

Rohas Nagpal is the founder President of Asian School of Cyber Laws.

He advises Governments and corporates around the world in cyber crime investigation and cyber law related issues. He has assisted the Government of India in drafting rules and regulations under the Information Technology Act, 2000.

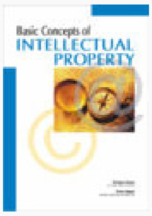
He has authored several books, papers and articles on cyber law, cyber terrorism, cyber crime investigation and financial law.

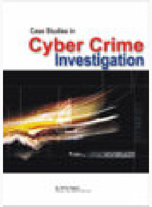
Rohas lives in Pune (India) and blogs @ rohasnagpal.com

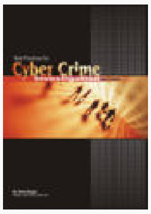
Some of the papers authored by Rohas Nagpal

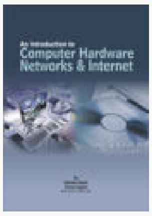
1. Internet Time Theft & the Indian Law
2. Legislative Approach to Digital Signatures
3. Indian Legal position on Cyber Terrorism
4. Defining Cyber Terrorism
5. The mathematics of terror
6. Cyber Terrorism in the context of Globalisation
7. Biometric based Digital Signature Scheme

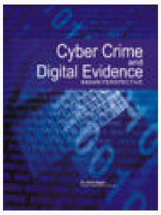
Some of the books authored by Rohas Nagpal

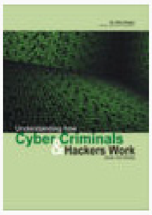


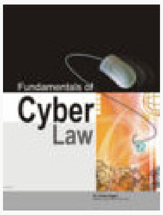


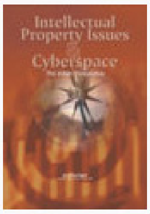


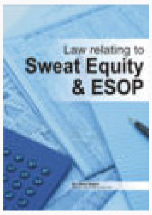












Digital Signatures

Let us take an overview of this concept using a simple illustration.

Illustration

Sanya uses her computer to generate a public and private key pair. Simply put, these keys are very large numbers.

She then stores her private key very securely on her computer. She uploads her public key to the website of a licensed certifying authority (CA). She also couriers a filled in application form and photocopies of her passport and Income Tax PAN card to the CA.

After following some verification procedures, the CA sends Sanya a hardware device by post. This device contains Sanya's digital signature certificate. The digital signature certificate contains Sanya's public key along with some information about her and the CA.

Sanya then has to accept her digital signature certificate.

All digital signature certificates are stored in the online repository maintained by the Controller of Certifying Authorities.

Each Certifying Authority stores digital signature certificates issued by it in an online repository.

In order to digitally sign an electronic record, Sanya uses her private key.

In order to verify the digital signature, any person can use Sanya's public key (which is contained in her digital signature certificate).

In case Sanya had originally generated her private key on a smart card or USB Crypto Token then the subsequent signatures created by her would be **secure digital signatures**.

Note: The smart card / crypto token have a chip built into it, which has crypto modules to enable the signing operation to happen in the device itself. The private key does not come out of the device in its original form.

In cases Sanya had generated and stored her private key on a hard disk, floppy, CD, pen drive etc then subsequent signatures are not secure digital signatures.

1. Obtaining a digital signature certificate

This chapter serves as a ready reference for the procedure of obtaining a digital signature certificate from a licenced Certifying Authority in India.

For the purposes of this chapter, the step by step procedure is outlined. The application for the certificate is made in the name of "Rohas Nagpal" to the Tata Consultancy Services Certifying Authority. A computer running Microsoft Windows XP operating system and Microsoft Internet Explorer 7 is used.

Where relevant, information obtained from the Tata Consultancy Services Certifying Authority website (www.tcs-ca.tcs.co.in) has been quoted.

The steps followed to obtain the digital signature certificate are as under:

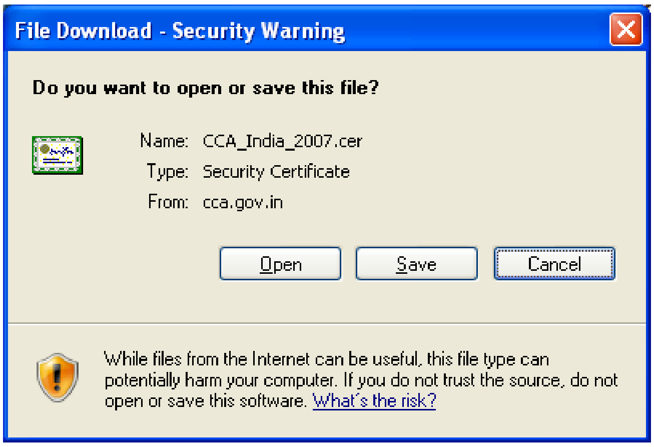
1. **Downloading root certificate**

   Visit the website of the Controller of Certifying Authorities (CCA) at www.cca.gov.in to obtain the digital signature certificate of the CCA. This certificate must be installed on our computer before we begin the process to obtain our personal digital signature certificate. The detailed procedure for the same is outlined below:

   i. Click on "**Download 2007 Root Certificate**" image.

Download
2007
Root Certificate

   ii. The following screen will open up. Click on "**Open**"

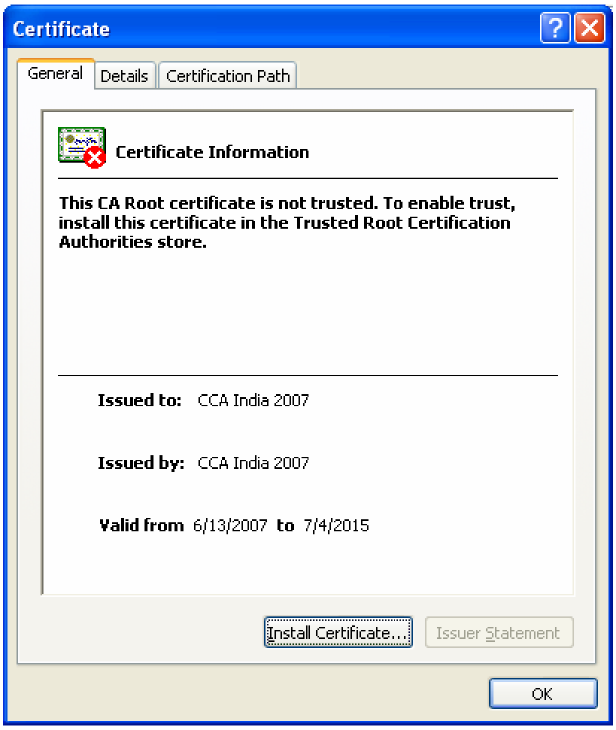


Do you want to open or save this file?

Name: CCA_India_2007.cer
Type: Security Certificate
From: cca.gov.in

While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not open or save this software. What's the risk?

iii. The following digital signature certificate will open up on your screen:



Certificate Information

This CA Root certificate is not trusted. To enable trust, install this certificate in the Trusted Root Certification Authorities store.

Issued to: CCA India 2007

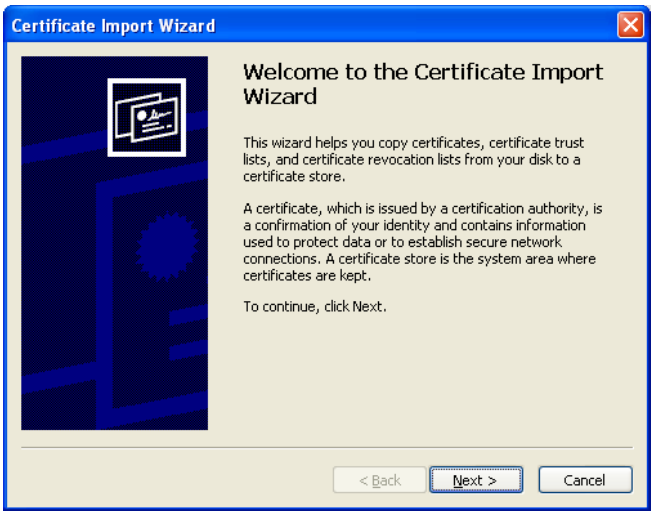
Issued by: CCA India 2007

Valid from 6/13/2007 to 7/4/2015

iv. The certificate displays the message that:

> "This CA Root certificate is not trusted. To enable trust, install this certificate in the Trusted Root Certification Authorities store".

The reason for this is that this certificate is not installed in the Microsoft Internet Explorer browser by default. We will manually need to do so. Click on "**Install Certificate**". The following screen opens up:



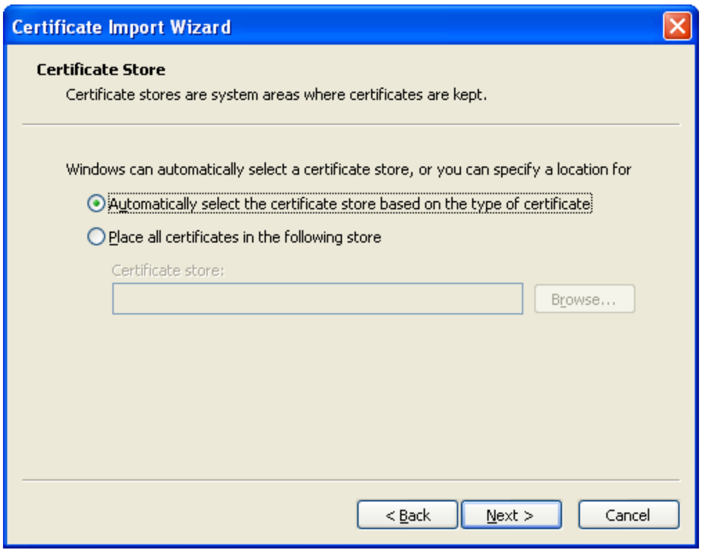
Welcome to the Certificate Import Wizard

This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

To continue, click Next.

v. Click on “**Next**”. The following screen will open up. Again click on “**Next**”.



Certificate Import Wizard

Certificate Store

Certificate stores are system areas where certificates are kept.

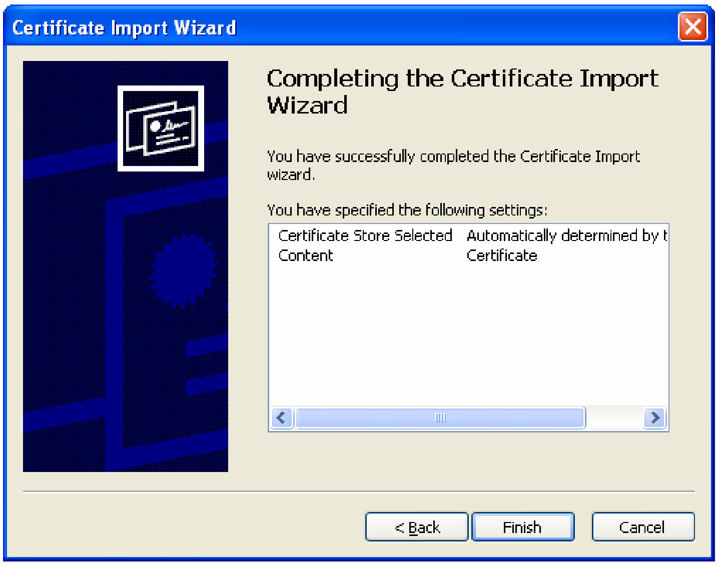
Windows can automatically select a certificate store, or you can specify a location for

● Automatically select the certificate store based on the type of certificate

○ Place all certificates in the following store

Certificate store:

vi. The following screen will open up. Click on “**Finish**”.



Certificate Import Wizard

Completing the Certificate Import Wizard

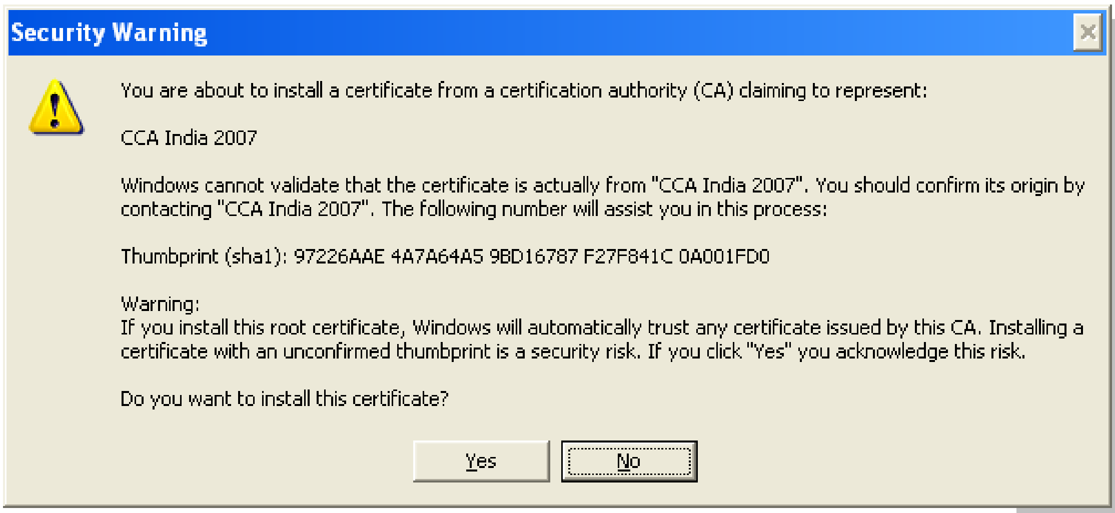
You have successfully completed the Certificate Import wizard.

You have specified the following settings:

Certificate Store Selected	Automatically determined by t
Content	Certificate

vii. This is the final stage for installing the CCA certificate on our computer. It must be clearly understood that once this root certificate is installed in our browser, it becomes a trusted **root** certificate. All Certifying Authorities who are issued certificates by the CCA will automatically be trusted by our computer.

viii. The following screen will open up. Click on “**Yes**”.



You are about to install a certificate from a certification authority (CA) claiming to represent:

CCA India 2007

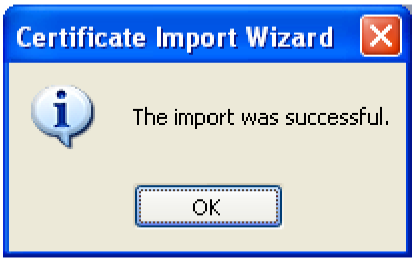
Windows cannot validate that the certificate is actually from "CCA India 2007". You should confirm its origin by contacting "CCA India 2007". The following number will assist you in this process:

Thumbprint (sha1): 97226AAE 4A7A64A5 9BD16787 F27F841C 0A001FD0

Warning:
If you install this root certificate, Windows will automatically trust any certificate issued by this CA. Installing a certificate with an unconfirmed thumbprint is a security risk. If you click "Yes" you acknowledge this risk.

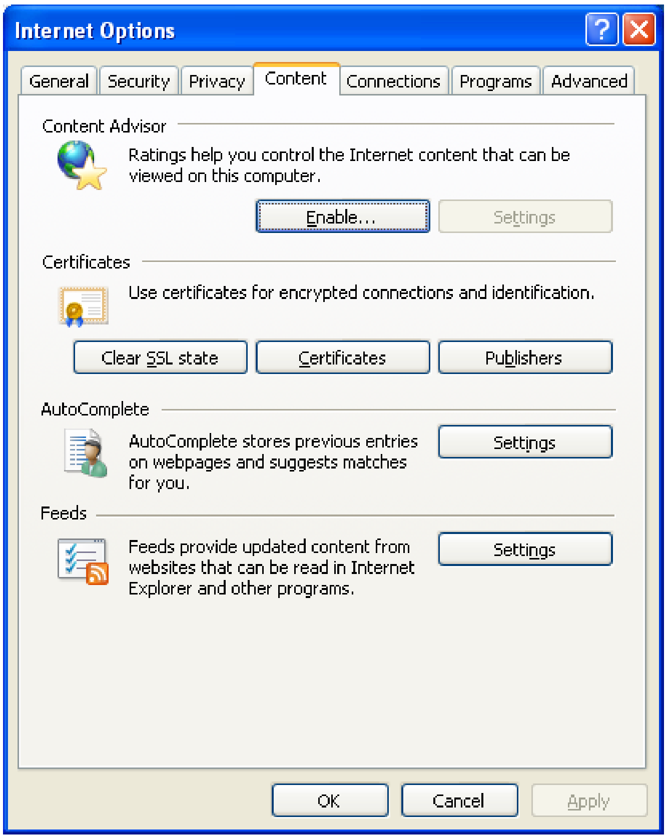
Do you want to install this certificate?

ix. The screen below will open up. Click "**OK**".



The import was successful.

x. To view the installed CCA certificate, open up a window of Microsoft Internet Explorer and then click on **Tools→Internet Options→Content**



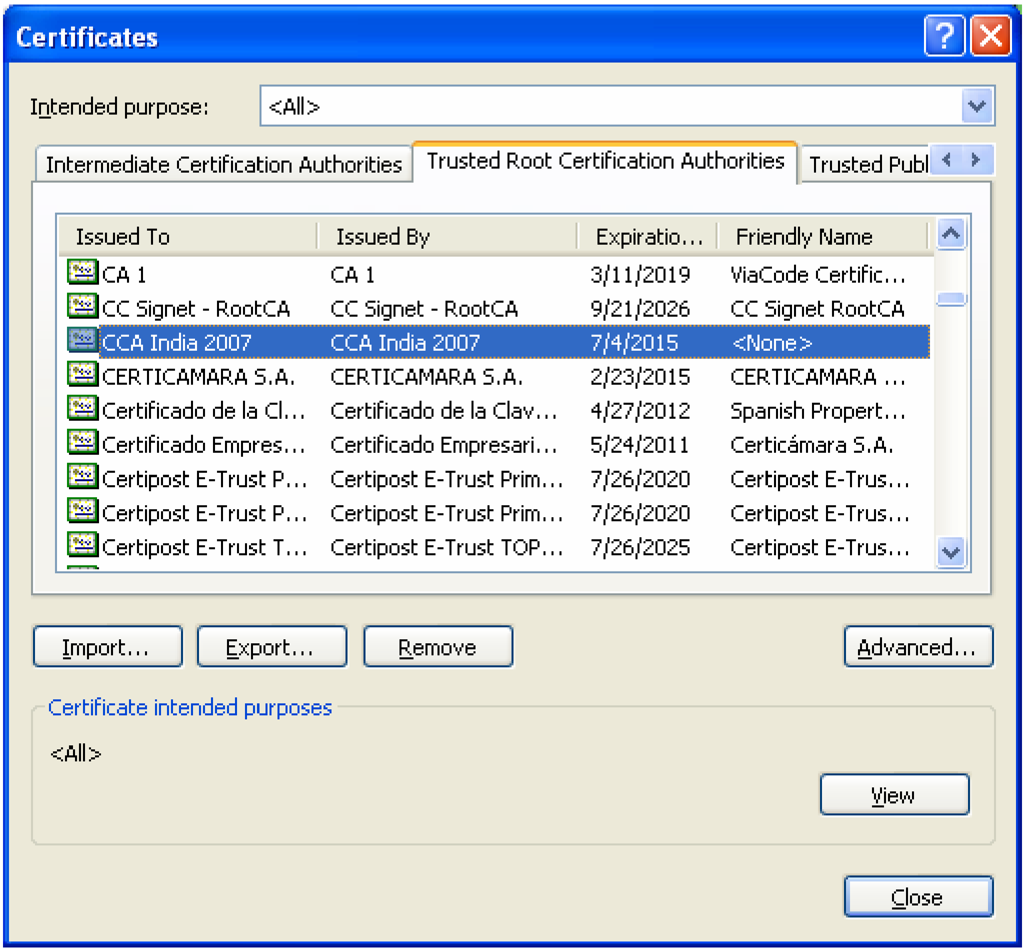
Ratings help you control the Internet content that can be viewed on this computer.

Use certificates for encrypted connections and identification.

AutoComplete stores previous entries on webpages and suggests matches for you.

Feeds provide updated content from websites that can be read in Internet Explorer and other programs.

xi. When the above window opens up, click on "**Certificates**" and then click on the "Trusted Root Certification Authorities" tab. The following screen will open up. Click on "**CCA India 2007**" and then click on "**View**".



Certificates

Intended purpose: <All>

Issued To	Issued By	Expiratio...	Friendly Name
CA 1	CA 1	3/11/2019	VíaCode Certific...
CC Signet - RootCA	CC Signet - RootCA	9/21/2026	CC Signet RootCA
CCA India 2007	CCA India 2007	7/4/2015	<None>
CERTICAMARA S.A.	CERTICAMARA S.A.	2/23/2015	CERTICAMARA ...
Certificado de la Cl...	Certificado de la Clav...	4/27/2012	Spanish Propert...
Certificado Empres...	Certificado Empresari...	5/24/2011	Certicámara S.A.
Certipost E-Trust P...	Certipost E-Trust Prim...	7/26/2020	Certipost E-Trus...
Certipost E-Trust P...	Certipost E-Trust Prim...	7/26/2020	Certipost E-Trus...
Certipost E-Trust T...	Certipost E-Trust TOP...	7/26/2025	Certipost E-Trus...

Certificate intended purposes

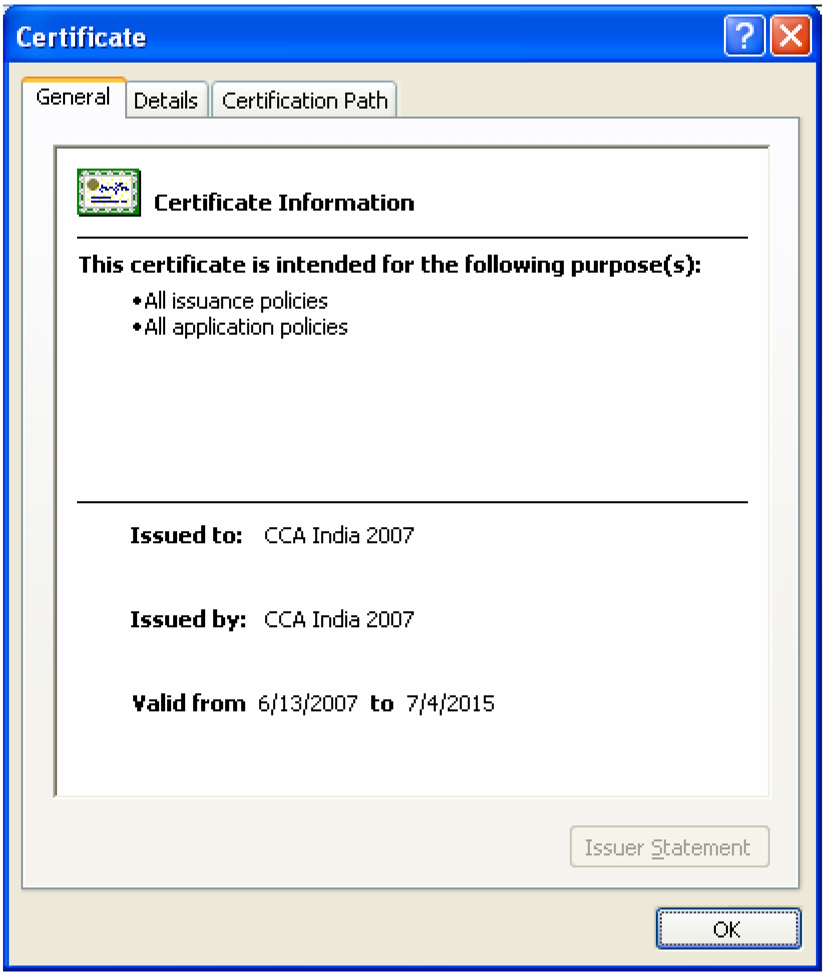
<All>

Intermediate Certification Authorities
Trusted Root Certification Authorities
Trusted Publ
Import...
Export...
Remove
Advanced...
View
Close

xii. The certificate illustrated in the next page will now open up on your screen. Notice that when we had first seen this certificate while downloading it from the www.cca.gov.in website, it displayed the following notice:

> "This CA Root certificate is not trusted. To enable trust, install this certificate in the Trusted Root Certification Authorities store".

Now it does not display that notice. This is because we have installed it in the "Trusted Root Certification Authorities store" of our computer and thereby we have indicated to our computer that we trust this certificate.



Certificate Information

This certificate is intended for the following purpose(s):

- All issuance policies
- All application policies

Issued to: CCA India 2007

Issued by: CCA India 2007

Valid from 6/13/2007 to 7/4/2015

2. **Selecting a Certifying Authority**

   Visit the website of the Controller of Certifying Authorities at www.cca.gov.in to obtain a list of licenced Certifying Authorities in India. This website also provides the disclosure records of the various licenced Certifying Authorities. The links to the websites of these Certifying Authorities is also provided.

   Based on this information and the study of the relevant websites, you can select a Certifying Authority. For this illustration we have selected the Tata Consultancy Services Certifying Authority (CA) which has the official website www.tcs-ca.tcs.co.in

3. **Visit the website of the Certifying Authority**

   A visit to the www.tcs-ca.tcs.co.in website shows that the CA provides three types of digital signature certificates. The following information is provided in respect of these certificates:

   Class-1 Certificates

   Class-1 Certificates are personal email Certificates that allow you to secure your email messages. These Certificates can be used to:

Digitally sign email - You can digitally sign your email messages using TCS-CA Personal Digital Certificate so that the recipient is assured that the email has come from you.

Encrypt email - You can encrypt emails using TCS-CA Personal Digital Certificate to prevent unauthorized people from reading it.

Authenticate to Web Servers - You can authenticate yourself to a Web Server to engage in secure communication with Web Server using TCS-CA Personal Digital Certificate. This protects all information such as credit card details that you send to the Web Server.

Class-1 Certificates however, do not facilitate strong authentication of the identity of the Subscriber; hence are not intended for, and shall not be relied upon, for commercial use where proof of identity is required.

Class-2 Certificates

Class-2 Certificates are issued as Managed Digital Certificates to employees/ partners/ affiliates/ customers of business and government organizations that are ready to assume the responsibility of verifying the accuracy of the information submitted by their employees/ partners/ affiliates/ customers.

Class-2 Certificates are issued following a top down approach. The entire organization is treated as a Sub-CA/RA. The organization is given a Digital Certificate signed by TCS-CA to initiate the process of issuing Certificates to its employees/ partners/ affiliates/ customers. The Sub-CA/RA in turn requests the issue of Digital Certificates for employees/ partners/ affiliates/ customers of the organization from TCS-CA. In the case of a Class-2 Certificate, the verification of details supplied with the request for a Digital Certificate is done by the organization appointed as a Sub-CA/RA under the TCS-CA Trust Network.

Class-2 Certificates issued under the TCS-CA Trust Network are legally valid under the Indian IT Act 2000.

Class-3 Certificates

Class-3 Certificates are issued to individuals, companies and government organizations. They can be used both for personal and commercial purposes. They are typically used for electronic commerce applications such as electronic banking, electronic data interchange (EDI), and membership-based on-line services, where security is a major concern.

The level of trust created by the Digital Certificate is based on the authentication procedures used by the CA to verify your identity and the service guarantees offered by the CA to back up that authentication.

TCS-CA uses various procedures to obtain evidence of your identity before issuing you the Class-3 Certificate. During verification, you will also need to be physically present before a Registration Authority (RA), qualified by TCS-CA due to their neutrality and reliability. These validation procedures provide stronger assurances of an applicant's identity.

Class-3 Certificates issued by the TCS-CA are legally valid under the Indian IT Act 2000.

4. Select the type of certificate needed

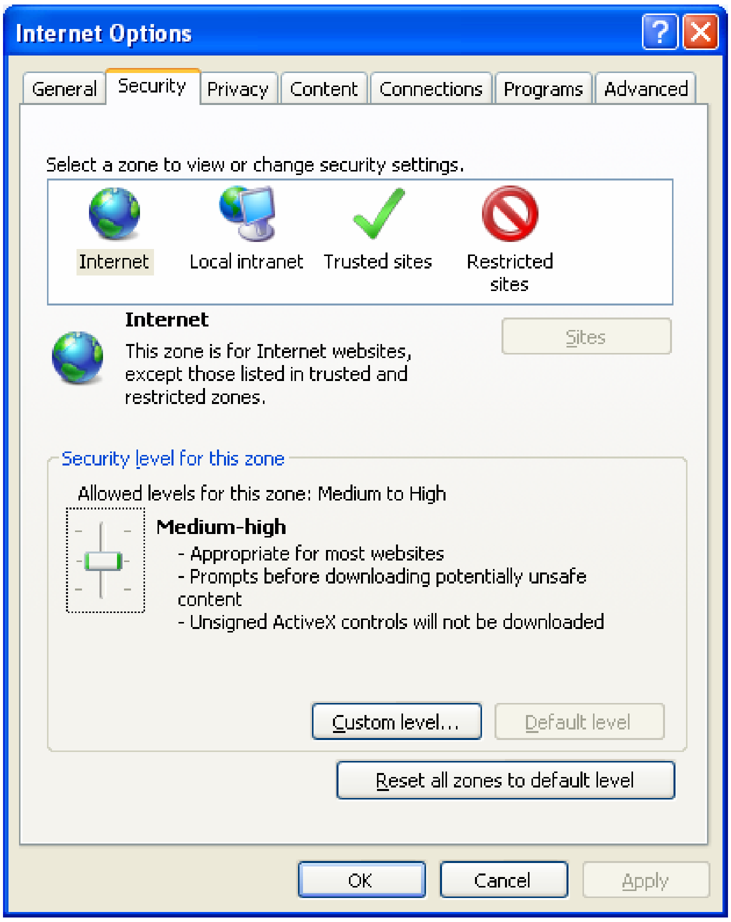
We need a legally valid digital signature certificate for an individual. The relevant certificate is a **Class 3 certificate**.

5. Submit an online request

The next steps are to create a user account on the TCS CA website, complete an online enrollment form and generate a cryptographic key pair on our computer. The following issues have to borne in mind:

i. **Computer Requirements**
A computer running Microsoft Windows NT, 2000 or XP operating system is needed. Additionally the computer must have Internet Explorer 5.5 or higher.

ii. **Browser Settings**
Active-X controls need to be enabled in the Internet browser. To do this go to Tools >> Internet Options >> Security and click 'Default Settings' and set to 'Medium'



Select a zone to view or change security settings.

Internet
This zone is for Internet websites, except those listed in trusted and restricted zones.

Security level for this zone

Allowed levels for this zone: Medium to High

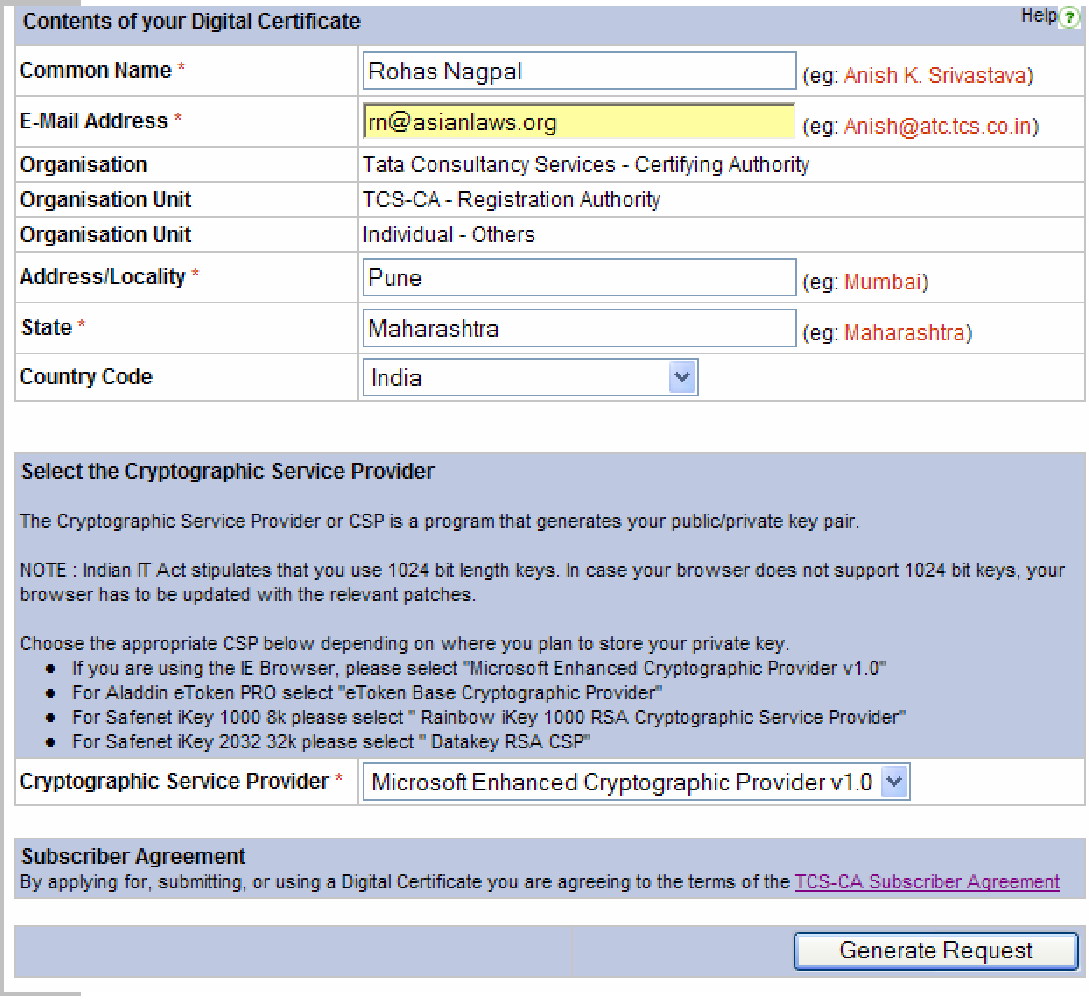
Medium-high
- Appropriate for most websites
- Prompts before downloading potentially unsafe content
- Unsigned ActiveX controls will not be downloaded

iii. Enrollment Instructions

Cryptographic keys are generated and stored on our computer when we enroll for a digital certificate. Ownership of these keys forms the basis of our digital identity for digital signatures and encryption applications.

During enrollment we specify that we are enrolling for a **Signing Certificate (single key pair)**.

We also select "**Microsoft Enhanced Cryptographic Provider v1.0**" as the "Cryptographic Service Provider".



Contents of your Digital Certificate

Common Name *	Rohas Nagpal	(eg: Anish K. Srivastava)
E-Mail Address *	rn@asianlaws.org	(eg: Anish@atc.tcs.co.in)
Organisation	Tata Consultancy Services - Certifying Authority	
Organisation Unit	TCS-CA - Registration Authority	
Organisation Unit	Individual - Others	
Address/Locality *	Pune	(eg: Mumbai)
State *	Maharashtra	(eg: Maharashtra)
Country Code	India	

Select the Cryptographic Service Provider

The Cryptographic Service Provider or CSP is a program that generates your public/private key pair.

NOTE : Indian IT Act stipulates that you use 1024 bit length keys. In case your browser does not support 1024 bit keys, your browser has to be updated with the relevant patches.

Choose the appropriate CSP below depending on where you plan to store your private key.

- If you are using the IE Browser, please select "Microsoft Enhanced Cryptographic Provider v1.0"
- For Aladdin eToken PRO select "eToken Base Cryptographic Provider"
- For Safenet iKey 1000 8k please select " Rainbow iKey 1000 RSA Cryptographic Service Provider"
- For Safenet iKey 2032 32k please select " Datakey RSA CSP"

Cryptographic Service Provider * : Microsoft Enhanced Cryptographic Provider v1.0

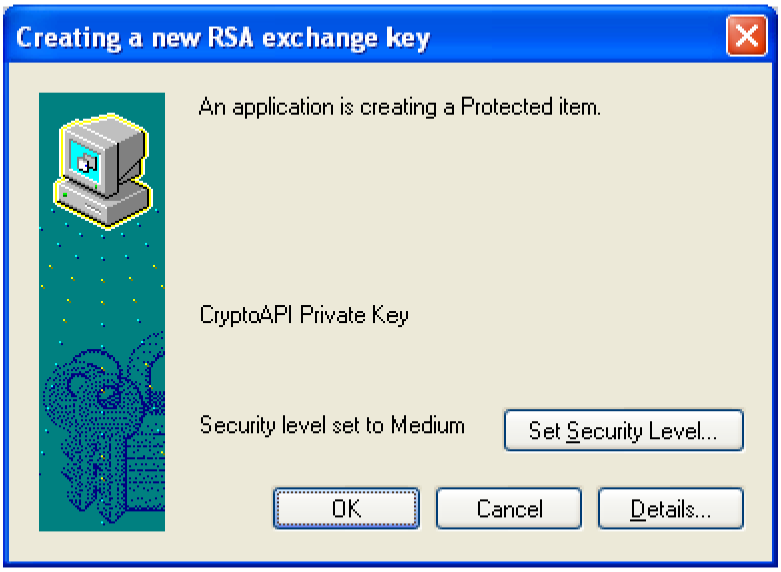
Subscriber Agreement

By applying for, submitting, or using a Digital Certificate you are agreeing to the terms of the TCS-CA Subscriber Agreement

After filling in the details, we click on "**Generate Request**".

We then confirm our details at the next screen and click on "**OK**". We are then asked whether we want to request a digital signature certificate. Click on "**Yes**".

The following screen will open up. Click on "**OK**".



Creating a new RSA exchange key

An application is creating a Protected item.

CryptoAPI Private Key

Security level set to Medium

The next screen will display the request number. Take a printout of this page and then click on "**Go to Step 2**".

The next screen informs us that paper copies of the following need to be submitted to TCS CA:

1. filled Certificate Request Form and
2. supporting Validation documents.

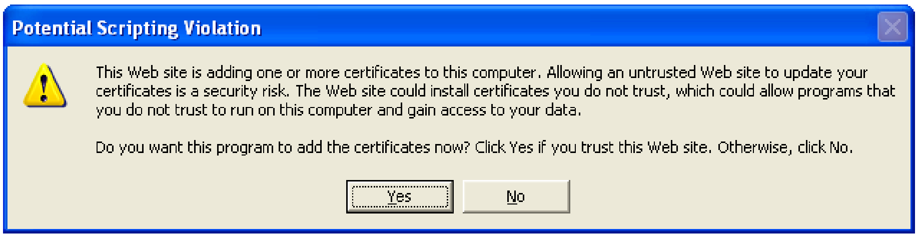
The Certificate Request Form can be downloaded from this page in Word Format as well as PDF Format.

An email is also received from TCS CA regarding the application made by us.

Until the certificate is generated and downloaded by us successfully, we must:

1. not format the computer
2. not re-install or upgrade the Internet Explorer

A few days later we receive an email from TCS CA informing us that the digital signature certificate is ready for download. Using the Authentication PIN provided in the email, the digital signature certificate can be downloaded after logging into the TCS CA website. While downloading the certificate, the following screen may pop up. Click on "Yes".

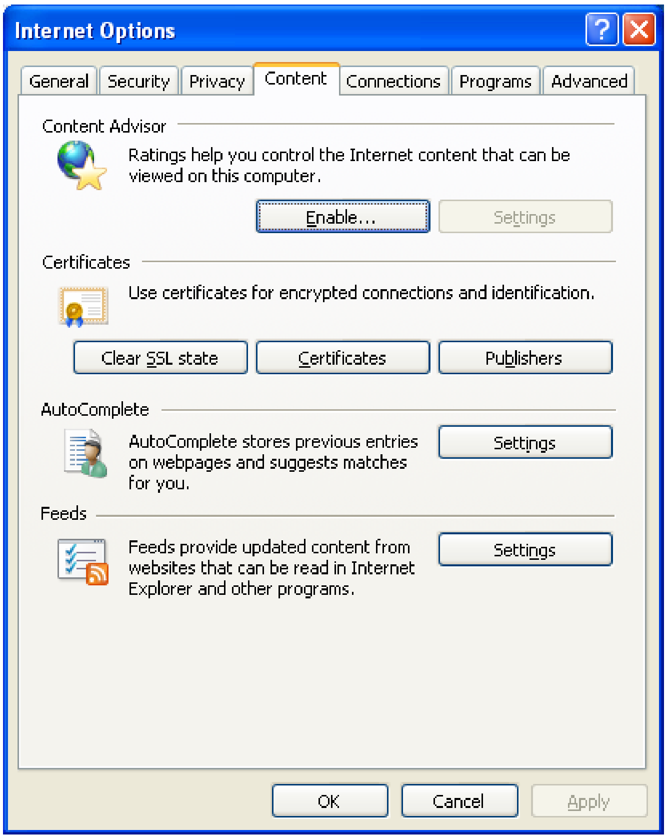


Potential Scripting Violation

This Web site is adding one or more certificates to this computer. Allowing an untrusted Web site to update your certificates is a security risk. The Web site could install certificates you do not trust, which could allow programs that you do not trust to run on this computer and gain access to your data.

Do you want this program to add the certificates now? Click Yes if you trust this Web site. Otherwise, click No.

To view your digital signature certificate, open up a window of Microsoft Internet Explorer and then click on **Tools→Internet Options→Content**



Content Advisor

Ratings help you control the Internet content that can be viewed on this computer.

Certificates

Use certificates for encrypted connections and identification.

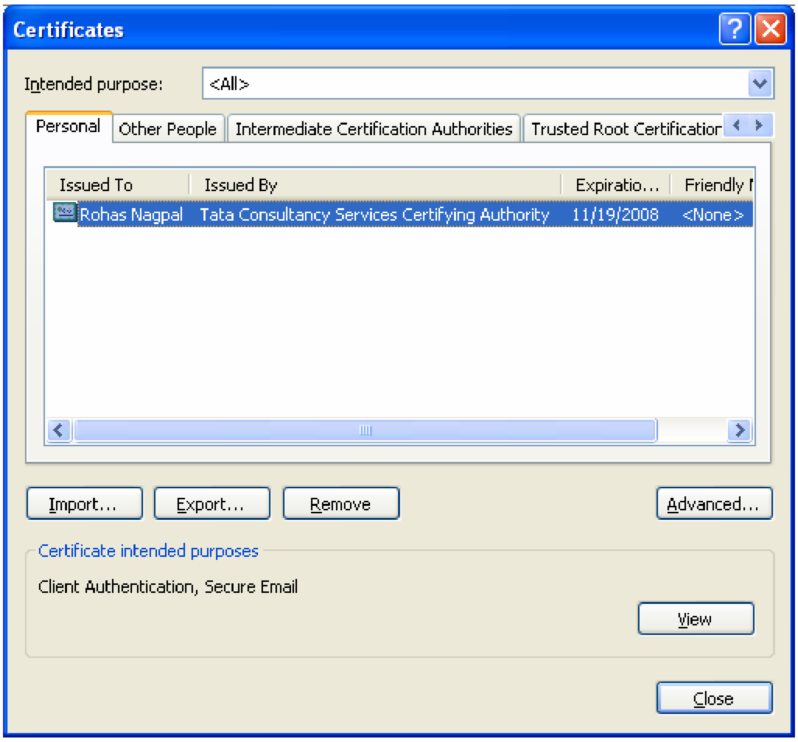
AutoComplete

AutoComplete stores previous entries on webpages and suggests matches for you.

Feeds

Feeds provide updated content from websites that can be read in Internet Explorer and other programs.

Now click on "**Certificates**".



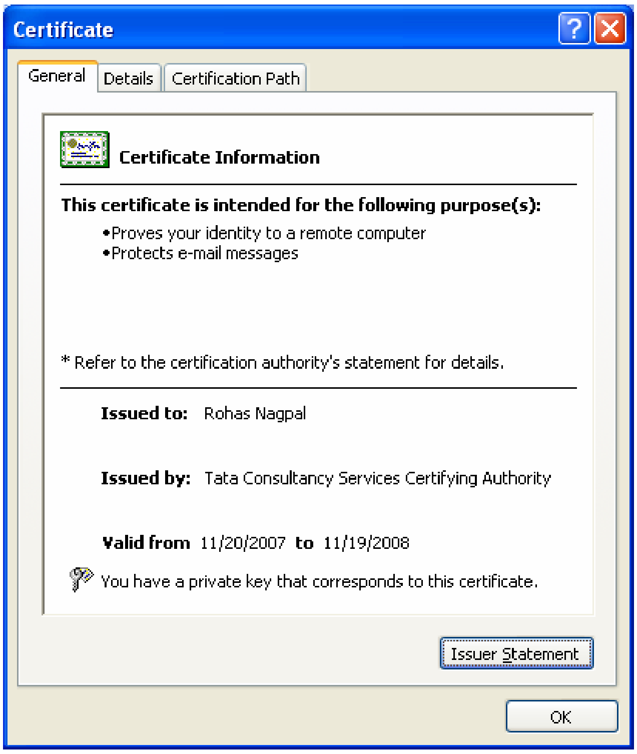
Intended purpose: <All>

Issued To	Issued By	Expiratio...	Friendly I
Rohas Nagpal	Tata Consultancy Services Certifying Authority	11/19/2008	<None>

Certificate intended purposes

Client Authentication, Secure Email

Click on "**View**".



Certificate

Certificate Information

This certificate is intended for the following purpose(s):

- Proves your identity to a remote computer
- Protects e-mail messages

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

Issued to: Rohas Nagpal

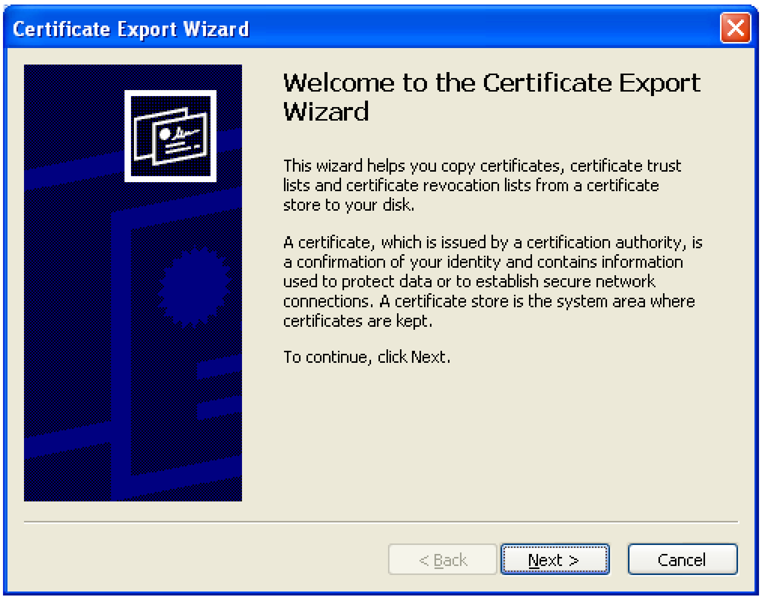
Issued by: Tata Consultancy Services Certifying Authority

Valid from 11/20/2007 to 11/19/2008

You have a private key that corresponds to this certificate.

It is advisable to backup a copy of your digital signature certificate along with the private key to a secure location.

To do this, click on "**Export**" in the screen before this.



Certificate Export Wizard

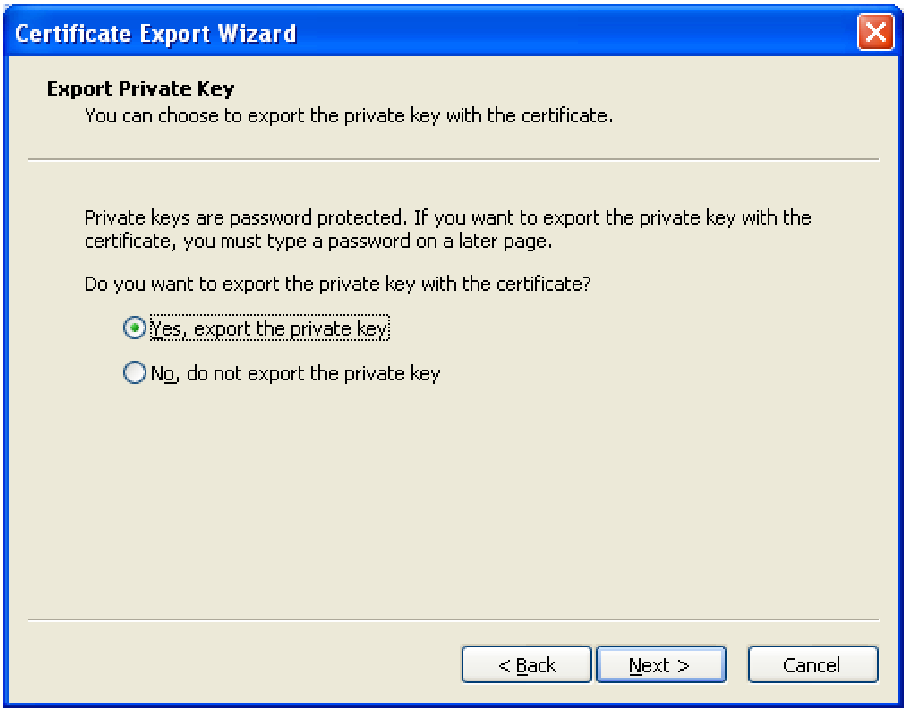
Welcome to the Certificate Export Wizard

This wizard helps you copy certificates, certificate trust lists and certificate revocation lists from a certificate store to your disk.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

To continue, click Next.

Click on "**Next**".



Certificate Export Wizard

Export Private Key

You can choose to export the private key with the certificate.

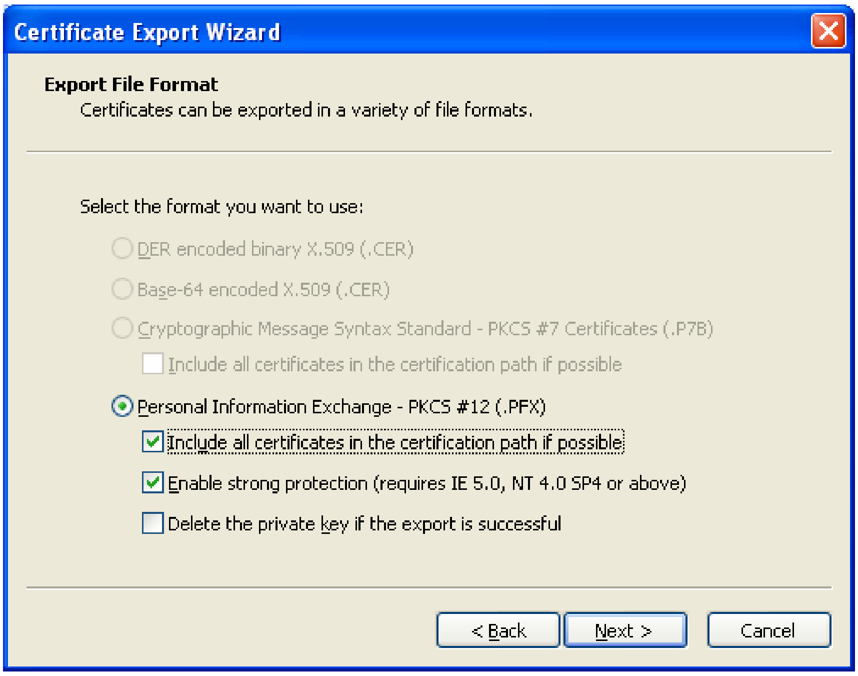
Private keys are password protected. If you want to export the private key with the certificate, you must type a password on a later page.

Do you want to export the private key with the certificate?

● Yes, export the private key

○ No, do not export the private key

Select the "**Yes, export the private key**" option and then click on "**Next**".



Certificate Export Wizard

Export File Format

Certificates can be exported in a variety of file formats.

Select the format you want to use:

○ DER encoded binary X.509 (.CER)

○ Base-64 encoded X.509 (.CER)

○ Cryptographic Message Syntax Standard - PKCS #7 Certificates (.P7B)

□ Include all certificates in the certification path if possible

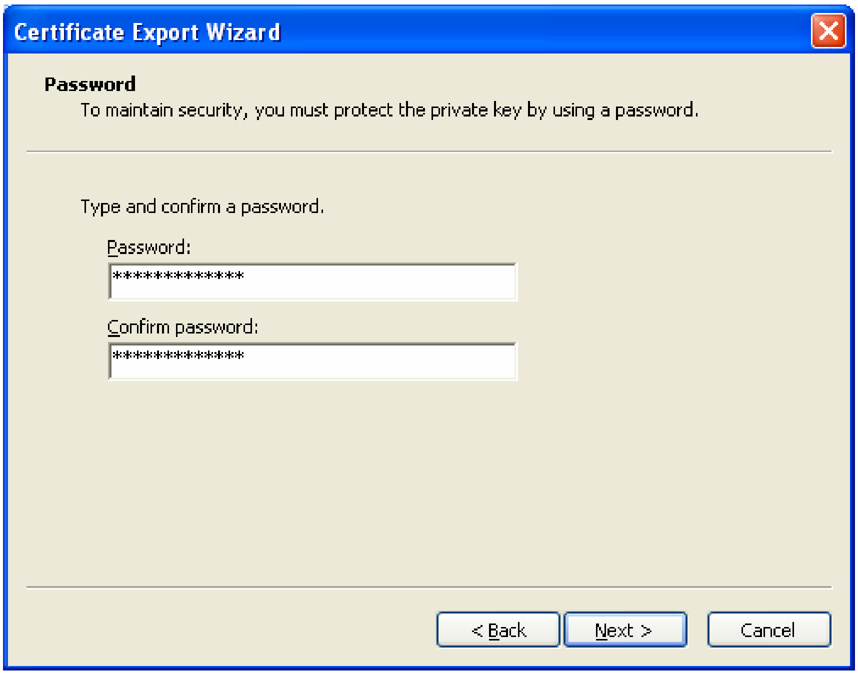
● Personal Information Exchange - PKCS #12 (.PFX)

☑ Include all certificates in the certification path if possible

☑ Enable strong protection (requires IE 5.0, NT 4.0 SP4 or above)

□ Delete the private key if the export is successful

Select the options marked above and click on "**Next**".



Certificate Export Wizard

Password

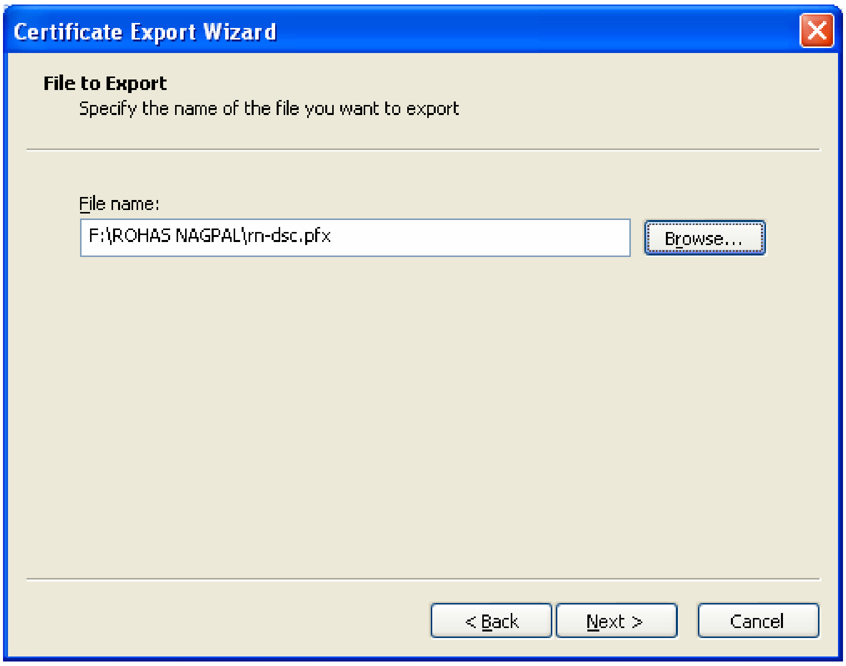
To maintain security, you must protect the private key by using a password.

Type and confirm a password.

Password: `*************`

Confirm password: `*************`

You will now need to enter a password. Ensure that you enter a complex password that is not known to anyone else. Then click on "**Next**".



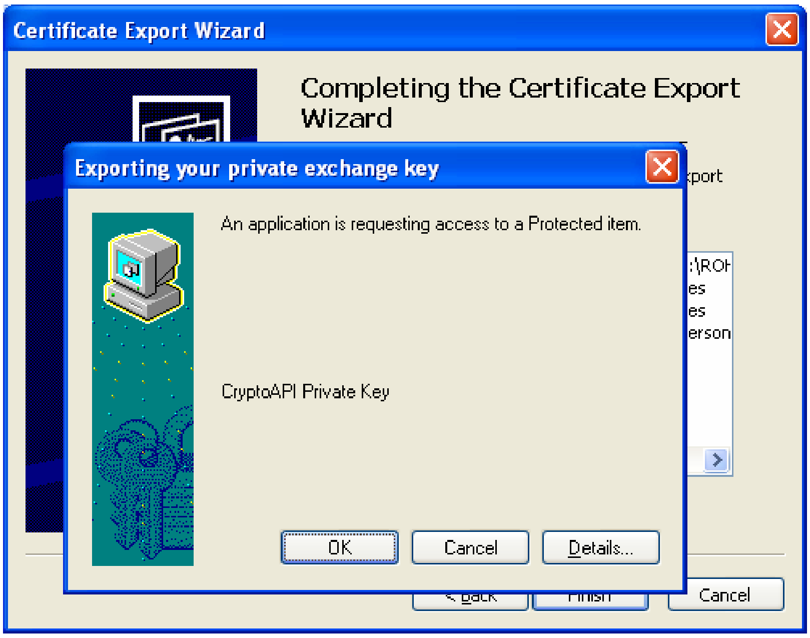
Certificate Export Wizard

File to Export

Specify the name of the file you want to export

File name: F:\ROHAS NAGPAL\rn-dsc.pfx

After selecting a suitable location to save the digital signature certificate, click on "**Next**".



Certificate Export Wizard

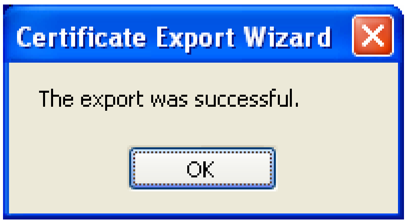
Completing the Certificate Export Wizard

Exporting your private exchange key

An application is requesting access to a Protected item.

CryptoAPI Private Key

Click on “**OK**” to complete the backup process. The following screen will then open up.



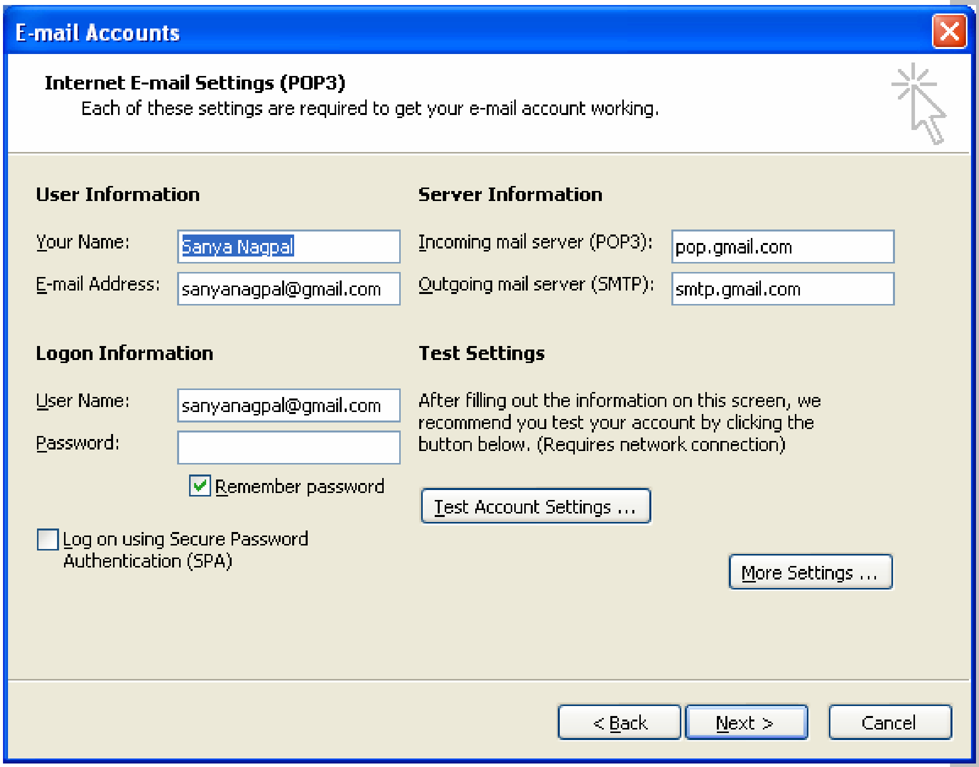
Certificate Export Wizard

The export was successful.

2. Digitally signing emails

This chapter serves as a step by step guide for digitally signing emails using Microsoft Outlook (version 2003 is used in this chapter). The basic steps are as under:

1. Configure your email account using Microsoft Outlook. The exact information to be entered (such as server details etc) would depend upon the email service used by you. The image below illustrates the basic configuration for a gmail account.



E-mail Accounts

Internet E-mail Settings (POP3)
Each of these settings are required to get your e-mail account working.

User Information

Your Name: Sanya Nagpal
E-mail Address: sanyanagpal@gmail.com

Server Information

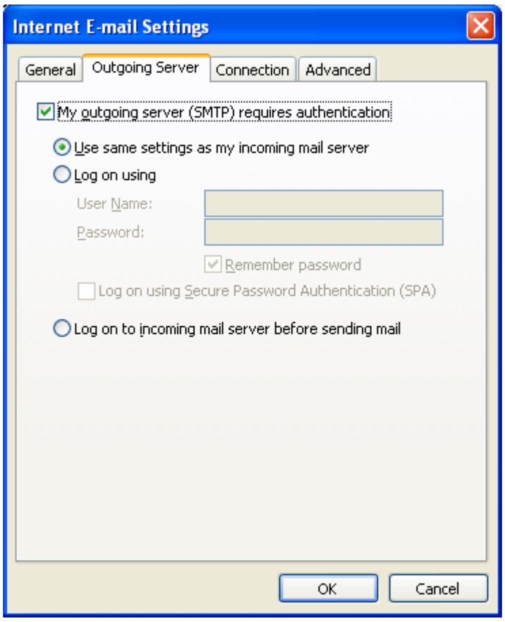
Incoming mail server (POP3): pop.gmail.com
Outgoing mail server (SMTP): smtp.gmail.com

Logon Information

User Name: sanyanagpal@gmail.com
Password:
☑ Remember password
□ Log on using Secure Password Authentication (SPA)

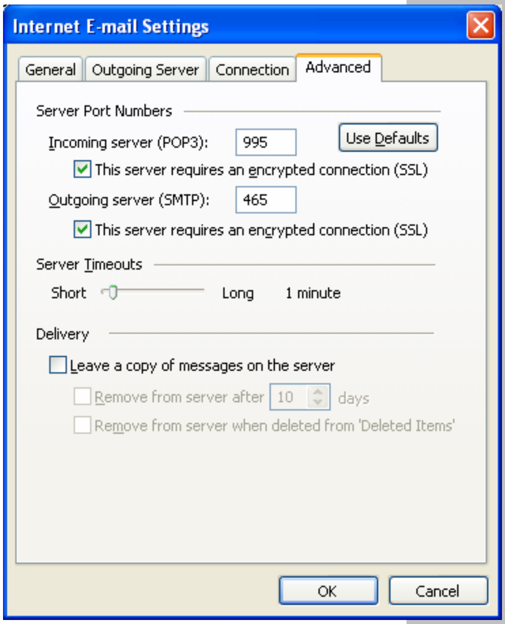
Test Settings

After filling out the information on this screen, we recommend you test your account by clicking the button below. (Requires network connection)



Internet E-mail Settings

☑ My outgoing server (SMTP) requires authentication
● Use same settings as my incoming mail server
○ Log on using
User Name:
Password:
☑ Remember password
□ Log on using Secure Password Authentication (SPA)
○ Log on to incoming mail server before sending mail



Internet E-mail Settings

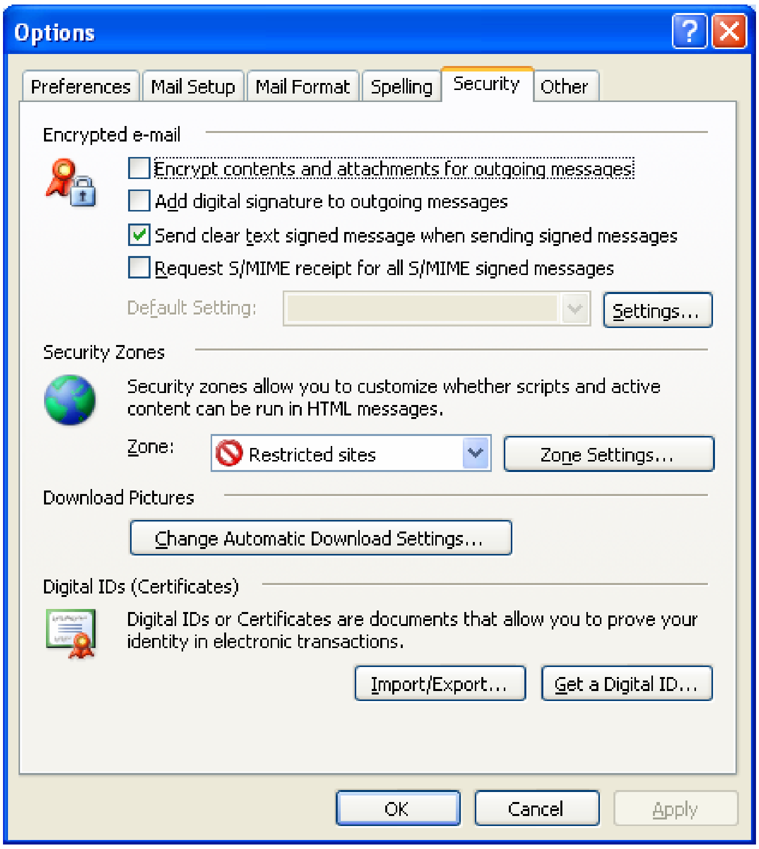
Server Port Numbers
Incoming server (POP3): 995
☑ This server requires an encrypted connection (SSL)
Outgoing server (SMTP): 465
☑ This server requires an encrypted connection (SSL)

Server Timeouts
Short Long 1 minute

Delivery
□ Leave a copy of messages on the server
□ Remove from server after 10 days
□ Remove from server when deleted from 'Deleted Items'

2. Go to the **Tools → Options → Security** option of Microsoft Outlook.

The following screen opens up.



Options

Encrypted e-mail

□ Encrypt contents and attachments for outgoing messages

□ Add digital signature to outgoing messages

☑ Send clear text signed message when sending signed messages

□ Request S/MIME receipt for all S/MIME signed messages

Default Setting:

Security Zones

Security zones allow you to customize whether scripts and active content can be run in HTML messages.

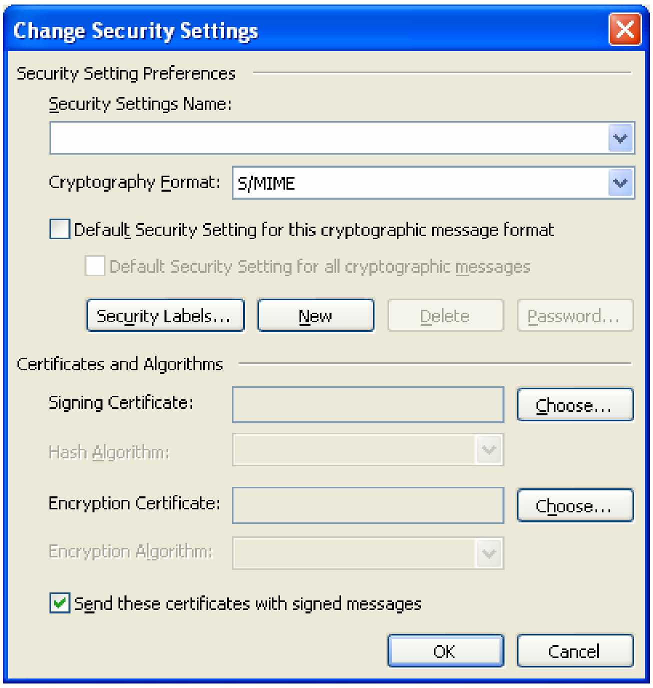
Zone: Restricted sites

Download Pictures

Digital IDs (Certificates)

Digital IDs or Certificates are documents that allow you to prove your identity in electronic transactions.

Check the "**Add Digital Signatures to outgoing messages**" option. Then click on "**Settings**". The following screen will open up.



Change Security Settings

Security Setting Preferences

Security Settings Name:

Cryptography Format: S/MIME

□ Default Security Setting for this cryptographic message format

□ Default Security Setting for all cryptographic messages

Certificates and Algorithms

Signing Certificate:

Hash Algorithm:

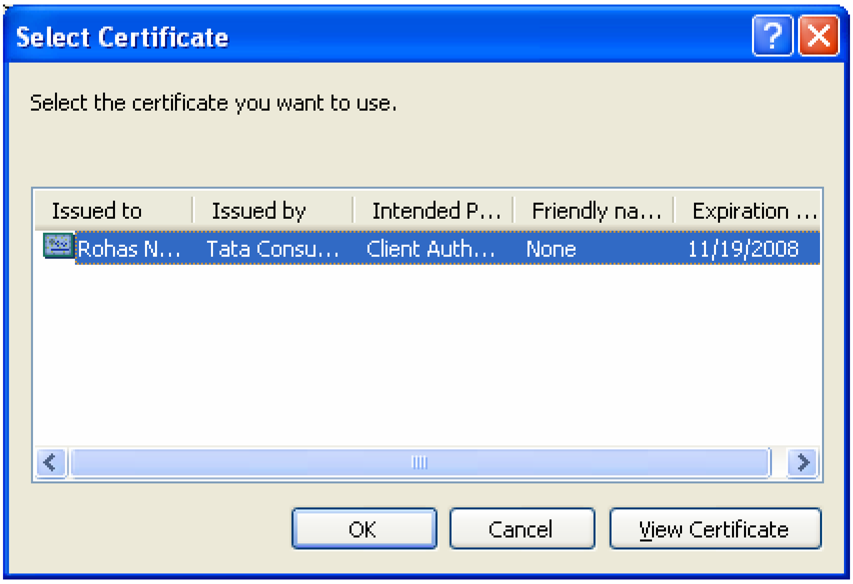
Encryption Certificate:

Encryption Algorithm:

☑ Send these certificates with signed messages

Click on the "**Choose**" button next to the **Signing Certificate** option. The following screen will open up.

> **Note:** In this illustration we are going to use the digital signature certificate issued to Rohas Nagpal having the email ID rn@asianlaws.org

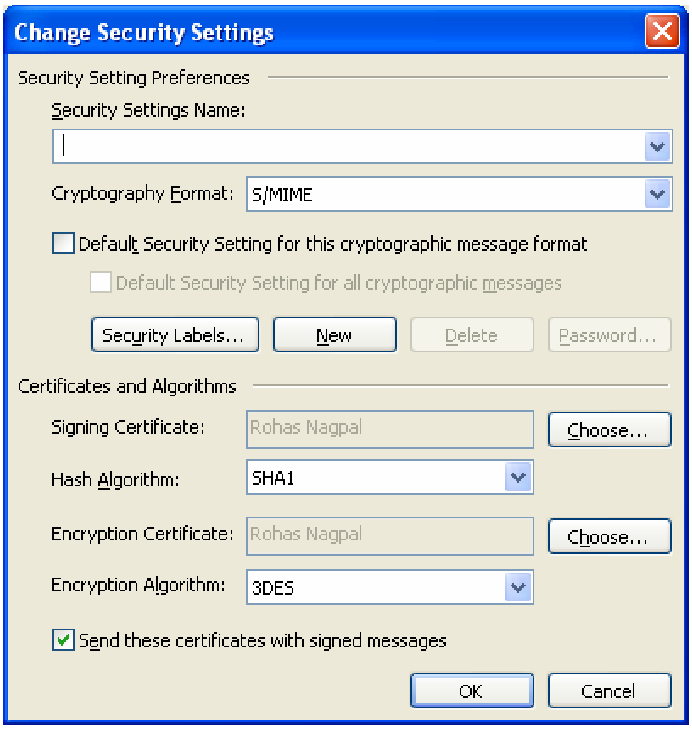


Select Certificate

Select the certificate you want to use.

Issued to	Issued by	Intended P...	Friendly na...	Expiration ...
Rohas N...	Tata Consu...	Client Auth...	None	11/19/2008

Click on "**OK**". The following screen will open up.



Change Security Settings

Security Setting Preferences

Security Settings Name:

Cryptography Format: S/MIME

□ Default Security Setting for this cryptographic message format

□ Default Security Setting for all cryptographic messages

Certificates and Algorithms

Signing Certificate: Rohas Nagpal

Hash Algorithm: SHA1

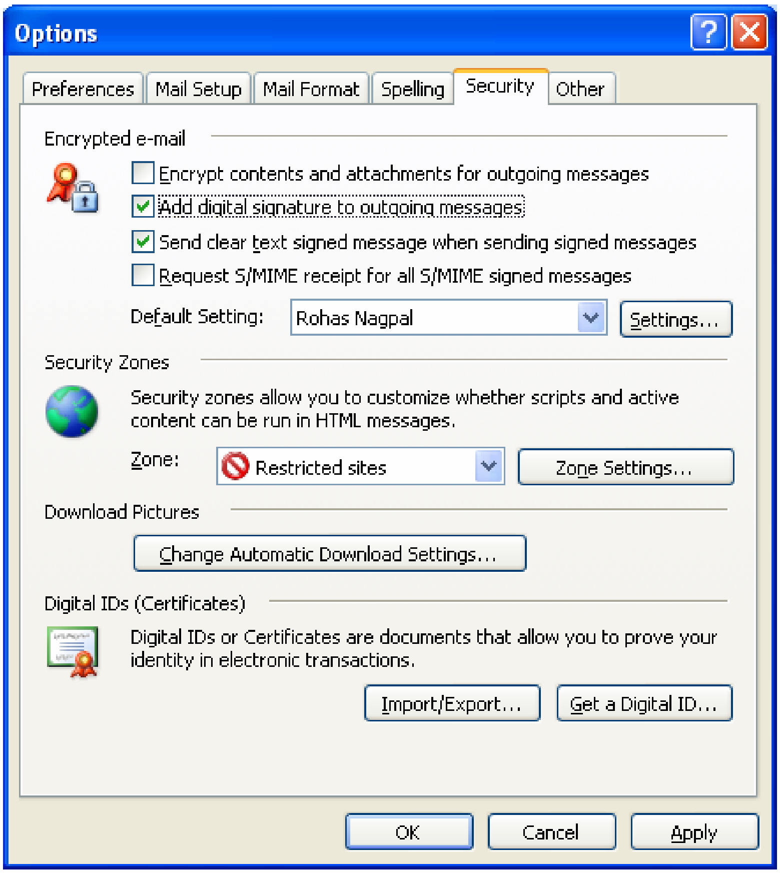
Encryption Certificate: Rohas Nagpal

Encryption Algorithm: 3DES

☑ Send these certificates with signed messages

Add a suitable title for the **Security Settings Name** (e.g. "Rohas Nagpal" in this case). Then click on "**OK**".

The following screen will open up.



Encrypted e-mail

☐ Encrypt contents and attachments for outgoing messages

☑ Add digital signature to outgoing messages

☑ Send clear text signed message when sending signed messages

☐ Request S/MIME receipt for all S/MIME signed messages

Default Setting: Rohas Nagpal

Security Zones

Security zones allow you to customize whether scripts and active content can be run in HTML messages.

Zone: Restricted sites

Download Pictures

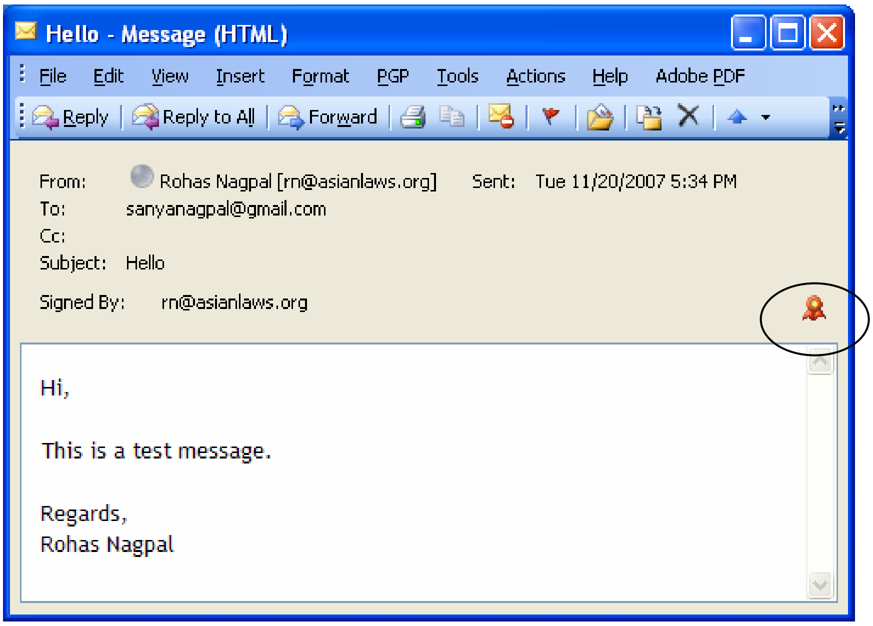
Digital IDs (Certificates)

Digital IDs or Certificates are documents that allow you to prove your identity in electronic transactions.

Click on "**Apply**" and then click on "**OK**".

Now compose and send an email. All emails sent using the rn@asianlaws.org account will be automatically signed. Let us presume that an email has been sent from rn@asianlaws.org to sanyanagpal@gmail.com

The sanyanagpal@gmail.com account is accessed by Sanya Nagpal using Microsoft Outlook. When Sanya received the digitally signed email from Rohas Nagpal, it will appear as under:



From: Rohas Nagpal [rn@asianlaws.org] Sent: Tue 11/20/2007 5:34 PM

To: sanyanagpal@gmail.com

Cc:

Subject: Hello

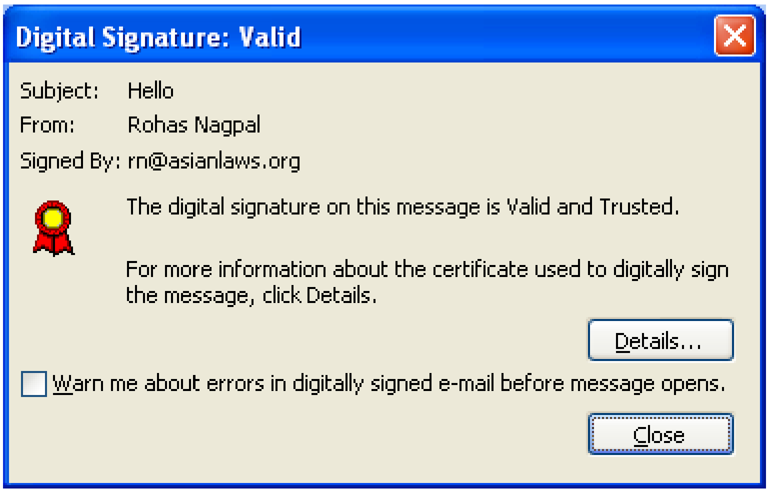
Signed By: rn@asianlaws.org

Hi,

This is a test message.

Regards,
Rohas Nagpal

Notice the icon marked with a circle in the image above. Clicking on it opens up the following screen:



Digital Signature: Valid

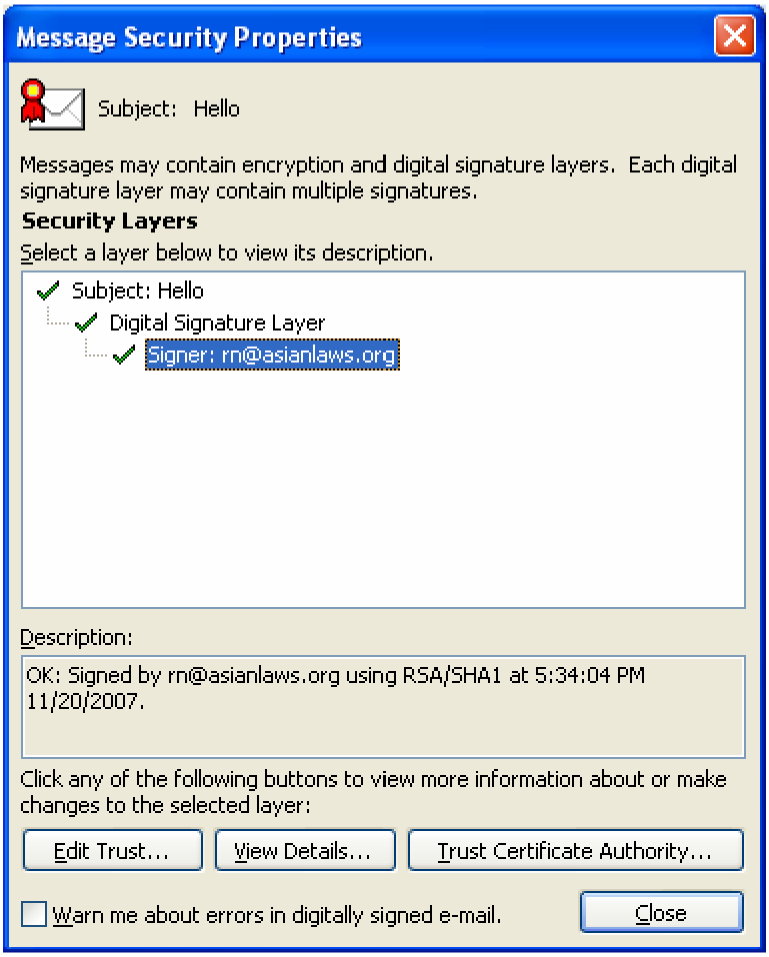
Subject: Hello
From: Rohas Nagpal
Signed By: rn@asianlaws.org

The digital signature on this message is Valid and Trusted.

For more information about the certificate used to digitally sign the message, click Details.

□ Warn me about errors in digitally signed e-mail before message opens.

It is clearly stated that "**The digital signature on this message is Valid and Trusted**". Clicking on the "**Details**" button opens up the following screen:



Message Security Properties

Subject: Hello

Messages may contain encryption and digital signature layers. Each digital signature layer may contain multiple signatures.

Security Layers

Select a layer below to view its description.

✓ Subject: Hello
✓ Digital Signature Layer
✓ Signer: rn@asianlaws.org

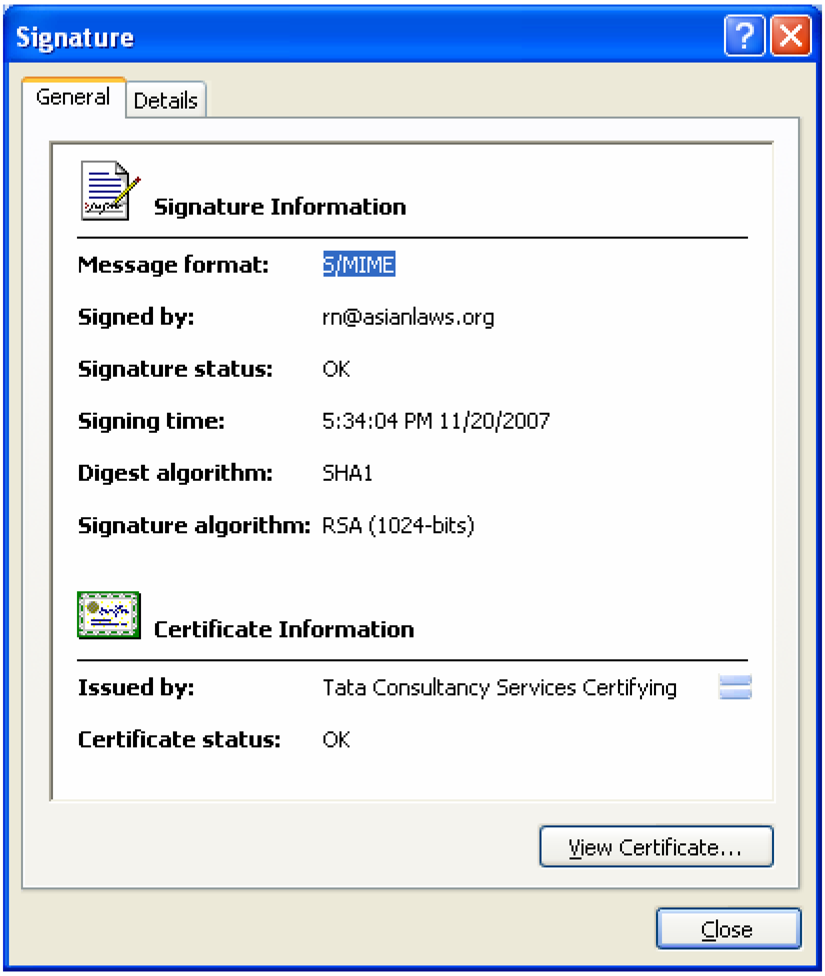
Description:

OK: Signed by rn@asianlaws.org using RSA/SHA1 at 5:34:04 PM 11/20/2007.

Click any of the following buttons to view more information about or make changes to the selected layer:

□ Warn me about errors in digitally signed e-mail.

Clicking on "**View Details**" shows the relevant signature information as under:



Signature Information

Message format: S/MIME

Signed by: rn@asianlaws.org

Signature status: OK

Signing time: 5:34:04 PM 11/20/2007

Digest algorithm: SHA1

Signature algorithm: RSA (1024-bits)

Certificate Information

Issued by: Tata Consultancy Services Certifying

Certificate status: OK

7. Digitally signing Word documents

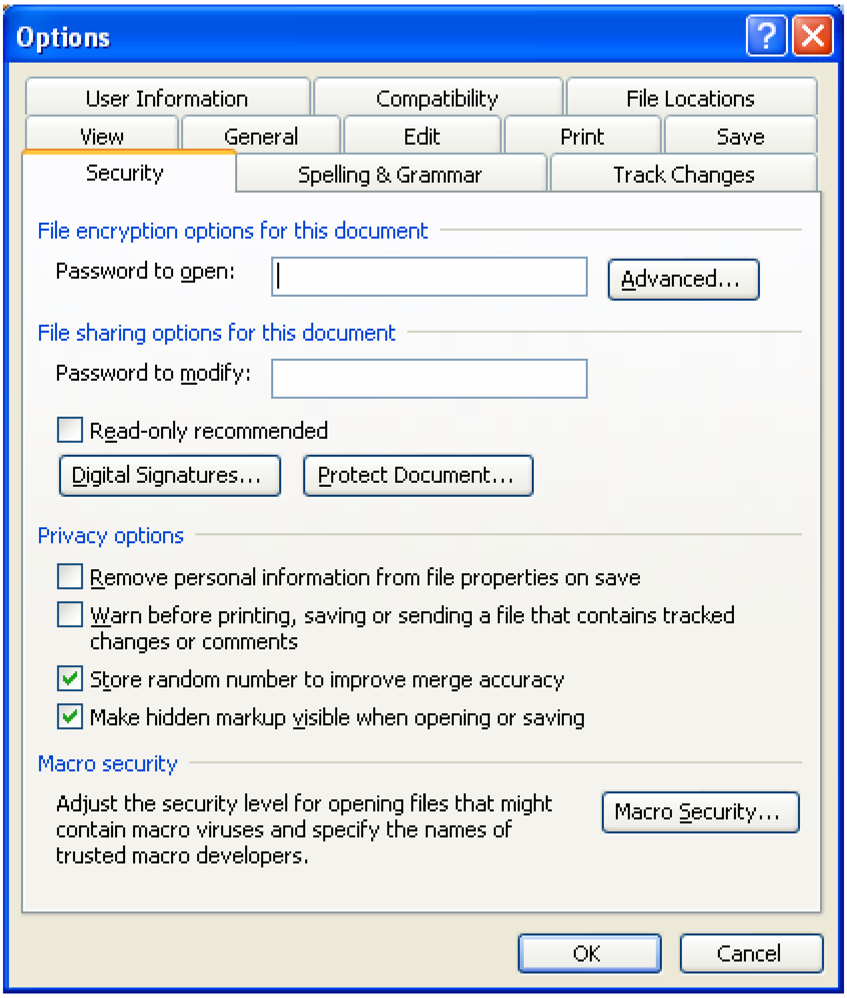
This chapter serves as a step by step guide for digitally Microsoft Word documents (version 2003 is used in this chapter). The basic steps are as under:

1. **Create** the Microsoft Word document that you want to digitally sign.

2. **Save** the document to a suitable location.

3. **Open** the document and then **click on Tools→ Options → Security**

4. The following screen will open up. Click on "**Digital Signatures**".



File encryption options for this document

Password to open:

File sharing options for this document

Password to modify:

□ Read-only recommended

Privacy options

□ Remove personal information from file properties on save

□ Warn before printing, saving or sending a file that contains tracked changes or comments

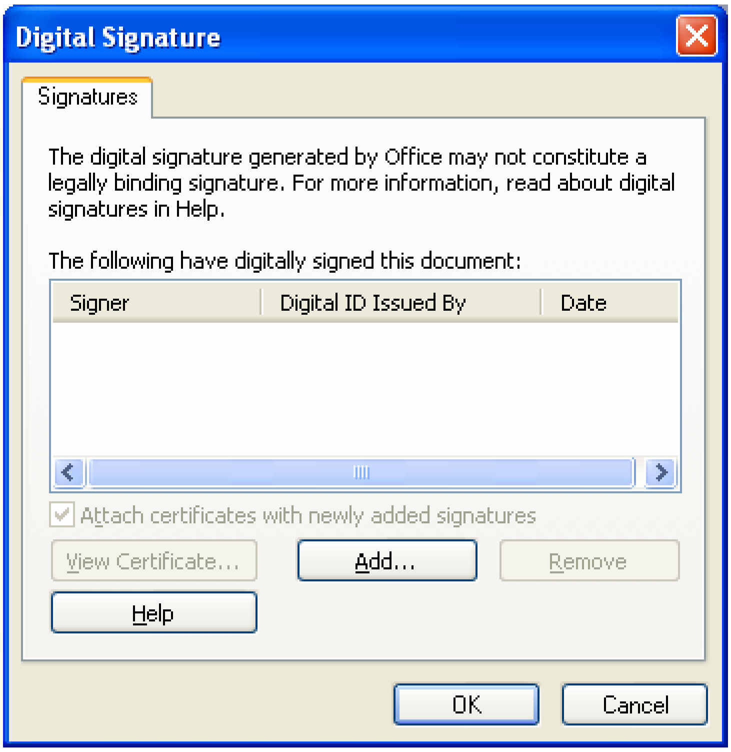
☑ Store random number to improve merge accuracy

☑ Make hidden markup visible when opening or saving

Macro security

Adjust the security level for opening files that might contain macro viruses and specify the names of trusted macro developers.

5. The following screen will open up.



Digital Signature

Signatures

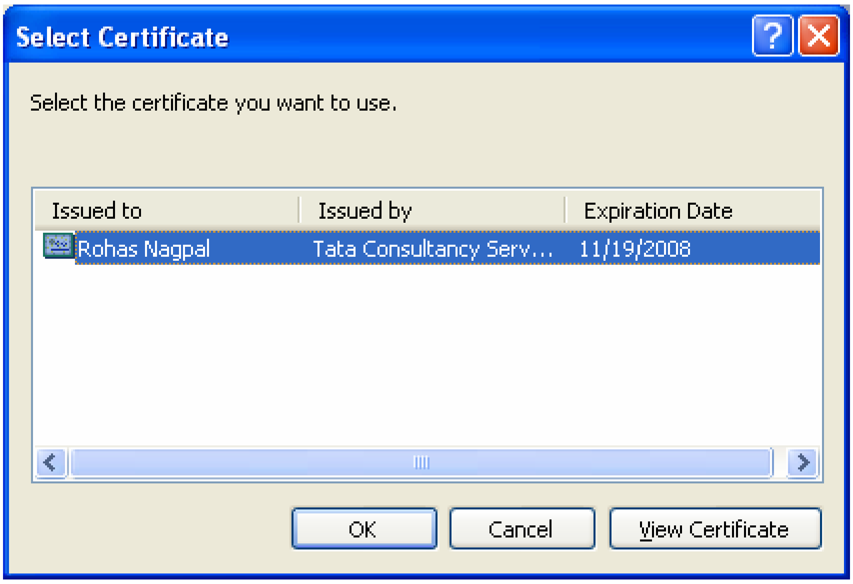
The digital signature generated by Office may not constitute a legally binding signature. For more information, read about digital signatures in Help.

The following have digitally signed this document:

Signer	Digital ID Issued By	Date

☑ Attach certificates with newly added signatures

6. Click on "**Add**". The following screen will open up:

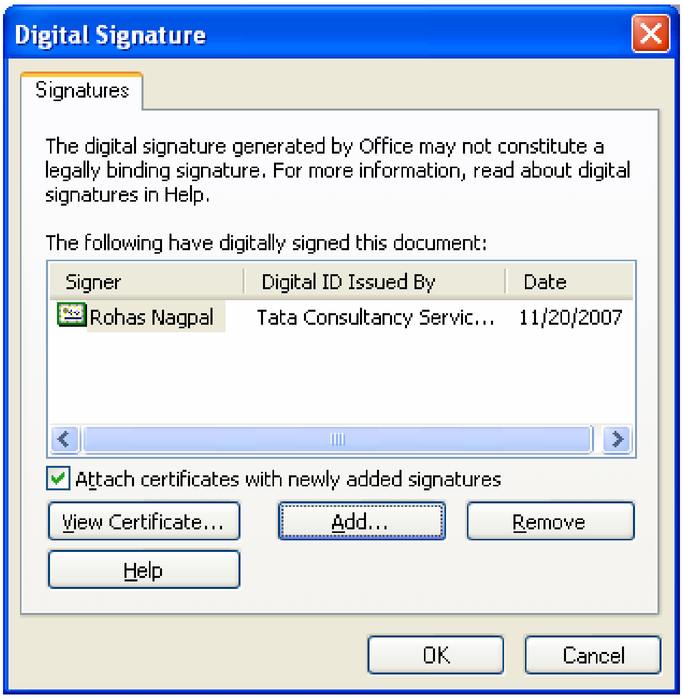


Select Certificate

Select the certificate you want to use.

Issued to	Issued by	Expiration Date
Rohas Nagpal	Tata Consultancy Serv...	11/19/2008

7. Click on "**OK**". The following screen will open up.



The digital signature generated by Office may not constitute a legally binding signature. For more information, read about digital signatures in Help.

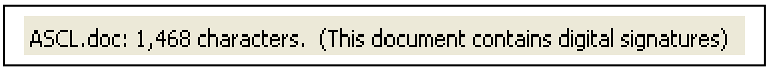
The following have digitally signed this document:

Signer	Digital ID Issued By	Date
Rohas Nagpal	Tata Consultancy Servic...	11/20/2007

☑ Attach certificates with newly added signatures

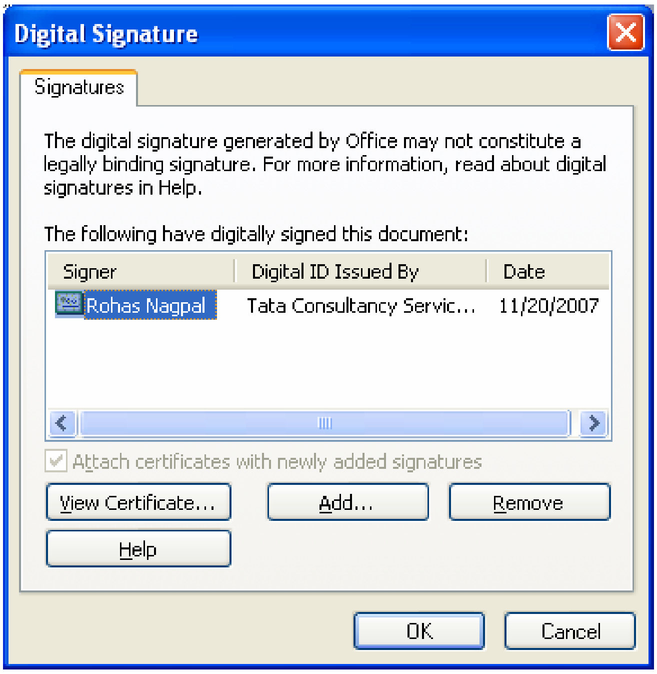
3. Click on “**OK**”. In the next screen that opens up click on “**OK**” again. The document is now digitally signed.

4. Whenever the document is opened, the following message will be displayed at the bottom of the screen:


ASCL.doc: 1,468 characters. (This document contains digital signatures)

5. Once the document opens up, the following icon will be displayed at the bottom of the screen.

6. On double clicking the icon the following screen opens up and displays information about the signer of the document.



The digital signature generated by Office may not constitute a legally binding signature. For more information, read about digital signatures in Help.

The following have digitally signed this document:

Signer	Digital ID Issued By	Date
Rohas Nagpal	Tata Consultancy Servic...	11/20/2007

☑ Attach certificates with newly added signatures

Asian School
of Cyber Laws

Head Office

6th Floor, Pride Senate,
Opp International Convention Center,
Senapati Bapat Road,
Pune - 411016.
India

Contact Numbers
+91-20-25667148
+91-20-40033365
+91-20-65206029
+91-20-6400 0000
+91-20-6400 6464
Fax: +91-20-25884192

Email: info@asianlaws.org
URL: www.asianlaws.org