stellar

BEST PRACTICES GUIDE FOR
MICROSOFT EXCHANGE SERVER
DATABASE CORRUPTION PROBLEMS

STELLAR WHITE PAPER | DECEMBER 2018

CONTENTS

INTRODUCTION

EMAIL IS THE BACKBONE OF EVERY ORGANIZATION

Though other forms of communication such as social media and instant messaging have emerged, email continues to dominate the communication sphere because it is convenient for business communication and it has also become an essential way to access a range of online services, from shopping to banking.

Radicati, a technology market research firm based in California, estimates that by the end of 2019, 3.9 billion people are expected to use emails for communication, and this represents over one-half of the world population. This number is expected to increase to four billion in 2020 and 4.2 billion by 2021 respectively. This represents a steady growth of three percent every year.
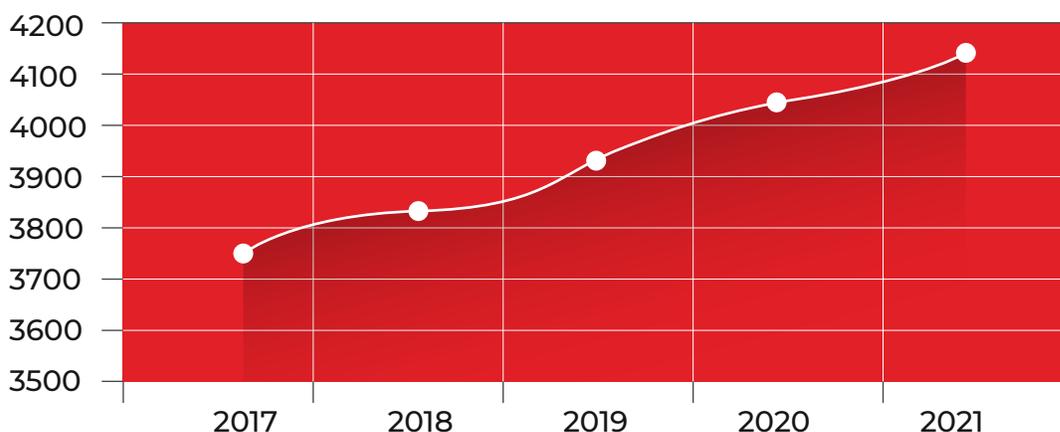
EMAIL USAGE (YEAR-WISE)

Also, it is estimated that the world will send and receive more than 269 billion emails every day by 2019.

These statistics clearly show that email use is growing by the day as an important means of personal and business communication. Further, many studies assert that business emails account for the bulk of all emails sent and received.

The table below gives a glimpse of the average number of emails that every business user sends and receives in a day, including projections for 2019.
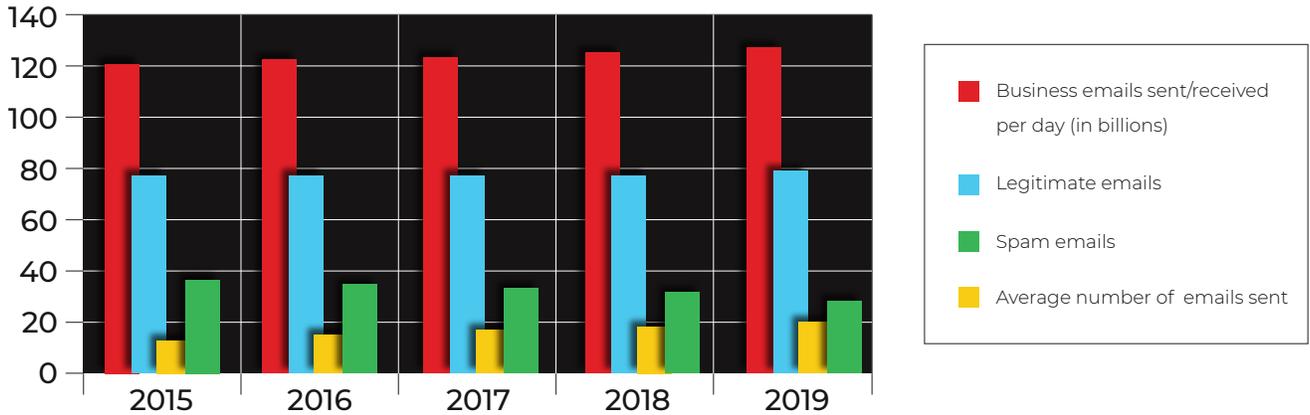
This chart clearly shows that business emails have not decreased over the last few years and is unlikely to decrease in the near future too. This makes emails an asset and the infrastructure that handles it becomes a critical resource, from an organization's point of view.

Business emails are likely to be a potent tool for marketing as well because it offers a better return on investment (ROI) when compared to other channels. Here is a study conducted in 2018 that shows the effectiveness of different digital marketing channels.
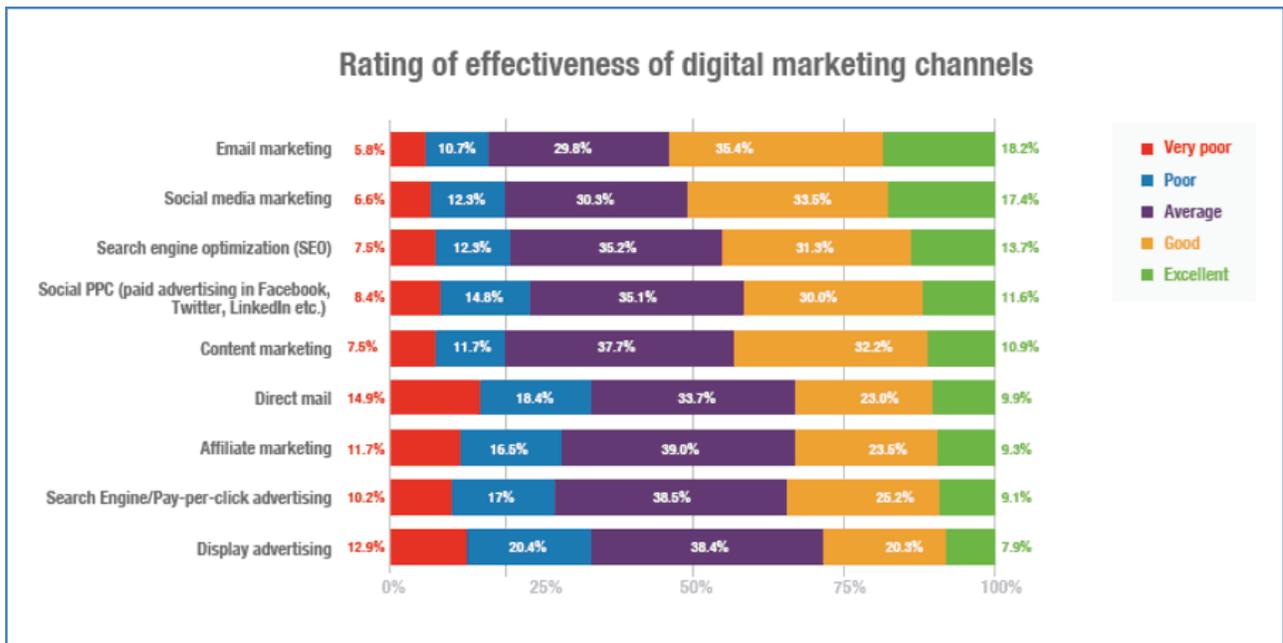

Source: Versatile

Many studies show that emails, especially newsletter, have one of the highest impacts in marketing campaigns.

All these numbers affirm to the fact that email is an indispensable medium of communication and is going to remain at the top for many years to come. Hence, the organization should take measures to protect the infrastructure and resources surrounding emails.

NEED FOR EXCHANGE SERVER

To sustain this email growth, a good mail server is the key. One of the most popular and widely used mail server today is Microsoft's Exchange Server.

COMPONENTS OF AN EXCHANGE SERVER

Broadly speaking, the functionality of Exchange server can be divided into three components - mail server, calendaring software and contact manager.

MAIL
SERVER

CONTACT
MANAGER

CALENDARING
SOFTWARE
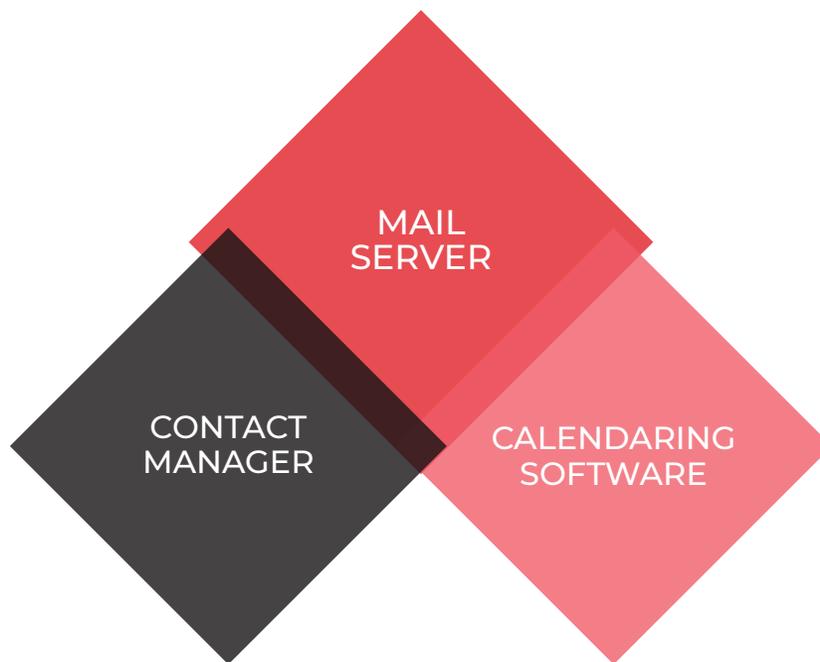
Mail server component acts as the communication medium between the sender and receiver. These emails are stored by Exchange in a database called the Exchange Database (EDB).

Calendaring software allows users to set up meetings and send reminders through emails. Finally, Contact Manager uses an efficient algorithm to store the email addresses of all employees within the organization, so you can quickly access the information of any contact.

These components clearly make Exchange Server an integral and a critical asset for any organization.

Other reasons to use Exchange are:

- Enables email to be delivered directly to a server.
- Centralizes emails, so they can be backed up easily.
- Proactively protects communications using built-in defenses against spam, virus and other kinds of security attacks
- Multi-layered anti-spamming filters help to identify important email from spam.
- Calendar sharing among colleagues helps everyone to stay organized and productive.
- Out-of-the-office replies keep everyone informed when a user is not at work.
- Advanced security settings that protect confidential emails.
- Web-based support to access emails from anywhere.
- Well-developed search feature makes it easy to find any information.
- Exchange server add-ins offer exceptional levels of flexibility and customization.
- Allows the collaboration of critical documents.

CHALLENGES FACED BY AN ORGANIZATION WHEN AN EXCHANGE SERVER DOES NOT WORK

Since Microsoft Exchange is a critical tool for every organization, many challenges come up when the Exchange server goes down. Some of the challenges are:
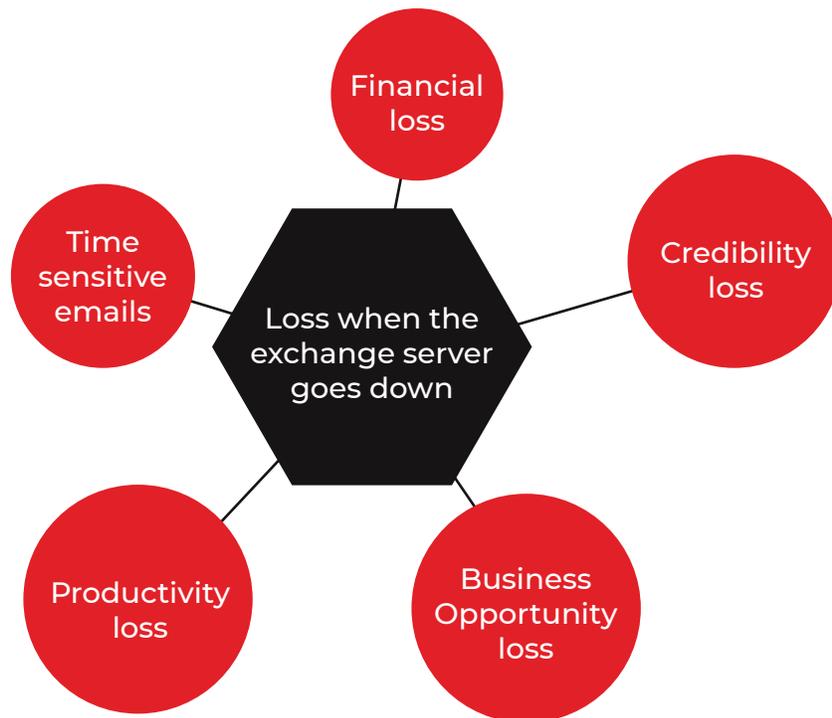
LOSS OF PRODUCTIVITY

When employees are unable to communicate well, it can result in substantial loss to the organization. This loss is further compounded when teams are spread across different locations and if they rely mainly on email for communication.

TIME-SENSITIVE EMAILS

Many network-related alerts are sent through emails. If your Exchange server is down, these time critical emails are not delivered and in turn, it can exacerbate the vulnerability. In some cases, it could even lead to an attack, if the problem is not fixed right away.

LOSS OF CREDIBILITY

Organizations may end up losing clients if their emails are not answered in a timely manner, due to problems in Exchange Server. It also leads to loss of credibility among clients and employees when Exchange Server is down for long periods of time.

Research shows that businesses **lose 22% of their revenue** when potential customers hear or find a negative review. In addition, a bad reputation costs a company at least 10% more for every person they hire.

BUSINESS OPPORTUNITY LOSS

Problems in exchange server can lead to business opportunity loss as well. Let's say, you have to send a tender to bid for a project and your exchange server is down. You will not be able to send it within the deadline and this may cause you to lose the project itself.

Such occurrences are more common than you expect and could lead to serious damage in your business image as well as to your growth and revenue.

FINANCIAL LOSS

One of the biggest and most profound problem for any organization is financial loss. Frequent problems in Exchange Server can lead to productivity loss, loss of credibility and more. Over time, this could multiply the financial loss and can greatly reduce the credibility among different stakeholders, thereby compounding the negative financial impact.

AVERAGE COST OF UNPLANNED DATA CENTER OUTAGES FOR NINE CATEGORIES
Computed from 41 benchmarked data centers

Category	Cost
Business disruption	$179,827
Lost revenue	$118,080
End-user productivity	$96,226
IT productivity	$42,530
Detection	$22,347
Recovery	$20,884
Ex-post activities	$9,537
Equipment costs	$9,063
Third parties	$7,008
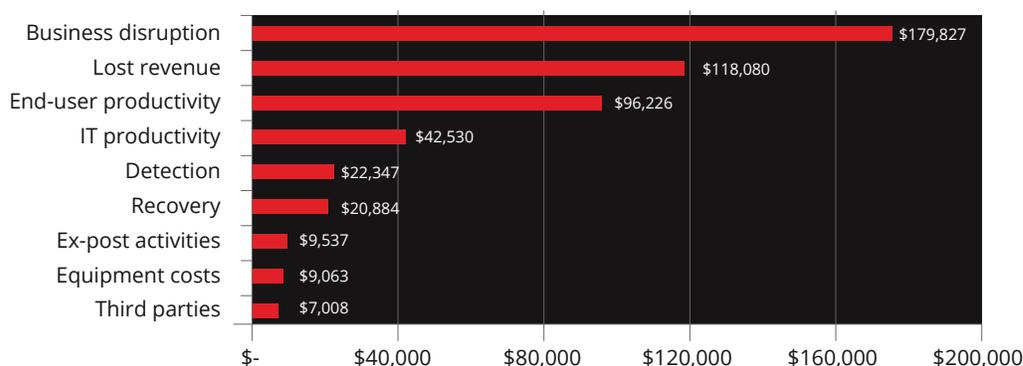
To avoid these losses and problems, it's best to have an alternate plan for Exchange Server problems.

EXCHANGE SERVER DATABASE CORRUPTION

One of the most common Exchange Server problems, and the one that this whitepaper will focus on, is server database corruption. This is a critical issue that will prevent users from accessing their mailbox. In fact, the Exchange Server will not mount at all in the first place, if there is a database corruption.

REASONS FOR DATABASE CORRUPTION

There are many reasons for database corruption and here are some of the important ones.

HARDWARE PROBLEMS

Using faulty or substandard hardware is a common cause for database corruption. Exchange data that gets stored in any of the bad sectors of the hard drive becomes inaccessible. Also, hardware problems such as motherboard failure and overheating can damage the hard drive in which Exchange database is stored.

SOFTWARE AND SERVER ERRORS

Sometimes, errors in software or the server itself can cause Exchange database corruption. Processor failure, OS stop error and communication issues are some of the factors that could lead to database corruption.

MALWARE

Malware attacks can have serious consequences for Exchange. In the past, major malware attacks have caused boot failures, system services termination and more. Such attacks and their consequences cause Exchange database corruption, and in many cases, all the data is lost unless they are in a backup drive.

POWER FAILURES/ACCIDENTAL SHUTDOWNS

At times, the system shuts down due to power failures or user errors. As a result, Exchange Information Store also shuts down without committing transactions to the database. The Exchange Information Store stores all transactions in a cache and commits to the database in bulk. When the system shuts down accidentally, the transactions that are stored in a cache are not committed to the database and this leads to data inconsistencies.

ANTI-VIRUS PROGRAMS

Anti-virus programs, especially those that are not Exchange Server compatible, cause problems while scanning for files and directories. This issue is more common among file-level anti-virus programs that block log files and Exchange database files, thereby leading to corruption.

ADMINISTRATOR ERRORS

In some cases, user errors are the cause of database corruption. Deleting files accidentally, stopping Microsoft Exchange Information Store Services, dismounting databases and deleting mailboxes or transaction files are some administrator errors that cause database corruption.

EXCESS GROWTH

When the database grows beyond the limits mentioned in the registry, the store dismounts. Though it sends an alert message to users, the database may be corrupted due to this excessive growth. In some cases, the database could even be lost forever.

SCHEDULING CLASH

When the scheduled maintenance of the database and the backup process coincide, it invariably throws an error. Sometimes, the database can get corrupted too in such conflicts.

INFORMATION STORE SERVICE PROBLEMS

The chances for database corruption is high when the Information Store service fails to start.
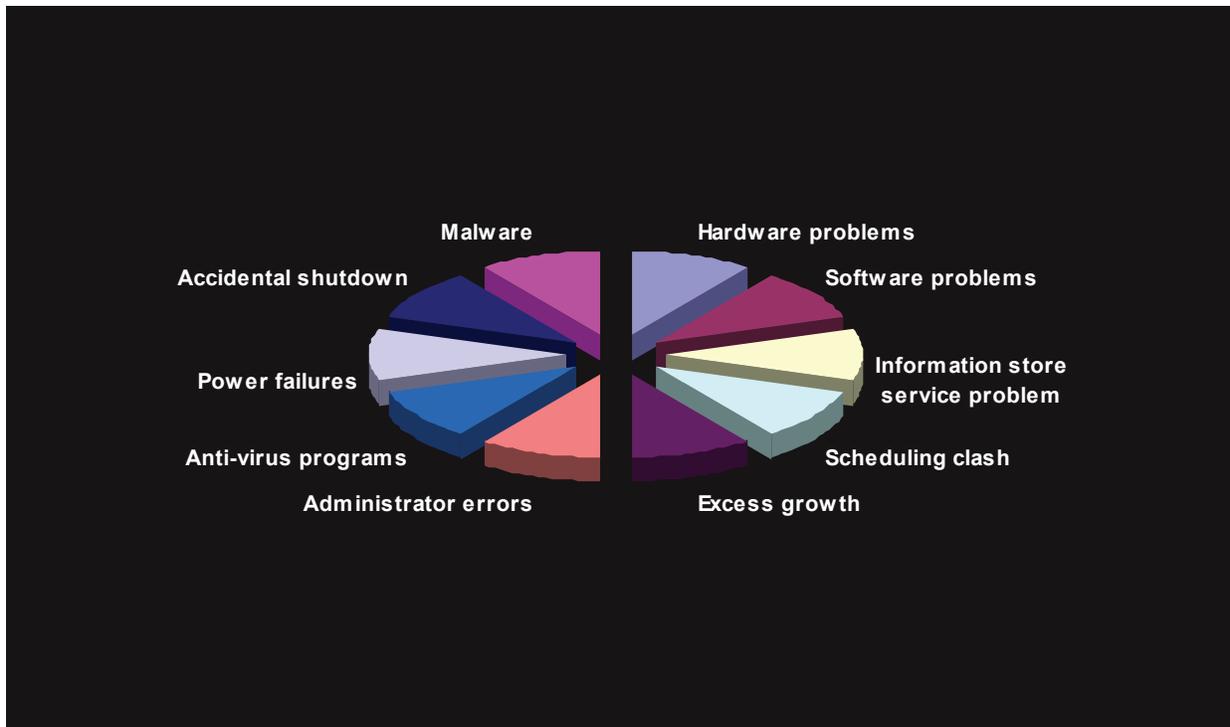
Thus, these are some of the reasons that cause Exchange database corruption.

SOLUTIONS FOR EXCHANGE DATABASE CORRUPTION

Now that we understand the different problems that cause database corruption, we'll talk about the possible solutions and the impact of each of these solutions.

PRECAUTIONS

As with everything, prevention is better than cure for Exchange database corruption issues too. Here are some things you can do to prevent this error from occurring in the first place.

- Use good quality hardware to avoid hardware-related issues.
- Do data integrity checks periodically to ensure that your data is accessible and up-to-date.
- Read through the manuals of anti-virus programs and use only those that are compatible with Exchange Server.
- Ensure that sufficient free space is available in your server.
- Perform backups regularly.

Despite taking these precautions, database errors could occur. To avoid its implications, one of the best options is to take regular backup of your data.

WHY BACKUPS ARE ESSENTIAL?

Over the last few decades, Exchange has grown from an email communication tool to a critical application that stores documents, images, files and more. Since these important documents are integral to the very operations of an organization, they have to be protected and backed up often.

Along with backup, a good recovery strategy is equally important to ensure that users have access to the information they want. As a business, you have to focus on the recovery strategy as loss of access to the Exchange Server and its files can lead to a financial loss that ranges from $25,000 to $4 million an hour, depending on the size of business.

LOSS DUE TO EXCHANGE SERVER PROBLEM

$25,000 TO $4,00,000 EVERY HOUR
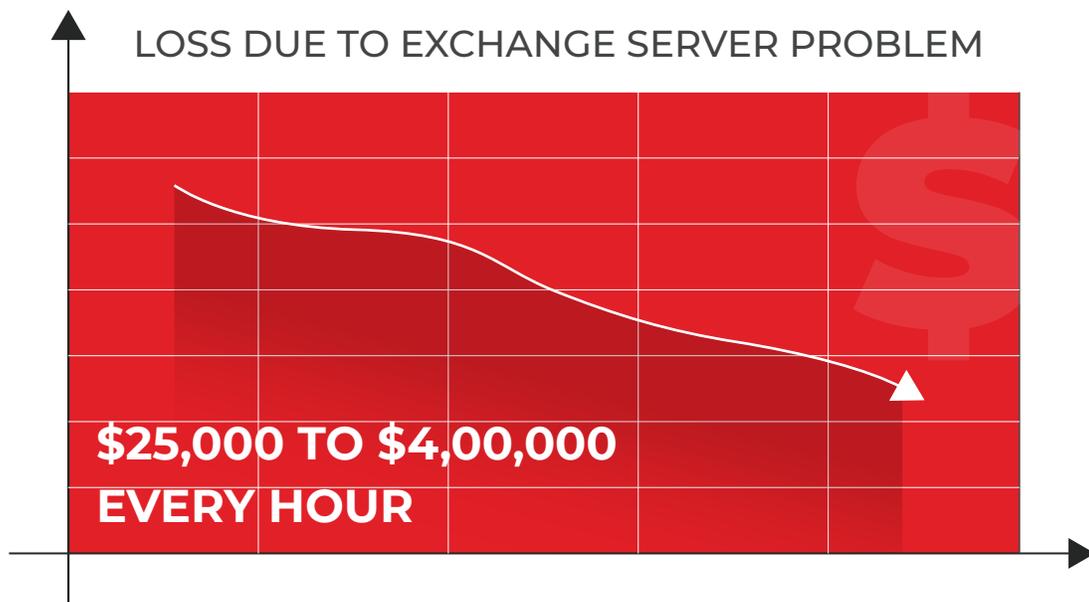
Hence, a good backup and recovery strategy is the key to having business continuity and to mitigate the losses that come from Exchange database corruption and loss. The exact backup and recovery strategy though, depends on the size and nature of the business. There is no "one-size-fits-all", so it is important to have a custom plan for backup and recovery.

LIMITATIONS OF EXCHANGE SERVER BACKUP

At the face of it, backup looks like the best solution for mitigating the losses that come from Exchange Server's database corruption. But, in reality, there are many limitations that come with Exchange Server backup too.

There are many situations/scenarios when a backup would fail. It's important to be aware of these situations.

SITUATION #1

Windows Server Backup (WSB) doesn't work well when every database and its associated logs are stored on a LUN, the database is accessed through a mount point and when some database copies on the server are not active.

For example, let's say, there are two mailbox servers and two mailbox databases. If both the mailboxes are active on server1, a backup with WSB will be successful. On the other hand, if the mailbox that is being backed up is inactive on server1 and active on server2, the backup fails. A consistency check error occurs.

SITUATION #2

Data Protection Manager (DPM) 2010 doesn't have the active/inactive backup issue of WSB. But the limitation comes while doing a restore. The only way to do a restore is to choose an alternate location and manually rollback the databases to bring them to a clean state. This is time-consuming, effort-intensive and the manual rollback is prone to user handling issues.

SITUATION #3

The VSS plug-in that ships with Exchange 2010 can't be used to back up volumes that contain passive mailbox database copies. It is ideal only for backing up volumes that contain active mailbox database copies or standalone mailbox databases only.

SOLUTIONS

There are quite a few workarounds for Microsoft Exchange Server and VSS Writer service that can fix the above problems. For example, disable the Microsoft Exchange Replication service VSS writer. The registry key for the same is "EnableVSSWriter=0"

Most of these workarounds are not easy to do and may not always work. This is why it's best to use built-in utilities or try third-party tools like Stellar Repair for Exchange to repair corrupt backup files.

EXCHANGE SERVER RECOVERY BUILT-IN UTILITIES

There are many built-in utilities that help with Exchange server recovery. These tools are most useful when there is no backup file or when the backup file is corrupted or lost. The two most prominent built-in tools used for recovering a corrupted Exchange server are Eseutil and Isinteg. They help to repair Exchange database files and their default location is

"C:Program Files\ExchSrvr\Bin"

PREREQUISITES FOR ESEUTIL AND ISINTEG

There are certain prerequisites for using Eseutil and Isinteg, and they are as follows.

- Create a replica of an existing database - Create a replica of the corrupted database to repair the EDB file. Take help from the Exchange Server Manager, if needed, to identify the location of the corrupted files.
- Dismount the database - Next, the database files have to be properly dismounted before they can be repaired. Open the Exchange Management Console, navigate to Organization Configuration, click Mailbox and choose Database Management tab. Look for the corrupted database in this tab, right-click on it and choose Dismount Database option.
- Disk space - In this last step, make sure to have an empty space that is at least equal to 20% of the total database size.

RUNNING ESEUTIL AND ISINTEG

With the prerequisites in place, open command prompt and run "Eseutil.exe". There are two important options in this tool, namely, "/r" and "/p". To fix minor database issues, use, "/r" and to fix major problems, use "/p".

Other options for ESEUTIL include,

- /d - defragments the offline database to remove its empty pages and indexes
- /c - displays restore log files after restoration from legacy online backups.
- /g - verifies page level and ESE level logical database integrity
- /m - displays file dump details including database file headers, checkpoint files, page header information, metadata, database page allocation and transaction log files.
- /k - verifies checksum on all database pages, log files and checkpoint files.
- /y- Does a fast copy of large files

You can use any of these options to identify the problem and use /p or /r to repair the corrupted database files.

STEP-BY-STEP GUIDE ON USING ESEUTIL TO FIX DATABASE ERRORS

Here is a step-by-step guide on using Eseutil to fix database errors.

- Check if the database is consistent with the command "eseutil /mh". If it is in "clean" state, move all log files and mount the stores. If it is in "dirty" state, check if the log files are available.
- Check the status of the required log files with the command "eseutil /ml."
- If the log files are available and healthy, do a soft recovery.
- If you encounter "error-1216", run soft recovery with the /i switch.
- If the log files are corrupted, restore database from backup. Alternately, do a hard recovery.
- If restoring from a backup is successful, a file called "restore.env" is created in a temporary location.
- Copy this "restore.env" file to a safe place on your drive.
- Do a hard recovery with the command "Eseutil /cc"

- Check the temporary folder. This folder should be empty if the recovery was successful.
- Mount the stores
- If a backup is not available, do a hard recovery with the command "Eseutil/p"
- If you get any prompt during this process, simply click "OK"
- Once the repair process is complete, defrag with the command "eseutil /d"
- Mount and demount the store right away. Use ISInteg tool to perform integrity check.

LIMITATIONS

Though these are built-in tools are a good starting point, they may not always give the desired end-result. In fact, the effectiveness of this tool is inversely proportional to the extent of database corruption. In other words, Eseutil is less effective in repairing databases with high corruption levels.

Secondly, using these tools requires high levels of expertise and is ideal for IT administrators and Exchange Server specialists. The prerequisites are hard to follow for most common people, and this complicated process makes the Eseutil tool less user-friendly.

Many times, even when this utility is used correctly, the manual backup may fail due to a number of reasons that are beyond the user's control. A common scenario is the lack of space for .edb file and log files or failure in creating a new mailbox for import. Such scenarios are frustrating and a waste of time, not to mention the financial loss that accrues with the delay in repairing the corrupted database.

For these reasons, it's best to opt for a third-party tool that can take care of repairing Exchange Server databases, regardless of the intensity of corruption.

PLAN EXCHANGE RECOVERY WITH Stellar Repair for Exchange is a comprehensive software
that repairs corrupt Exchange database files and restores mailbox contents like emails, attachments, images, documents, contacts and calendars.

FEATURES

Stellar Repair for Exchange comes with a host of features that make recovery easy and thorough.

- Recovers dismounted and offline EDB files.
- Repairs large EDB files
- Fixes multiple EDB files
- Exports recovered mailboxes to Live Exchange Server/Office 365
- Restores all mailbox items such as calendars, attachments, documents, emails and so on.
- Saves recovered mails in many formats such as PST. MSG, EML, HTML, PDF and RTF
- Supports Microsoft Exchange 2016/2013/2010/2007/2003/2000
- Gives the option to selectively repair user mailboxes.
- Comes with a user-friendly and secure software.
- 24 X 5 technical support is available from Monday to Friday.

These features address most of the common problems faced during Exchange database corruption backup and recovery. Additionally, Stellar Repair for Exchange also addresses the root cause of the problems, so the financial loss is mitigated. Let's now look at how Stellar Repair for Exchange addresses many of the common causes of database corruption.

HARDWARE AND SOFTWARE ISSUES

Hardware and software issues are one of the most common causes of Exchange database corruption. Stellar Repair for Exchange algorithms repair these damaged EDB files, regardless of the extent of the damage. It even restores content from inaccessible mailboxes, so you can access all data.

DIRTY SYSTEM SHUTDOWN

Exchange Server uses a service called Information Store to store transactions in cache, with an aim to reduce the number of input/output operations. When a transaction is stored in cache, but is not committed to the database, it is marked as "dirty". If the system shuts down accidentally before the transaction is committed to the database, a "dirty shutdown error" occurs.

This error means that the database is inconsistent and some database files (EDB files) could be damaged. Fixing this error is not easy, as the built-in tools such as ESEUTIL can't always repair them. These built-in tools work best only when the database is consistent with the log files, during an accidental shutdown. In other cases, the repair may not be complete and the process of repairing is long and arduous.

In such scenarios, Stellar Repair for Exchange is your best bet as this tool can repair damaged EDB files and extract all contents into a PST format. This PST file can be imported to Outlook and even to a different server. All that it requires is three steps to repair the damaged EDB files, and in this sense, Stellar Repair for Exchange is the easiest tool to fix the dirty system shutdown error.

HIGHLY CORRUPTED FILES

Though Microsoft has built-in tools like ESEUTIL, it can't fix EDB files that are severely corrupted. At best, it can fix minor corruption issues, but will invariably fail in high intensity corruption problems.

In such situations, third-party tools work best. Stellar Repair for Exchange is most ideal for such situations, as it is built using advanced algorithms to recover such severely corrupted files. An easy-to-use interface makes the entire recovery process a breeze.

MOUNTING FAILURE

When the transaction log files that contain uncommitted transactions are removed, the database will not mount. This throws up "Exchange Server (HR = 0X80004005, EC=528)" error.

The best way to fix this error is to use the Stellar Repair for Exchange tool.

Why?

Because this tool,

- Handles different levels of corruption, under all circumstances.
- Restores deleted mailboxes and folders.
- Exports recoverable data to another live Exchange Server environment
- Generates a preview of all recoverable data before initiating recovery
- Brings inaccessible databases to consistent mode.
- Speeds up the recovery process using highly progressive scanning algorithms to assess the level of damage.

IDEAL FOR ALL USERS

One of the problems with tools like Eseutil is its complexity. Most of these built-in tools are not meant only for advanced users who understand Exchange thoroughly and are experts in handling issues. However, Stellar Repair for Exchange is ideal for users with varying technical knowledge, as the interface is intuitive and easy to use.

INTUITIVE AND USER-FRIENDLY INTERFACE

A salient feature of Stellar Repair for Exchange is its user-friendly and intuitive interface. It contains many menus and buttons that let you access the various features of the software with absolute ease.

Here are some snapshots of the menu options to give you an idea of how user-friendly the software is.
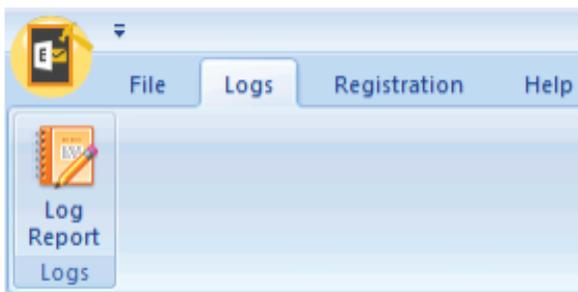
QUICK RECOVERY

Stellar Repair for Exchange uses advanced scanning algorithms to look for recoverable items in a corrupted EDB file. After identifying the corrupted files, it scans through it and restores all items into a new PST file that can be imported to another Exchange environment. This way, Stellar Repair for Exchange helps to recover almost every item including documents, emails, contacts, attachments and calendar entries from corrupted EDB files.

RECOVERS DELETED MAILBOXES

Stellar Repair for Exchange uses powerful techniques to search for deleted data, and using this technique, it recovers mailboxes that were deleted accidentally or intentionally, so users never have to face mailbox inaccessibility issues.

MULTIPLE FORMATS

Besides saving recovered data in PST format, Stellar Repair for Exchange also saves it in a host of other formats such as MSG, EML, PDF, RTF and HTML. These formats give great flexibility to users, as they can access their mailbox and its contents in any convenient format.

These above features clearly show that Stellar Repair for Exchange is a powerful tool to fix corrupted database files.

HOW TO USE Stellar Repair for Exchange is designed to make it easy for users to repair corrupted EDB files.

Below is a step-by-step guide on how to use Stellar Repair for Exchange to scan and recover a corrupted EDB file.

SELECT THE CORRUPTED EDB FILE

As a first step, select the corrupted EDB file. Go to File -> Select EDB. This opens a dialog box where you can choose a file from a specific location or search for it in your computer using the name.
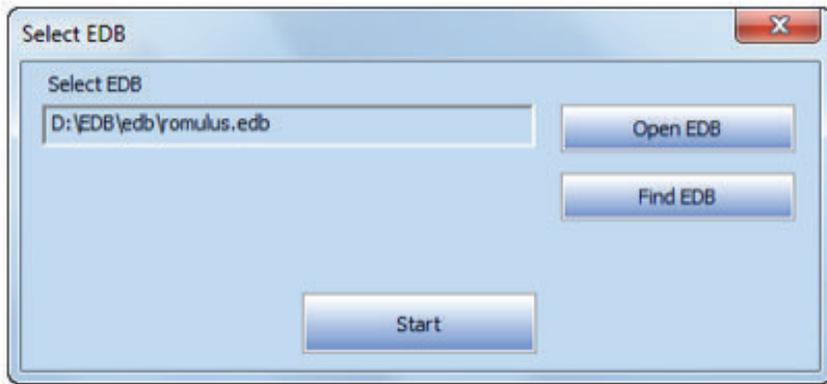
In case, you use the "Find EDB file" option, a dialog box will display the list of files with .EDB extension, so you can choose the one you want to recover.
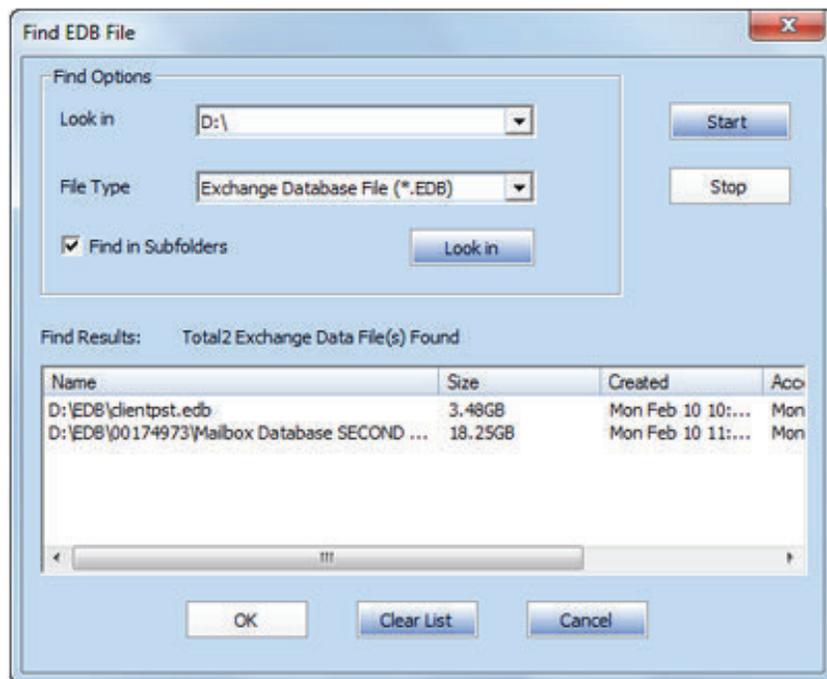
Click Start.

SCAN EDB FILE

When you click the Start button, a dialog box opens. It offers two types of scans - a quick scan and an extensive scan. As the name suggests, the "quick scan" option scans quickly to recover while the "extensive scan" mode will do a detailed scan.

After the scanning is complete, you can see a preview of the corrupted file.
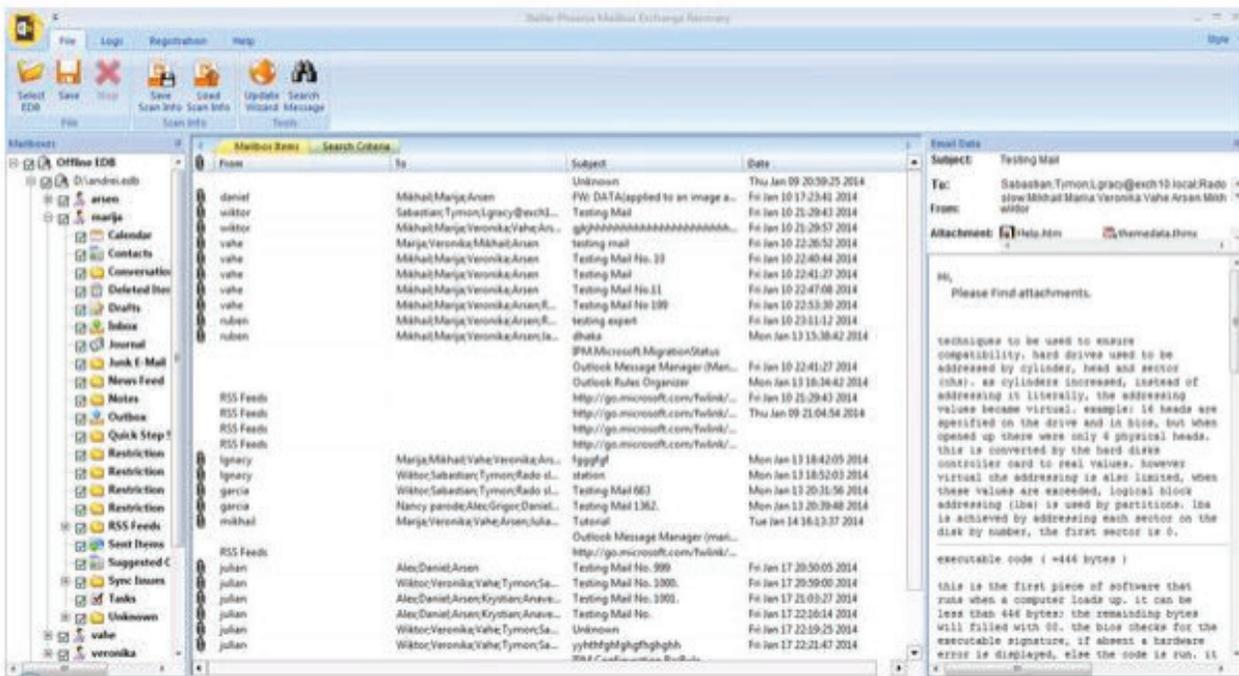
You can save this scanned file in multiple formats for future reference. Alternately, you can also export this scanned file to a Microsoft Exchange mailbox. You can even choose to search for specific emails and save/export them. This will help you to recover the contents of a corrupted file.

The above steps reflect the simplicity and effectiveness of Stellar Repair for Exchange. Fixing a corrupt database file is time-consuming and effort-centric job, but Stellar Repair for Exchange helps you to do it with just a few steps. The easy user interface masks the complex algorithms that go behind implementing this arduous task.

CONCLUSION

To conclude, the use of emails is growing at a phenomenal rate and soon, almost one-third of the world population will be using it. Microsoft Exchange Server is one of the most popular servers that has the capability to handle this growing volume of emails for both personal and business use.

However, as with any software, the Exchange Server is also prone to problems. One of the most critical and common problem that many IT administrators face is the Exchange Server database corruption error. This problem occurs due to a variety of reasons such as hardware and software failures, user errors, accidental shutdown and more.

One way to overcome the financial loss of database corruption error is to take regular backups. That said, backups alone are not the end-solution, as there may be times when a backup is not possible or worse, the backup file also may get corrupted or lost. So, you need another plan that works in tandem with backup to restore the content of corrupted database.

Though built-in tools like ESEutil work to some extent, they are not always effective. A better solution is to use third-party tools like Stellar Repair for Exchange. This tool comes with a host of features that help you to extract the contents from a corrupted database

file. In addition, its complex algorithms help you to scan and extract the content you want and export it to files with multiple formats. All this power and complexity is hidden behind a simple and user-friendly interface that allow you to fix any problem with a few clicks.

For these reasons, Stellar Repair for Exchange is your go-to product for fixing database corruptions. In fact, it is best to have this software on hand to ensure that there is little to no financial or productivity loss due to corrupted database files and their resulting mail inaccessibility. With more than 2 million satisfied customers, you can rest assured that you are in safe hands.

If you would like to know more this product or want to talk to one of our experts on how to make Stellar Repair for Exchange work for you, reach out to us.

CONTACT DETAILS

Stellar Data Recovery Inc.
48 Bridge Street Metuchen,
New Jersey 08840
United States
call us - 1-877-778-6087
email - support[at]stellarinfo.com

USA Helpline
Sales Queries (Tollfree)+1-877-778-6087
Support Queries+1-732-584-2700

UK (Europe) Helpline
Sales & Support Queries+44-203-026-5337

World Wide Helpline
Sales & Support Queries+91-124-4326-777

Stellar Information Technology Pvt. Ltd.
D16, Sector-33,
Infocity Phase II,
Gurugram-122001
call us - (0124) 432 6700
email - helpdeskdrs[at]stellarinfo.com

Australia & Asia Pacific
Sales & Support Queries+61-280149899

Netherlands
Sales & Support Queries+31-208-111-188