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Print Document using Password Authentication on Network Printer

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Abstract

In this era of information technology where technology is rapidly popularize, the security of information is very much needed. As information becomes more valuable and confidential so use of secure technology plays vital role. In today's scenario, most of organizations use document processing devices like printers, scanner and fax machines etc., on network. Many confidential and important data and documents are handling by these devices. This may cause document theft or snooping. Such kind of loss may lead to crime or fraud also. Printing security prevent users from document theft. Most of printer manufacturing companies provide security solutions but 90% people are not aware about security solutions. This unawareness causes the leakage of confidential data. When user prints document, user gets option for security of data. If user chooses security of data then user has to enter user name with password. At the printer side, job will be held on printer till the user unlocks the document through password. With this technique user will not only be aware about security solutions but also user will secure data.

Keywords: Printing; Security; Network; Password; Driver

Introduction

Today with the rapid popularization of networks, large amount of information travel on network. As information becomes the precise and valuable, the threat posed by loss of data and leakage of information has becomes the more serious. A network printer is that shared among all employees of office. Printing confidential information on a shared printer in a public place or large office can be risky, but several technologies help you eliminate most of the risk. For office or home network use, the protection comes from the printer driver. In a public place, such as a school or public library, a college computer lab, or a print shop, risk reduction depends on the steps the institution takes to promote security. Every day, employees send business-critical information to networked printers away from their workstations but there is no way to physically ensure that the correct person picks up a specific print job. It's critical for security and management to be able to audit what's been printed by whom and when at which location. Employees at the organization with networked environment can access networked printer anywhere and send document to the printer. In such environment where printer is away from the employee printing security is becoming a requirement. The proposed printing security is a convenient and cost effective way to secure printing environment. Printing security reduces unclaimed prints and increase efficiency. In this, user can print to a secure network, authenticate with ease and retrieve job when necessary. Basically the proposed solution is for any kind of people.

Need of Security

With increasing popularization of network printer as data becomes more valuable so effective way to security breaches are required. Data theft is the removal of physical documents from the output tray of the printer. It is easier to perform [1]. Theft can gain access to confidential information such as financial letters, private letters, credit card details, bank account number, certificates, personal records and many other legal documents that are having private information. For example, in today's scenario many organizations take records of employee's property. In case while printing these report on networked printer and someone has stolen the document then person can misuse the record of that employee. Many employees also print their personal photographs on network printer. Many people use others personal information by storing printed documents and add that information like photographs, phone number, email address and post vulgar information. Misuse of certificates and documents and such kind of crime becomes very popular in youth and increasing rapidly. According to the new 2012 print security survey conducted by ISMG and HP, agencies are aware of risks to printing and imaging assets, but are doing little to ensure their protection. Asked, on a scale of 1-5, how important print security is to their organization, 86% of respondents say "Important" or "Very Important". Only 45% include print as part of their IT security plan. As per Quocirca research reveals that enterprises place a low priority on print security despite over 60% admitting that they have experienced a print-related data breach.

Printer threads

Printer faces many threats and vulnerabilities. These are unauthorized changes of settings, copy internal storage, hacking on network printer. These are basically the internal attacks. For a general purpose use of network printer these are not so much harmful but physical attack may spoil the reputation and career of the employee in case of document theft [2].

Document theft

A person can simply walk over to a printer and pick up a document that belongs to someone else. The growth of network printing, combined with increased requirements for data confidentiality and regulatory compliance, has made organizations more aware of the need for document output security. Due to document theft, the person can misuse the document, photographs or any personal information. A person can use personal information and post vulgar things to social sites. For example now a day, most of organizations keep record of legal properties of employee, if this information is leaked when printing report then this may lead to a big loss.

Physically securing printers

Document theft is a kind of physical attack on printer. To secure data from damage and misuse, physically securing printer is needed. Increasing the physical security of the printer can help in preventing

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document theft or snooping. In physically securing printer strategies, one is to place printer strategically to balance ease of access and security. Place the printer in open area where document cannot be easily theft. Another one is designating separate printer for management and other sensitive departments and keeps those secure from regular employees [3]. In this case, there should be more than one printer. So this strategy is costly and need maintenance cost too. Also consider printers that can help in preventing others from document theft and its loss. In this case, use password protected printer.

Present security solutions

Each printer company provides their own way to secure data. For internal attacks (coping, hacking etc.) there are number of solutions available. Some of them are anti-coping mark, clear log, reset printer, watermark, cryptography etc. But these solutions are used only when internal attack is taking place. Password protection is the way to secure data from theft. Some networked printers let you send private print jobs to them. Brother, Xerox, and HP make some models that have this feature. To use private printing, you may have to enter a four-digit PIN when you send the print job, and then re-enter the PIN on the printer's 10-digit keypad when you reach the printer. With some machines, you must also provide the correct user name and the name of the document. As soon as it completes a private job, the printer will delete the job from its memory. Many printers today have a basic PIN code secure release printing capability built-in. Such basic print security measures can help to reduce the risk of sensitive data falling into the hands of unauthorized persons, and is a particularly cost-effective approach for small business operating a single brand device fleet [4]. In Word, Excel, or any other printable office document, there is a section in the print dialog box which tell the printer to hold off printing document till the owner reach to the printer. However, where to set this up depends on the type of printer that is being used. Here is how to set up secure printing for Xerox and HP brands.

Secure print to a xerox printer:

1. Click on the file menu and select Print.
2. Click Properties.
3. Click Paper/Output tab in properties.
4. Select Job Type combo box.
5. Under Job Type, click on the down arrow.
6. Select Secure Print in job type.
7. Click Setup.
8. Enter a 4-10 digit Secure Print Password twice. Click OK.

Secure print to a HP printer:

1. Click on the file menu and select Print.
2. Click Properties.
3. Click Job Storage tab in properties.
4. Select Job Storage Mode.
5. Under Job Storage mode, select Personal Job.
6. The Make Job Private/Secure drop-down menu is available when Personal Job or Stored Job is selected.
7. Under Make Job private, select PIN to print.
8. Enter 4 digit pin number in the box provided. Click OK.

In these solutions, first two steps are familiar with all people but remaining part of the solutions is not known by every people. Only few people or people are not aware of security strategy provided by printer manufacturing companies [5].

Proposed System

When users print confidential or private documents, it becomes necessary that no one else can take the document from the printer. The proposed security is not only for network printer but also for the printer which is nearby. Using the proposed solution the user will be able to secure sensitive information and provide privacy. The proposed printing security strategy is based on automation. Here automation for security will be provided using existing security features. Figure 1 shows the flowchart of the proposed printing security solution. Here the beginning step of printing is common to all solution. User has to click on file menu and click print or CTRL+P to print document. Instead of printing directly, an intermediate user interface for automation to secure print will be available. Using this interface, user will be able to secure print. As shown in figure at the interface level user have option to choose both securing and non-securing print [6]. If user chooses secure print then using password protection mechanism, user will print securely. Otherwise, the general printing process will take place. Figure 2 show the complete flow of proposed printing security

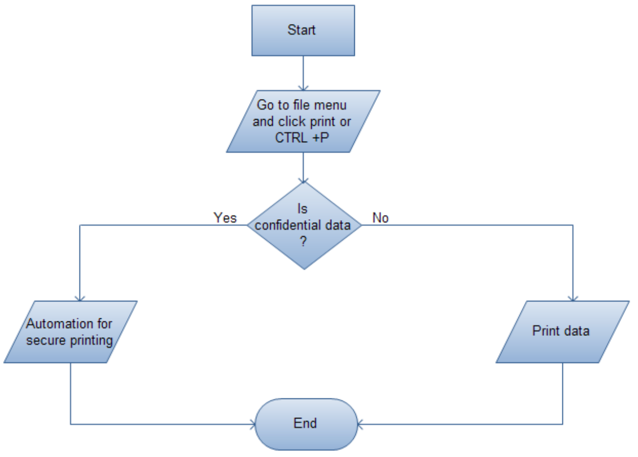
Start
Go to file menu and click print or CTRL +P
Is confidential data ?
Yes
No
Automation for secure printing
Print data
End

Figure 1: The proposed printing security solutions.

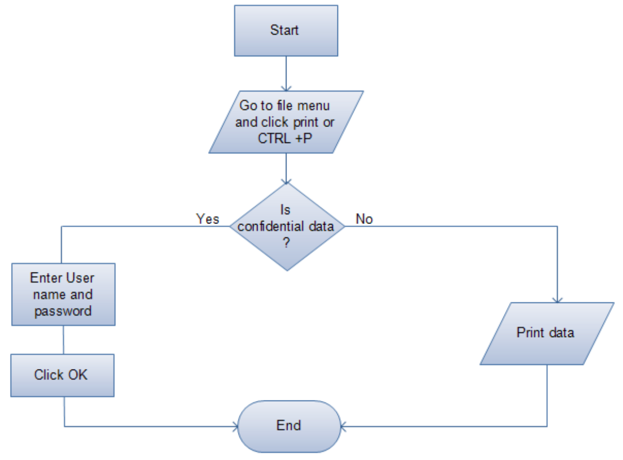
Start
Go to file menu and click print or CTRL +P
Is confidential data ?
Yes
No
Enter User name and password
Click OK
Print data
End

Figure 2: The complete proposed printing security solutions.

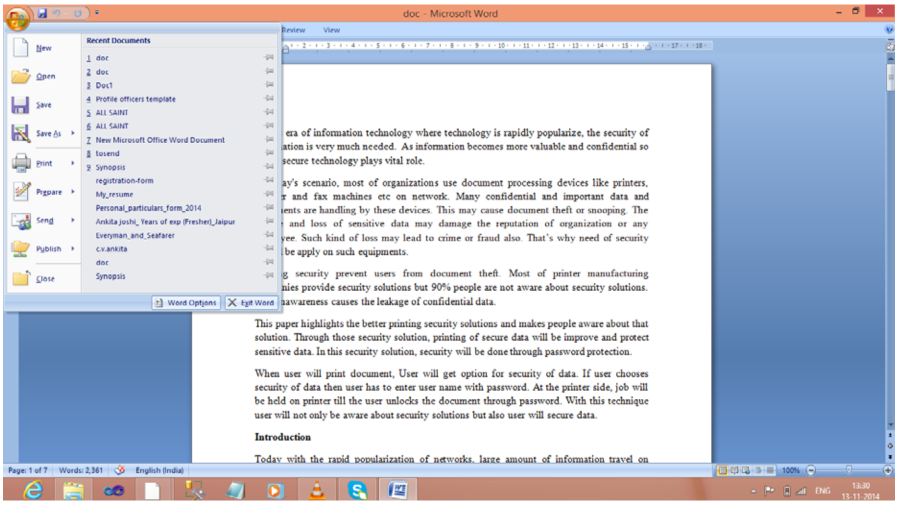

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Figure 3: Click on the file menu.

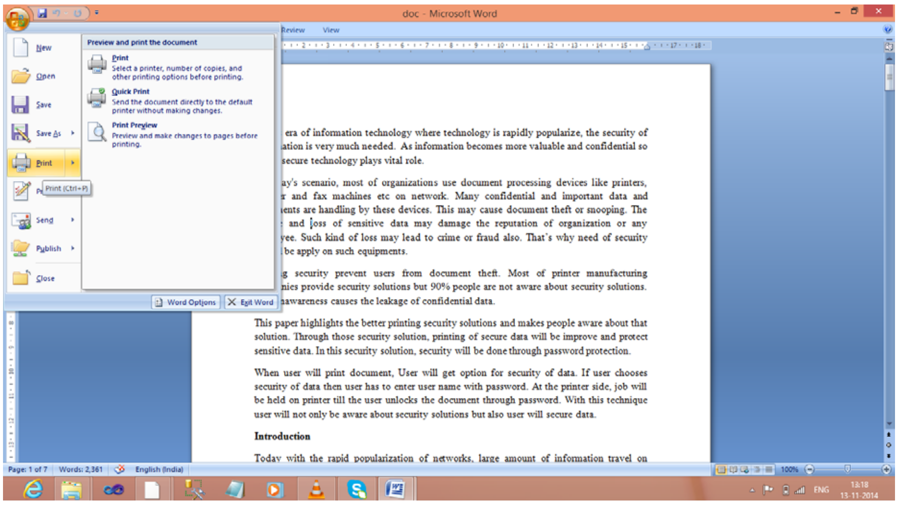
doc - Microsoft Word
Review
View
New
Open
Save
Save As
Print
Print (Ctrl+P)
Send
Publish
Close
Preview and print the document
Print
Select a printer, number of copies, and other printing options before printing.
Quick Print
Send the document directly to the default printer without making changes.
Print Preview
Preview and make changes to pages before printing.
Word Options
Exit Word
Page: 1 of 7
Words: 2,361
English (India)
100%
ENG
13:18
13-11-2014

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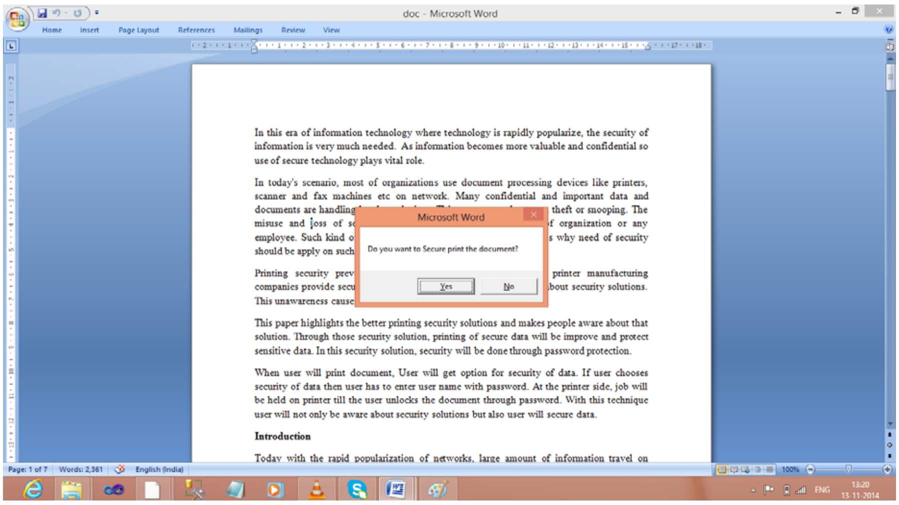
Figure 4: Select Print on file menu.



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This unawareness cause

Microsoft Word

Do you want to Secure print the document?

Yes No

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Figure 5: A dialog box will be open and it will ask user to secure print.

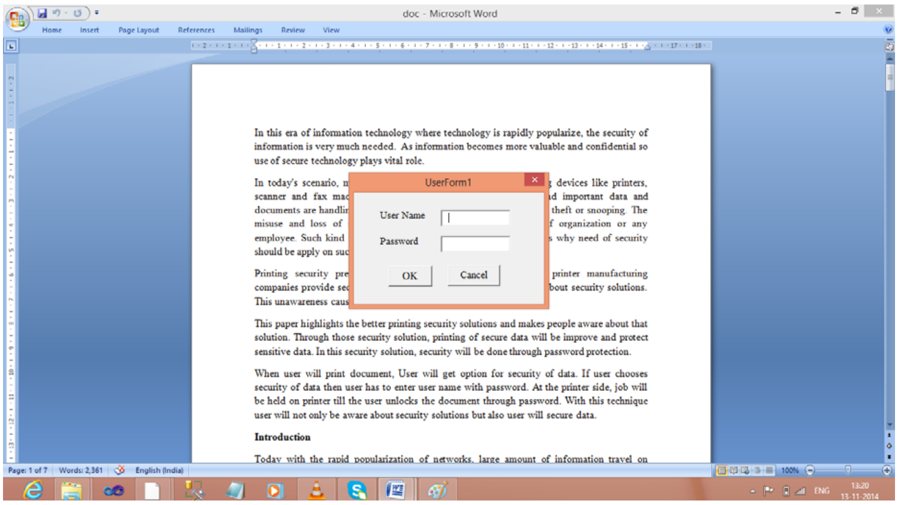

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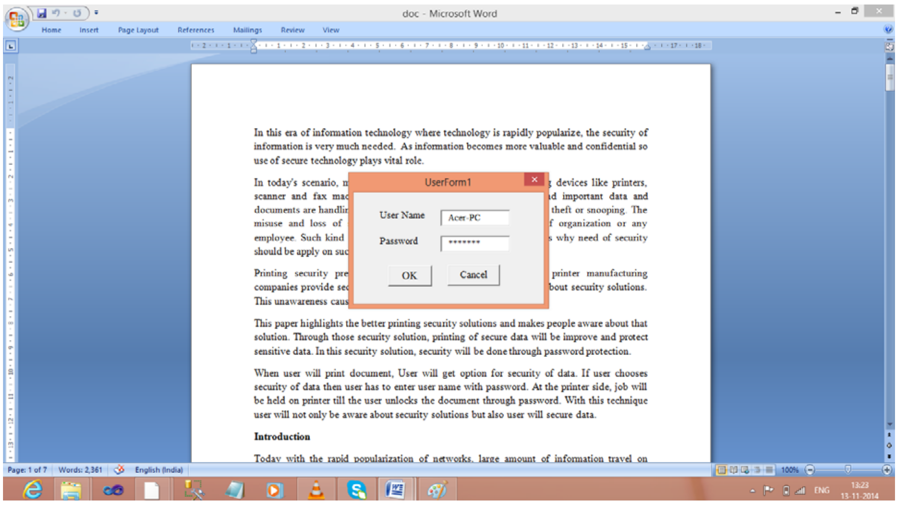
Figure 6: A password box will be available.



User Name: Acer-PC

Password: *******

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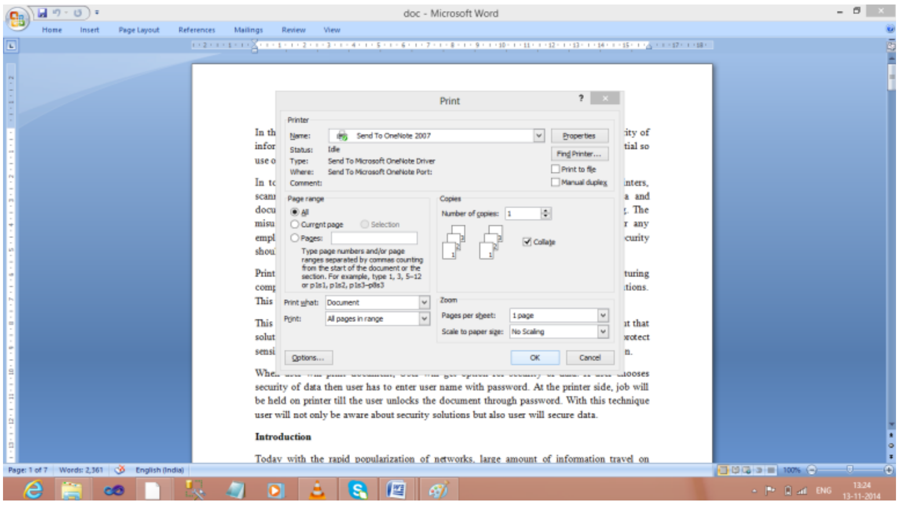
Figure 7: Enter pin number in the box provided. Click OK.



Printer

Name: Send To OneNote 2007

Status: Idle

Type: Send To Microsoft OneNote Driver

Where: Send To Microsoft OneNote Port:

Comment:

□ Print to file

□ Manual duplex

Page range

● All

○ Current page ○ Selection

○ Pages:

Type page numbers and/or page ranges separated by commas counting from the start of the document or the section. For example, type 1, 3, 5–12 or p1s1, p1s2, p1s3–p8s3

Copies

Number of copies: 1

☑ Collate

Print what: Document

Print: All pages in range

Zoom

Pages per sheet: 1 page

Scale to paper size: No Scaling

In th … ity of
infor … tial so
use o

In to … inters,
scann … a and
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Figure 8: Properties window will be open. Click Ok.

solution. Here the automation for printing security will be done by the password protection mechanism. A user interface having user name and password will be open and user will fill password and click ok to secure the printing mechanism.

Secure print using proposed solution:

1. Click on the file menu (Figure 3)
2. Select Print on file menu (Figure 4)
3. A dialog box will be open and it will ask user to secure print (Figure 5)
4. Choose yes or no from dialog box.
5. If YES is selected.
6. A password box will be available (Figure 6)
7. Enter pin number in the box provided. Click OK (Figure 7)
8. If NO is selected.
9. Properties window will be open. Click Ok (Figure 8)

As the proposed printing security strategy is based on resource sharing, so single printer will be used for both general and confidential data. Use of single printer will be cost effective and if there is single printer so maintenance cost of single printer will be less. Thus, it is cost effective and less maintenance [7].

Objective

The main objective of printing security is to provide the security solution to enhance security solution for general people and to aware the people about security regarding issues.

The objectives are

- Securing networked devices against misuse and compromise by unauthorized users.
- Enhancements of existing security solutions.
- Print confidential documents without the risk of having them picked up or seen by other employees.
- Control device output.
- To make people awareness about printing threat.

Benefits

These are the benefits of proposed printing security strategy:

- **User friendly:** In the proposed solution, an intermediate interface will be provided that will be for automation. So that user can use with ease.
- **Automation for secure print:** Here the automation for secure print will be provided using existing strategy of printing. No need of complex operations/ steps.
- **Privacy:** As secure printing strategy is used, so it will provide privacy.
- **Resource sharing:** Single printer is used for both general and confidential data printing.
- **Cost saving:** Use of single printer makes the strategy cost effective.
- **Less maintenance:** The maintenance cost of single printer is very less because it only require to recover or clean of single printer.
- **People awareness:** The intermediate interface will make it user friendly. So maximum people will be aware of this strategy and secure print.

Conclusion

As organizations increase their use of information technology in their modern office, the use of shared network environment becomes more common. Due to rapid popularization of such environment, the risk of documents fallings into the wrong hands is heightened. The proposed print security strategy provides the solution to secure documents from the unauthorized access and misuse. The proposed approach will be used to minimize the potential data loss through theft and to make the people awareness of printing threats. As a resultant we will get that instead of 9%, 90% people will be aware of secure printing strategy and will use the secure printing.

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