



Successful businesses today are the sum of integrated groups of people that work together to achieve the company's goals. In today's organizations, regardless of their size, communication between people and departments is a priority. Equally important is the method an organization uses to manage and distribute its own information. Reliance on electronic information has grown massively in the past 20 years and information management processes and solutions are vital for the success of the organization.

Electronic messaging has become an essential part of the corporate business environment, for some companies this is their primary means of communication. Electronic messaging is so important, in fact, that if a simultaneous telephone and email outage occurred, many companies would want their email service restored first.

A number of software vendors have developed messaging applications over the years. This month's technical article focuses on one—Microsoft Outlook and the Personal Folder Information Store files it uses. We will look at how they work internally, common data loss scenarios, and why Ontrack is the recovery solution for data loss involving archived messages.

## 1. Overview of Microsoft Personal Folder Information Store

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Microsoft Outlook is designed around the Messaging Application Programming Interface (MAPI) which provides the foundation for message data organization. This library is used for receiving raw message data.

There are four message storage providers within the Microsoft messaging environment. ([A previous Ontrack newsletter article dealt with Microsoft Exchange message server](#))

### From the Server Application

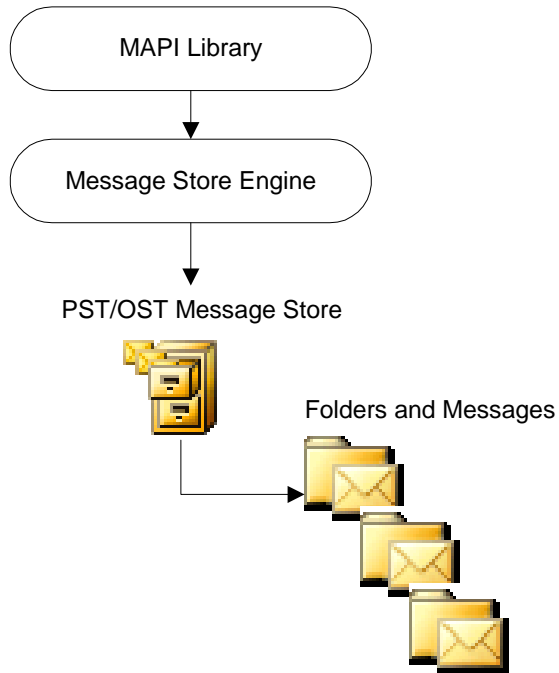
- Public Information Store – stores public folders, contains information to be shared between users
- Private Information Store – stores mailboxes for users, contains information to be secured from other users

### From the Client Application

- Personal Folder Information Store (PST)  
This is the file where the Microsoft Exchange server delivers messages.
- Offline Personal Folder Information Store (OST)  
An information store that is used to store folder information that can be accessed offline.

# Ontrack **DataRecovery**

MAPI, the communication protocol, is a library of instructions on how to process message data. MAPI handles the message data and then transfers the information to the message store provider. The message store engine puts the message data inside of the PST/OST file.



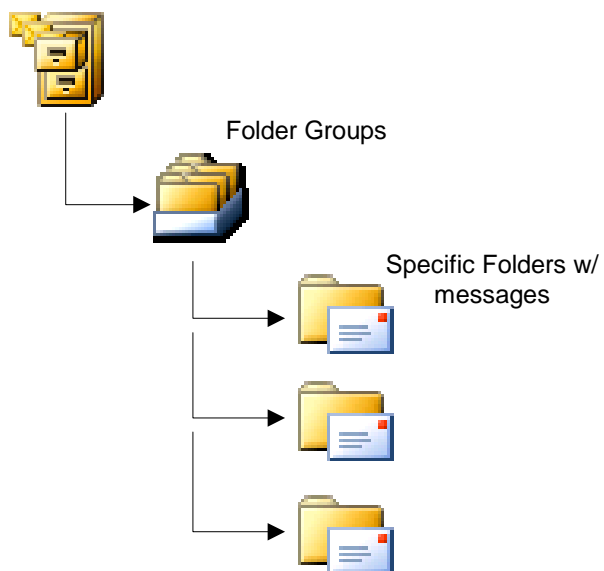
MAPI could be compared to a hotel's concierge – just as the concierge receives new guests and manages existing hotel guests, so MAPI receives new messages and manages existing messages. A hotel concierge is also the contact for requests and information. Similarly, MAPI interacts with back-end message organization for requests such as sorting by date or sender. MAPI is also the central interface for all the information associated with individual message data.

## 2. Complexity Built-In for Storage Integrity

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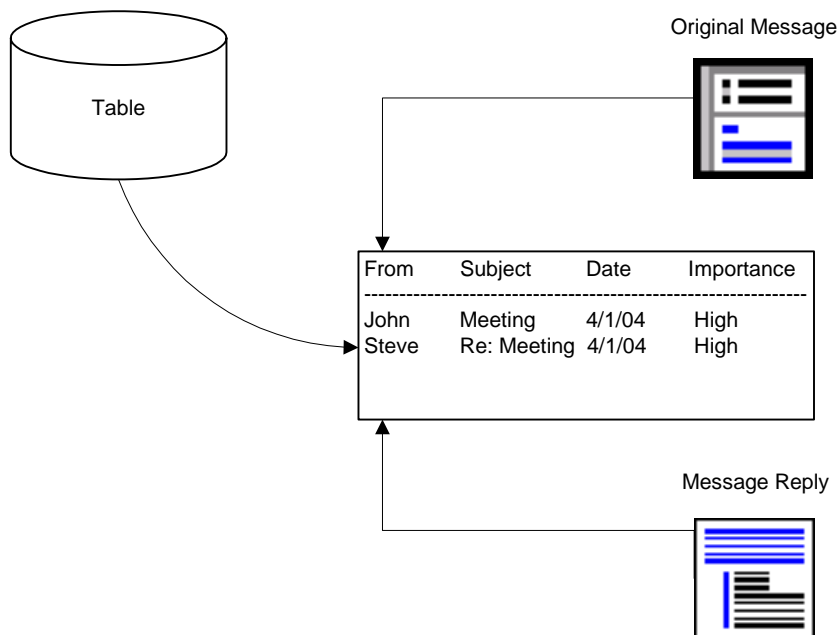
PST/OST file formats are very complex and the file is designed around relational database concepts. The PST/OST file organizes message information into a hierarchical system using folder groups and specific user folders to define each of the multiple levels that are possible within the file.

PST/OST Message Store



Interestingly, the way you see your message information is not how it is stored inside of the file. Outlook uses a standard form or interface to present the message data to you.

The MAPI library contains specific definitions for the database tables that store your messages. There are many, many tables within a PST/OST file. Here is a simplified example of the relationship between the displayed information and stored information:



In this particular example, there are only four pieces of information about each message and there are only two messages in this table. On a production Outlook PST file, there is more information stored from each message. Additionally, each table would correspond to a folder and there would be many messages in that table.

The list of MAPI tables is too long to list here; however, these internal storage mechanisms all work together in a seamless fashion to store your electronic messages.

This level of complexity is built-in for data organization and speed. PST files are always growing due to the streaming messages that are being received. Appreciating the intricate nature of these files and protecting your PST/OST files are important to avoiding a data disaster.

There are many types of data loss situations. PST/OST files are just one of many file types that can be affected. What can you do to minimize data loss if a disaster happens to you or your client?

### 3. When Disasters Happen

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Data disasters happen every day, what are the most common types of data loss situations?

Ontrack has been in the business of recovering data for nearly 20 years and we have seen all types of data loss. Categorically, data loss falls under one or more headings. Those are: physical device failure, logical file system errors, internal file data corruption, and human error.

#### **Physical Failure**

What steps should be taken if the data loss is a physical problem with the hard drive?

1. If you hear strange noises (such as grinding, clicking, or screeching noises), do not attempt to restart the machine. This can cause further damage. Call Ontrack for data recovery.
2. If the hard drive does not spin up do not attempt to force the drive to start, this may produce internal damage. Call Ontrack for data recovery.
3. If the hard drive has been in a flood or experienced water damage do not dry out or start up. Keep the drive moist and send it to Ontrack immediately.
4. If the hard drive has been in a fire, put the drive in a sealable plastic bag with a moist paper towel. Send it to Ontrack immediately.

#### **File System Errors, File Corruption, and Human Error**

What steps should be taken if the data loss is a logical file system problem or if files were deleted?

1. If the operating system starts up but you cannot find your data, turn off the computer without shutting down normally. This will avoid further data loss. Call Ontrack immediately.
2. If the computer starts but the operating system fails, call Ontrack. Do not reinstall or use a 'Restore CD' or 'System Rescue' CD supplied by the OEM, this will overwrite your data.
3. If files have been deleted, do not restore backup data to the machine that has lost the data. Call Ontrack for recovery.
4. If a user profile has been deleted, do not log into the domain/network or original user data will be overwritten. Call Ontrack for recovery.
5. If the problem is internal file corruption, do not attempt to repair the file without first backing up the data.

Data disasters can be as complex as hard drive failures and file system errors. Or data disasters can be straightforward such as critical files being deleted by mistake, a user's profile being replaced, or the user's operating system being reinstalled.



#### 4. Ontrack: The Solution Provider

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Ontrack is your premier data recovery company. This means that we find multiple ways to get your information available. Outlook PST/OST recoveries are an excellent example of this. **Even in situations where the drive has been reformatted, Ontrack can get back PST/OST data.** There have been recent recoveries where the data loss was so severe that original file system did not point to the user's Outlook PST file. Ontrack's team of recovery engineers was able to find important message data with thousands of messages made available for the client.

Data recovery is more than getting hard drives to operate, running generic recovery tools, and hoping for a good recovery. Ontrack ensures quality recoveries by thoroughly researching and developing data recovery tools for in-lab and remote service. In the case of PST/OST recoveries, Ontrack has invested in research and development to produce a suite of tools that will recover message data from these files.

Ontrack's expertise and knowledge in all types of recoveries proves that Ontrack is the market leader in data recovery. If you find that you, your users, or your client's users are having a data disaster, don't panic, Ontrack is here to help.

## 5. Tips

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Tips from MS about PST archiving

- [Outlook Personal Folder Backup Add-in](#)
- [Copy Outlook Folder Structure to another computer](#)
- [More information about data files](#)

Understanding Disk Defragmentation

- [Disk fragmentation overview](#)

Disaster Recovery suggestions

- [Disaster Recovery for Microsoft Exchange 2000 server](#)

Email Recovery

- [Ontrack's Solutions for Email Recovery](#)

## 6. Reference

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Source material – MSDN references

- [MAPI Programming Basics](#)
- [Developing a Message Store Provider](#)

Public Information Store ([Link to Definition](#))

Private Information Store ([Link to Definition](#))

Personal Folder Information Store (PST) ([Link to Definition](#))

Offline Personal Folder Information Store (OST) ([Link to Definition](#))

## 7. Suggested reading

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- [Exchange market placement 2004 -2006 – \(Actual Report here\)](#)