G Suite Migration for Microsoft Exchange

Administration Guide

- G Suite
- G Suite for Education

Google

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About this guide

What this guide contains

This guide helps administrators understand and implement G Suite Migration for Microsoft[®] Exchange (GSMME), a utility that lets you migrate email, calendar, and contact data to G Suite from:

- Microsoft Exchange

- Any 3501-compliant IMAP server, such as Novell[®] GroupWise[®], Cyrus, Courier, and Dovecot.

- Personal Storage Table (PST) files

- Another G Suite Account

What's covered

This guide contains the following information:

- An overview of GSMME features and functionality

- An explanation of the architecture and how information is migrated

- Instructions for running the utility

- Troubleshooting tips and FAQ

Who should use this guide

This guide is intended for administrators who are responsible for setting up and running GSMME. Administrators should be familiar with the server data they need to migrate (Exchange or IMAP server) and with G Suite.

Where to find the latest information about the utility

You can find information about the latest version of the utility, including new features and fixed issues, and a link to the latest documentation on the What's new in GSMME page.

You can also find updates and information in the About GSMME Help Center article.

How to provide comments about this guide

Google values your feedback. If you have comments about this guide or suggestions for its improvement, please send an email message including a specific section reference to:

`enterprise-apps-doc-feedback@google.com`

If you have any questions or need technical support, please contact Support. See How to get support.

Disclaimer for third-party product configurations

Parts of this guide describe how Google products work with Exchange and the configurations that Google recommends. These instructions are designed to work with the most common Exchange scenarios—any changes to Exchange configuration should be made at the discretion of your Exchange administrator.

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Overview

What is G Suite Migration for Microsoft Exchange?

G Suite Migration for Microsoft® Exchange (GSMME) is a server-side tool that migrates your company's email, calendar and contact data from Exchange, IMAP server, or a PST file to G Suite. With the tool, migrations are:

- Scalable: set up a small migration in 4 steps, with expanded control as required for large migrations.

- Server-level: migrate hundreds of users at the same time.

- Non-invasive: employees can continue to use their mail, calendar, and contacts during the migration without interruption.

You can migrate mail from:

- **Microsoft Exchange 2000, 2003, 2007, or 2010**. G Suite Administrators can migrate mail, calendar events and resources, contacts, and public folders from Exchange servers.

- **IMAP mail servers**. Administrators can use the tool's IMAP capabilities to migrate email from systems such as Novell GroupWise, Cyrus, Courier, Dovecot, SunMail, Zimbra, or other RFC 3501-compliant IMAP servers, into G Suite. You can even use IMAP server support to migrate data from one G Suite account to another.

- **PST files**. Administrators can migrate Personal Storage Table (PST) files on behalf of users in their domain after they have aggregated the files into one location. Password-protected PST files cannot be migrated.

- **Hosted Exchange accounts.** Administrators can migrate data from hosted Exchange by running the migration tool on local servers, without requiring the Exchange hosting partner to run any special software on their end.

- **Other G Suite accounts.** Administrators can migrate data from one G Suite account to another using this tool.

Features

Some of the important features of the tool include:

- The ability to migrate mail, calendars, contacts, and combinations thereof from Microsoft Exchange or mail from IMAP servers.

- Administrator migration. No end-user participation is required.

- Control of the users and calendar resources that are migrated through comma-separated values (CSV) files that you format and create.

- Parallel migration for multiple users to speed the migration process. By default, GSMME migrates 25 users at a time, but depending on your hardware capacity, you can configure up to 200 users. See Step 3: Select the data to migrate for more details.

- Migrate calendar resources (like meeting rooms) from Microsoft Exchange. See Step 3 (Optional): Migrate a subset of users.

- In Exchange, the ability to migrate using your administrator credentials or profile. Using an Outlook profile helps when migrating from hosted Exchange accounts because you run the tool from outside the hosting service.

- Migrate public folders using the GSMME desktop interface or the command line. See the help center article Migrate public folders with GSMME.

- Add migrated email messages to Google Vault, an archiving and eDiscovery service for G Suite.

- Built-in tool that estimates before running the migration how many emails, calendar events, and contacts you'll be migrating for a set of users. This is very useful when you're planning a migration.

- Pre-migration diagnostics that check for configuration errors in connectivity and authentication as well as errors in your user list.

- Detailed migration reports that show an overview of a migration (or all migrations combined), any message errors during a migration, why errors occurred, and which users were affected by errors.

- Logging and reporting of migration results, with an adjustable level of detail for quick updates or detailed debugging.

- Real-time status updates on the progress of a migration.

- Option to only migrate email messages that were sent or received during a time frame you specify.

- Ability to use a command-line interface to automate the utility. Both methods are discussed in Migrating data.

Comparison with other tools

GSMME offers a single solution for migrating your data from Exchange, IMAP mail servers, and PST files. The following table provides an overview of the similarities and differences between GSMME and other solutions provided by Google.

Tool	Features
G Suite Migration for Microsoft Exchange	**Supported on Microsoft Exchange 2000, 2003, 2007, and 2010, Novell GroupWise, Gmail, Cyrus, Dovecot, Courier, other IMAP servers, G Suite, and PST files.** **Key points:** • Migration managed by a G Suite Administrator. • Migration managed outside of email and G Suite environments. • Migrates directly from your mail server or PST files to G Suite. • Migrates mail, contacts, and calendar data for multiple users at once. • Calendar events and resources, contacts, and public folders are only supported for Microsoft Exchange 2000, 2003, 2007, and 2010.
G Suite Sync for Microsoft Outlook	**Supported on Microsoft Exchange 2003, 2007, and 2010.** **Key points:** • Migration managed by individual users. • Migration implemented through wizard in G Suite Migration for Microsoft Outlook. • Migrates directly from Outlook profiles or PST files to G Suite. • Migrates mail, calendar events, and contacts for one user.
G Suite Migration for Microsoft Outlook	**Supported on Microsoft Exchange 2003, 2007, and 2010.** **Key points:** • Migration managed by individual users. • Migration implemented through a migration wizard. • Migrates directly from Outlook profiles or PST files to G Suite. • Migrates mail, calendar events, and contacts for one user

For a more in-depth look at available migration solutions, see the *G Suite Technical Transition Guide*.

Architecture

GSMME is run on one or more client machines in your network, with a single instance of the utility on each client. If you run more than one instance of the utility, then those multiple instances run in parallel. Each instance of the utility migrates a specific list of users. The utility is multi-threaded, with a thread opened for each user that's being migrated. You can specify the number of users that are migrated simultaneously by an instance of the utility.

The following diagram illustrates how GSMME gets users' data and migrates it to G Suite.
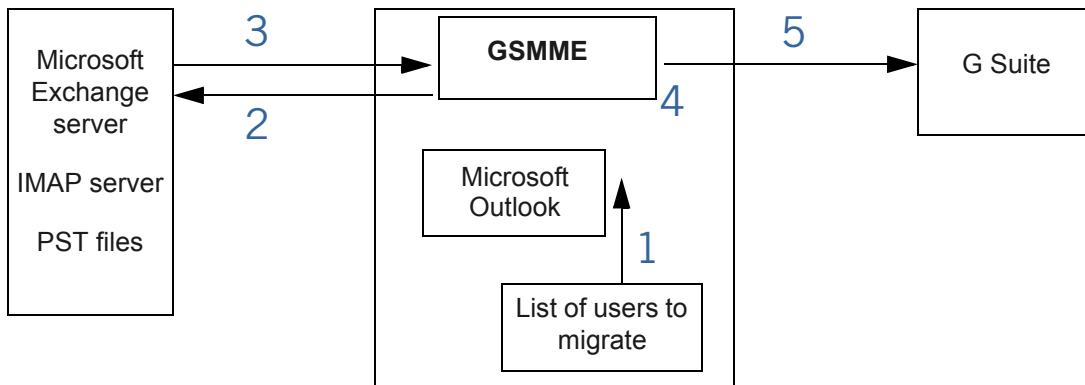
1. The utility reads the list of users you want to migrate. This is a list of users you create beforehand.

    You can specify how many threads are processed simultaneously. For example, if you configure the utility to process 25 users at a time, and you have 25 users to process, 25 threads are spawned; however, if you have only 10 users to process in this case, only 10 threads are spawned. As soon as a thread finishes processing a user, it moves to the next user available in the list you submit.

2. Using the information you provide in the migration wizard, the utility opens the message store or PST file for each user identified in the list.

3. The utility retrieves mail data for each user. For Microsoft Exchange, the utility can also retrieve calendar and contact data. Newer messages are migrated first.

4. The utility transforms email data to MIME. If you are migrating from Microsoft Exchange Server or PST files, this step uses Microsoft Outlook components.

5. The utility makes a WinHTTP connection to G Suite.

   Using 2-legged OAuth, the utility logs in to the users' G Suite accounts, and writes the transformed message-store data to each user's account.

   Email is processed at a maximum rate of 1 message per 3 seconds per user, assuming that no latency is introduced by mail server or network performance. Processing times can often be significantly slower for larger messages, especially those with attachments.

Note: For customers running a hosted Exchange or IMAP solution that is not located on the same LAN as the GSMME client, the rate of migration can be significantly impacted based on the network latency to and from the hosted mail server. If you are planning to migrate, try to run GSMME on your server, and configure your network to minimize latency. Alternatively, ask your hosting provider to provide you with PST files for all users you want to migrate, and then run a PST migration.

The original message headers are preserved. Duplicate messages are filtered out based on subject and body.

Calendar and contact data are processed according to the speed at which your network connects to external networks.

What is migrated?

During the migration, contacts are processed first, followed by calendar data, and then email.

Any data that fails to migrate is identified in the log files by account name, entry ID, and location. Log files are located on each client machine in the following location:

- **Microsoft® Windows® 7 or Vista**: `C:\Users\`*user-name*`\AppData\Local\Google\Google Apps Migration\Tracing\ExchangeMigration`

- **Windows XP**: `C:\Documents and Settings\`*user-name*`\Local Settings\Application Data\Google\Google Apps Migration\Tracing\ExchangeMigration`

`user-name` in the path identifies the administrator who signed in and ran the utility.

Consider the following table when you're setting up a migration.

Mail

Mail data	Migrated to G Suite	Notes
Email messages	✔	All email in top-level folders is migrated. A top-level folder is any folder that resides at the same level as your Inbox folder. You have the option to exclude specific top-level folders from migration. For more information, see Step 3: Select the data to migrate.
Email state (read versus unread)	✔	
Folders (Labels in Gmail)	✔	Folders map to *labels* in Gmail. You can elect to omit top-level folders from a migration. If you omit a folder, its subfolders are also omitted. There is a 255 character limit per label. If you're migrating a folder with a title that's over 255 characters, the mail will still migrate, but it will be put with the prior label.
Subfolders	⚠	Subfolders in your Exchange inbox don't migrate as nested labels in Gmail. Instead, the subfolders appear as Inbox/*foldername* in an unnested state.
Junk email	✔	Migration is optional. Junk email is labeled "Junk email" in Gmail.
Deleted Items	✔	Migration is optional. Deleted items are labeled Trash in Gmail.
Public folders	✔	For details, see Migrate public folders with GSMME.
Large messages and attachments	✖	Messages that are bigger than 25 MB (message plus attachments) aren't allowed in Gmail. Messages that are bigger than 16 MB (message plus attachments) are not migrated into Google Groups.
Attachments	✔	Most attachments are migrated, except when the message and attachment are larger than 25 MB or when there is an executable file in the attachment.
Executable files in compressed attachments	✖	These types of attachments aren't allowed in Gmail.
Posts in mailbox folders	✖	Not available in Gmail.

Mail data	Migrated to G Suite	Notes
Message importance level	✖	Not imported into Gmail.
Message flags	✔	Flags appear as stars in Gmail.
Rules	✖	Rules (both server and client) aren't migrated., but you can create equivalent filters in Gmail.
Signatures	✖	Not migrated but can be re-created in Gmail.
POP or IMAP account	✖	Account settings don't import, but you can re-create the account in your G Suite profile.
POP messages	✔	
Shared mailboxes	✖	Gmail does not support shared messages.
Category definitions	✖	Categories aren't available in Gmail.
Category assignments	✖	Categories aren't available in Gmail.

Calendar

Calendar data in Exchange	Migrated to G Suite	Notes
Default calendar	✔	Includes all events, descriptions, attendees, and locations. If you are using an exported or archived PST file, it's not possible to identify the primary root folder for Calendar and Contacts. Therefore, all calendars are migrated as additional calendars into G Suite Calendar, instead of any default calendar. You can avoid this by using PST migration for mails only and using Exchange server migration for migrating calendars.
Additional calendars	✔	Shared calendars are migrated for the owner, but not for other users who have access.
Event reminders	✔	
Free / Busy status	✔	Only other G Suite users can see the free or busy status in Google Calendar.
Calendar resources	✔	See Calendar resources CSV file for details.

Calendar data in Exchange	Migrated to G Suite	Notes
Tentative / Out of Office status	✖	Any special status for calendar data is not migrated.
Optional attendees	✖	Not migrated.
Calendar attachments	✖	Not migrated.
Rich content in event descriptions	✖	Event descriptions are migrated as plain text.
Category definitions	✖	Not available in Google Calendar.
Category assignments	✖	Not available in Google Calendar.

Personal contacts

Personal contact data in Exchange	Migrated to G Suite	Notes
All personal contacts	✔	Includes all fields (File As, images, notes, and so on).
Multiple contact folders	⚠	Separate contact folders don't migrate to G Suite. Instead, all contacts from all folders are migrated and then appear together in G Suite under My Contacts. You can reorganize them using Google Groups.
Personal distribution lists	✖	Mailing lists don't migrate to G Suite. But you can still email a list from G Suite by creating a Google Group.
Rich formatting in personal contact notes	✖	Notes in contacts are migrated as plain text.
Notes larger than 16KB	✖	Larger notes are truncated in G Suite.
Follow-up flags, dates, and reminders.	✖	Flags aren't available in Google Contacts.
Category definitions	✖	Not available in Google Contacts.
Category assignments	✖	Not available in Google Contacts.

Global contacts

Global contact data	Migrated to G Suite	Notes
Domain contacts	✖	You need to migrate domain contacts separately. For more information, see Migrate your shared contacts to G Suite.
Out-of-domain contacts	✖	You need to migrate out-of-domain contacts separately. For more information, see Migrate your shared contacts to G Suite.

Notes, Tasks, Journal entries, RSS feeds

Other Exchange data	Migrated to G Suite	Notes
Notes	✖	Not migrated.
Tasks	✖	Not migrated.
Journal entries	✖	Not migrated.
RSS feeds	✖	Not migrated.

Parallel processing

Each client machine simultaneously processes the number of users based on the user restriction you specify. The utility defaults to 25. The amount of data processed at any one time depends on the number of users you have configured for each client machine, and the number of client machines you are using.

GSMME is capable of processing, and G Suite can receive, message data at the rate of 1 message per user per 3 seconds.

The processing speed can be limited further by hardware constraints or network latency, including:

- Physical resources on the client machine, such as the CPU, memory, disk speed, and network connection speed

- Physical resources on the Exchange or IMAP server, such as the CPU, memory, disk speed, and network connection speed, along with how well you tuned your server performance

- The overall speed of your network and your connection to external networks

- The density of traffic outside your network

You can increase the amount of data you process by increasing the number of users you process simultaneously on each client machine, and the number of client machines you use.

Special notes on migrating from Exchange

Exchange 2010 client request throttling

Exchange 2010 supports client request throttling, which can limit the performance of GSMME migrations when performing a large number of user migrations. To mitigate this, you can configure a specific policy to the GSMME administrator account that exempts it from throttling.

Follow these steps to create and apply a custom throttling policy:

1. On the Microsoft Exchange Server, click **Start** > **Microsoft Exchange Server 2010** > **Exchange Management Shell**.

2. In the shell, enter:

    ```
    New-ThrottlingPolicy GSMME –RCAMaxConcurrency $null -RCAPercentTimeInAD $null
    -RCAPercentTimeInCAS $null -RCAPercentTimeInMailboxRPC $null

    Type Set-Mailbox "GSMME_Admin" -ThrottlingPolicy GSMME
    ```

For a detailed explanation of the Exchange 2010 client throttling policies and settings, refer to Microsoft documentation.

Exchange 2010 IMAP Migration Considerations:

If using IMAP migrations with Exchange 2010 you maybe required to increase the Maximum Allowed Service Sessions Per User to allow for large numbers of threaded migrations. For more information, see Microsoft's documentation: http://support.microsoft.com/kb/980049

Exchange Server 2003, 2007, 2010: MAPI sessions limit

Microsoft Exchange Server supports a limit of 32 MAPI sessions for the GSMME Administrator migration account. If you receive error 0x8004011d when running a migration, first determine whether Exchange Server exceeded the 32 MAPI session limit. If the limit was exceed, you can resolve the issue by configuring GSMME or your Exchange Server.

To determine whether the MAPI session limit was exceeded

If error 0x8004011d was caused by the MAPI session limit, the GSMME trace logs will have details such as the following. For more information about trace logs, see "Interpreting log filesInterpreting log files" on page 59.

```
2013-03-25T07:33:21.110-04:00  e2c E:TaskSystem
ExchangeMigration!TaskRunnerThread::ExecuteSingleTask @ 41 ()> Failed with
0x8004011d, last successful line = 34.
```

```
2013-03-25T07:33:21.110-04:00  e2c A:Migration
ExchangeMigration!MigrationUserStatus::SetMigrationStart @ 117
(user@domain.com)> In progress: Now migrating user=user@domain.com
Trace-2013-03-25-06-51-22-p3316.log:Error=Microsoft Exchange is not
available.  Either there are network problems or the Exchange server is down
for maintenance.
Component=Microsoft Exchange Information Store
LowLevelError=-2147221227
Context=1318
```

Also check the event logs on the Microsoft Exchange Server machine. The following example
log for Exchange 2007 indicates the MAPI session limit was exceeded:

```
Log Name: Application
Source: MSExchangeIS
Date: 1/1/2013 11:00:00 PM
Event ID: 9646
Task Category: General
Level: Error
Keywords: Classic
User: N/A
Computer: server.domain.com
Description: Mapi session "a1234567-abcd-1234-a5c5-fcb5b810b949" exceeded the
maximum of 32 objects of type "session".
```

For an example event log for Exchange Server 2003, see the following article on the Microsoft
Support site: http://support.microsoft.com/kb/842022

To avoid exceeding the MAPI session limit

Do one of the following:

- If GSMME is configured to use more than 32 threads for a single migration, configure
  GSMME to use fewer than 32 threads.

- If you have multiple GSMME migration servers, create a single Administrator account for
  each server, and ensure that each server is configured to use fewer than 32 threads.

- Configure the Exchange Server Information Store service to allow more than 32 MAPI
  connections, by following the steps in this support article on the Microsoft Support site:
  http://support.microsoft.com/kb/842022.

Preparing for your migration

Preparation

Before you migrate your data using G Suite Migration for Microsoft® Exchange (GSMME):

- Confirm that you meet the System requirements.

- Provision users in G Suite.

- Authorize GSMME for your domain

- Allow access for less secure apps

- Create CSV files for users and calendar resources

- Prepare folder structure for PST migration

- Set up access to your Exchange or IMAP server

- Prepare your Windows client machines

- Migrate your shared contacts to G Suite

- Migrate public folders from Exchange to G Suite

- Download and run the installer

- Optional: Specify custom log folder path

System requirements

Before you run GSMME, you need to meet G Suite edition and configuration requirements, account requirements for your Exchange server, and Windows system requirements for your client machines.

For details, see GSMME system requirements.

Provision users in G Suite

Before you migrate your users, you need to provision G Suite accounts, create any nicknames or groups, and add any domain aliases for them. For information about provisioning user accounts, see the *G Suite Technical Transition Guide*.

It' important to ensure that all users are provisioned when you migrate calendar data, even if you only want to perform a partial migration. For details on how to avoid calendar issues with user accounts, see Troubleshoot calendar issues with user accounts.

Additional requirements

In addition to provisioning user accounts in G Suite, you need to complete the following requirements before starting your migration:

- Create nicknames for your users that match aliases they had on your mail server.

- Create groups that match the mailing lists on your mail server.

- Add any domain aliases.

For information about these configurations, see the G Suite Administrator Help Center.

Authorize GSMME for your domain

Before you install GSMME, you must authorize it for your domain. For details, see Authorize GSMME for your domain.

Allow access for less secure apps

If you are migrating from a G Suite account you must give permission for less secure apps to access accounts. For more information, see Allow less secure apps to access accounts.

Note: Accounts that have 2 step verification are unable to allow access to less secure apps. 2 Step verification must be disabled for these user accounts if you want to migrate mail to another G Suite account with GSMME.

Create CSV files for users and calendar resources

There are 2 types of comma-separated values (CSV) files used in a GSMME migration:

1. A Control CSV file, which is used to map users and, if required, calendar resources (such as meeting rooms).

2. A Calendar resources CSV file, which is used if you are migrating calendar resources.

Important: Keep your calendar resources CSV file separate from your control CSV file because they need to be run with a different number of active threads.

Control CSV file

Create a CSV file for each group of users you want to migrate. If you plan to use multiple client machines, you need a separate list for each client, and each list must contain a unique set of users. We recommend that you don't exceed 1000 users in a single CSV file.

The general structure of the user CSV file is **sourceuser, destinationuser**. Adding a space after the comma is optional.

Example: `matt@solarmora.com, mattwerner@solarmora.com`

You can remove **destinationuser** if it's identical to **sourceuser**.

Depending on the type of server you are migrating from, there are some variations to this format. For details on how to use and format the control CSV file, see Create a control CSV file.

If you are also migrating calendar resources, you need to add the calendar resources to the control CSV file as well as creating a Calendar resources CSV file with a list of the calendar resources that need to be migrated.

The format for adding calendar resources to the control CSV file is: **exchange-resource-email**, **GSuite-resource-email**.

Calendar resources CSV file

If you are also migrating calendar resources (such as meeting rooms) to G Suite, you need to add the calendar resource information to 2 separate files:

1. A **control CSV file**, which contains the list of each group of users. Once you have added the users, add the calendar resources to this file.

2. A **calendar resources CSV file** which lists the calendar resources.

    Important: Keep these two CSV files separate because they need to be run with a different number of active threads.

The general structure of the calendar resource CSV file is **exchange-resource-email**, **GSuite-resource-email**. Adding a space after the comma is optional.

Example: `conf-room-1@example.com, example.com_2d372903631@resource.calendar.google.com`

For more information on calendar resource CSV files, see Create CSV files for calendar resources.

Preserve calendar resource free/busy status

Because calendar events may not be migrated from Exchange in a specific order, we recommend that you enable the **Automatically add all invitations to this calendar** for all of your calendar resources to preserve their correct free/busy status:

1. Sign in to the Admin console, and click **Apps** > **G Suite** > **Calendar** > **Resources**.

> **Note:** You need to create calendar resources for **Resources** to appear in your Admin console.

2. Click the resource and make note of the email address, for example, domain.com_2d344403832323233393232@resource.calendar.google.com

3. Go to Google Calendar as the domain administrator and in the bottom-left corner in the box below **Other calendars**, add the calendar email address.

4. Under **My calendars**, click the down arrow next to the calendar email address.

5. Click **Calendar Settings.**

6. In the **Auto accept invitations** section, select the **Automatically add all invitations to this calendar** option and click **Save**.

7. After the migration is complete, change the **Auto-accept invitations** setting to the **Auto-accept invitations that do not conflict** option to preserve the free/busy status of the resources you migrate.

Prepare folder structure for PST migration

If you want to migrate PST files, first set up a folder structure to accommodate those files.

Note: GSMME can't migrate password-protected PST files. Disable password protection before you attempt to migrate, or the migration will fail.

1. Set up one top-level folder. Within that top-level folder, create an individual folder for each user whose PST files you want to migrate. Place the PST files within these individual folders.

   For example:

   PST (top-level folder)

   user1@domain.com (individual folder)

          archive.pst (PST file to migrate)

          MyPst.pst (PST file to migrate)

2. Name the individual folders based on the primary email address configured in the source mail system. (See Create CSV files for users and calendar resources).

    For example, if your file of usernames takes the form:

    > user1@domain.com

    > user2@domain.com

    name your individual folders:

    > user1@domain.com

    > user2@domain.com

    Allow read and write permissions on each individual PST file so that the utility can write migration-related metadata to those files.

Note: If you're using an exported or archived PST file, it's not possible to identify the primary root folder for Calendar and Contacts. Therefore, all calendars are migrated as "additional calendars" into Google Calendar, instead of any default calendar. You can avoid this by using PST migration for mails only, and use Exchange for migrating calendars.

PST migration: resolving X.500 to SMTP

When migrating a PST file with GSMME the file may not contain the SMTP address for a user but instead have the Exchange X.500 address. GSMME can be configured to resolve the X.500 address to an SMTP address using your Exchange address book.

How to configure GSMME to use the Exchange address book for recipient resolution:

Create a (non-cache mode) MAPI mail profile on the server that will be doing the migrations. Ensure the profile is configured based on the Windows user or service account on the server that will be signed in to while performing the GSMME PST mail migration. The MAPI mail profile needs to be connected to the original Exchange infrastructure so GSMME can properly resolve recipients.

Note: It's important to configure the mail profile with the user or service account that is current logged in so that authentication to the Exchange address book is automatic and doesn't fail due to an authentication error.

When GSMME finds an X.500 address on a message, it will look to see if there any MAPI mail profiles registered on the migration server that match the same X.500 Exchange Organization name, for example /O=ExchangeOrg. If there is a MAPI mail profile registered with the same X.500 Exchange Organization name, GSMME will try to resolve the X.500 address using the address book registration in the MAPI mail profile.

If GSMME fails to find a valid mail profile or recipient in the Exchange address book, it reverts to a best-effort method of converting the X.500 address to an SMTP address. GSMME will look at the last CN value of the X.500 address (which should map to the user's Exchange alias) and use that as the e-mail address name. For example, the X500 Address: / O=ExchangeOrg/OU=CA/CN=RECIPIENTS/CN=EX_ALIAS produces the best-effort SMTP address of ex_alias@domain.com.

Important: Test and confirm you have properly configured the migration machine as this feature is not enabled by a command line. If you migrate data and later realize this feature was not working, a re-migration will not update the content already stored in your Google accounts, and you must delete the mail content from Google and then re-migrate it.

Set up access to your Exchange or IMAP server

Exchange Server

Check GSMME system requirements for details on the versions of Exchange supported by GSMME.

Additional setup steps for Exchange 2007 and 2010 administrators

If you are using Exchange 2007 or 2010, you need to set the following GSMME administrator permissions to migrate your users' mailboxes:

1. Create a normal Active Directory user, such as CORP\GSMME_ADMIN.

2. Enable mail on the user account in your Exchange Management Shell.

   ```
   Enable-Mailbox -Identity 'corp.domain.com/Users/GSMME ADMIN' -Alias
   'GSMME_ADMIN'
   ```

3. Grant **GSMME_ADMIN permission** to specific mailboxes or databases with Exchange Management Shell

   a. To grant access to individual mailbox:

      Add-MailboxPermission -Identity "Corp\Joe.User" -User Corp\GSMME_ADMIN -AccessRights FullAccess -InheritanceType All

   b. To grant permission to all mailboxes in a specific mailbox database:

      ```
      add-ADPermission -Identity "Mailbox Database 0212328573" -User
      "Corp\GSMME_ADMIN" -ExtendedRights Receive-As
      ```

For details about granting Exchange 2007-2010 permissions, review How to allow Mailbox access.

IMAP servers

Check GSMME system requirements for details on IMAP servers supported by GSMME.

There are no special permissions required to migrate from an IMAP server. Connections to the IMAP server are made based on the username and password information you provide in the list of users you are migrating (see Create CSV files for users and calendar resources).

For Cyrus IMAP servers, if you want to migrate using the admin account and password, see Step 2: User and domain information.

Prepare your Windows client machines

Each client machine that runs the migration utility needs to have the following minimum configuration:

- Check GSMME system requirements for details on Windows versions supported by GSMME.

- Memory: 512 MB RAM

- CPU: 2 GHz or more

- Minimum disk space: 8 GB of disk space

Remember that the migration process is multi-threaded, which can consume a lot of resources, and that the data for each user being processed is loaded into memory. Given that, we recommend that you opt for dedicated machines with more robust CPU and memory, increasing the resources with the number of users you plan to process simultaneously on each machine.

Note: To avoid authentication issues with Exchange, we recommend that you sign in to the client machines with your Exchange administrator credentials.

Migrate your shared contacts to G Suite

Before you migrate your users, you should migrate your shared contacts to G Suite so that your users have immediate access to your full address list as soon as they're migrated.

For information about migrating contacts, see the following options:

- G Suite Technical Transition Guide

- G Suite Directory Sync Help Center

Migrate public folders from Exchange to G Suite

You can migrate public folders from Exchange to G Suite running by GSMME from the GSMME desktop utility or the command line. For more information, see Migrate public folders with GSMME.

Download and run the installer

1. Go to the GSMME download page and click **Download Migration Tool**.

   You can copy the installer to any folder on your client machines and run it from there.

2. Double-click **GSuiteMigration.msi**, then click **Run**.

   The utility is installed in the following location:

   `C:\Program Files\Google\G Suite Migration\ExchangeMigration.exe.`

Optional: Specify custom log folder path

GSMME creates log files that you can use to troubleshoot issues or provide to Google Support (for details, see Interpreting log files). By default, GSMME saves these log files at the following location on each client machine:

- **Windows 7 or Vista**: `C:\Users\`*user-name*`\AppData\Local\Google\Google Apps Migration\Tracing\ExchangeMigration`

- **Windows XP**: `C:\Documents and Settings\`*user-name*`\Local Settings\Application Data\Google\Google Apps Migration\Tracing\ExchangeMigration`

The `user-name` variable in the path identifies the administrator who signed in and ran the utility.

However, you can specify a custom folder path for the log files, by editing the following registry key for the utility:

```
HKEY_CURRENT_USER\Software\Google\Google Apps Migration
Create new key (string value) name = "LogFolder"   value = "C:\custom-
folder-path"
```

Specify `custom-folder-path` as the path for the log files.

Deployment

Deployment scenarios

The deployment scenarios in this chapter are suitable for large organizations migrating many user accounts with GSMME. Some small and medium-sized organizations don't require a special server topology and might choose to not run a pilot migration. Familiarize yourself with the content in this chapter, and then decide whether all the phases are relevant for your organization. If not, you can skip directly to Migrating data.

There are 5 major phases to a GSMME deployment:

* Plan

* Test

* Migrate

* Delta migration (optional)

* Go Live

Plan

In the planning phase, consider:

* Topology options

* Preparing your users

* Organize your data

Topology options

A single instance of GSMME runs on an intermediary client machine between your source server and G Suite. You can migrate the data from one or more servers, and you can deploy one or more clients for each server. You must use at least one client per server, and each client migrates a unique list of users.

Important:

• You can only run one instance of GSMME on each client machine. If you try to run multiple instances on a single client, those instances overwrite one another's configuration files because there's a single location for configuration files.

• Each instance has to reference a unique list of users in order to avoid corrupting the status information for each user's data.

Use one of the following topologies:

• Single server, single client (most basic)

• Single server, multiple clients

• Multiple servers, each with single client

• Multiple servers, each with multiple clients (most complex)

Single server, single client

This is the most basic configuration. Use it when all your data is on a single server, and a single migration client meets your needs. Depending on your network latency and client capacity, a single client can migrate 500–1,000 users.

```
┌──────────┐        ┌──────────────┐        ┌──────────┐
│  Source  │───────▶│    GSMME     │───────▶│ G Suite  │
│  server  │        │Client machine│        │          │
└──────────┘        └──────────────┘        └──────────┘
```
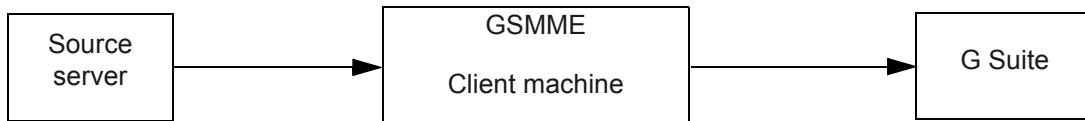
Single server, multiple clients

In this configuration, all data is pulled from a single source server, but you use multiple GSMME clients to migrate data. Be sure that every client has a completely separate user list. Multiple clients handling the same user causes data corruption.

Use this topology if you need to migrate more data than a single client can handle.

```
                    ┌──────────────┐
                    │    GSMME     │
                ┌──▶│Client machine│──┐
┌──────────┐    │   └──────────────┘  │   ┌──────────┐
│  Source  │────┤                     ├──▶│ G Suite  │
│  server  │    │   ┌──────────────┐  │   │          │
└──────────┘    └──▶│    GSMME     │──┘   └──────────┘
                    │Client machine│
                    └──────────────┘
```
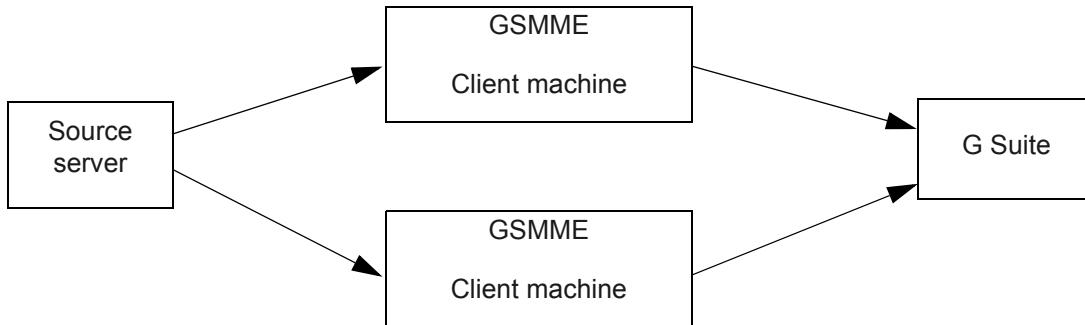
Multiple servers, each with single client

If your user data is stored on multiple servers, each server should have its own client machine running a migration. Be sure that user data is separate for these servers.

Use this topology if you have multiple data servers, but a single client is enough capacity for each server.

```
┌──────────┐          ┌──────────────────┐
│  Source  │  ──────► │      GSMME        │
│  server  │          │                  │ ──┐
└──────────┘          │  Client machine   │   │        ┌──────────┐
                      └──────────────────┘   └─────►  │          │
                                                       │  G Suite │
┌──────────┐          ┌──────────────────┐   ┌─────►  │          │
│  Source  │  ──────► │      GSMME        │   │        └──────────┘
│  server  │          │                  │ ──┘
└──────────┘          │  Client machine   │
                      └──────────────────┘
```
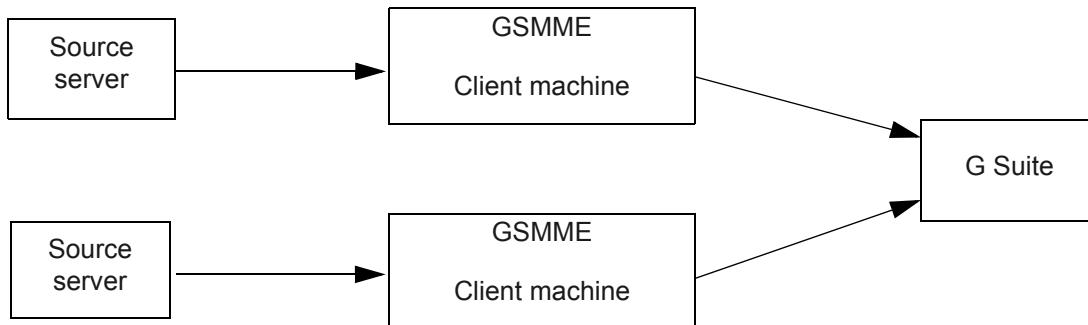
Multiple servers, each with multiple clients

This is the most complex topology. In this configuration, there are multiple source servers, and each server has more data than a single client can handle.

```
                        ┌──────────────────┐
                        │      GSMME        │
                        │                   │
                        │  Client machine   │
                   ┌──▶ └──────────────────┘ ──┐
                   │                            │
  ┌──────────┐     │     ┌──────────────────┐   │
  │  Source  │─────┤     │      GSMME        │   │
  │  server  │     │     │                   │   │
  └──────────┘     └──▶  │  Client machine   │ ──┤     ┌──────────┐
                         └──────────────────┘   │     │          │
                                                 ├───▶ │ G Suite  │
                         ┌──────────────────┐   │     │          │
                   ┌──▶  │      GSMME        │   │     └──────────┘
                   │     │                   │   │
  ┌──────────┐     │     │  Client machine   │ ──┤
  │  Source  │─────┤     └──────────────────┘   │
  │  server  │     │                            │
  └──────────┘     │     ┌──────────────────┐   │
                   └──▶  │      GSMME        │ ──┘
                         │                   │
                         │  Client machine   │
                         └──────────────────┘
```
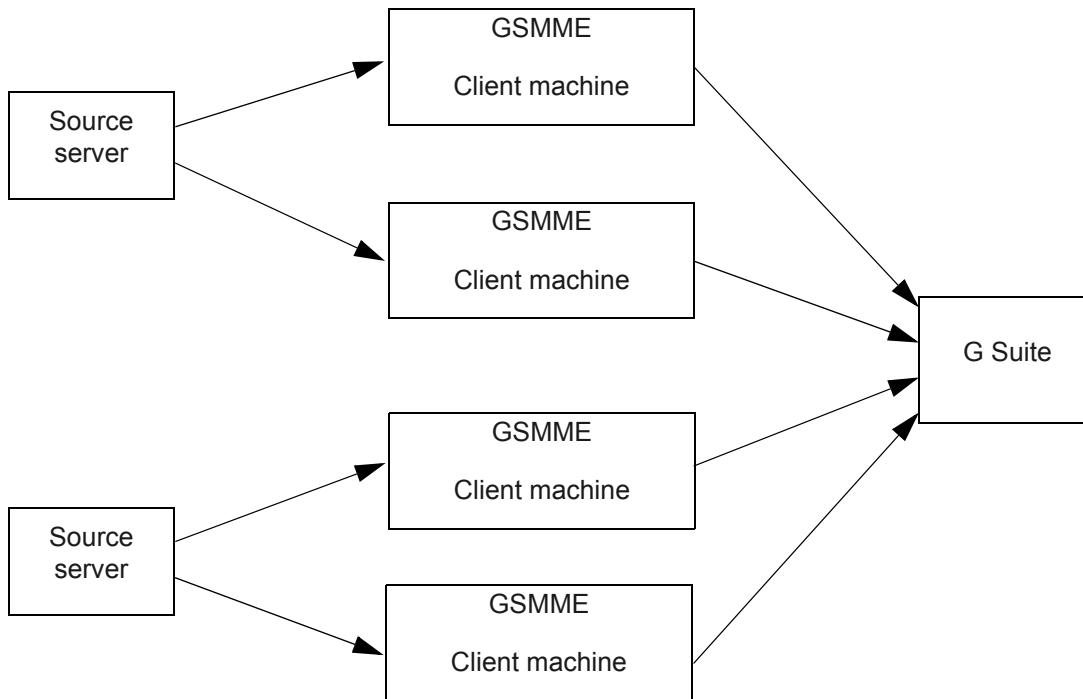
Preparing your users

Before you begin the transition to G Suite, we recommend giving your users:

- Details about the upcoming transition to G Suite. Early communication is important to prepare them for the change in their routines.

- Options for G Suite training. Make training available to your users as early as possible and eliminate the anxiety that accompanies change.

Visit G Suite Setup to find resources, such as:

- Communication templates

- eLearning videos

- Quick reference sheets

- Helpdesk training and resources

- User Help Centers

- G Suite professional training

Organize your data

- **Clean up inboxes**—To reduce the amount of data migrated, you can choose to not migrate deleted emails. Prior to the migration, have your users clean up their accounts by deleting unwanted emails and moving any important emails into their inbox.

- **Create an exclusion folder**—When you configure your migration, you can elect to exclude specific, top-level folders. A top-level folder is any folder at the same level as the inbox.

  If there are messages that you or your users want to exclude from migration, you can have your users prepare **exclusion folders** prior to migration. They should locate the folders at the same level as their inbox (top-level) folders, and then move all relevant messages to those folders.

  To keep it simple, enforce a naming convention, such as Excluded Mail. Then, when you identify the folders you want to exclude from a migration, you have a reliable way to specify the correct folders for every user. You specify excluded folders by entering a comma-separated values (CSV) list in Step 3: Select the data to migrate.

Test

Before you migrate all of your users to G Suite, you might want to test the migration on a small group of users to gather data on how your proposed deployment topology will handle the process. For example:

- How many users can a single client machine process at one time and stay within the capacity of its physical resources?

- How many client machines can you run at capacity without overwhelming your network?

- How long will it take to migrate all your data with your migration resources running at an optimal rate?

You can consult the migration reports on each client to get an idea of migration performance. For information about reports, see Reviewing migration reports.

In addition to gathering data about performance, your test migration allows you to go through the process on a smaller scale and identify any problems that might arise as well as possible solutions.

When you're ready to migrate your users, you can migrate a pilot group first to estimate how long it will take to migrate all your users.

For example, you can migrate 25 users and then review the migration report to estimate the migration time for all users. Here's how you do it:

1. On the report, find the average message migration rate (**Rate**) and number of migrated messages for those users (**Total Mail Messages Migrated**).

2. Calculate the following: (total messages migrated / total users migrated) / migration rate = average migration time for one user.

3. Calculate the following: (average migration time for one user * total number of users) / number of migration threads = total migration time.

For more information on threading (the number of users migrated simultaneously), see Parallel processing.

For more information on reports, see Reviewing migration reports.

Run a G Suite pilot deployment

A test migration and running a pilot deployment allows you to check the process of migrating data and then working with mail, calendars, and contacts in G Suite. Any issues you encounter with a small pilot deployment are more easily corrected, so you can provide a smoother transition for the rest of your users.

You can also use the data from your pilot deployment to plan the resources you'll need to migrate the rest of your users.

What to expect after a G Suite pilot deployment

If you implement dual delivery for your G Suite pilot deployment users, G Suite removes duplicate messages resulting from the following scenarios:

*   Dual delivery through your Exchange server

*   Dual delivery through an edge appliance or service

*   Dual delivery through G Suite

Note: You have the option to configure GSMME to only migrate messages from the period prior to your implementation of dual delivery.

If you implemented direct delivery to G Suite for your pilot users, there are no duplicate messages for the period of the pilot deployment.

Migrate

Before you migrate all user data, you need to decide:

- When the migration will begin.

- How much time you need to migrate data.

- What access your users will have to the existing email server infrastructure before, during, and after the migration.

Example time frame

The following scenario is one way to stage a migration with minimal disruption to your organization.

Time frame	Activity
Thursday to Friday	Provision users.
Friday end of business	Start receiving mail in G Suite. Stop receiving mail on your Exchange or IMAP server. Establish read-only access to your Exchange or IMAP server.
Friday night to whenever migration finishes	Migrate data.
Monday start of business	Start using Gmail and Google Calendar.

If your network can accommodate the migration traffic along with normal business, you can let the migration continue until it's finished. If your network can't accommodate the extra traffic, you can start the migration again each night until it's finished. If you restart the migration, it picks up from the point where it left off.

Newest data is migrated first. So, on Monday morning, your users have access to their most recent mail and calendar events. Your users can work with their G Suite accounts while older data is being migrated.

You can also consider allowing read-only access to your mail server for a period of time. This allows your users to view data that hasn't migrated, but transition to using G Suite for new email, contacts, and calendar data.

Delta migration (optional)

A delta migration is performed after the bulk migration, but before the Go Live period. The purpose of this stage is to migrate email received in your users' legacy inbox during the bulk migration period.

To perform a delta migration, specify the date range in Step 3: Select the data to migrate. The date range for the delta migration is usually the starting date of the bulk migration through to current day.

If you're able to migrate all data over a quiet period, such as a weekend, you might not need to run a delta migration. Delta migrations are generally used when the amount of data to migrate is significant and the migration time causes a gap in the user's migrated email data. That is because email received into the user's legacy inbox while the bulk migration is occurring isn't migrated.

Delta migrations only migrate content that hasn't been migrated. Changes to content that's already migrated (such as changes to the read status of an email) won't be reflected in G Suite.

It's important to run the delta migration as close as possible to your Go Live date to ensure your users' email is up-to-date. Inform your users that they shouldn't access their mailboxes during the delta migration period.

If you're running a delta migration, consider migrating your contact and calendar data as close as possible to the Go Live date to ensure all data is as up-to-date as possible.

Go Live

In the Go Live phase, all users become active and begin using G Suite accounts for daily activities.

During this phase you should consider:

- Running any necessary re-migrations.

- Starting the migration of additional data (for example, PST files or data older than the original migration scope).

- Ensuring your users have the training and support they need.

Best practices for your migration

Best practices for your first migration

Groups and distribution lists

- The email migration tools don't migrate your organization's distribution lists or groups into G Suite.

- However, emails sent to groups or distribution lists are migrated. You need to ensure groups and lists are provisioned in G Suite before users start to use G Suite to ensure proper email flow when users reply to messages sent to any groups or distribution lists.

Email

- When a domain is configured for dual delivery at the email gateway, mail between users within the same organization is not routed to external gateways and dual-delivered. If you're running this configuration, you may want to consider also migrating email to G Suite for the period of time you have dual delivery enabled.

- Post-migration, G Suite provides an estimate of the number of emails in a user's inbox. It doesn't provide an absolute count. The number of emails in your Gmail inbox may therefore be different to the number of emails in your legacy inbox.

- If you set a retention policy in your Admin console or Google Vault for your mail, migrated mail will be retained based on its original date, not its migration date.

- Don't migrate message stubs (from an archival system, for example). Migrating message stubs prevents content from being remigrated.

Email attachments

- Outlook stores attachments using Base64 encoding. Gmail uses MIME encoding. The MIME format takes up more storage space so data sizes may differ between the legacy account and Gmail. Gmail accepts attachments that are up to 25 MB in size.

User calendar migration

- Make sure you provision **all users** in G Suite before migrating calendars, even if you only want to perform a partial migration. This includes ensuring that all domain aliases and nicknames are added for each user. For details, see Troubleshoot calendar issues with user accounts.

- Calendar attachments can't be migrated. You can manually download attachments from calendar events, upload those events to Google Docs, and then reattach them to the event in Google Calendar.

- Consider carefully when best to migrate calendar data, as changes to existing events won't be updated in G Suite.

- Events that were declined on your legacy system are not shown as declined; instead, they aren't accepted in Google Calendar.

- To enable fan-out for a Calendar migration, you must open GSMME from the command line using the `--enable_calendar_fanout=true` argument. Calendar migration fan-out is not enabled by default.

Calendar resource migration

- You can change event attendees' Exchange email addresses to Google email addresses using the calendar resource CSV file. See Calendar resource migration for details.

- Until you change the Calendar resource setting to **Auto-accept invitations that do not conflict**, the resource appears as a "guest" instead of a resource under "Rooms" in the Calendar invitation interface.

- **Migrate resources as early as possible in the migration timeline**. Resource migrations need to be single-threaded for each administrator performing a migration; they take more time than expected to complete.

- **Migrate resources using only a single thread per GSMME system**. Using a single thread prevents GSMME from making too many concurrent Calendar API requests to Google.

- **Use a different Google administrator account for each GSMME system**. Using a different administrator account maximizes the number of concurrent Calendar API requests to Google that can be made and helps avoid peaks of 403 errors.

- **Separate resource migrations out to as many different GSMME systems as possible and attempt to distribute resources evenly**. This action ensures that the resource migration's load is reasonably well-balanced across all GSMME systems.

- **Only migrate resources going forward for one year; don't migrate each resource's history**. Recurring events over one year are identified and added beyond the one-year time frame.

- **If you migrate more than one year's worth of data**, we highly recommend you run a test migration to a test domain early in the G Suite deployment project.

- **By default, calendar fanout is disabled in GSMME, meaning that the resources themselves need to be added to 2 CSV files**. You must add the calendar resources to both the user CSV file and the calendar resource CSV file. See Create CSV files for users and calendar resources for details.

Multiple domains and email aliases

- If your organization has multiple domains or multiple email aliases for user accounts, these email addresses should be provisioned on the user account in G Suite before migrating Calendar data. If these aliases aren't defined in G Suite, Calendar event data may not be properly reflected or migrated to G Suite.

Best practices for subsequent migrations

If you need to migrate content again, take the following considerations into account:

Email

- If there are errors or problems with a user migration, you may choose to remigrate all data for that user. Doing so will not duplicate existing email content already in the mailbox.

- Remigrating emails may alter the state of messages (from unread to read), particularly when you are remigrating email messages to Vault.

- Remigrated emails will reflect any newly-applied labels. Updated content, read status, and any previously applied labels aren't migrated to G Suite.

User calendar migration

- If you delete calendar events in G Suite, these events are purged from Google Calendar after 21 days. If you want to remigrate these events you must wait for the deleted events to be purged (that is, 21 days).

- If you remigrate calendar events, the migration tool picks up new meeting requests created since your last migration, as it does with contacts and email.

- If, after a migration, you change an existing calendar event on your legacy server (such as updating the meeting room or date of a meeting), the updates will not appear in G Suite following a subsequent migration. Even if you configure the migration tool to **Migrate all data (overwriting previously migrated data)**, these events will not be updated.

Contacts

- Avoid remigrating contact data that you already migrated. If you remigrate contacts and choose **Migrate all data (overwriting previously migrated data)**, duplicate contacts are created in G Suite. If you need to remigrate contact data, first delete the data you migrated originally, and then run a new migration.

- If you do remigrate contacts and duplicate contacts are created, you can use the option in Contacts to merge duplicate contacts.

- The contact migration tool will migrate new contacts created since your last migration, but doesn't migrate contacts that have been modified since the last migration.

Migrating data

Migration overview

To start your migration with GSMME, simply sign in to the client machine where you installed the utility and run it. When you run the utility, the migration wizard opens and prompts you for connection, authentication, and configuration information. You enter the required information in 4 basic steps:

- Step 1: Choose a server type

- Step 2: User and domain information

- Step 3: Select the data to migrate

- Step 4: Migration settings

In Step 4: Migration settings, if you click **Cancel** before clicking **Save** or **Migrate**, then the information you entered is lost. When you click **Save** or **Migrate** your information is saved in a configuration file and you can choose to use those settings when you run another migration. The configuration file only contains the settings from your most recent Save or Migrate operation.

If you cancel the migration while it's in progress, or if it stops due to a hardware failure or power outage, then the process begins where it stopped on the previous run when you resume migrating the same data.

During the migration, contacts and calendar data are processed, followed by email. An update is provided as data is migrated. If a migration is stopped for any reason, you can restart the process, and the migration picks up at the point it stopped.

After a migration is complete, you must close and restart the utility before you start a new migration.

Multiple instances

It's possible to have multiple instances migrating simultaneously, but this can cause very serious problems if administered incorrectly.

Important: If you run multiple instances of a migration, be aware of the following restrictions to avoid data corruption:

- Run only one instance of GSMME on each client machine. If you try to run multiple instances on a single client, those instances overwrite one another's configuration files because there is a single location for configuration files.

- Each instance must reference a unique list of users. If you use multiple instances for the same user, a migration may cause corrupted status information for each user's data.

Before you begin

Before you begin your migration, make sure you address the following:

- Provision users in G Suite

- Authorize GSMME for your domain

- Set up access to your Exchange or IMAP server

- Prepare your Windows client machines

For additional information about all the prerequisites, see Preparing for your migration.

Also, consider the information in Best practices for your first migration and Best practices for subsequent migrations.

Run the utility

On the computer where you installed GSMME:

1. If you're migrating data from an on-premise Microsoft Exchange server, we recommend that you sign in to Windows using the same administrator username that you want to the utility to use to connect to your Exchange server and open users' mail stores.

2. Click **Start** > **All Programs** > **G Suite Migration** > **G Suite Migration For Microsoft**[®] **Exchange**.

Step 1: Choose a server type

The options for step 1 are different depending on what type of server you choose.

Provide the following information:

- **Use my most recent migration settings**: Select this option to use the settings from your most recent configuration file.

  If this is your first migration and you have not saved any previous settings, this option has no effect.

- **Server Type:** Select **Exchange**, **IMAP**, or **Gmail**.

  Examples:

  - **Exchange**: For Exchange or PST files

- **IMAP**: For IMAP
- **Gmail**: For another G Suite domain or the consumer version of Gmail

Exchange options for step 1

- **Specify Exchange server details:**

Host name/IP address: Enter the fully qualified domain name or the IP address of the email server from which you want to migrate data. For example: *smtp.mydomain.com* or *198.102.434.8*.

- **Admin username:** Enter the username for the Exchange administrator account you want to use to open your users' mail stores.

  This account must have at least the *Receive As* permission on the Exchange server.

  Note: We recommend that this username be the same username you use to sign in to the computer where you're running the utility.

  You're prompted for this username and the associated password in Step 4: Migration settings.

- **Specify a profile to use for migration:** Select this option to sign in to a hosted Exchange server and migrate the data for each user.

  Under **Outlook Admin Profile**, select the Outlook administrator profile you want to use to sign in to your hosted Exchange server.

- **Specify a folder with PST files:** Select this option to migrate data in PST files. Next to **Folder with PST files**, browse to the folder that contains the PST files you want to migrate.

IMAP options for step 1

- **IMAP Server type**: Select the type of IMAP server that contains the user data you're migrating. If you specify an incorrect server type, the performance of the migration may be affected.

  Note: The **Gmail IMAP** option provides the same type of migration as the **Gmail** option. The **Gmail** option above is recommended because it provides configuration presets to make migration simpler.

- **Hostname/IP address**: Enter the fully qualified domain name or the IP address of the IMAP server from where you want to migrate data. For example: *smtp.mydomain.com* or *198.102.434.8*.

- **IMAP Security**: Choose the type of IMAP packet encryption you want to use for your migration:

  - **None**: No encryption.
  - **SSL**: SSL encryption
  - **STARTTLS**: TLS encryption

- **IMAP Port:** Enter the connection port on the IMAP server.

  IMAP Path Prefix: Enter the IMAP folders' path prefix that is common to all folders. This usually is the IMAP namespace for the folder names.

For example, if the IMAP folder listing for a user is:

```
INBOX
INBOX.Sent
INBOX.Drafts
```

and so on, then `INBOX` is the path prefix.

Typical values of path prefix are:

- Groupwise IMAP, Gmail, Dovecot: none (leave the field blank)
- Cyrus, Courier: `INBOX`

If in doubt, consult your IMAP server documentation to find the IMAP folders' common namespace.

Special step 1 migration instructions for Cyrus IMAP

When you select **Cyrus IMAP** in step 1, you're presented with 2 additional text boxes to add **IMAP Admin User** and **IMAP Admin Password**. You can run a Cyrus IMAP migration in one of these 2 modes:

Admin mode: You enter your Cyrus administrator ID and password and set the IMAP path prefix to **user.%s** or **user/%s** depending on whether the folder separator character is configured to be a "." or "/" on your Cyrus IMAP server. Because you're running the Cyrus server in admin mode, you don't need to include your users' passwords in the CSV file. You can just format the file with their username in Cyrus followed by their username in G Suite:

Generic example: `user1, gapps-user1`

Organization example: `paul, pauljones` or `paul, pauljones@solarmora.com`

Note: Some versions of Cyrus prior to 2.3.10 don't provide the read or unread state of mail if you migrate using an administrator's password. In such cases, all mail is migrated as "unread." If you want to migrate email with the correct state in **Admin mode**, make sure that your Cyrus servers support the "sharedseen" annotation, and that it's turned on. If your server doesn't support the "sharedseen" annotation, use **Normal mode** and list each user's password.

Normal mode: The migration proceeds just like other IMAP migrations if you leave the fields for IMAP Admin User and IMAP Admin Password empty. In this instance, you need to provide individual user passwords from the migration CSV file to sign in and fetch emails during migration. The CSV file must be in the following format:

Generic example: `user1#user1password, gapps-user`

Organization example: `janesmith#Q8BW2svB, janesmith@solarmora.com`

Special step 1 instructions for Other IMAP Server

When you select **Other IMAP Server**, an extra button appears for **IMAP Server Capabilities**. If you click **IMAP Server Capabilities**, you can enable or disable IMAP server search capabilities, such as message size, deleted flags, date range, and message ID range.

If you're unsure of your IMAP server's capabilities, uncheck each box and click **OK**. Most modern IMAP servers support all of these capabilities. In rare cases where an IMAP server doesn't support a setting, the IMAP Search failure shows up in the logs. Either way, you can run the migration again after enabling the supported flags.

Gmail options for step 1

Simply click **Next** to continue.

Step 2: User and domain information

This step is the same for Exchange and IMAP migrations.

Provide the following information:

- **G Suite domain name:** Enter the name of the G Suite domain to which you are migrating email.

  Example: `my-domain.com`

- **Service Account credentials file**: Enter the path to your credentials JSON file. For more information, see Authorize GSMME for your domain.

- **G Suite Admin user:** Enter your G Suite administrator email address.

Step 3: Select the data to migrate

The options in this step vary depending on whether you chose Exchange or IMAP as your server type.

Provide the following information:

*   **File of accounts to migrate:** If you're migrating email messages, calendars, or contacts, click **Browse** to locate the CSV file with the names of the users you want to migrate. For more information about this file, see Control CSV file.

*   **File of folders to migrate:** If your migrating the content in public folders, click **Browse** and locate the file that provides a mapping between the hierarchical folder name in Exchange and the Google Group email address. For details, see Migrate public folders with GSMME.

Advanced options

*   **Migrate *x* users at a time:** Enter the number users you want to migrate at one time on the client. A separate thread is opened for each user. If you don't specify a value, the utility defaults to 25 users. The utility processes 1 message per 3 second per user.

    If you're using Windows Server 2003 or later, 25-50 users is an optimal setting, depending on the machine's configuration.

*   **Do not migrate mail from these top-level folders:** Used to exclude specific top-level folders from the migration. Any folder at the same level as the inbox is considered a top-level folder.

    Enter a comma-separated values (CSV) list of top-level folder names. Folder names can include spaces and don't require quotation marks. For example:

    ```
    Folder A,FolderB,Folder C
    ```

    The utility ignores any subfolder names you enter.

    For information about preparing exclusion folders, see Organize your data.

*   **Migrate to Google Vault:** If your G Suite account has the Google Vault service, select this option to add all migrated email messages to Vault. Remember though that users' migrated messages will not be visible in their Gmail inboxes. Learn more about Google Vault.

    You can migrate email to Vault from any type of supported mail server, including the Exchange, IMAP, and Gmail server types. You can also migrate email to Vault from PST files.

Exchange options for step 3

- **Select the data you wish to migrate:** If you're migrating from an Exchange server, you have the option to import email, calendars, contacts, and public folders. Check the box for each type of data you want to migrate.

  You can migrate **All** of your email messages and calendar events, or you can select a date range.

  If you select **Calendar**, you can upload your calendar resources (such as meeting rooms). For more information, see Step 3 (Optional): Migrate a subset of users.

  If you select **Public Folders**, you can't migrate both users and public folders at the same time. Migrate your users' mail, calendar events, and contacts first, and then migrate public folders. For details about migrating public folders, see Migrate public folders with GSMME.

- **I am migrating a subset of users:** Available only if you select **Calendar** under **Select the data you wish to migrate**. Upload CSV files with a complete list of every user in your organization (even if you aren't migrating them in this round of migrations), and every calendar resource in your organization, such as meeting rooms. For more information, see Create CSV files for users and calendar resources.

Advanced options for Exchange

- **Migrate deleted emails:** Select this option to migrate messages in the Deleted Items folder.

  Emails in the Deleted Items folder are migrated to Gmail Trash and are deleted 30 days after the data is migrated.

- **Migrate junk emails:** Select this option to migrate messages in the Junk Email folder.

  For more information about how users are processed, see Parallel processing.

Advanced options for IMAP with Exchange IMAP server

- **Do not migrate mail from these top-level folders**: If you select **Microsoft Exchange IMAP**, you must add calendar and contacts folders to the exclusion list.

IMAP options for step 3

- **Select the data you wish to migrate:** You can migrate **All** of your email messages, or you can select a date range.

For IMAP with Gmail

- **Do not migrate mail from these top- level folders**: In the case of Gmail IMAP, use label names to exclude specific folders. Gmail IMAP uses the following system labels:

  ```
  Inbox
  Starred
  Sent
  AllMail
  Drafts
  Spam
  ```

```
Trash
```

Users can create other labels that can be used as exclude folders as well.

Excluding folders for Gmail IMAP works slightly differently. Each message in Gmail can have multiple labels so that the same message can appear as part of many labels. If a label is mentioned as an exclude label or folder, all the messages with that label will be excluded, whether or not they are labeled with other labels as well.

Gmail IMAP options for step 3 (only for Gmail migrations)

If you selected the **IMAP** > **Gmail** or the **Gmail** server type in Step 1, migrating users need to individually disable folder size limits and make **All Mail**, **Spam**, and **Trash** labels available to IMAP.

To disable folder size limits:

1. Open **Gmail** and click the gear icon on the right side, then **Settings**.

2. On the **Forwarding and POP/IMAP** tab under **Folder Size Limits**, check the **Do not limit the number of messages in an IMAP folder (default)** box and click **Save Changes**.

To show **All Mail**, **Spam**, and **Trash** labels in IMAP:

1. Open **Gmail** and click the gear icon on the right side, then **Settings**.

2. On the **Labels** tab, check the **Show in IMAP** box for **All Mail**, **Spam**, and **Trash** labels, if they are not already checked.

Step 3 (Optional): Migrate a subset of users

GSMME version 3.0 and later allows you to migrate a subset of users and their calendar resources to G Suite. To do so, you need 2 CSV files:

1. A CSV file that contains the subset of users

2. A CSV file that contains an exhaustive list of *all* users and resources. If your users' addresses are changing from Exchange to G Suite, the mapping file should contain all users and calendar resources in your organization. The list should be exhaustive and cover all users and resources—even if some of the users aren't migrated at this time because they may be listed as attendees for calendar events that you're currently migrating.

For more information on formatting CSV files, see Create CSV files for users and calendar resources.

To do so, you need to enable 2 settings in GSMME:

1. In Step 3: Select the data to migrate, under **Select the data you wish to migrate**, check the **Calendar** box.

2. Check the **I am migrating a subset of users** box.

3. Upload the CSV files and click **OK**.

Step 3 (Optional): Add migrated email to Google Vault

GSMME version 4.0 and later allows you to add users' migrated email messages to Google Vault. You can migrate email to Vault from any type of supported mail server, including the Exchange, IMAP, and Gmail server types. You can also migrate email to Vault from PST files.

If you add users' messages to Vault:

• Migrated messages won't be available in users' Gmail inboxes.

• Folder information is removed from messages before they're migrated, so they won't have labels in Vault.

• Migration time is not affected.

To add users' migrated email messages to Vault:

1. In Step 3: Select the data to migrate, under **Select the data you wish to migrate**, check the **Email messages** box.

2. Click **Advanced options**.

3. Check the **Migrate to Google Vault** box and click **OK**.

Step 4: Migration settings

The information displayed in these screens is a little different depending on whether you chose Exchange, IMAP, or Gmail in Step 1: Choose a server type. The same procedures apply to all options, however. All selections are optional.

1. Review your migration settings. If you want to change a value, click **Edit**.

   - Select **Migrate all data**. If you select this option with a subsequent migration:

     Messages that were previously migrated will not be duplicated, but their status may be reverted (for example, read mail could become unread and old labels could be assigned to messages).

     Calendar events that were previously migrated will be overwritten.

     Contacts that were previously migrated will be duplicated. After the migration, you can remove duplicates by merging contacts.

   - Select **Save settings** to save your settings in a configuration file. The next time you run the utility, you can reuse these settings in Step 1: Choose a server type.

   - Select **Run Diagnostics** if you want the utility to validate your configuration and users list before running the migration. For more information about running diagnostics, see Run diagnostic tests.

   - Select **Estimate** if you want the utility to perform an estimate of the amount of data you want to migrate. Select this option by itself if you want to utility to perform only an estimate. Select this option along with the Migrate option if you want the utility to perform an estimate, and then proceed with the migration.

   - Select **Migrate** if you want the utility to migrate the data you've identified.

2. When you're satisfied with your settings, click **Next**.

If you're migrating from an Exchange server, you'll see a dialog box.

Note: This dialog box doesn't appear if you signed in to the client computer using your Exchange administrator credentials, or previously selected **Remember my password** in this box.

   - Enter the username and password for the Exchange administrator account you're using to open your users' mail stores. This is the same username you entered in Step 1: Choose a server type. (We recommend that this username be the same username you used to sign in to the client computer where you're running the utility.)

   - Check the **Remember my password** box to bypass this step in future migrations.

   - Click **OK**.

3. If you checked the **Run Diagnostics** box, the **Validation Settings** screen appears. See Run diagnostic tests.

   If you didn't select **Run Diagnostics**, the migration starts.

Run diagnostic tests

If you selected **Run Diagnostics** on the **Review** screen, the utility validates your configuration and users list before you run the migration. This validation helps to prevent migration errors or a failed migration.

What's validated?

The diagnostic tests validate the following information:

- Connection to the Exchange or IMAP server

- Administrator privileges for the credentials you provided

- Format of the user CSV file

- Whether or not users in the users list exist on the Exchange or IMAP server, and whether their mailboxes are accessible using the administrator credentials you provided

    Note: The utility initially only checks the first 10 users in the CSV file. After the diagnostic test completes, you can validate the entire user list. See Validate entire user list.

- Whether or not users in the user CSV file also exist in G Suite

- Connection to the G Suite server

- OAuth consumer key and secret you provided, if applicable

Diagnostic test results

After you click **Next** on the Review screen, the Validation Settings screen shows the progress of the diagnostic test. If the utility encounters an error, "Failed" appears next to he validation that failed. For more information about a failed validation, click **Help**. Additional information appears in the Error Details box.

Validate entire user list

The utility initially only checks the first 10 users in your CSV file. After the diagnostic test completes, you can run the test again to validate the entire user list. If you select this option, however, the diagnostic test may take much longer.

To validate the entire user list, check the **Include exhaustive user validations** box on the **Validating Settings** page.

Click the **Log file** link to open the log file for the current migration.

When the migration is finished (either successfully or due to a cancellation or failure), you see the following line of text: End local time is: *end time of migration.*

What to expect during migration

- With Exchange, contacts are migrated first, followed by calendar data, and then email.

- Your users can use their G Suite accounts during migration.

- If a user in the list isn't also provisioned in G Suite, the migration moves on to the next user. If the migration encounters a mail store it can't open, it moves on to the next user in the list. If the migration encounters an error with a particular item, for example a message, it moves on to the next item.

- Errors are recorded in the log files. You can find the migration log files as well as status and output files in the following location:

  Windows 7/2008:

  ```
  C:\Users\username\AppData\Local\Google\Google Apps Migration\Tracing
  ```

  Windows XP/2003:

  ```
  C:\Documents and Settings\username\Local Settings\Application
  Data\Google\Google Apps Migration\Tracing
  ```

  The `username` variable identifies the administrator who signed in and ran the utility.

Run a migration from the command line

For details, see Run GSMME from the command line.

Migrate public folders from Exchange

You can migrate public folders from Exchange to Google Groups using the GSMME desktop interface or from the command line. Do this after you migrate your users' mail, calendars, and contacts. For instructions, see Migrate public folders with GSMME.

Monitor a migration

When your migration starts, you can monitor the progress in the following screens.

Estimate

1. In Step 4: Migration settings, check the **Estimate** box.

   GSMME performs an estimate before it begins the migration.

2. When the estimate is finished, click **Migrate** to start the migration.

3. Click **Detailed estimation report** for more detailed information.

Migrate

In Step 4: Migration settings, on the **Review** screen or the **Estimation** screen check **Migrate**.

The **Output** screen shows the progress of your migration:

As the migration progresses, the utility updates the Output screen with information about which user is being migrated, which data is being migrated, and when each segment of data has been migrated successfully.

Reviewing migration reports

Migration reports overview

GSMME provides detailed reports about the migrations you run. You can view an aggregate report that includes information from all your migrations or a separate report for each one. Use these reports to determine whether or not errors occurred during a migration and why.

In addition to migration reports, GSMME provides the following related information:

- **Log files:** In most cases, migration reports provide all the information you need to troubleshoot errors in a migration. However, you may need to examine detailed logs to troubleshoot a specific issue or send logs to Google support for analysis. For details, see Interpreting log files.
- **Diagnostics:** Migration reports show only message errors that occur during a migration. To determine whether there are errors with your configuration, run the pre-migration diagnostics. For details, see Run diagnostic tests.

Report IDs

Whenever you run a migration, GSMME creates a report with a unique name, or ID. A report is named by the date and time at which the migration run completed, and includes the process ID. For example, a report with the name `2011-10-12-11-14-20-p5172.log` was created on October 12, 2011 at 11:14:20 AM, with process ID 5172.

Migration report views

There are two types of migration report views, that available for aggregate reports and specific migration reports:

- **User view:** Shows a list of users that were migrated and indicates whether any failures occurred in the migration of email, calendar events, or contacts. If any errors occurred, you can click links on the report to open additional pages that show details about the error.

- **Error view:** Shows a list of all the errors and the number of users or messages for which a error occurred. You can click links on the report to open additional pages that show details about specific errors.

Open migration reports

When you open a report, it appears in a new window in your web browser.

Note: Be aware of the following limitations to viewing reports:

- To generate reports, GSMME first opens a command console window, which then starts a reports server on the machine where you run the utility. Be sure to leave this console window open.
- If you open a report while you're running a migration, the migration may fail.

To open a report:

1. On the machine where the utility is installed, click **Start** > **All Programs** > **Google** > **G Suite Migration** > **Show Report**.

   The command console window opens, which starts the reports server. Don't close this window.

   After the reports server starts, the Aggregate Report opens in a browser window.

2. To open a report for a specific migration, select it from the **Select Migration Run ID** list.

   Note: For details about report IDs, see Report IDs.

Report pages

After you open an aggregate report or a specific migration report, you can navigate to additional pages to determine which users were affected by errors and which errors occurred as well as any details about the errors.

Summary page

The summary page is the top-level page of an aggregate or specific migration report. It shows a summary of the following statistics for all migration runs (for the aggregate report) or a single migration run (for a specific migration report):

- Total users
- Failed users
- Number of emails, calender entries, and contacts migrated
- Number of failed emails, calendar entries (events), and contacts
- Email migration rate

User list for Migration page

To get to this page, click **Summary page** > **Total Users Migrated**

The User list for Migration page shows a list of all users that were migrated. You can click the name of a user to view the **User Migration Summary for Run ID** page for that user.

Failed Users List for Migration page

To get to this page, click **Summary page** > **Failed Users**

The Failed Users List for Migration page shows a list of all users for whom a migration error occurred and which type of error occurred. For more details about specific user errors, click the name of a user to view the **Failed User Migration Summary for Run ID** page.

User migration summary page

To get to this page, click one of the following:

- **Summary page** > **Total Migrated Users** > **user name**

- **Summary page** > **Failed Users** > **user name**

- **Summary page > Total Errors > Users Affected > user name**

The user migration summary page shows each type of folder that was migrated for a user (email, calendar, and contacts) and the number of errors that occurred for a folder. Click the name of a folder to view the **Folder Details** page.

Folder Details page

To get to this page, click one of the following:

- **Summary page** > **Total Migrated Users** > **user name** > **folder name**

- **Summary page** > **Failed Users** > **user name** > **folder name**

The Folder Details page shows details about each error that occurred for a specific folder. Click the link under **Subject** to view the **Message Summary** page. Click the error code to view the **Users Failed by Error** page.

Message Details page

To get to this page, click one of the following:

- **Summary page** > **Total Migrated Users** > **user name** > **folder name** > **message**

- **Summary page** > **Total Errors** > **Users Affected** > **folder name** > **message**

The Message Details page shows details about a message that failed to be migrated, including the error message and error description. This page also shows HTTP request and response information if a Google API error occurred while the message was being uploaded to G Suite.

Error list for Migration page

To get to this page, click **Summary page** > **Total Errors**.

The Error list for Migration page shows each type of error that occurred during a migration and the number of users for which that error occurred. Click the number under **Users Affected** to view the **Users failed with Error** page.

Users failed with Error page

To get to this page, click **Summary page** > **Total Errors** > **Affected Users**.

The Users failed with Error page shows the users for which an error occurred during a migration and details about each user's migrated messages. Click the name of a user to view the **Failed User Migration Summary** page for that user.

Troubleshooting

You can find the latest troubleshooting information for GSMME in Troubleshoot GSMME.

How to get support

When you contact support please provide the information for a ZIP file that is outlined at the bottom of Troubleshoot an Exchange Migration using GSMME.

For additional resources provided by Google to help you with your move to G Suite, see the G Suite Technical Transition Guide. Available support includes deployment resources, Help Center articles, deployment training and certification, and technical support.

Common issues

How do I cleanly remigrate a user's calendar?

You may need to remigrate a user's calendar if there are changes to it after an initial migration. To completely remigrate a user's calendar, follow these steps:

1. Delete the user's G Suite account to remove their calendar.

2. Configure the GSMME to migrate the user's calendar and select the **Migrate all data (overwriting previously migrated data)** option.

How many calendar resources can I migrate per admin account?

A stable migration can be achieved when running one administrator per GSMME instance and one calendar resource (single concurrent thread).

For more information about calendar migration best practices, see Best practices for your migration.

Troubleshoot calendar issues with user accounts

To ensure that migrated calendar data will be associated with the correct G Suite accounts, make sure you ***provision all your users in G Suite before you migrate any accounts***— even if you only want to perform a partial migration. This includes ensuring that all domain aliases and nicknames are added for each user. Otherwise, the following issues might occur:

- If an unprovisioned user previously signed up for a *consumer* Google Account (such as Gmail, Picasa, or Blogger) using the same email address they use in your domain, calendar invitations to and from that user on migrated users' calendars will be associated with a *conflicting account for the unprovisioned user* (learn more about conflicting accounts) and the user may not get calendar event updates from the organizer.

  Resolution: Provision the user and then delete and recreate all events for which the user is the organizer or a guest.

- If the organizer of the calendar event used an alias or non-routable internal-only SMTP address when creating the event, and the event is migrated before that alias or nickname is added to the organizer's user account in G Suite, the following issues may occur:

  - The migrated calendar events of attendees are not synchronized and are disconnected from the event on the organizer's calendar. If the organizer makes a change to the event, it will not fan out to the attendees' calendars even though the events have the same event ID.

  - Calendar notifications and updates will not propagate to the attendees' calendars

  Resolution: Either:

  - Add a domain alias in the Admin console in order to create nicknames for all users in the domain.

  - Add a non-primary domain and create an alias for each user, organizer, or attendee of the migrated event.

Migrated calendar events where the organizer or attendees are listed with the legacy domain are updated with the primary domain and are synchronized once the nicknames are added.

How can I tell if my OAuth settings are entered correctly?

1. In the Google Admin console, click **Security** > **Advanced settings**. You may need to click **Show more** to access **Advanced settings**.

2. In the **Authentication** section, click **Manage API client access**.

3. Make sure all of the scopes appear next to your Client ID with an English description. If they don't, make sure that you've entered the scopes correctly.

For details, see Authorize GSMME for your domain.

Verifying your configuration and users list

If you're unable to start a migration or you find that some users were not migrated, there might be an issue with your configuration or users list. To identify and resolve the issue, you can run pre-migration diagnostic tests. These tests can identify errors in connectivity, authentication, and your user list, including:

- Users in your user list who can't be found on your Exchange or IMAP server

- Users in your user list who are suspended, deleted, or not yet provisioned in G Suite

- Incorrect sign-in credentials or other information about your Exchange or IMAP server

- An incorrect email address or Exchange alias for a user

- Failed OAuth requests caused by an incorrect OAuth key, secret, or Windows clock setting

For information on running diagnostic tests on your configuration and user list, see Run diagnostic tests.

Viewing migration reports

If message errors occur during a migration, you can check the migration reports for details about which errors occurred, and which users were affected. For more information, see Reviewing migration reports.

Interpreting log files

In most cases, migration reports provide the information you need to troubleshoot message errors that occur during a migration. However, you may need to examine log files for more information about migration errors or provide logs to Google support.

The log files provide an ongoing account of how each segment of the migration has progressed. In general, this information is most valuable to Google support. For example, if a log file implicates a particular Exchange Migration module or method as the cause of an error, then Google engineers can address the issue. However, the log files can also help you identify problems like timeouts or network errors that need to be resolved in your own environment.

Log analyzer

Google provides a log analyzer for GSMME. The analyzer can scan your trace log files and identify many types of migration issues. To use the analyzer, go to G Suite toolbox and upload your files:

Most issues can be identified within a few moments of submission.

Types of log files

GSMME produces two log files:

- **Status log** files contain a summary of the overall status of a completed migration run.

- **Trace log** files which contain detailed information about the migration as it progresses through the data for each user.

Log files are located on each client machine in the following location:

- **Windows 7 or Vista**: `C:\Users\`*`user-name`*`\AppData\Local\Google\Google Apps Migration\Tracing\ExchangeMigration`

- **Windows XP**: `C:\Documents and Settings\`*`user-name`*`\Local Settings\Application Data\Google\Google Apps Migration\Tracing\ExchangeMigration`

The user-name variable identifies the administrator who signed in and ran the utility.

Note: You can customize the folder path for the log files. For details, see Optional: Specify custom log folder path.

If you encounter a problem during migration, you can use these log files to identify where in the process the error occurred.

The following sections explain how to interpret the information in each file.

Status log file

The Status log file for a given migration is created on and named by the date and time that the migration completed, and includes the process ID. For example, a file with the name `Status-2012-11-12-11-14-20-p5172.log` was created on November 12, 2012 at 11:14:20 AM with process ID 5172.

The file contains summary information for each user who was processed during the migration, and information about each type of data you elected to migrate (contacts, calendars, and email).

The information for a user includes:

- The username and the overall status of data migration for that user:

  ```
  <Exchange User:hyduser1:
  Status:Success:
  ```

- Information about the success or failure of migrating contact data for that user:

  ```
  <Contact Migration:Not Started
  Total Contacts:0
  Sucess Count:0
  Fail Count:0
  ```

- Information about the success or failure of migrating calendar data for that user:

  ```
  <Calendar Migration:Success
  Total Calendar Events:0
  Success Count:0
  Fail Count:0
  ```

- Information about the success or failure of migrating email data (per folder) for that user:

  ```
  <Email Migration:Success
  <Folder Name:blr/apmt/spf-old
  Folder Migration Status:Success
  Folder Total:248
  Migrated Count:248
  Success Count:248
  Fail Count:0>
  ```

Trace log file

Similarly the trace log file for a given migration is created on and named by the date and time that the migration run started and includes the process ID. For example, a file with the name `Trace-2012-07-19-16-53-58-p8108.log` was created on July 19, 2012, at 4:53:58 PM with process ID 8108. The file is updated as the migration progresses.

The trace file begins with entries similar to:

```
Configuration: Exe name: C:\Program Files\Google\G Suite
Migration\ExchangeMigration.exe

Exe version: 8.6.7.5309

GSync version: 8.6.7.5309

OS Version: 5.1.2600

OS Service Pack: 3.0

OS Suite/Product: 256/1

Processor arch: 0/6/3846

Process Id: 8108
```

These opening entries provide information about the location and version of the Exchange migration executable file, the Exchange migration product version, operating-system information about the computer where the utility is running, and the process ID for the particular migration run.

Subsequent entries in the trace log file begin with the same general information as the following example:

```
2012-07-19T16:53:58.264+05:30   3ac A:Migration
ExchangeMigration!ServerMigrationSource::ProcessUser @ 88 ()> source_user:drafts
google_user:drafts

2012-07-19T16:54:00.139+05:30   3ac A:Migration
ExchangeMigration!ServerMigrationConfig::LogConfig @ 343 ()>

Migration Configuration:

        ExchangeProfileName: (null)
        SourceServer: 172.26.201.222
        SourceAdmin:
        GoogleDomain: testdomain.com
        GoogleConsumerKey: testdomain.com
        ForceRestart: 1
        IsMigrateEmail: 1
        IsMigrateContacts: 0
        IsMigrateCalendar: 0
        EmailMigrationStartDate: 2012-08-01
        EmailMigrationEndDate:
        ExcludeTopLevelFolders:
```

- **2012-07-19T16:53:58.264+05:30 / 2012-07-19T16:54:00.139+05:30**: Date and time entry was written

- **3ac**: The thread ID

- **A**: The logging level (A: All, I: Information, E: Error, F: Fatal, W: Warning, V: Verbose)

  All, Error, Fatal, and Warning are hard coded. You can enable Information and Verbose by editing the Windows registry. For more information, see Enable Trace logging.

- **Migration**: Module name (for example, Migration, Generic, Sync, Calendar)

- **ServerMigrationSource / ServerMigrationConfig**: Class name

- **ProcessUser / LogConfig**: Method name

- **@ 88/@ 343**: Line number

- **sourceuser:drafts**: Username on the source server

- **googleuser:drafts**: Username in G Suite

- **Migration Configuration**: Beginning of the list of configuration details

- **ExchangeProfileName**: Name of the Exchange profile used for the migration

- **SourceServer**: IP address or fully qualified domain name of the source server

- **SourceAdmin**: Administrator account on the source server

- **GoogleDomain**: G Suite domain where the data was migrated

- **GoogleConsumerKey**: Consumer key for G Suite domain where the data was migrated

- **ForceRestart**: Whether the migration ran from last stopping point or all data is migrated (0=run migration from last stopping point, 1=migrate all data)

- **IsMigrateMail**: Whether or not mail was migrated (0=no, 1=yes)

- **IsMigrateContacts**: Whether or not contacts were migrated (0=no, 1=yes)

- **IsMigrateCalendar**: Whether or not calendar events were migrated (0=no, 1=yes)

- **EmailMigrationStartDate**: Beginning date for the migration

- **EmailMigrationEndData**: End date for the migration

- **ExcludeTopLevelFolders**: List of top-level folders to exclude

Enable Trace logging

To enable Information, Verbose, or Performance logging in the Trace log file:

Edit the **Tracing** registry key and its accompanying **Level** DWORD Value:

- Registry key: HKEY_CURRENT_USER\Software\Google\Google Apps Migration**Tracing**

- DWORD Value: **Level**

- Level Value data: Change the default value of 7 to:

    - **f** (Information)
    - **ff** (Verbose)
    - **4F** (Performance)
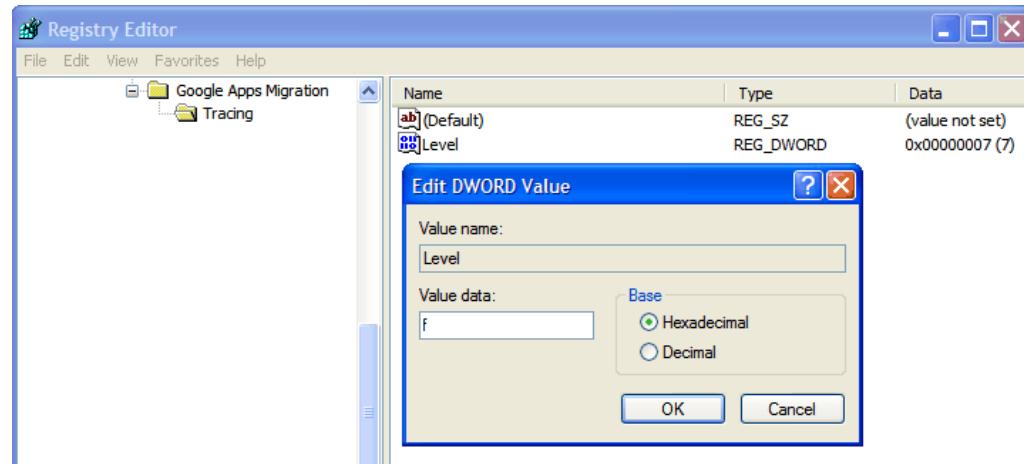
Getting additional support

To contact support directly for assistance and receive expedited support as a G Suite customer, find your G Suite Support PIN before contacting support.