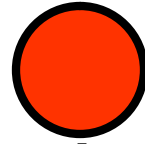


Internet and Data Security



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February 8, 2008
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To Do.....



Paranoia meter

In this paper I will discuss why using the internet for transactions is useful besides being convenient. I will also show why being cognizant of internet security is important and what steps are necessary to protect your internet usage. I will show how to recognize secure sites and how to protect online purchases by using virtual credit cards. Lastly, I will discuss options for storing passwords conveniently and securely as well as secure file storage and complete removal of sensitive data.

On each page a reference number(s) will be listed with a complete reference list on the last page. Just copy the address starting with http and paste it in your browser to get additional information. The circle at the top right of the page is my arbitrary assignment of importance with red being the highest importance ranking.

- Why bother with security

Internet security

- Prerequisites
- How to tell if an internet site is secure
- Online financial transactions
- Online purchases – virtual credit cards
- Password management – records/Roboform

Data security

- Storing data securely – True Crypt
- Use it and lose it – complete data removal
- Final thoughts

References #

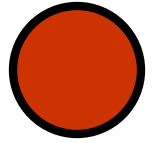
Why bother with Internet Security

- **Online transactions are very convenient – for example I took advantage of Black Friday sales on the Wednesday before from my computer and got several great deals.**
- **Wide range of possibilities**
 - **online purchases (eBay, Amazon, stores..)**
 - **online banking**
 - **online trading**
 - **credit card bill status**
 - **social security, insurance.....**
- **Diligent monitoring of financials reduces identity theft exposure. I check my credit cards and other financials (banks, brokerage) online frequently to make sure no unauthorized usage is occurring. In this way I can catch any theft much sooner than if I wait for a monthly statement.**
- **Hopefully this will have convinced you that using the internet is a good idea but now I will show you why internet security is important.**

OK – so why is security important?

Reference 1

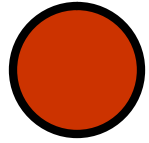
Importance of good security



-
- Unsecured internet activity data can be viewed with programs that are readily available. This is called “packet sniffing” and is like sending regular mail in a clear envelope.
 - Personal information can be viewed on a site that is not secure and dramatically increases exposure to identity theft!!!!
 - It is necessary to protect both internet use and your computer.

Reference 2

Computer Security



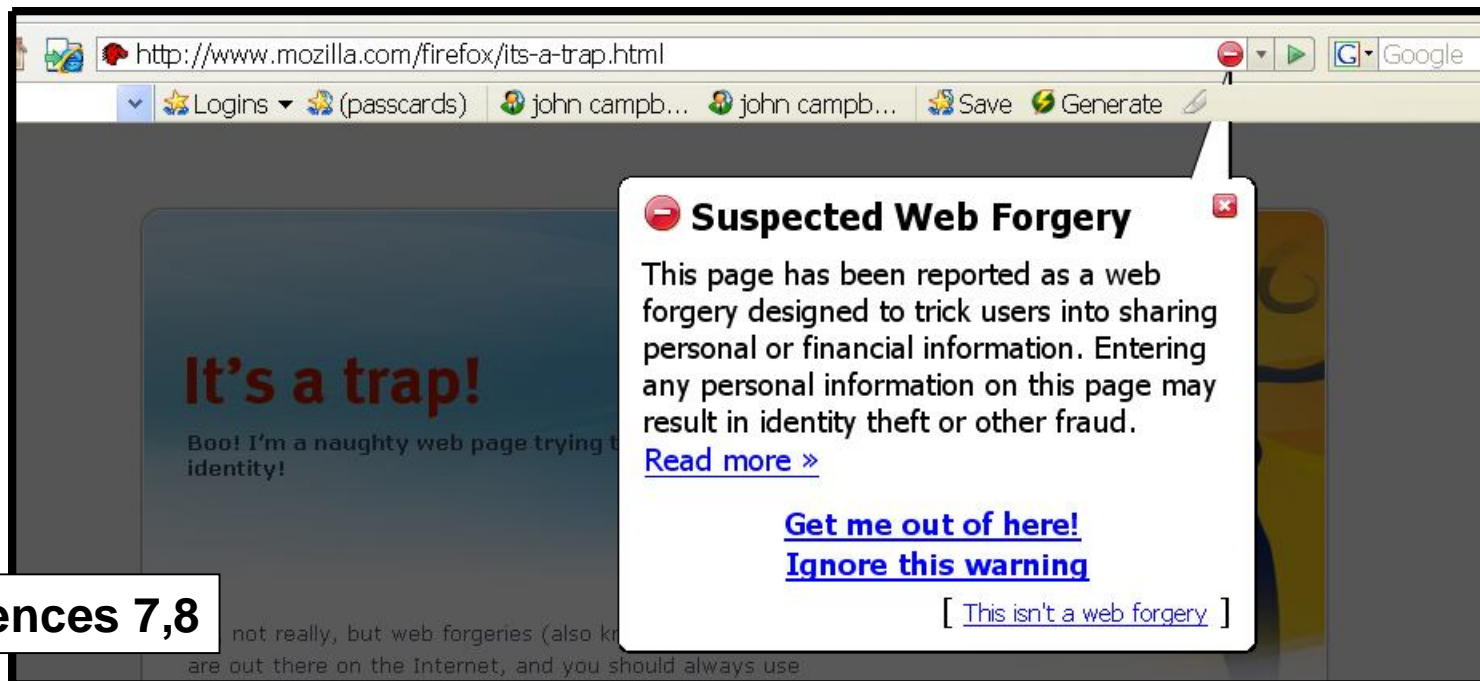
- It is very important to have a good anti-virus program running that is up to date along with a firewall. I use AVG anti-virus and Zone Alarm firewall (both free) together with the spyware programs listed below.
- Anti-virus (one only, updated and running) – AVG (free)
- Firewall Windows XP – Zone Alarm
- Malware programs
 - Adaware
 - Spybot
- Windows Updates current

References 3 - 6

Types of security?

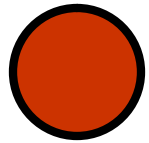
Browser security - Phishing?

- One threat is a “phish” as described below. Fortunately both Firefox 2 and Internet Explorer 7 browsers provide protection.
- Phish – e-mail masquerading as legitimate to obtain user information – link to web sites
- Both Firefox 2 and Internet Explorer 7 have built-in protection



References 7,8

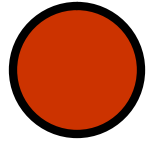
Is a site secure – how to tell



-
- **Secure websites use data encryption that is virtually uncrackable with indicators to show that the site is secure. On such sites confidential information can be transmitted with confidence. References 9-11 provide much more detail on the mechanics of this process.**
 - **Secure sites encrypt data transmission**
 - use SSL (Secure Sockets Layer)
 - all data is encrypted (strong!!)
 - **Look for 2 SSL indicators on Web page:**
 - https in address bar and padlock
 - **Key to secure internet transactions**
 - banking
 - online purchases
 - investing.....

Reference 9, 10, 11

Secure site identifiers



Staples.com®. that was easy® - FREE Delivery on Office Supplies, Technology, Furniture. - M...

File Edit View History Bookmarks Tools Help

http://www.staples.com/webapp/wcs/stores/servlet/home

Staples.com®. that was easy®

Welcome that was easy. You are logged in.

Search: Go

Cart: \$12.64

FREE delivery on this order. Checkout

Products Ink & Toner Specials Print Services My Account Customer Service

Personal Information Looking for tech gifts? Best Selling Holiday Gifts

Fast & FREE Delivery on ALL orders. Now through 12/26/07! Visit our Holiday Center

STAPLES copy & print center

Request a Catalog

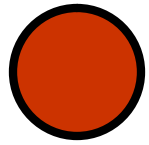
Want a FREE catalog? Or view select catalogs online now. Go

javascript:jsSubmitLink('http://www.staples.com/webapp/wcs/stores/servlet/personalinfo?&langId=-1&storeId=10001&catalogId=10051')

start AV... 2 W Mic... 2 F. Sta... 9:28 PM

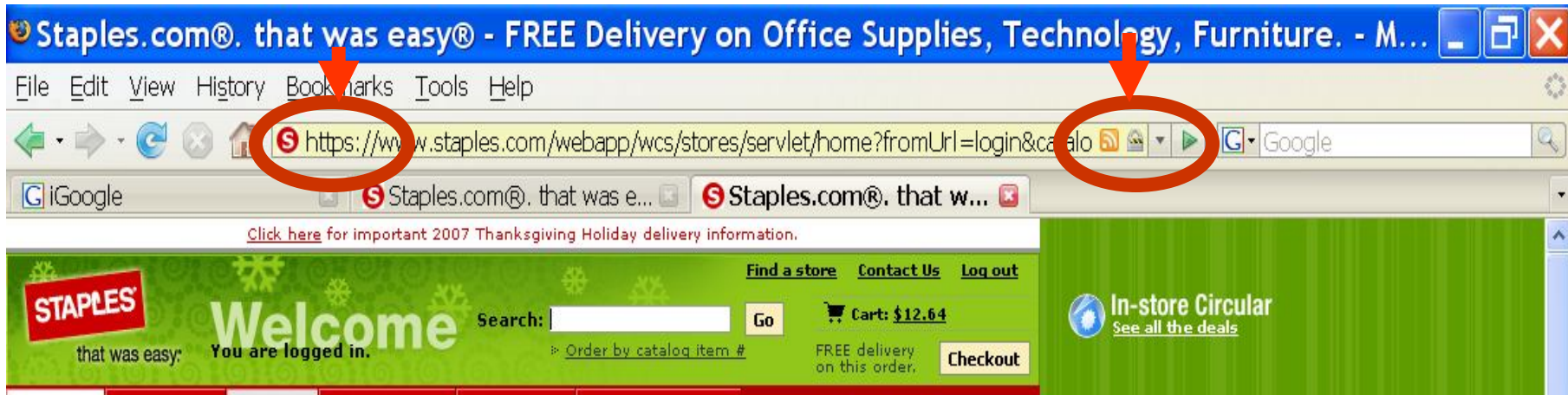
Site not secure – no https or padlock

Secure site example

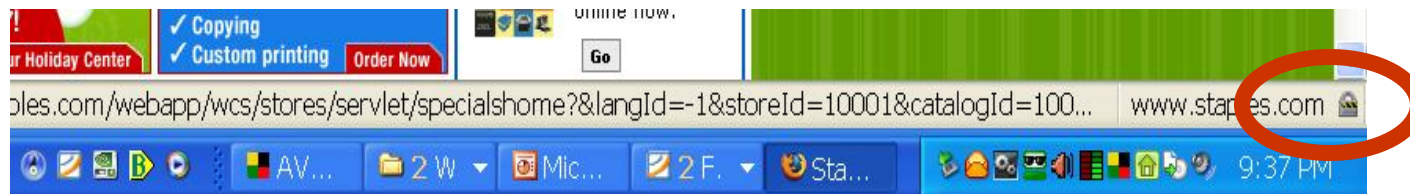


Identifier 1- https

Identifier 2- padlock

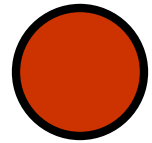


- Padlock is shown at bottom of page also for Firefox



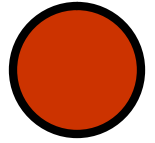
Both identifiers present – buy with confidence

Secure Internet Explorer Site



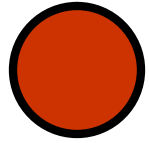
- **Both identifiers – secure for:**
 - online purchases
 - financial transactions (eg banking, investments)
- **Online banking – monitor activity, transfer funds, pay bills.....**
- **Convenient access – better monitoring improves security (banking and credit cards)**

Wireless hot spot cautions

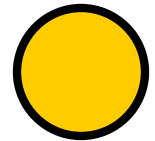


- **Wireless hot spots – open networks – vulnerable**
- **Avoid for sensitive transactions**
- **If you use:**
 - **have an active firewall**
 - **disable file sharing**
 - **keep sensitive data off your laptop**
 - **make files private**
 - **monitor connections – restricted access better**
 - **secure sites only**

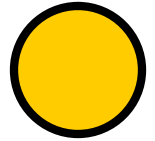
Online purchases



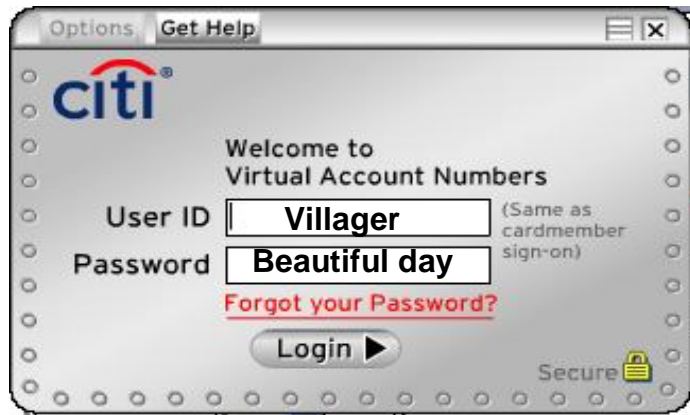
- **Online purchasing security depends not only on using a secure site but also on the reputation of the company. However use of a credit card provides some additional security in that purchases can be disputed if there is an error. Moreover, virtual credit cards offer additional security in that a “special” credit card is issued to a regular account holder with certain restrictions. As shown below these restrictions provide some additional security and are launched as shown on the next page for the case of a Citicard account.**
- **Transactions on secure sites - reputable companies**
- **Credit card reputation – fraud detection, dispute handling**
- **Use virtual credit cards**
 - **issuer installs program to generate a number**
 - **linked to regular card – specific to 1 purchase or merchant**
 - **limited lifetime - one use/one month**
- **Free service – many companies – Citi, Discover MBNA....download program**
- **Claim increased security**



Virtual Card Set-up



Step 1- start program and log in



Options Get Help

citi

Welcome to
Virtual Account Numbers

User ID (Same as
cardmember
sign-on)

Password

[Forgot your Password?](#)

Login ▶

Secure

Step 2 – generate #



Options Get Help Logout

citi

- Generate Virtual Account Number
- View Virtual Account Numbers
- View/Edit Billing Information
- Preferences
- Select a Card
- Go to citicards.com

Step 3 – transfer info to
online order



Options Get Help Logout

citi

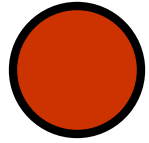
I.M. AVillager

1234 5678 9012 3456

EXPIRATION DATE CVC
01/08 345

Auto Fill

Password Management



- The following table illustrates how important the choice of a strong password is.

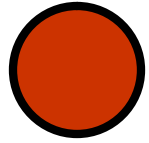
Existing password cracking times – average computer

| Password Length | All Characters | Only Lowercase |
|-----------------------------|------------------------------------|-----------------|
| 3 characters | 0.86 seconds | 0.02 seconds |
| 4 characters | 1.36 minutes | .046 seconds |
| 5 characters | 2.15 hours | 11.9 seconds |
| 6 characters | 8.51 days | 5.15 minutes |
| 7 characters | 2.21 years | 2.23 hours |
| 8 characters | 2.10 centuries | 2.42 days |
| 9 characters | 20 millennia | 2.07 months |
| 10 characters | 1,899 millennia | 4.48 years |
| 11 characters | 180,365 millennia | 1.16 centuries |
| <u>12 characters</u> | <u>17,184,705 millennia</u> | 3.03 millennia |
| 13 characters | 1,627,797,068 millennia | 78.7 millennia |
| 14 characters | 154,640,721,434 millennia | 2,046 millennia |

Reference 13,14

Password checker: <https://www.microsoft.com/protect/yourself/password/checker.mspx>

Password Storage



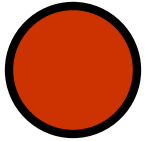
- Write them down – NOT!!
- See 11/30/07 talk on Autohotkey
- Programs - Roboform
 - Stored in encrypted form (password protected)

To store passwords record them as a rule rather than the password themselves.
The rule serves as a memory device to regenerate the password as you enter it.

- Record in coded form
- Code by recording a memory device/rule
 - eg: tT1!qQ2@bB3#fF4\$jJ5%oO6^
 - rule: typing&number up/down 5 level
 - from: the quick brown fox jumped over

I just picked the first letter of each word using both lower and upper case, added the number of the word from with the letter came (again lower and upper case). In this way I generated a 20 character password that appears hard to remember but can be easily recreated by looking at the rule which one can keep handy in written form as it appears to be nonsense to anyone else.

Password Management - Roboform



- **Lots of alternates**

- **Firefox stores passwords in protected file**

But I don't like this as the level of security is not known to me and might be susceptible to hacking.

- **autohotkey**

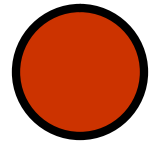
- **Roboform**

- **Very convenient way of storing passwords in an encrypted file (10 passwords free, \$30 for >10)**

- **Automatic login and password submission**

- **Form fill-in....**

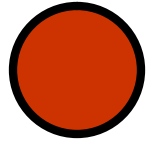
Roboform login



After installing Roboform, a toolbar appears when your browser is opened. As you go to a site that requires a password Roboform will ask you to open it with your master password then store the login and password. Each time you go to login you can select that site and after entering the Roboform master password which is required only for the first time you open the browser, Roboform will open the site and log you in. For some sites that require a 2 step process it is more difficult, although the password will be stored.

The screenshot shows the Mozilla Firefox browser interface with the Roboform toolbar. The address bar displays the URL `http://www.google.com/ig?hl=en`. The Roboform toolbar includes a search field, a 'Logins' dropdown menu, and several icons. The 'Logins' menu is open, showing a list of saved logins such as 'Staples', 'Americanexpress', and 'Sumterpubliclibrary'. A red arrow points to the Roboform toolbar, and a green arrow points to the 'Logins' menu. A 'RoboForm Master Password f...' dialog box is overlaid on the screen, prompting the user to enter their master password to open a password-protected passcard for 'Staples'. The dialog box contains a text input field and 'OK' and 'Cancel' buttons.

Roboform login



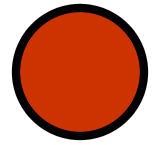
In the example below I selected the staples item from the Roboform login menu and Roboform automatically opened the Staples page and logged me in. Very convenient!!

The screenshot shows a web browser window displaying the Staples.com login page. The browser's address bar shows the URL: <https://www.staples.com/webapp/wcs/stores/servlet/login?fromUrl=login&ca>. The page features a green header with the Staples logo, a search bar, and navigation links like 'Find a store', 'Contact Us', and 'Log in'. Below the header is a red navigation bar with categories such as 'Products', 'Ink & Toner', 'Specials', 'Print Services', 'My Account', and 'Customer Service'. The main content area is titled 'Log in to staples.com®' and contains a red error message: 'Sorry, but an error has been made.' Below the error message, there are two columns of login options. The left column is titled 'I have a Username and password.' and contains fields for 'Username:' (with the value 'jcampbell1761@yahoo.com') and 'Password:'. The right column is titled 'I do not have a Username and password.' and contains the text 'We'll help you create one on the next page.' and a 'Continue' button. A red oval highlights the entire login section, and two green arrows point to the 'I have a Username and password.' section.

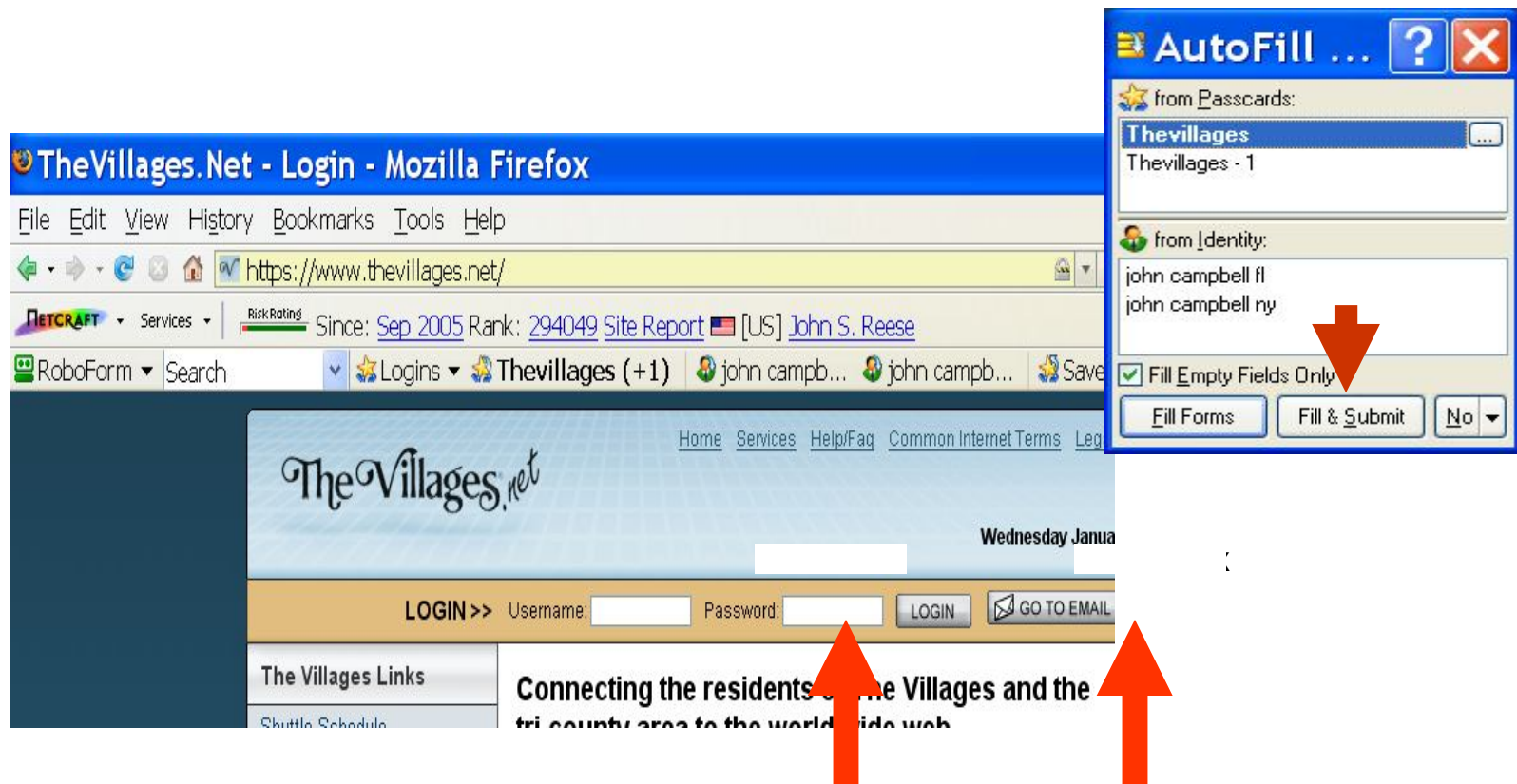
- More involved with dual sign-in sites (banks)

Very convenient, secure password management

Roboform login advanced

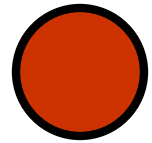


Alternately, if you open a website from your browser bookmarks, a pop up Roboform window will appear asking you if you want to fill in a password. Once you select a version (if more than 1 stored) Roboform will fill in and log you in automatically.



- **Good for 2 step logins (eg banks)**

Roboform form fill-in



The same thing can be done with addresses and even credit card information although I prefer to Do that myself each time.

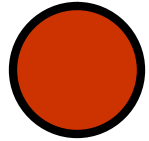
The screenshot shows the BestBuy.com 'Billing Address' form. The form fields are filled with the following information:

- *First Name: john
- MI: r
- *Last Name: campbell
- *Address: 1761 lakewood drive
- Address Line 2 (optional):
- *City: lady lake
- *State: FL - Florida
- *ZIP Code(5 digit): 32162
- *Country: USA

An 'AutoFill' window is overlaid on the right side of the form. It shows a list of suggestions for the 'from Identity' field, with 'john campbell fl' and 'john campbell ny' visible. A red arrow points from the 'john campbell fl' suggestion to the 'MI' field in the form. The AutoFill window also has buttons for 'Fill Forms', 'Fill & Submit', and 'No'.

Additional elements on the page include a navigation bar with 'Return to Cart', 'Thousands of Possibilities | GET YOURS', and a progress bar showing 'Your Info', 'Shipping & Pickup', 'Payment', 'Review & Submit', and 'Order Complete'. There is also a 'Is it a Gift?' section with a link to 'Learn about Gifting Options' and an 'Address Tips' section with links for 'General Information', 'APO/FPO Military', 'Corporate', 'International', and 'College/School'.

Roboform to go



Roboform also offers the option of storing your encrypted information on a flash drive for use when Travelling.

The screenshot shows the RoboForm2Go website interface. At the top, there is a navigation bar with links for 'Logins', 'Roboform', and user profiles. Below this is a green header with the 'RoboForm' logo and the text 'Remembers Passwords So You Don't Have To'. To the right of the header, it says 'RoboForm2Go: Portable Automated Password Manager, Form Filler, Password Generator for USB key'. A menu bar below the header offers various options: 'DOWNLOAD', 'BUY RF PRO', 'ENTERPRISE', 'CONTACT', and language selections including English, Deutsch, Español, Français, Italiano, 简体中文, 繁體中文, 日本語, and more..

The main content area features a large heading 'TAKE YOUR PASSWORDS WHEREVER YOU GO' and a sub-heading 'EASY AS 1-2-3'. To the left of the text is an image of the RoboForm2Go product box, which is green and yellow and shows a USB key. The text describes the product's ease of use:

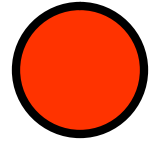
1. Plug your USB key with RoboForm2Go on it into any computer, anywhere in the world.
2. **RoboForm2Go**^(TM) memorizes your passwords and bookmarks and logs you into online accounts automatically. Fills long registration and checkout forms too.
3. Pull out your USB key and No traces of RoboForm2Go are left on the computer.

At the bottom of the main content area, there are two yellow buttons: 'Download RoboForm2Go' and 'Buy RoboForm2Go'. To the right of the main content, there is a section titled 'RoboForm2Go Benefits' with three sub-sections:

- One click logins**: RoboForm2Go navigates to the site, enters passwords and logs in for you.
- Complete portability**: Just plugin RoboForm2Go USB key into computer. No install is required.
- Ultimate Security**: Once you pull out USB key, all passwords are gone from the computer.

At the very bottom of the benefits section, there is a heading 'Only one password'.

To Do.....



Paranoia meter

- Why bother with security

Internet security

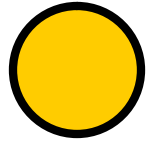
- Prerequisites
- How to tell if an internet site is secure
- Online financial transactions
- Online purchases – virtual credit cards
- Password management – records/Roboform

Data security

- Storing data securely – True Crypt
- Use it and lose it – complete data removal
- Final thoughts

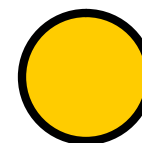
References #

Secure data storage

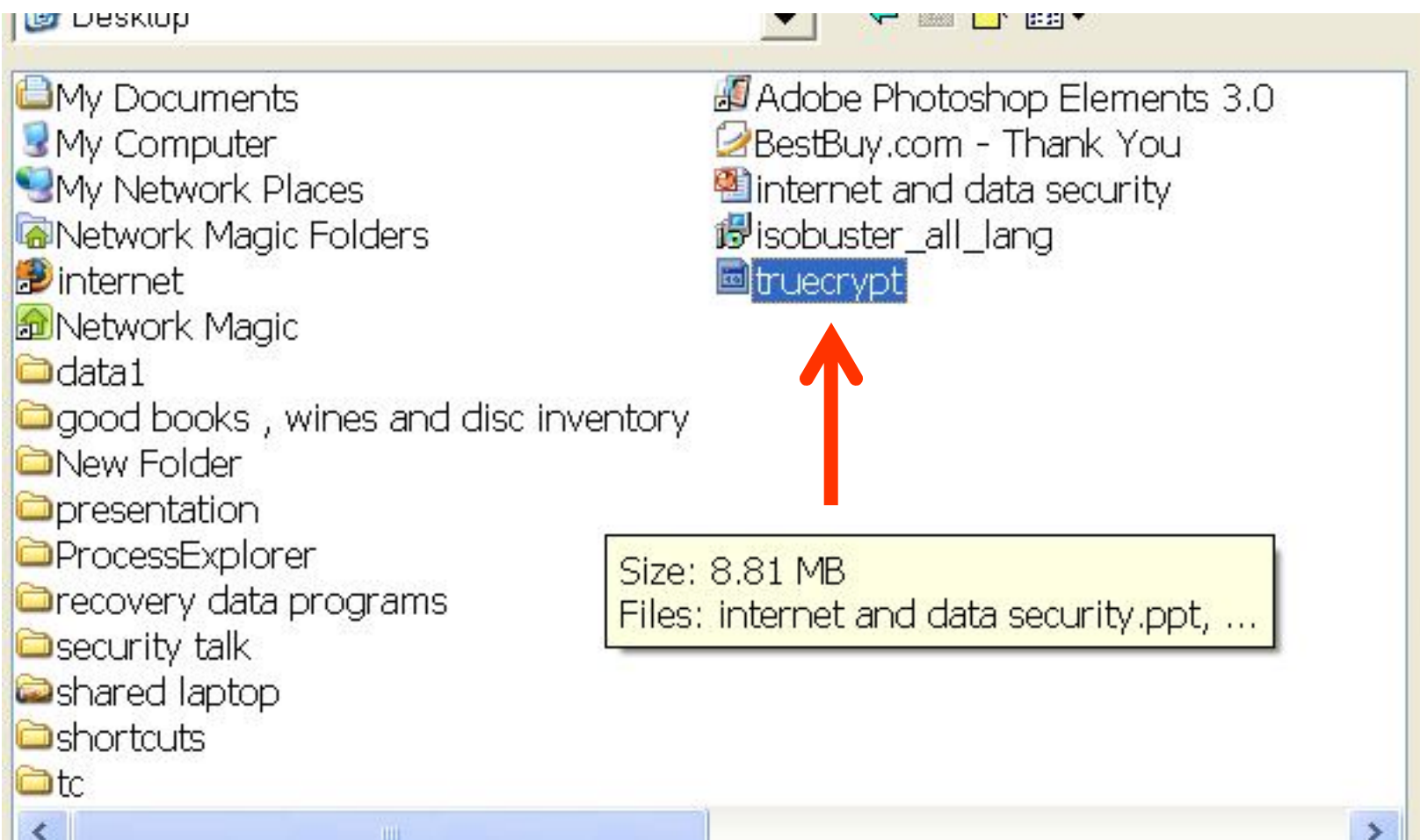


- Incidents of data theft – hardware theft
- Data encryption – several easy options
- True Crypt – free download, easy to use & set up
- Used by IRS
- Set up – set up an encrypted file
 - password protected
 - only read via password activation
 - access as another drive (My Computer)
 - file can be copied from drive to DVD
 - good manual has step by step guide

True Crypt file



- Set up an encrypted folder (step by step in manual)



Access file by mounting

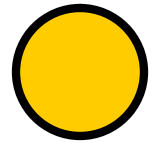


The image shows the TrueCrypt application window. In the foreground, a dialog box titled "Enter password for C:\Documents and S..." is open. It contains a "Password:" field with a single asterisk, and several checkboxes: "Cache passwords and keyfiles in memory", "Display password", and "Use keyfiles". There are also buttons for "OK", "Cancel", "Keyfiles...", and "Mount Options...".

In the background, the TrueCrypt main window is visible. It has a menu bar with "File", "Volumes", "Keyfiles", and "Tools". Below the menu is a list of drives from J: to Z:. At the bottom of the window, there are several buttons: "Create Volume", "Volume Properties...", "Wipe Cache", "Volume Tools...", "Select Device...", "Mount", "Auto-Mount Devices", "Dismount All", and "Exit".

A red circle highlights the "Select File..." button in the "Volume" section of the TrueCrypt window. A red arrow points from this button to a text box on the right that says "Select file just made and mount". Another red arrow points from the "Mount" button back to the "Select File..." button.

File shows up as another drive



The image shows two overlapping windows from a Windows operating system. The background window is titled "TrueCrypt" and displays a list of drives (J: through Z:). The foreground window is titled "My Computer" and shows a list of drives and folders. An orange arrow points to the drive "Local Disk (X:)" in the "My Computer" window, with the text "True Crypt folder" next to it.

TrueCrypt

File Volumes Keyfiles Tools Settings

| Drive | Volume |
|-------|--|
| J: | |
| K: | |
| L: | |
| M: | |
| N: | |
| O: | |
| P: | |
| Q: | |
| R: | |
| S: | |
| T: | |
| U: | |
| V: | |
| W: | |
| X: | C:\Documents and Settings\john\Desktop\truecr... |
| Y: | |
| Z: | |

My Computer

File Edit View Favorites Tools Help

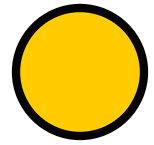
Back Forward Search Folders

Address My Computer Go

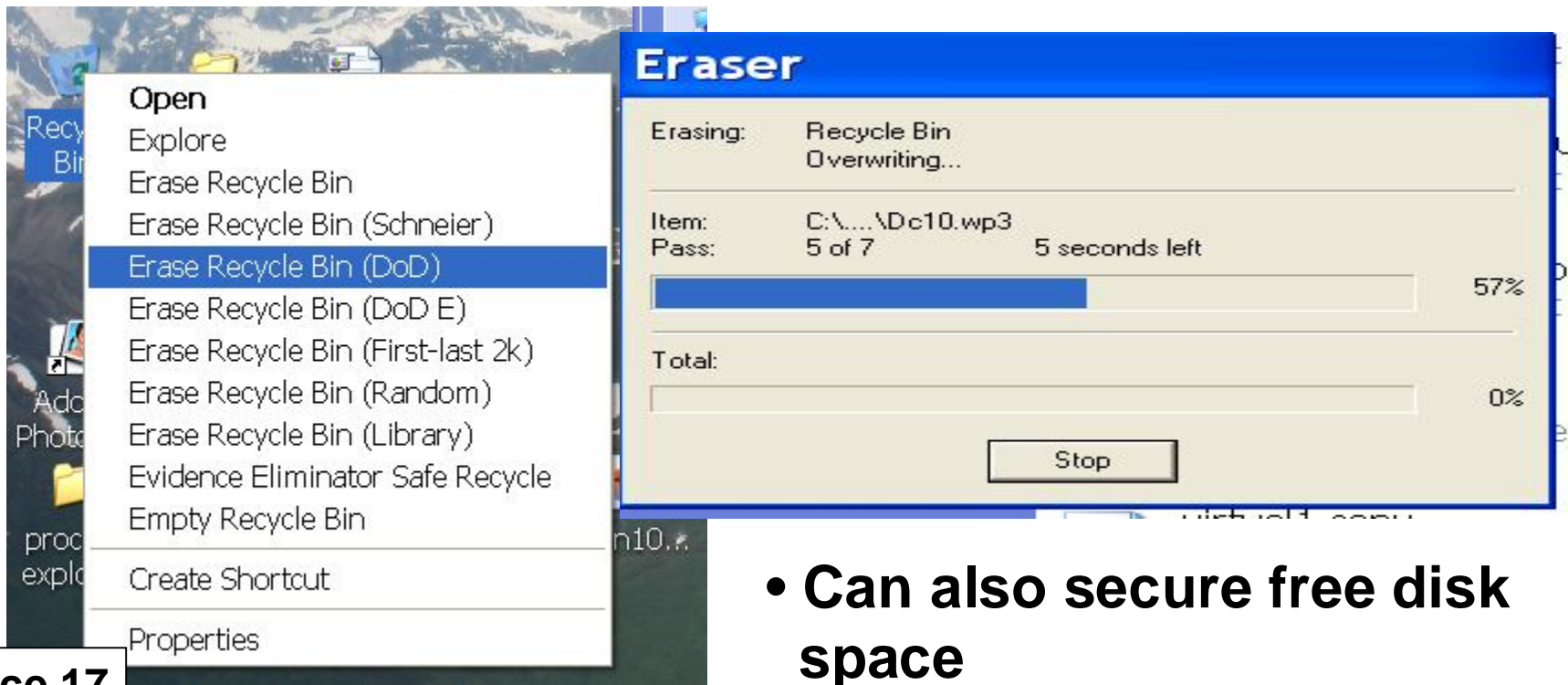
- Local Disk (C:)
- DVD-RW Drive (D:)
- My Book (E:)
- SEA_DISK (G:)
- Local Disk (X:) ← True Crypt folder
- DESlock+ Offline Folders
- Shared Documents
- john's Documents

True Crypt folder

Secure data removal



- Important to completely erase sensitive documents
- Eraser – free
- Recycle bin – erase with options (DOD – 7x, up to 28x)



Reference 17

- Can also secure free disk space

Final Thoughts

- **Internet brings convenience but requirements**
- **Online options for better personal security**
- **Security software**
- **Knowledge of secure sites**
- **Approaches to secure online transactions**
- **Secure data storage and removal**

Internet is a great resource if used correctly and securely

Resources/References

- 1.(stealing information): http://en.wikipedia.org/wiki/Computer_surveillance
- 2.(packet sniffing): http://en.wikipedia.org/wiki/Packet_sniffer
- 3.(free AVG download): <http://free.grisoft.com/doc/5390/us/frt/0?prd=aff/>
- 4.(free zone alarm): <http://www.zonelabs.com/store/content/company/products/znaIm/freeDownload.jsp>
- 5.(free Adaware download): http://www.lavasoftusa.com/products/ad_aware_free.php
- 6.(free spybot): <http://www.safer-networking.org/en/mirrors/index.html>
- 7.(definitions): <http://www.smartcomputing.com>
- 8.(firefox phishing demo): <http://www.mozilla.com/firefox/its-a-trap.html>
- 9.(SSL definition): http://en.wikipedia.org/wiki/Secure_Sockets_Layer
- 10.(how it works): <http://computer.howstuffworks.com/encryption2.htm>
11. (details of SSL process): http://en.wikipedia.org/wiki/Image:Ssl_handshake_with_two_way_authentication_with_certificates.png
- 12.(virtual credit cards): <http://bankrate.com/brm/news/cc/20021011a.asp>
- 13.(hacking weak passwords): <http://onemansblog.com/2007/03/26/how-id-hack-your-weak-passwords/>
- 14.(password checker): <https://www.microsoft.com/protect/yourself/password/checker.msp>
- 15.(Roboform download): <http://www.roboform.com/download.html>
- 16.(free True Crypt download): <http://www.truecrypt.org/downloads.php>
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