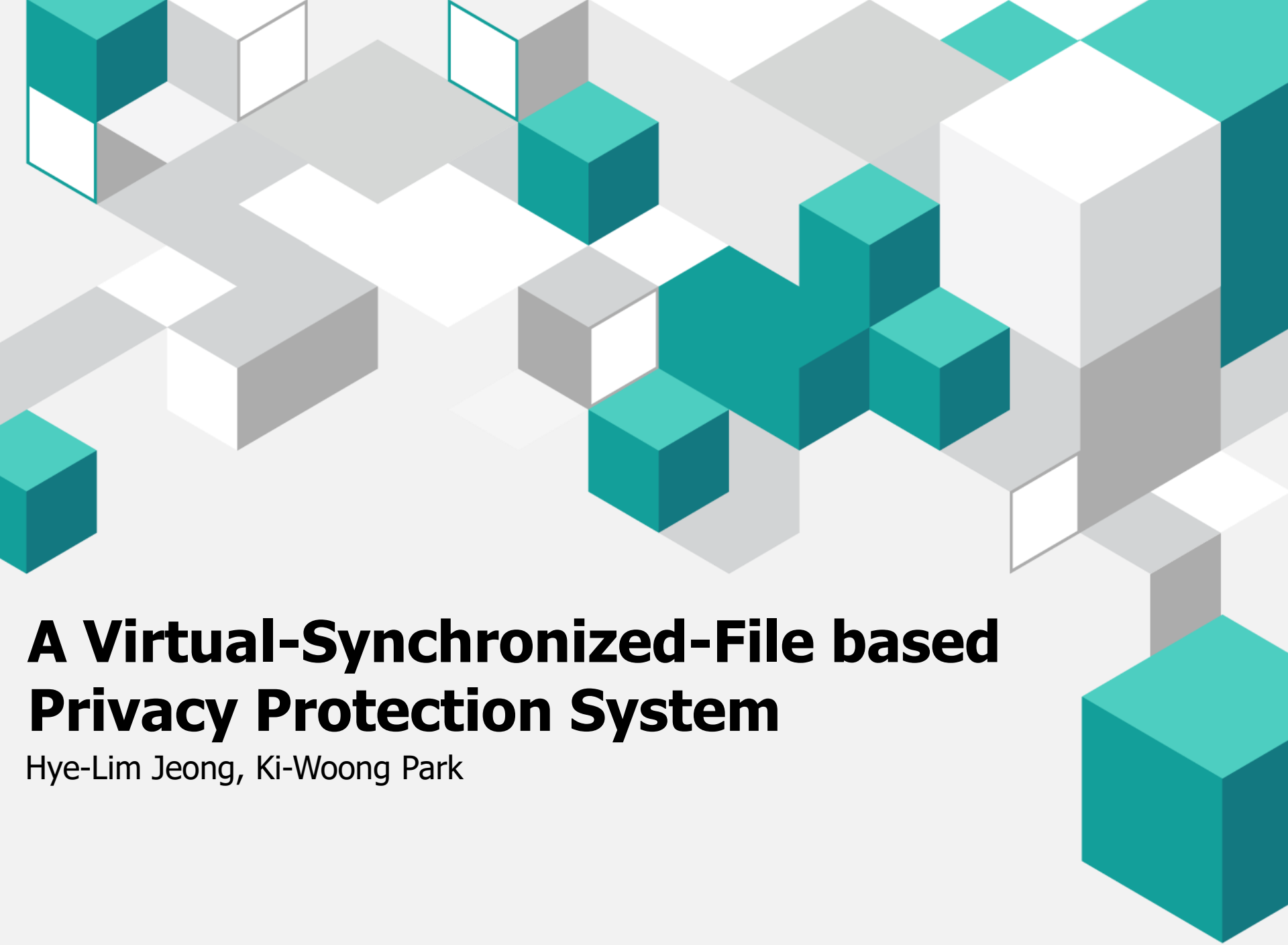

A Virtual-Synchronized-File based Privacy Protection System

Hye-Lim Jeong, Ki-Woong Park

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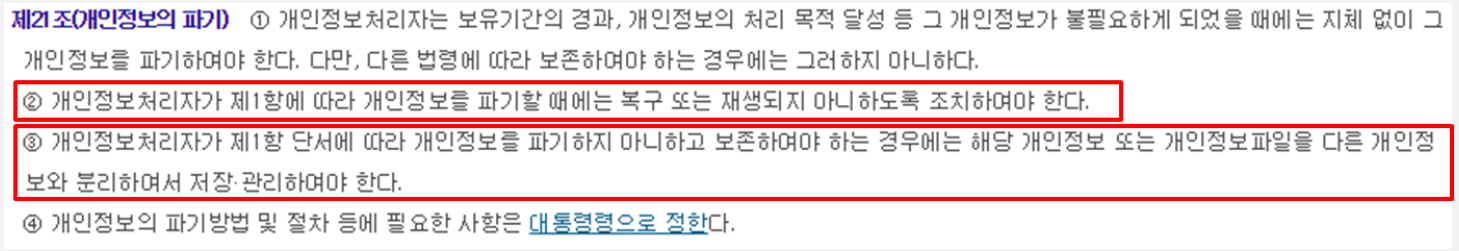
Problems

Introduction

- About thousands of personal information leak of Korea are hacked every year..
- There are revised personal information security acts as follows.
  - **To permanently delete** the documents.
  - **To separately store** the documents at server.



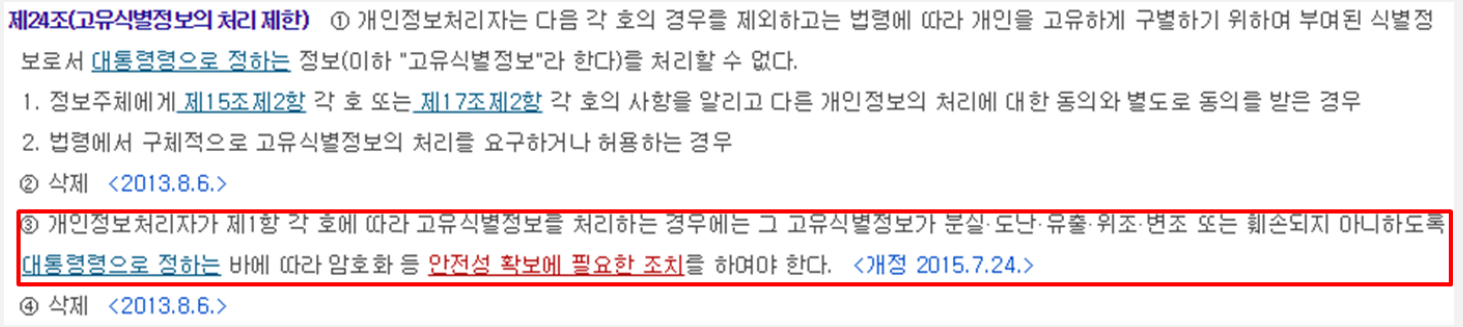
제21조(개인정보의 파기) ① 개인정보처리자는 보유기간의 경과, 개인정보의 처리 목적 달성 등 그 개인정보가 불필요하게 되었을 때에는 지체 없이 그 개인정보를 파기하여야 한다. 다만, 다른 법령에 따라 보존하여야 하는 경우에는 그러하지 아니하다.

② 개인정보처리자가 제1항에 따라 개인정보를 파기할 때에는 복구 또는 재생되지 아니하도록 조치하여야 한다.

③ 개인정보처리자가 제1항 단서에 따라 개인정보를 파기하지 아니하고 보존하여야 하는 경우에는 해당 개인정보 또는 개인정보파일을 다른 개인정보와 분리하여서 저장·관리하여야 한다.

④ 개인정보의 파기방법 및 절차 등에 필요한 사항은 대통령령으로 정한다.

  - **To encrypt** each documents.



제24조(고유식별정보의 처리 제한) ① 개인정보처리자는 다음 각 호의 경우를 제외하고는 법령에 따라 개인을 고유하게 구별하기 위하여 부여된 식별정보로서 대통령령으로 정하는 정보(이하 "고유식별정보"라 한다)를 처리할 수 없다.

1. 정보주체에게 제15조제2항 각 호 또는 제17조제2항 각 호의 사항을 알리고 다른 개인정보의 처리에 대한 동의와 별도로 동의를 받은 경우
2. 법령에서 구체적으로 고유식별정보의 처리를 요구하거나 허용하는 경우

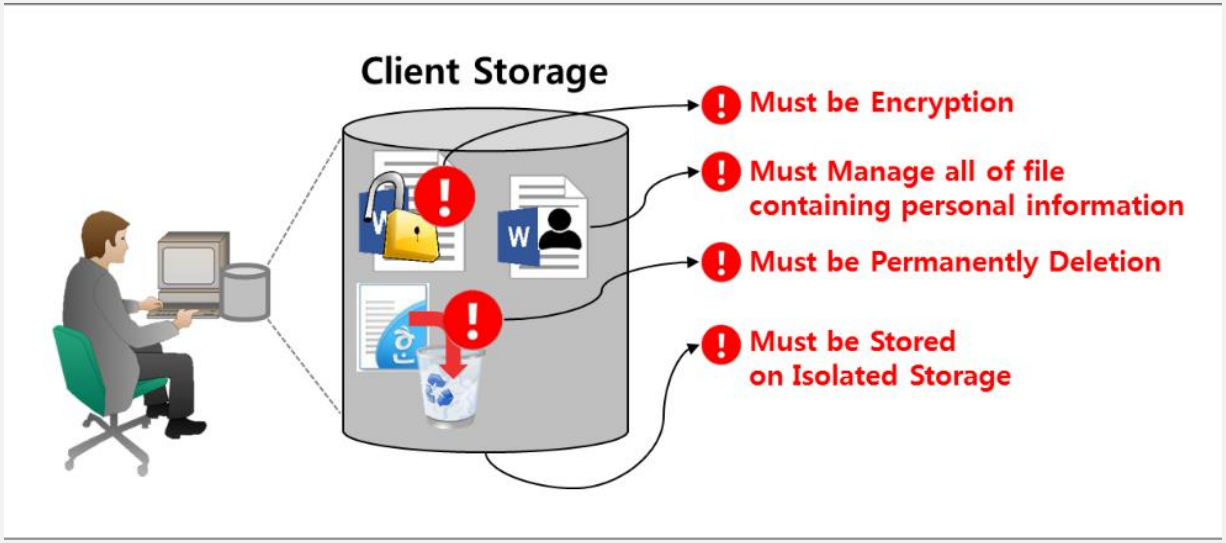
② 삭제 <2013.8.6.>

③ 개인정보처리자가 제1항 각 호에 따라 고유식별정보를 처리하는 경우에는 그 고유식별정보가 분실·도난·유출·위조·변조 또는 훼손되지 아니하도록 대통령령으로 정하는 바에 따라 암호화 등 안전성 확보에 필요한 조치를 하여야 한다. <개정 2015.7.24.>

④ 삭제 <2013.8.6.>

Problems

Introduction



(a)

A user have to **what to do for complying with the personal information protection law.**

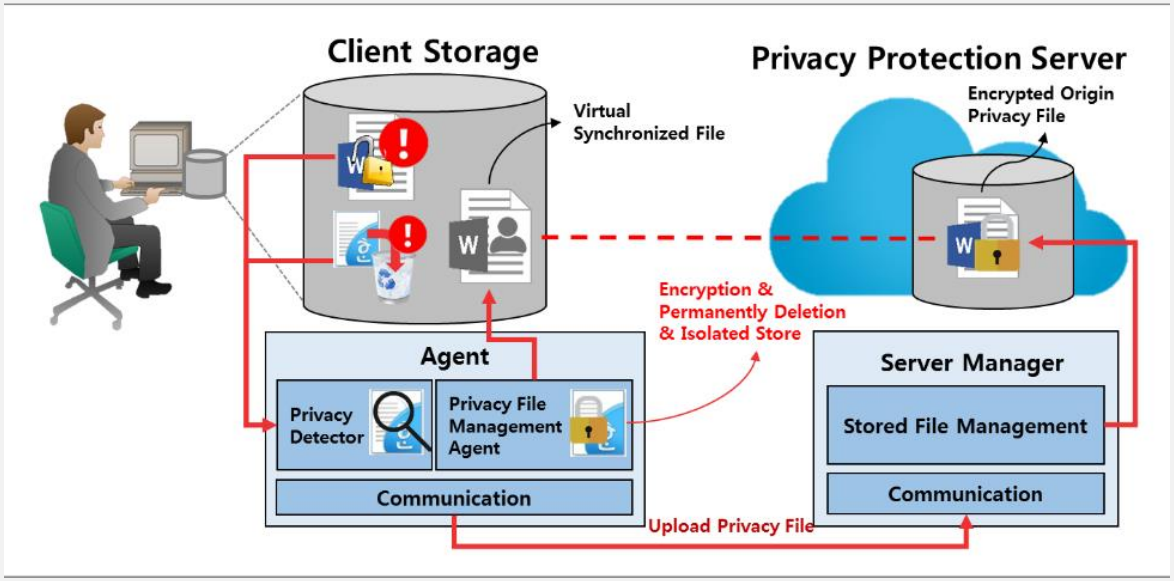
- A user **have to encrypt** all of file containing personal information.
- A user **have to delete** in an unrecoverable manner.
- The file **have to be stored** on an isolated storage.

Main contribution

- We proposed an **automated privacy protection system** to comply with the laws automatically.
- The proposed privacy protection system enhanced with **'Virtual Synchronized File(VSF)'.**
- The system is able to conserve client's storage space by **replacing the original file to 1KB size VSF file**

(regardless of size of original file).

Overall System Design

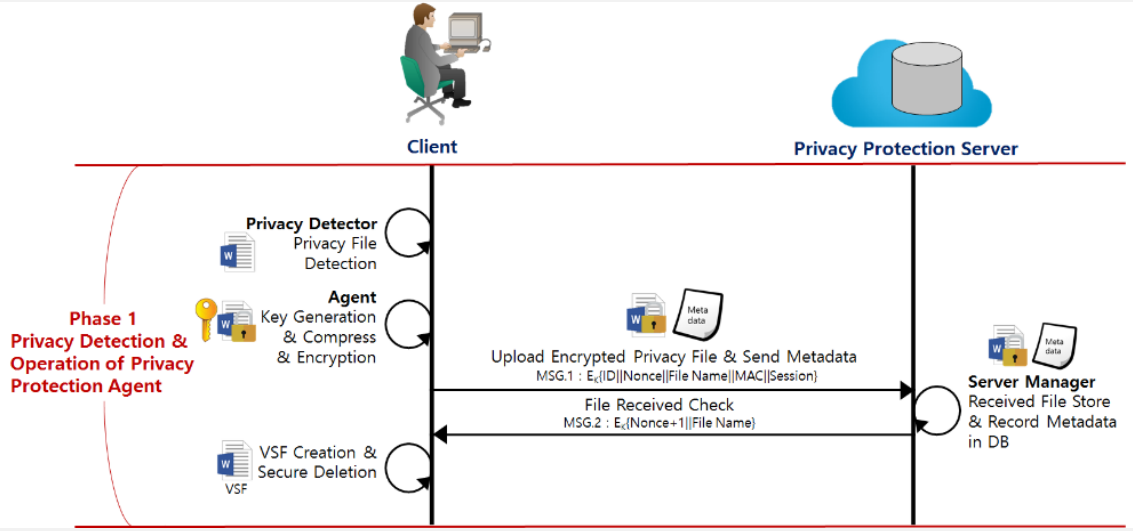


(b)

- **VSF manages file containing the personal information.**
- A user can open **the VSF like a normal data file.**
- VSF gives users **a transparent user experience.**

Overall Operation Flow of Privacy Protection System

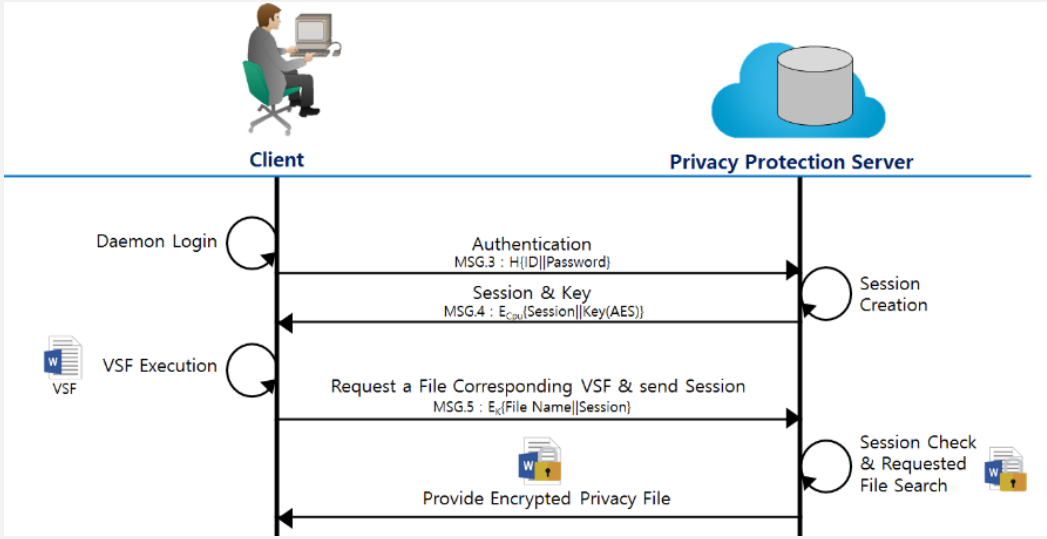
Operation flow for privacy detection and VSF creation



1. **Privacy detector detects file** containing personal information.
2. **Privacy Protection agent** performs operation to comply with the laws.
   ①Key generation for file encryption ②Compression ③Encryption
3. **Agent upload the encrypted file to privacy protection server.**
4. Agent **creates VSF** and **deletes the data region of the original file.**

Overall Operation Flow of Privacy Protection System

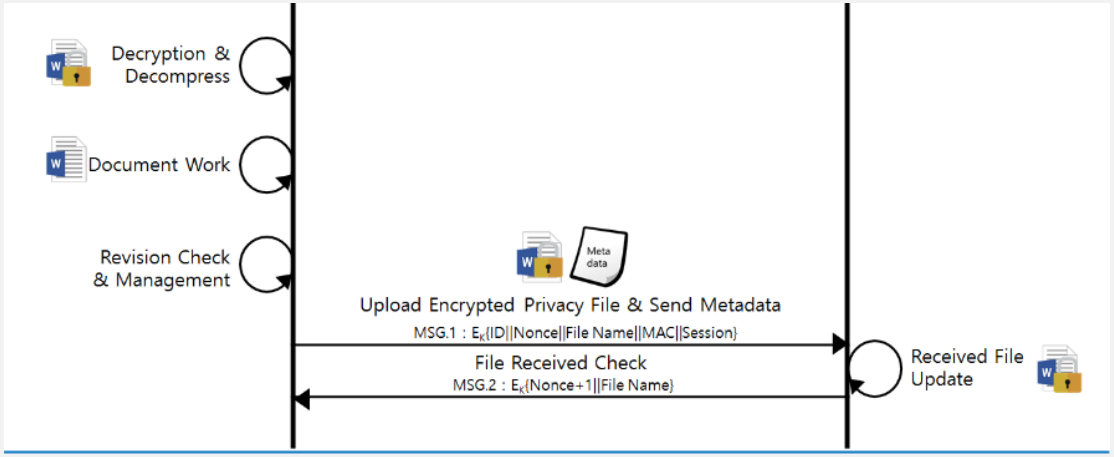
Operation flow of VSF execution



1. A user **login Daemon.**
2. Privacy protection server **checks client's session.**
3. A user **executes VSF.**(Agent requires a encrypted file.)
4. Server **provides the file** to client.

Overall Operation Flow of Privacy Protection System

Operation flow of VSF execution



4. **Received file is decrypted and is decompressed** from agent.
5. **A user is able to work on the document.**
6. After document work is finished, **Agent check whether the opened file has been modified or not.**
7. If the file is modified, **Agent updates** the file stored at server.

①Key generation for file encryption ②Compression ③Encryption

Conclusion

- We proposed an **automated privacy protection system** to comply with the laws automatically.
- A proposed privacy protection system enhanced with **‘Virtual Synchronized File(VSF)’.**
- VSF is efficiency because **VSF equally has 1KB size regardless of size of original files.**

Thank you