

# Google Apps Migration for Microsoft® Exchange

## Administration Guide

- Microsoft Exchange
- IMAP servers (Novell™ Groupwise®, Cyrus, Courier, Dovecot, and other RFC 3501-compliant IMAP servers)
- PST (Personal Storage Table files)
- Gmail and Google Apps Account Migration



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# About This Guide

## What this guide contains

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This guide helps administrators understand and implement Google Apps Migration for Microsoft® Exchange, a utility that lets you migrate email, calendar, and/or contact data from into Google Apps from:

- Microsoft® Exchange
- Any IMAP-compliant server
- PST files
- Another Google Apps Account

## What's in this guide

This guide contains the following information:

- An overview of the 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 the administrators who are responsible for the preliminary setup and for running Google Apps Migration for Microsoft® Exchange. Administrators should be familiar with their server data to be migrated (Microsoft® Exchange or IMAP mail server) and with Google Apps.

## 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 Google Apps Migration for Microsoft Exchange page here:

<https://support.google.com/a/bin/answer.py?answer=162794>

You can also find updates and new information in the *Google Apps Migration for Microsoft Exchange* Help Center article.

## How to provide comments about this guide

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

In your message, be sure to tell us the specific section to which your comment applies. Thanks!

If you have any questions or need technical support, please contact Support rather than using this address. For more information about contacting support, see “How to get support” on page 71.

## Disclaimer for third-party product configurations

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

Google does not provide technical support for configuring mail servers or other third-party products. In the event of a Microsoft® Exchange issue, you should consult your Microsoft® Exchange administrator. **GOOGLE ACCEPTS NO RESPONSIBILITY FOR THIRD-PARTY PRODUCTS.** Please consult the product's Web site for the latest configuration and support information. You may also contact Google Solutions Providers for consulting services and options.

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# Overview

## What is Google Apps Migration for Microsoft Exchange?

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Google Apps Migration for Microsoft® Exchange is a server-side tool that migrates your company's email, calendar and/or contact data from Microsoft Exchange, IMAP server, or PST file to Google Apps. 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.

With this tool you can migrate mail from:

- **Microsoft® Exchange Server 2000, 2003, 2007, or 2010.** Administrators can migrate mail, calendar events and resources, contacts, and public folders from Microsoft Exchange Servers.
- **IMAP** (Internet Message Access Protocol) **mail servers.** Administrators can use the tool's IMAP capabilities to migrate email from systems like Novell Groupwise, Cyrus, Courier, Dovecot, SunMail, Zimbra, or other RFC 3501-compliant IMAP servers, into Google Apps. You can even use IMAP mail server support to migrate data from one Google Apps account to another.
- **PST** (Personal Storage Table) **files.** Administrators can migrate PST files on behalf of users in their domain once they have aggregated the files into one location. Password-protected PST files cannot be migrated.
- **Hosted Exchange.** 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 Google Apps accounts.** Administrators can migrate data from one Google Apps account to another using this tool.

## Features

Some of the important features of the tool include:

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

- Administrator migration. No end user participation is required.
- Control of which users are migrated, through formatted CSV files you create.
- Parallel migration for multiple users to speed the migration process. By default, Google Apps Migration for Microsoft Exchange migrates 25 users at a time, but depending on your hardware capacity, you can configure this up to 200 users. See “[Step 3](#)” on [page 48](#) for more details.
- Migrate calendar resources (like meeting rooms) from Microsoft Exchange. See “[Migrate a subset of users](#)” on [page 54](#).
- In Microsoft Exchange, the ability to migrate using either your administrator credentials or an Outlook profile. Using an Outlook profile assists in migration from Hosted Exchange, by running the tool from outside the hosting service.
- Migrate Public Folders using the command line. See the help center article [Migrate Public Folders with GAMME](#): <http://support.google.com/a/bin/answer.py?&answer=2840803>.
- Built-in tool that estimates how many emails, calendar events and contacts you will be migrating for a set of users before running the migration. This is very useful in planning the migration.
- Pre-migration diagnostics, which check for configuration errors in connectivity and authentication; and errors in your user list before you run a migration.
- Detailed migration reports that show an overview of a migration (or all migrations combined), any message errors that during a migration, why those errors occurred, and which users were affected by them.
- Logging and reporting of migration results, with adjustable level of detail for quick updates or detailed debugging.
- Real-time status updates on the progress of migration.
- Option to migrate only email messages sent or received during the time frame you specify.
- Ability to use a command-line interface to automate or script usage of the utility. Both methods are discussed in “[Migrating Data](#)” on [page 39](#).



## Comparison with other tools

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

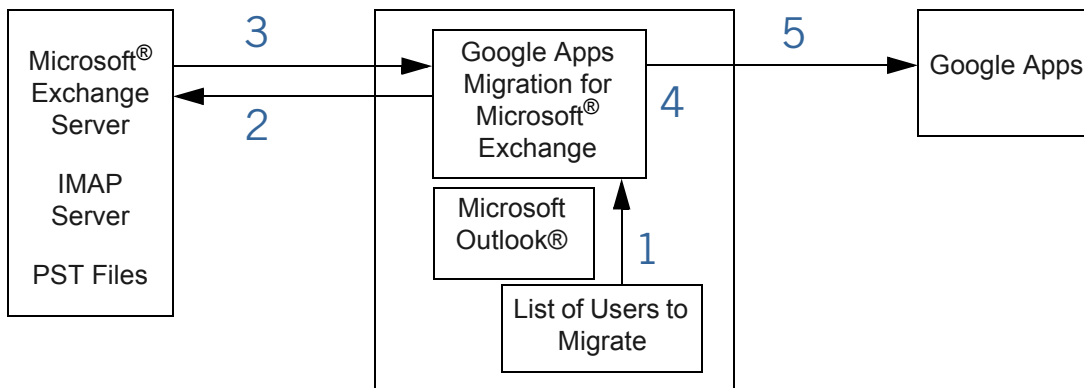
Tool	Features
<b>Google Apps Migration for Microsoft® Exchange</b>	<b>Supported on Microsoft® Exchange 2000, 2003, 2007 and 2010, Novell™ Groupwise®, Gmail, Cyrus, Dovecot, Courier, other IMAP servers, Google Apps, and PST files.</b> <b>Facts:</b> <ul style="list-style-type: none"><li>• Migration managed by an administrator.</li><li>• Migration managed outside your email and Google Apps environments.</li><li>• Migrates directly from your mail server or PST files to Google Apps.</li><li>• Migrates mail, contacts, and calendar data for multiple users at once.</li><li>• Calendar events and resources, contacts, and public folders are supported only for Microsoft® Exchange 2000, 2003, 2007, and 2010.</li></ul>
<b>Google Apps Sync for Microsoft Outlook®</b>	<b>Supported on Microsoft® Exchange 2003, 2007, and 2010.</b> <b>Facts:</b> <ul style="list-style-type: none"><li>• Migration managed by individual users.</li><li>• Migration implemented through wizard in Google Apps Migration for Microsoft Outlook.</li><li>• Migrates directly from your Microsoft® Outlook profiles or PST files to Google Apps.</li><li>• Migrates mail, calendar events, and contacts for one user.</li></ul>
<b>Google Apps Migration for Microsoft Outlook®</b>	<b>Supported on Microsoft® Exchange 2003, 2007, and 2010.</b> <b>Facts:</b> <ul style="list-style-type: none"><li>• Migration managed by individual users.</li><li>• Migration implemented through a migration wizard.</li><li>• Migrates directly from your Microsoft® Outlook profiles or PST files to Google Apps.</li><li>• Migrates mail, calendar events, and contacts for one user.</li></ul>

For a more in-depth look at available migration solutions, see the [Google Apps for Business Technical Transition Guide](#).

# Architecture

Google Apps Migration for Microsoft® Exchange 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 Google Apps Migration for Microsoft® Exchange gets users' data and migrates it to Google Apps.



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 Google Apps.

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

Email is processed at a maximum rate of one message per second per user, assuming that no latency is introduced by mail server or network performance. For example, if you configure the utility to process 25 users at a time, then the utility will process up to 25 messages per second. However, 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 GAMME 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 GAMME 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 and then calendar data are processed first, followed by email.

The following tables outline which aspects of mail, calendar, and contact data are and are not migrated from Microsoft® Exchange to Google Apps. For example, messages with .exe attachments are not migrated.

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:

- **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 logged in and ran the utility.

## Mail

Mail data	Migrated to Google Apps	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” on page 48.
Email state (read vs. unread)	✓	
Folders and nested subfolders (Labels in Gmail)	✓	Folders map to <i>labels</i> in Google Mail.  You can elect to omit top-level folders from 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 label prior to this.
Junk E-mail	✓	Migration is optional.
Deleted Items	✓	Migration is optional. Deleted items are labeled <i>Trash</i> in Google Mail.
Public folders (Microsoft® Exchange only)	✓	See the help center article Migrate Public Folders with GAMME: <a href="http://support.google.com/a/bin/answer.py?&amp;answer=2840803">http://support.google.com/a/bin/answer.py?&amp;answer=2840803</a> .
Messages larger than 25 MB	✗	Messages whose total size exceeds 25 MB (message plus attachments) aren’t allowed in Gmail.
Attachments	✓	Most attachments are migrated. See below for exceptions.
Executable files in compressed attachments	✗	These types of attachments aren’t allowed in Gmail.
Posts in mailbox folders (Microsoft® Exchange only)	✗	Not available in Gmail.
Importance levels (marking messages high, low priority) (Microsoft® Exchange only)	✗	Not imported into Gmail.
Message flags	✓	Flags appear as <i>stars</i> in Gmail.

Mail data	Migrated to Google Apps	Notes
Rules (Microsoft® Exchange only)	✘	Rules (both server and client) aren't migrated. But you can create equivalent <i>filters</i> in Gmail.
Signatures (Microsoft® Exchange only)	✘	Your users' signatures are not migrated. Users can manually recreate it in Gmail.
POP/IMAP account (Microsoft® Exchange only)	✘	IMAP or POP account settings don't import from your Microsoft® Exchange profile. You can add an account to your Google Apps profile after migration.
POP messages (Microsoft® Exchange only)	✔	
Shared mailboxes (Microsoft® Exchange only)	✘	Gmail does not support shared messages.
Category definitions (Microsoft® Exchange only)	✘	Categories aren't available in Google Mail.
Category assignments (Microsoft® Exchange only)	✘	Categories aren't available in Google Mail.

## Calendar

Calendar data in Microsoft® Exchange	Migrated to Google Apps	Notes
Default calendar	✔	Includes all events, descriptions, attendees, and locations.  <b>Note:</b> If you are using an exported or archived PST file, it is not possible to identify the primary root folder for Calendar and Contacts. Therefore, all calendars are migrated as “additional calendars” into Google Apps Calendar, instead of any default calendar. You can avoid this by using PST migration for mails only, and use Exchange server migration for migrating calendars.
Additional calendars	✔	Shared calendars are migrated for the owner, but not for other users who have access.

Calendar data in Microsoft® Exchange	Migrated to Google Apps	Notes
Event reminders	✓	
Free / Busy status	✓	Only other Google Apps users can see free/busy status in Google Calendar.
Calendar resources	✓	For more information, see <a href="#">“Migrate a subset of users” on page 54</a>
Tentative / Out of Office status	✗	Special status for calendar data is not migrated.
Optional attendees	✗	Not migrated.
Calendar attachments	✗	Not migrated.
Rich content in event descriptions (images, links, bold, italic)	✗	Event descriptions are migrated as plain text.
Category definitions	✗	Categories aren’t available in Google Calendar.
Category assignments	✗	Categories aren’t available in Google Calendar.

## Personal contacts

Personal contact data in Microsoft® Exchange	Migrated to Google Apps	Notes
All personal contacts	✓	Includes all fields (File As, images, notes, etc.).
Multiple contact folders	⚠	Separate contacts folders don’t migrate to Google Apps. Instead, all contacts from all folders are migrated, and then appear together in Google Apps under My Contacts. You can reorganize them using Google <i>groups</i> .
Personal distribution lists	✗	Mailing lists don’t migrate to Google Apps. But you can still email a list from Google Apps by creating a Google <i>group</i> .
Rich formatting in personal contact notes	✗	Notes in contacts are migrated as plain text.
Notes larger than 16KB	✗	Larger notes are truncated in Google Apps.
Follow-up flags, dates, and reminders.	✗	Flags aren’t available in Google contacts.

Personal contact data in Microsoft® Exchange	Migrated to Google Apps	Notes
Category definitions	✘	Categories aren't available in Google contacts.
Category assignments	✘	Categories aren't available in Google contacts.

## Global contacts

Global contact data	Migrated to Google Apps	Notes
Domain contacts	✘	You need to migrate domain contacts separately. For more information, see <a href="#">“Migrate your shared contacts to Google Apps”</a> on page 28.
Out-of-domain contacts	✘	You need to migrate out-of-domain contacts separately. For more information, see <a href="#">“Migrate your shared contacts to Google Apps”</a> on page 28.

## Notes, Tasks, Journal entries, RSS feeds

Other Microsoft® Exchange data	Syncs with Google Apps	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.

Google Apps Migration for Microsoft® Exchange is capable of processing, and Google Apps can receive, message data at the rate of 1 message per user per second. For example:

- 1 client machine, processing 25 users = 25 messages processed per second
- If each of those 25 users has 4,000 messages, the utility could process and migrate those messages in 4,000 seconds, or 1.11 hours (25 users \* 4,000 messages = 100,000 messages; 100,000 / 25 messages per second = 4,000 seconds or 1.11 hours)

The utility will migrate a maximum of one message per user per second. This may be limited further by hardware constraints or network latency issues.

Factors that can affect this include:

- Physical resources on the client machine like CPU, memory, disk speed, and network connection speed
- Physical resources on the Microsoft® Exchange Server (or IMAP server) like CPU, memory, disk speed, and network connection speed, along with how well you've tuned your Microsoft® Exchange 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.

In current testing, using Microsoft® Windows Server 2003 and later, you can optimally process 20-50 users at a time on a client machine, depending on the client machine's configuration.

## Special note on migrating from Exchange 2010

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

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

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

In the shell, enter the following:

```
New-ThrottlingPolicy GAMME -RCAMaxConcurrency $null -RCAPercentTimeInAD $null -RCAPercentTimeInCAS $null -RCAPercentTimeInMailboxRPC $null
```

```
Type Set-Mailbox "GAMME_Admin" -ThrottlingPolicy GAMME
```

For a detailed explanation of the Exchange 2010 Client Throttling Policies and settings, see Microsoft's documentation: <http://technet.microsoft.com/en-us/library/dd297964.aspx>

### **Exchange 2010 IMAP Migration Considerations:**

If using IMAP migrations with Exchange 2010 you may be 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>



# Preparing for Your Migration

## Preparation

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Before you migrate your data, plan to make the following preparation

- Confirm that your client machines meet server requirements.
- Provision your users' accounts in Google Apps.
- Configure Google Apps and your Microsoft® Windows client machines.
- Create lists of the users and calendar resources you want to migrate by generating CSV files.
- Set up folders for the PST files you want to migrate.
- Set up your Microsoft® Exchange Server or IMAP server.
- Migrate shared contacts.
- Run the installer for the Microsoft® Exchange Migration for Microsoft® Exchange utility.
- Optionally, specify a custom folder path for log files.

Details are described below.

## System requirements

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Before you run Google Apps Migration for Microsoft® Exchange, you need to meet some Google Apps edition and configuration requirements, some account requirements for your Microsoft® Exchange Server, and Microsoft® Windows system requirements for your client machines.

### Google Apps

Google Apps Migration for Microsoft® Exchange works with Google Apps for Business and Google Apps for Education.

Before you can migrate Microsoft® Exchange data to Google Apps, you need to make the following configurations in the Google Apps control panel:

- Enable OAuth client access so the utility can access the user accounts in Google Apps

For more information about configuring Google Apps, see [“Configure Google Apps” on page 19](#).

## Mail Server

Google Apps Migration for Microsoft® Exchange requires one administrative account on your Microsoft® Exchange Server that has read/write permission for each user's mailbox. The Microsoft® Exchange permission *Receive As* is sufficient for this task. For other mail servers, see your mail server administration documentation.

For IMAP migration, you don't need an administrator's account or password. Instead, you will need to provide the individual username and password for each user being migrated.

## Microsoft® Windows client machine

Each client machine needs to have the following minimum configuration:

- Microsoft® Windows: Windows XP SP3, Windows Vista Business SP1 or later, Windows 7, Windows Server 2003 SP 2 or later
- Microsoft Outlook® 2003, 2007, or 2010 (required only for migrating from Microsoft® Exchange Server or PST files)

We recommend that you use the latest patches for both Microsoft® Windows and Microsoft Outlook®.

**Important:** Be sure to install the latest Time Zone patch. For more information, see the Microsoft Support page [Daylight Saving Time Help and Support Center](#).

## Provision users in Google Apps

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Before you migrate your users, provision Google Apps accounts for them. For information about provisioning user accounts, see the [Google Apps for Business Technical Transition Guide](#).

## Avoid Calendar issues

To ensure that migrated calendar data will be associated with the correct Google Apps accounts, make sure you **provision all your users in Google Apps before you migrate any accounts**—even if you want to perform only a partial migration. Otherwise, the following issue might occur:

If an unprovisioned user had 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](#)). The only way to resolve this issue is to provision the user and then delete and recreate all events for which the user is the organizer or a guest.

## Additional steps

In addition to provisioning user accounts in Google Apps, you need to complete the following steps 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 domain aliases

For information about these configurations, see the [Google Apps Administrator Help Center](#).

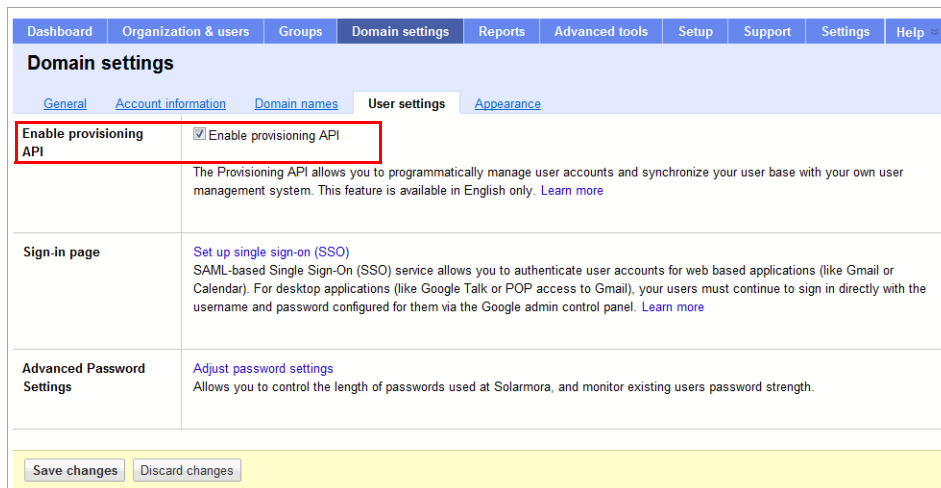
## Configure Google Apps

Before you can migrate mail server data to Google Apps, you need to do the following in the Google Apps control panel:

1. Enable the Provisioning API (read only)
2. Configure OAuth Client

### Step 1: Enable the Provisioning API

In the Google Apps control panel, go to **Domain Settings** tab > **User settings** > **Enable Provisioning** API section, and select **Enable provisioning API**. Click **Save changes**. This API is required for validating users before the migration; therefore, only read-only access is required.



The screenshot shows the Google Apps control panel interface. At the top, there is a navigation bar with tabs: Dashboard, Organization & users, Groups, Domain settings (selected), Reports, Advanced tools, Setup, Support, Settings, and Help. Below the navigation bar, the 'Domain settings' section is active, with sub-tabs: General, Account information, Domain names, User settings (selected), and Appearance. The 'User settings' section contains three main areas: 'Enable provisioning API', 'Sign-in page', and 'Advanced Password Settings'. The 'Enable provisioning API' section has a checkbox labeled 'Enable provisioning API' which is checked. Below this checkbox, there is a description: 'The Provisioning API allows you to programmatically manage user accounts and synchronize your user base with your own user management system. This feature is available in English only. [Learn more](#)'. The 'Sign-in page' section has a link 'Set up single sign-on (SSO)' and a description: 'SAML-based Single Sign-On (SSO) service allows you to authenticate user accounts for web based applications (like Gmail or Calendar). For desktop applications (like Google Talk or POP access to Gmail), your users must continue to sign in directly with the username and password configured for them via the Google admin control panel. [Learn more](#)'. The 'Advanced Password Settings' section has a link 'Adjust password settings' and a description: 'Allows you to control the length of passwords used at Solarmora, and monitor existing users password strength.' At the bottom of the page, there are two buttons: 'Save changes' and 'Discard changes'.

## Step 2: Configure OAuth client access

You must configure OAuth Client access to migrate data.

1. In the Google Apps control panel, go to **Advanced Tools > Authentication** section and click **Manage OAuth domain key**.
2. Click **Enable this consumer key** and write down your **OAuth consumer secret**.

Dashboard Organization & users Groups Domain settings Reports Advanced tools Setup Support Settings Help

← Back to Advanced tools

### Manage OAuth key and secret for this domain

OAuth consumer key:   Enable this consumer key  
Allows this key and secret to be used to generate OAuth requests to Google Data APIs. [Learn more](#)

OAuth consumer secret:

X.509 certificate: We do not have a certificate for your domain.

Upload a certificate: (Optional)  
 No file chosen  
File must be in PEM format. [Learn More](#)

Two-legged OAuth access control  Allow access to all APIs  
The key and secret above are able to access any user's data for all Google Data APIs. [Learn more](#)

3. In the Google Apps control panel, go to **Advanced Tools** tab > **Authentication** section, and click **Manage third party OAuth Client access**.

Dashboard Organization & users Groups Domain settings Reports Advanced tools Setup Support

← Back to Advanced tools Your settings have been saved.

### Manage API client access

Developers can register their web applications and other API clients with Google to enable access to data in Google services like Calenda having to individually give consent or their passwords. [Learn more](#)

Authorized API clients The following API client domains are registered with Google and authorized to access data

Client Name	One or More API Scopes
<input type="text"/>	<input type="text"/> <input type="button" value="Authorize"/>
Example: www.example.com	Example: http://www.google.com/calendar/feeds/ (comma-delimited)
<b>solarmora.com</b>	<b>Email Settings (Read/Write)</b> <a href="https://apps-apis.google.com/a/feeds/emailsettings/2.0/">https://apps-apis.google.com/a/feeds/emailsettings/2.0/</a> <b>Groups Provisioning (Read only)</b> <a href="https://apps-apis.google.com/a/feeds/group/#readonly">https://apps-apis.google.com/a/feeds/group/#readonly</a> <b>Email Migration (Write only)</b> <a href="https://apps-apis.google.com/a/feeds/migration/">https://apps-apis.google.com/a/feeds/migration/</a> <b>User Provisioning (Read only)</b> <a href="https://apps-apis.google.com/a/feeds/user/#readonly">https://apps-apis.google.com/a/feeds/user/#readonly</a> <b>Calendar (Read/Write)</b> <a href="https://www.google.com/calendar/feeds/">https://www.google.com/calendar/feeds/</a> <b>Contacts (Read/Write)</b> <a href="https://www.google.com/m8/feeds/">https://www.google.com/m8/feeds/</a> <a href="https://www.googleapis.com/auth/apps.groups.migration">https://www.googleapis.com/auth/apps.groups.migration</a>

4. In the **Client Name** field, enter your OAuth consumer key from step 2. This is usually your primary domain: example.com or www.example.com.

5. In the **One or More API Scopes** field, enter the following comma-separated list of URLs:

```
https://apps-apis.google.com/a/feeds/emailsettings/2.0/,  
https://apps-apis.google.com/a/feeds/user/#readonly,  
https://www.google.com/calendar/feeds/,  
https://www.google.com/m8/feeds/,  
https://www.googleapis.com/auth/apps.groups.migration,  
https://apps-apis.google.com/a/feeds/migration/,  
https://apps-apis.google.com/a/feeds/group/#readonly
```

If you entered the scopes correctly, here's how the scopes should appear:

```
Email Settings (Read/Write) https://apps-apis.google.com/a/feeds/emailsettings/2.0/  
Groups Provisioning (Read only) https://apps-apis.google.com/a/feeds/group/#readonly  
Email Migration (Write only) https://apps-apis.google.com/a/feeds/migration/  
User Provisioning (Read only) https://apps-apis.google.com/a/feeds/user/#readonly  
Calendar (Read/Write) https://www.google.com/calendar/feeds/  
Contacts (Read/Write) https://www.google.com/m8/feeds/  
https://www.googleapis.com/auth/apps.groups.migration
```

6. Click **Authorize**. You can now migrate data to your domain(s).

## Create user lists

---

Create a CSV (comma-separated value) 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 you don't exceed 1000 users in a single CSV. You can also list calendar resources like meeting rooms in this CSV. For more details, see ["Migrate a subset of users" on page 54](#).

You can use Excel or any spreadsheet software to create the CSV. We recommend you copy the final file and save it in Notepad as a CSV so that you can review the syntax for consistency. Some spreadsheet editors add quotation marks to cells, which you need to delete in Notepad before running the migration. Please spend extra time on this step to make sure your CSV is correctly formatted, or else the migration won't run successfully.

The general structure of the CSV should be:

```
sourceuser, destinationuser
```

And `destinationuser` can be removed if it's identical to `sourceuser`. Adding a space after the comma is optional. Depending on the type of server you're migrating from, there are some variations on this format. See below for details.

## Migrate users from Exchange

If you are migrating from a Microsoft® Exchange Server, we recommend you use the same usernames in Google Apps as you do in your current mail server. This streamlines the process and allows you to create user lists with just one name or SMTP address per line. You don't need to enter your users' passwords in the CSV because authentication is through your Exchange server administrator account.

Generic example of CSV:

```
user1@domain.com
user2@domain.com
user3@domain.com
```

Business example of CSV:

```
mattwerner@solarmora.com
joesabia@solarmora.com
joesciarrillo@solarmora.com
```

If the addresses in your mail server are different from the addresses in Google Apps, then you need two addresses per line in the CSV: the mail-server address followed by the Google Apps address.

Generic example:

```
user1@exchange-domain.com, google_apps_user1@gmail-domain.com
user2@exchange-domain.com, google_apps_user2@gmail-domain.com
user3@exchange-domain.com, google_apps_user3@gmail-domain.com
```

Business example:

```
matt@solarmora.com, mattwerner@solarmora.com
jsabia@solarmora.com, joesabia@solarmora.com
jsciarrillo@solarmora.com, joesciarrillo@solarmora.com
```

**Note:** If you're only including a subset of users in this CSV in step 2, you need to upload a CSV of **all** of your users and calendar resources in step 3. For more information, see [“Migrate a subset of users” on page 54](#).

## Migrate Calendar resources from Exchange

You can also list the calendar resources (like meeting rooms) that you want to migrate from Exchange to Google Apps in this CSV. The format is similar to the Exchange user migration CSV in that the Exchange resource email is followed by Google Apps email. For example: <exchange-calendar-email-id>, <google-calendar-email-id>. Each mapping needs to be on a separate line.

**Generic example of**

```
conf-room-1@example.com, example.com_2d372903631@resource.calendar.google.com
conf-room-2@example.com, example.com_3cba3232631@resource.calendar.google.com
```

**Business example of**

board-room-1@solarmora.com, solarmora.com\_37r2903631@resource.calendar.google.com  
phone-room-2@solarmora.com, solarmora.com\_3cba3t326@resource.calendar.google.com

Check **Enable resource calendar migration** in step 2 and enter the Google Apps administrator's email in the **Google Apps Admin user** field to make all migrated events in Google Calendar appear as owned by this user.

## Disable Auto-accept invitations for Calendar resources

Because calendar events may not be migrated from Exchange in a specific order, we recommend that you disable **Auto-accept invitation** for all of your calendar resources to preserve their correct free/busy status. You can do this either by using the [Calendar API to update your settings](#) or by completing the following steps for every resource calendar:

1. Sign in to your Google Apps control panel and go to **Settings > Calendar > Resources**

**Note:** You need to create calendar resources for **Resources** to appear in your control panel.

2. Select the Calendar Resource and make note of the Email Address eg:  
domain.com\_2d344403832323233393232@resource.calendar.google.com
3. Sign in to Google Calendar as the domain administrator by going to `http://calendar.google.com/a/your_domain`
4. Add the copy and paste the calendar email address in the box **Other Calendars** in the bottom left. The calendar should appear right above, under **My Calendar**.
5. Select the calendar under **My Calendar**, click the drop down arrow > **Calendar settings**
6. Under **Calendar Settings > Auto-accept invitations**, select **Do not show invitations**

Once the migration is complete, follow steps 5 and 6 to change the **Auto-accept invitations** setting back to **Auto-accept invitations that do not conflict**. Doing this should preserve the free/busy status of the resources you migrate.

## Migrate users from IMAP servers

When you're using an IMAP server other than Microsoft® Exchange, you must include the user's IMAP user ID and password along with their Google Apps username. The basic format is:

```
sourceuser#sourceuserpassword, destinationuser
```

Generic example:

```
userid1#user1password, google_apps_user1  
userid2#user2password, google_apps_user2  
userid3#user3password, google_apps_user3
```

Business example:

```
mattwerner@solarmora.com#fKz47MCb, mattwerner@solarmora.com  
joesabia@solarmora.com#Q8BW2svB, joesabia@solarmora.com  
joesciarrillo@solarmora.com#4tPYdpnQ, joesciarrillo@solarmora.com
```

## Variations on IMAP Servers

Use the same username that your user enters in their IMAP email client to check their email. Some IMAP clients like Dovecot and Courier only require a username, whereas other IMAP servers require the full email address. When in doubt, use the full email address for the destination user, i.e. "joesabia@solarmora.com" rather than just "joesabia".

The domain you specify in Step 1 of the Google Apps Migration for Microsoft® Exchange tool needs to be the same Google Apps domain you include in the email address. If you make an error or typo in the CSV, the migration will not work until you fix the error.

**Exception:** If you're migrating mail into an account with secondary domains, you are allowed to use multiple domains.

## IMAP migration using the administrator's password

Some IMAP servers support migration using the administrator's password and don't require you to enter every user's password.

For Cyrus/Mirapoint IMAP migrations, please enter the admin credentials in Step 1 of the tool and use the same syntax for the userlist for the Exchange migration.

```
user1@cyrus-domain.com, google_apps_user1@gogledomain.com
```

Please ensure the Cyrus admin account has all (i.e. "lrsnipcda") access control rights to each user's mailbox. For more information about migrating from Cyrus IMAP servers, see "[Step 1: Special migration instructions for Cyrus IMAP](#)" on page 45.

For Exchange IMAP migrations (not regular Exchange migrations), you can use this syntax:

```
windowsNTdomainname/exchangeadmin-samAccountName/sourceuser-  
samAccountName#exchangeadminpassword,destinationuser-emailaddress
```

Business example:

```
salomara/admin/mwerner#VjJ8zTsm, mattwerner@solarmora.com  
salomara/admin/jsabia#VjJ8zTsm, joesabia@solarmora.com  
salomara/admin/jsciarrillo#VjJ8zTsm, joesciarrillo@solarmora.com
```

In this example, the Active Directory (Windows) domain is solarmora, the admin username is "admin" and his password is "VjJ8zTsm". The admin is migrating email for users mattwerner, joesabia, and joesciarrillo.

**Tip:** For additional information on migrating users from other IMAP servers not listed in GAMME, see "[Step 1: Special migration instructions when selecting Other IMAP Server](#)" on page 45.

## Prepare folder structure (for PST migration)

---

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

**Note:** Google Apps Migration for Microsoft Exchange cannot migrate password-protected PST files. Disable password protection for PST files before you attempt to migrate, or migration will fail.



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)

Name the individual folders' names based on the primary e-mail address as configured in the source mail system. (see [“Create user lists” on page 21](#)).

For example, if your file of user names takes the form:

```
user1@domain.com
user2@domain.com
```

then 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 are using an exported or archived PST file, it is not possible to identify the primary root folder for Calendar and Contacts. Therefore, all calendars are migrated as “additional calendars” into Google Apps Calendar, instead of any default calendar. You can avoid this by using PST migration for mails only, and use Exchange server migration for migrating calendars.

## PST Migration Recipient Address Resolution X.500 to SMTP

When migrating a PST with GAMME the PST may not contain the SMTP address of a user but instead have the Exchange X.500 address. GAMME can be configured to resolve the X.500 address to SMTP address using your Exchange Address Book.

### **How to configure GAMME 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 MAPI Mail profile is configured based on the Windows user/service account on the server that will be logged into while performing the GAMME PST mail migration. It is important the MAPI Mail profile needs to be connected to the original Exchange Organization/ Infrastructure so GAMME can properly resolve recipients.

**Note:** It's important to configure a mail profile with the current logged in user/service account so that authentication to the Exchange Address Book is automatic and does not fail due to an authentication error.

When GAMME sees 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 (e.g /O=ExchangeOrg). If there is a MAPI Mail profile registered with the same X.500 Exchange Organization name, GAMME will try to resolve the X.500 address using the address book registration in the MAPI Mail profile.

If GAMME fails to find a valid Mail profile or recipient in the Exchange Address Book, it falls back to a best effort method of converting the X.500 address a SMTP address. GAMME 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 at Google, and you would be required to delete the mail content from Google and then re-migrate it.

## Set up access to your Microsoft® Exchange or IMAP server

---

### Microsoft® Exchange Server

Google Apps Migration for Microsoft® Exchange supports the following version of Microsoft® Exchange Server: 2000, 2003, 2007 (Service Pack 3 recommended), and Exchange 2010 (SP2 UR3 for Exchange 2010 recommended).

Google Apps Migration for Microsoft® Exchange requires one administrator account on your Microsoft® Exchange Server with the following:

- A mailbox for the administrator account
- Sufficient permission to read each user's mailbox (the Microsoft® Exchange permission *Receive As* is sufficient for this task)

#### Additional setup step for Exchange 2007 and 2010 admins:

With Exchange 2007/2010, you need to set the following GAMME Admin Permissions to migrate your users' mailboxes:

- 1) Create a normal Active Directory User e.g. CORP\GAMME\_ADMIN
- 2) Mail enable the user account in your Exchange Management Shell

```
Enable-Mailbox -Identity 'corp.domain.com/Users/GAMME ADMIN' -Alias 'GAMME_ADMIN'
```

- 3) Grant GAMME\_ADMIN permission to specific mailboxes or databases with Exchange Management Shell

#### To grant access to individual mailbox:

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

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

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

For more details about granting Exchange 2007/2010 permissions please review Microsoft's support article: [http://technet.microsoft.com/en-us/library/aa996343\(v=exchg.80\).aspx](http://technet.microsoft.com/en-us/library/aa996343(v=exchg.80).aspx).

## IMAP server

Google Apps Migration for Microsoft® Exchange supports the following IMAP servers: Microsoft Exchange, Novell<sup>(TM)</sup> Groupwise®, Gmail, Cyrus, Courier, Dovecot, SunMail, and Zimbra.

There are no special permissions required to migrate from an IMAP server. Connections to the IMAP server are made based on the user name/password information you provide in the list of users you are migrating (see “Create user lists” on page 21).

For Cyrus IMAP servers, if you want to migrate using the admin account and password, see “Step 1: Special migration instructions for Cyrus IMAP” on page 45.

## Prepare your Microsoft® Windows client machines

---

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

- Microsoft® Windows: Windows XP SP3, Windows Vista Business SP1 or later, Windows 7, Windows Server 2003 SP 2 or later

**Note:** We have seen increased performance in terms of the number of simultaneous threads you can run with Microsoft® Windows Server 2003 and up. Current testing indicates that 25 simultaneous threads is an optimal number with this configuration.

For all versions, use the latest patches for your version of Microsoft® Windows.

- Microsoft Outlook® 2003 or 2007 (required only if you are migrating from Microsoft® Exchange Server or PST files). Be sure to upgrade to the latest service packs and patches for Outlook, especially if you see any 0x80040900 or Missing Property errors.
- Memory: 512 RAM
- CPU: 2 GHz +
- Minimum Disk Space: 8 GB of Disk Space
- Accurate time: In order for 2-Legged OAuth to function properly, make sure the time on each client machine is set accurately to the current time for the local time zone.

Keep in mind that the migration process is multi-threaded, which can consume a lot of resources, and that 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 Server, we recommend that you log in to the client machines with your Exchange Server administrator credentials.

## Migrate your shared contacts to Google Apps

---

Before you migrate your users, you should migrate your shared contacts to Google Apps 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 books for suggested options:

- *Google Apps for Business Technical Transition Guide*
- *Google Apps Directory Sync Administration Guide*

## Migrate public folders from Exchange to Google Apps

---

You can migrate public folders from Exchange to Google Apps running GAMME from the command line. For more information, see the help center article [Migrate Public Folders with GAMME](#).

## Download and run the installer

---

Download `GoogleAppsMigration.msi` from the following location:

`https://tools.google.com/dlpage/exchangemigration`

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

### To run the installer:

Double-click **GoogleAppsMigration.msi**, then click **Run**.

The utility is installed in the following location:

```
C:\Program Files\Google\Google Apps Migration\ExchangeMigration.exe.
```

## Optional: Specify custom log folder path

---

Google Apps Migration for Microsoft® Exchange creates log files that you can use to troubleshoot issues or provide to Google Support (for details, see “Interpreting log files” on page 73). By default, the utility 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`

where *user-name* in the path identifies the administrator who logged 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"
```

where *custom-folder-path* is the path you specify for the log files.



# Deployment

## Deployment scenarios

---

This chapter is geared towards large organizations migrating many user accounts, and the steps in this chapter are optional for smaller organization. Many small and medium-sized organizations don't require special server topology and choose not to run a pilot migration. Familiarize yourself with the content in this chapter, and you can decide whether or not your organization needs to run a pilot migration, or if you can skip directly to "Migration overview" on page 39.

This chapter covers:

- Running a pilot migration
- Topology options

## Running a pilot migration

---

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

For example, you can migrate just 25 users, and then view the migration report to get the information you need to estimate the migration time for all users. Here's how:

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:  $(\text{total messages migrated} / \text{total users migrated}) / \text{migration rate} = \text{average migration time for one user}$
3. Calculate the following:  $(\text{average migration time for one user} * \text{total number of users}) / \text{number of migration threads} = \text{total migration time}$

For more information on threading (the number of users migrated simultaneously), see "Parallel processing" on page 15.

For more information on reports, see "Viewing Migration Reports" on page 63.

Using a pilot group also allows you to test the whole process of migrating data and then working with mail, calendar, and contacts in the new Gmail environment. Any technical or communication issues you encounter with a small group are more easily managed and corrected, and with that experience you can provide a smoother transition for the rest of your users.

Once you have data from your pilot test, you can plan the migration of the rest of your users, including the hardware resources you'll need, and the amount of time you'll need to devote to the process.

## Topology options

---

Examples of the topological approaches you can take to setting up client machines between your mail server infrastructure and Google Apps, and information about the parallel processing of users on those client machines

A single instance of Google Apps Migration for Microsoft® Exchange runs on an intermediary client machine between your source server and Google Apps. 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.

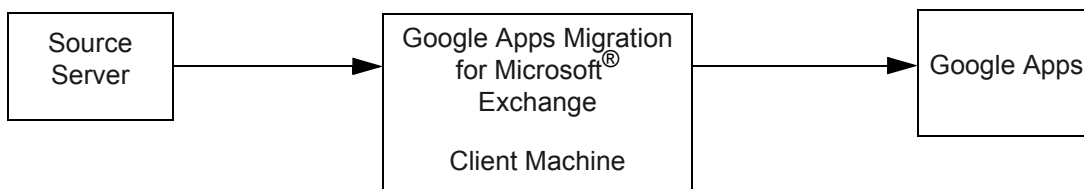
### Important:

- You can run only one instance of Google Apps Migration for Microsoft® Exchange on each client machine. If you try to run multiple instances on a single client, those instances overwrite one another's configuration files (there is a single location for configuration files).
- In addition, each instance has to reference a unique list of users in order to avoid corrupting the status information for each user's data.

The following four diagrams illustrate approaches you can take.

### Single server, single client

This is the most basic configuration. Use this configuration 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 up to 500-1000 users.

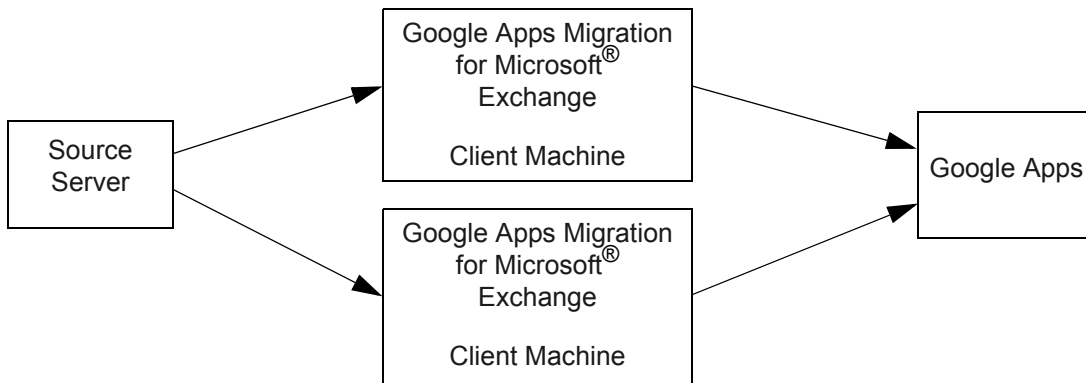


### Single server, multiple clients

In this configuration, all data is pulled from a single source server, but you use multiple GAMME clients to migrate data. Be sure that every client has a completely separate user list. If multiple clients handle the same user, this will cause data corruption.



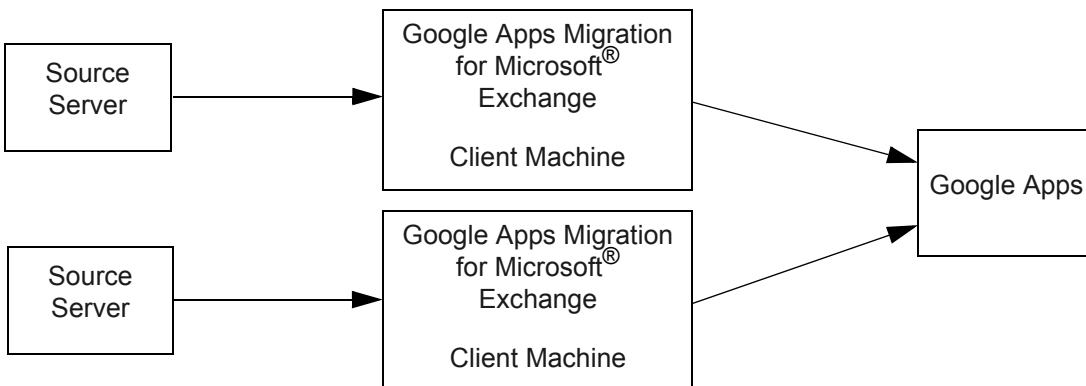
Use this topology if you need to migrate more data than a single client can handle.



### Multiple servers, each with single client

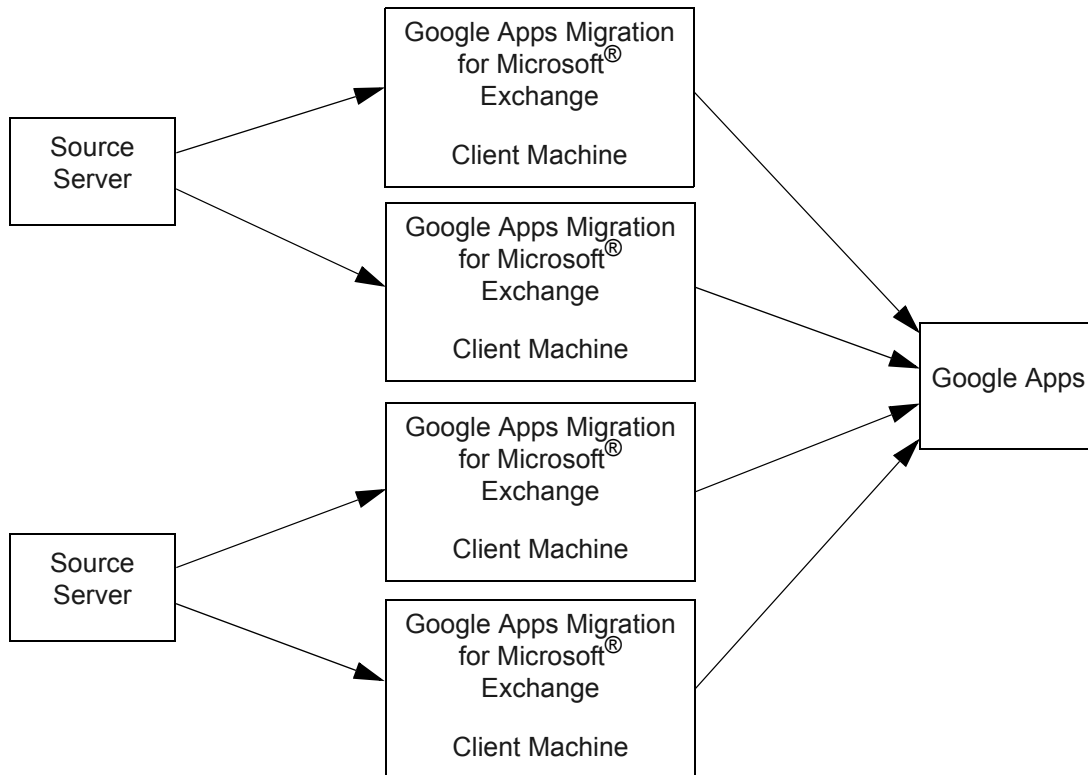
If your user data is stored on multiple servers each server should have its own client machine running migration. Be sure that user data is separate for these servers.

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



## Multiple servers, each with multiple clients

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



## What to expect after a Google Apps pilot deployment

---

If you have gone through the experience of a Google Apps pilot deployment, and you implemented dual delivery for your pilot users, Google Apps removes duplicate messages resulting from the following scenarios:

- Dual delivery through your Microsoft® Exchange Server
- Dual delivery through an edge appliance or service
- Dual delivery through Google Apps

**Note:** You have the option to configure Google Apps Migration for Microsoft® Exchange to migrate only messages from the period prior to your implementation of dual delivery.

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

## Plan a test migration

---

Before you migrate all of your users from your mail platform to Google Apps, you may want to first test the migration on a smaller group of users to gather some 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?
- With your migration resources running at an optimal rate, how long will it take to migrate all your data?

You can consult the migration reports on each client to get an idea of migration performance. For information about reports, see “Viewing Migration Reports” on page 63.

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

## Decide on a time frame

---

You need to decide on when the migration will begin, over what period of time you will migrate data, and what access your users will have to your existing email server infrastructure before, during, and after the migration.

### Example

The following scenario is one example of how to stage a migration with minimal disruption to your enterprise.

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

If your network can accommodate the migration traffic along with normal business, you can let the migration continue until it has finished. If your network cannot accommodate the extra traffic, you can start the migration again each night until it has finished. If you restart the migration, it picks up from the point at which 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 Google Apps accounts while older data is being migrated.

One option you may wish to consider is to allow read-only access to your mail server for some period. This allows your users to view data that hasn't yet migrated, but to transition to using Google Apps for new email, contacts, and calendar data.

## Notify and provide training for your users

---

Before you begin the transition from your email server to Google Apps, we recommend the following communication to your users:

- Notify all users of the coming transition from your email server to Google Apps. Early communication is important to prepare users for the change in their routines.

- Notify users of their options for Google Apps training. Users accustomed to another application may find Google Apps unfamiliar. By making training available to them as early as possible, you can eliminate much of the anxiety that accompanies this sort of change.

Visit the [Google Apps Deployment for Enterprise site](#) to find resources like:

- Communications templates
- eLearning videos
- Quick reference sheets
- Helpdesk training and resources
- User Help Center
- Google Apps professional training

## Have users prepare exclusion folders if necessary

---

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 folder.

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, locate those folders at the same level as their Inbox folders, and then move all relevant messages to those folders.

For the sake of simplicity, enforce a naming convention, like Excluded Mail. Then when you identify the folders you want to exclude from migration, you have a reliable method of specifying the correct folders for every user.

You specify excluded folders by entering a comma-separated list in [Step 3](#) of the migration wizard.



# Migrating Data

## Migration overview

---

To start your migration, simply log in to the client machine on which you've installed the utility and run the utility. When you run the utility, the migration wizard opens and prompts you for connection, authentication, and configuration information. You'll enter the required information in four basic steps.

If during your configuration you click **Cancel** before clicking **Save** or **Migrate** in [Step 4](#), then the information you entered is lost. When you click **Save** or **Migrate** in [Step 4](#), then your information is saved in a configuration file and you can choose to use those settings in [Step 1](#). The configuration file contains only the settings from your most recent Save or Migrate operation.

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

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

## Multiple instances

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

**Important:** If you run multiple instances of migration, be aware of these restrictions to avoid data corruption.

- Run only one instance of GAMME on each client machine. If you try to run multiple instances on a single client, those instances overwrite one another's configuration files (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, migration may cause corrupted status information for each user's data.

## Review

---

Before you begin your migration, make sure you've addressed the following:

- “Provision users in Google Apps” on page 18
- “Configure Google Apps” on page 19
- “Set up access to your Microsoft® Exchange or IMAP server” on page 26
- “Prepare your Microsoft® Windows client machines” on page 27

For additional information about all the preparations you need to make before you migrate your data, see “Preparing for Your Migration” on page 17.

You can find the latest release at the following URL:

<https://tools.google.com/dlpage/exchangemigration>

## Run the utility

---

On the computer on which you’ve installed Google Apps Migration for Microsoft Exchange:

1. If you’re migrating data from an on-premise Microsoft Exchange server, we recommend that you log in to Windows using the same administrator user name that you want to the utility to use to connect to your Exchange server and open users’ mail stores.
2. Click **Start > All Programs > Google Apps Migration > Google Apps Migration**.



# Step 1

---

In this first step, choose a Server Type: Exchange or IMAP. The options for this step change based on which type of server you choose.

Provide the following information, then click **Next**.

Setting	Description
Use my most recent migration settings	<p>Select this option to use the settings from your most recent configuration file.</p> <p>If this is your first migration and you have not saved any previous settings, this option has no effect.</p>
Server Type	<p>Select <b>Exchange</b> or <b>IMAP</b>.</p> <p>Examples:</p> <ul style="list-style-type: none"><li>• <b>For Exchange or PST files:</b> Exchange.</li><li>• <b>For IMAP:</b> IMAP</li></ul>
<b>Specify Exchange server details</b>	<p><b>(Exchange Only)</b></p> <p>Options:</p> <ul style="list-style-type: none"><li>• <b>Host name/IP address:</b> Enter the fully qualified domain name or the IP address of the email server from which you want to migrate data. For example: <code>smtp.mydomain.com</code> or <code>198.102.434.8</code>.</li><li>• <b>Admin user name:</b> Enter the user name for the Microsoft® Exchange administrator account you want to use to open your users' mail stores.</li></ul> <p>This account must have at least the <i>Receive As</i> permission on the Microsoft® Exchange Server.</p> <p><b>Note:</b> We recommend that this user name be the same user name you use to log into the computer on which you're running the utility.</p> <p>You are prompted for this user name and the associated password in <a href="#">Step 4</a>.</p>

Setting	Description
<b>Specify a profile to use for migration</b>	<p><b>(Exchange Only)</b></p> <p>Use this option to log in to a hosted Exchange Server.</p> <p>When you select this option, the utility logs in to the Exchange Server you specify, and migrates all data you specify for each user you specify.</p> <p>Under <b>Outlook Admin Profile</b>, enter the Outlook administrator profile you want to use to log in to your hosted Exchange Server.</p>
<b>Specify a folder with PST files</b>	<p><b>(Exchange Only)</b></p> <p>Use this option to migrate data in PST files.</p> <p>Under <b>Folder with PST files</b>, browse to the folder that contains the PST files you want to migrate.</p>
<b>IMAP Server type</b>	<p><b>(IMAP Only)</b></p> <p>Select the type of IMAP server from which you are migrating user data.</p> <p><b>Note:</b> If you specify an incorrect server type, the performance of the migration may be affected.</p>
<b>Hostname/IP address</b>	<p><b>(IMAP Only)</b></p> <p>Enter the fully qualified domain name or the IP address of the IMAP server from which you want to migrate data. For example:  <code>smtp.mydomain.com</code> or <code>198.102.434.8</code>.</p>
<b>IMAP Security</b>	<p><b>(IMAP Only)</b></p> <p>Choose the type of IMAP packet encryption you want to use for your migration:</p> <ul style="list-style-type: none"> <li>• None: No encryption.</li> <li>• SSL: SSL encryption</li> <li>• STARTTLS: TLS encryption</li> </ul>

Setting	Description
<b>IMAP Port</b>	<p><b>(IMAP Only)</b></p> <p>Enter the connection port on the IMAP server.</p>
<b>IMAP Path Prefix</b>	<p><b>(IMAP Only)</b></p> <p>Enter the IMAP folders' path prefix that is common to all folders. This usually is the IMAP namespace for the folder names.</p> <p>For example, if the IMAP folder listing for a user is:</p> <pre data-bbox="885 556 1047 661">INBOX INBOX.Sent INBOX.Drafts ...</pre> <p>and so on, then <code>INBOX</code> is the path prefix.</p> <p>For another example, if the IMAP folder listing is:</p> <pre data-bbox="885 808 1112 924">user.user1.INBOX user.user1.Sent user.user1.Drafts ...</pre> <p>and so on, then the path prefix is <code>user.user1</code>.</p> <p>Typical values of path prefix are:</p> <ul data-bbox="836 1039 1347 1165" style="list-style-type: none"> <li>• Groupwise IMAP, Gmail, Dovecot: none (leave the field blank)</li> <li>• Cyrus, Courier: <code>INBOX</code></li> </ul> <p>If in doubt, consult your IMAP server documentation to find the IMAP folders' common namespace.</p>

(Exchange version)

Step 1 of 3 : Server Details

Google Apps Migration For Microsoft® Exchange [Help](#)

Use my most recent migration settings

Server Type:  Exchange  IMAP

Specify Exchange server details [?](#)

Hostname/IP Address:

Admin username:

Specify a profile to use for migrator [?](#)

Outlook Admin Profile:

Specify a folder with PST files [?](#)

Folder with PST files:  ...

(IMAP version)

Step 1 of 3 : Server Details

Google Apps Migration For Microsoft® Exchange [Help](#)

Use my most recent migration settings

Server Type:  Exchange  IMAP

IMAP Server type:

Hostname/IP Address:

IMAP Security:  None  SSL  STARTTLS

IMAP Port:

IMAP Path Prefix:  [?](#)

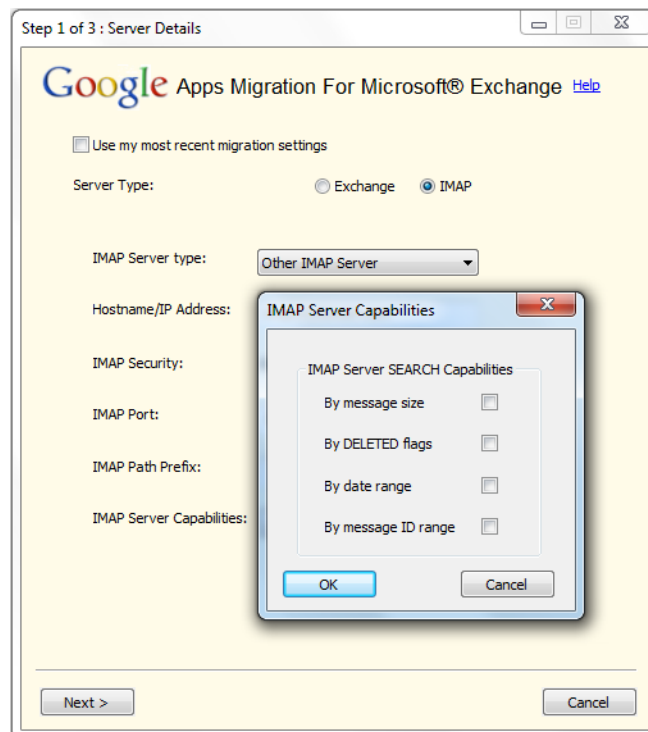
## Step 1: Special migration instructions for **Cyrus IMAP**

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

- **Admin mode:** You enter your Cyrus admin 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 Google Apps. Generic example: "user1, gapps-user1" or business example: "matt@solarmora.com, mattwerner@solarmora.com".
- **Normal mode:** The migration will proceed just like other IMAP migrations if you leave blank the fields for IMAP Admin User and IMAP Admin Password. In this instance, you will need to provide individual user passwords from the migration CSV file to login and fetch emails during migration. The format of this CSV file is the same as for other IMAP migrations. See "Migrate users from IMAP servers" on page 23.

## Step 1: Special migration instructions when selecting **Other IMAP Server**

When you select **Other IMAP Server**, an extra button appears for **IMAP Server Capabilities**. Clicking this opens a dialog box with checkboxes for enabling/disabling different IMAP server search capabilities: by message size, deleted flags, date range, and message ID range.



If you're unsure of your IMAP server's capabilities, turn off these settings. Most modern IMAP servers support all of these capabilities. In the rare cases where an IMAP server doesn't support a setting, the IMAP Search failure will show up in the logs. Either way, one can re-run the migration after turning on only the supported flags.

## Step 2

---

This step is the same for Exchange and IMAP migrations. Provide the following information, then click **Next**.

Setting	Description
<b>Google Apps Domain name</b>	Enter the name of the Google Apps domain to which you are migrating email.  Example: electric-automotive.com
<b>Consumer key</b>	Enter the consumer key for your Google Apps domain.  For more information, see <a href="#">“Configure Google Apps” on page 19</a> .
<b>Consumer secret</b>	Enter the consumer secret for your Google Apps domain.  For more information, see <a href="#">“Configure Google Apps” on page 19</a> .
<b>Select a file with the list of users to migrate</b>	Click <b>Browse</b> to locate the CSV file with the names of the users you want to migrate.  For more information about this file, see <a href="#">“Create user lists” on page 21</a> .
<b>Enable resource calendar migration</b>	This optional setting is for Exchange migrations only. For more information, see <a href="#">“Migrate a subset of users” on page 54</a> .
<b>Google Apps admin user</b>	If you’re migrating calendar resources with your Exchange migration, enter your Google Apps administrator email address here.

(Exchange version)

Step 2 of 3: User and Domain information

Google Apps Migration For Microsoft Exchange [Help](#)

File of users to migrate: C:\users.csv

Google Apps domain name: sloarmora.com

Google Apps Two-legged OAuth Details

Consumer key: sloarmora.com

Consumer secret: ●●●●●●●●

Show Consumer Secret

Enable resource calendar migration

Help me configure my domain for migration

< Back Next > Cancel

(IMAP version)

Step 2 of 3: User and Domain information

Google Apps Migration For Microsoft Exchange [Help](#)

File of users to migrate: C:\users.csv

Google Apps domain name: sloarmora.com

Google Apps Two-legged OAuth Details

Consumer key: sloarmora.com

Consumer secret: ●●●●●●●●

Show Consumer Secret

< Back Next > Cancel

## Step 3

---

The options in this step change depending on whether you chose Exchange or IMAP. Provide the following information, then click **Next**.

Setting	Description
<b>Select the data you wish to migrate</b>	<b>(Exchange)</b> If you are migrating from an Exchange Server, you have the option to import email, calendar, and contacts. Select the check box for each type of data you want to migrate.  You can migrate <b>All</b> of your email messages and calendar events, or you can select a date range. <b>(IMAP)</b> You can migrate <b>All</b> of your email messages, or you can select a date range.
<b>Migrate deleted emails</b>	<b>(Exchange Only)</b> Select this option to migrate messages in the Deleted Items folder.
<b>Migrate junk emails</b>	<b>(Exchange Only)</b> Select this option to migrate messages in the Junk E-Mail folder.



Setting	Description
<p><b>Do not migrate mail from these top-level folders</b></p>	<p>Select this option to exclude specific top-level folders from migration. Any folder at the same level as the Inbox is considered a top-level folder.</p> <p>Enter a comma-separated list of top-level folder names. Folder names can include spaces and don't require quotation marks. For example:</p> <p>Folder A, FolderB, Folder C</p> <p>The utility ignores any subfolder names you enter.</p> <p>For information about preparing exclusion folders, see <a href="#">"Have users prepare exclusion folders if necessary"</a> on page 37.</p> <p><b>(For IMAP with Gmail)</b></p> <p>In the case of Gmail IMAP, use label names to exclude specific folders. Gmail IMAP exposes the following system labels:</p> <ul style="list-style-type: none"> <li>Inbox</li> <li>Starred</li> <li>Sent</li> <li>AllMail</li> <li>Drafts</li> <li>Spam</li> <li>Trash</li> </ul> <p>Apart from these, users can create other labels. Other labels can be used as exclude folders, too.</p> <p>Exclude folders for Gmail IMAP works slightly differently. Each message in Gmail can have multiple labels. In other words, the same message can appear as part of many labels. If a label is mentioned as an exclude label/folder, all the messages with that label will be excluded, whether or not they are labeled with other labels as well.</p> <p><b>(For IMAP with Exchange IMAP server)</b></p> <p>If you select <b>Microsoft Exchange IMAP</b>, you must add calendar and contacts folders to exclusion list.</p>

Setting	Description
<b>Restrict migration to ___ users at a time</b>	<p>Select this option to enter the number users you want to migrate at one time on this client. A separate thread is opened for each user. If you do not specify a value the utility defaults to 25 users. The utility processes one message per second per user.</p> <p>If you are using Microsoft® Windows Server 2003 or later, 25-50 users is an optimal setting, depending on the machine's configuration.</p> <p>For more information about how users are processed, see <a href="#">"Parallel processing" on page 15.</a></p>
<b>I am migrating a subset of users. File of all users and resources:</b>	<p><b>(Exchange Only)</b></p> <p>Upload a CSV file with a complete list of every user in your organization (even if you aren't migrating them in this round of migrations), as well as every calendar resource in your organization, such as meeting rooms. For more information, see <a href="#">"Migrate a subset of users" on page 54.</a></p>

### Step 3: (Only for Gmail migrations using IMAP) Configure Gmail IMAP

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 Google Apps Mail > click the gear icon on the right side > click **Settings**.
2. Click **Forwarding and POP/IMAP**.
3. Under **Folder Size Limits**, check **Do not limit the number of messages in an IMAP folder (default)**.

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

1. Open Google Apps Mail > click the gear icon on the right side > click **Settings**.
2. Click **Labels**.
3. Check the **Show in IMAP** checkboxes for **All Mail**, **Spam** and **Trash** labels, if they are not already checked.

(Exchange version)

Step 3 of 3 : Migration Settings

Google Apps Migration For Microsoft® Exchange [Help](#)

**Select the data you wish to migrate**

Email messages All  12/ 4/2012 Through 12/ 4/2012

Calendar All  12/ 4/2012 Through 12/ 4/2012

Contacts

**Additional options**

Migrate deleted emails  Migrate junk emails

Do not migrate mail from these top-level folders. Subfolders are not supported. Enter comma-separated list:

Restrict migration to 25 users at a time.

I am migrating a subset of users

< Back Next > Cancel

(IMAP version)

Step 3 of 3 : Migration Settings

Google Apps Migration For Microsoft® Exchange [Help](#)

**Select the data you wish to migrate**

Email messages All  10/31/2012 Through 10/31/2012

**Additional options**

Migrate deleted emails  Migrate junk emails

Do not migrate mail from these top-level folders. Subfolders are not supported. Enter comma-separated list:

Restrict migration to 25 users at a time.

I am migrating a subset of users

< Back Next > Cancel

## Step 4

(Exchange version)

Review Google Apps Migration for Microsoft® Exchange Settings

**Google** Apps Migration For Microsoft® Exchange [Help](#)

Hostname/IP : **123.45.67.98** edit

Microsoft® Exchange Service Account : **Administrator**

Google Domain : **sloarmora.com** edit

Google Consumer Key : **solarmora.com**

User list filename : **C:\users.csv**

Data to migrate : **Email** edit

Email Migration date range : **None (Migrate All)**

Calendar Migration date range : None (Migrate All)

Migrate all data (overwrite previously migrated data) ?

Save settings ?

Run Diagnostics  Estimate  Migrate

< Back   Next >   Cancel

(IMAP version)

Review Google Apps Migration for Microsoft® Exchange Settings

**Google** Apps Migration For Microsoft® Exchange [Help](#)

Hostname/IP : **123.45.67.98** edit

Google Domain : **sloarmora.com** edit

Google Consumer Key : **solarmora.com**

User list filename : **C:\users.csv**

Data to migrate : **Email, Calendar, Contacts** edit

Email Migration date range : **None (Migrate All)**

Migrate all data (overwrite previously migrated data) ?

Save settings ?

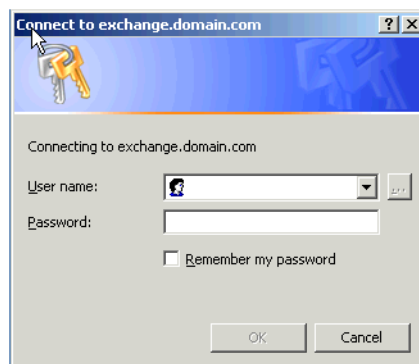
Run Diagnostics  Estimate  Migrate

< Back   Next >   Cancel

The information displayed in these screens is a little different depending on whether you chose Exchange or IMAP in [Step 1](#). The same procedures apply to both, however.

1. Review your migration settings. If you want to change a value, click **edit**.
2. Selecting **Migrate all data** does the following:
  - 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 may be duplicated. To mitigate this, delete the users' calendars before the migration to ensure they're clear. See ["How to get support" on page 71](#)
  - Contacts that were previously migrated will be duplicated. After the migration, [merge Google Contacts](#) to remove duplicates.
3. Select **Save settings** to save your settings in a configuration file. The next time you run the utility, you can elect to use these settings in [Step 1](#).
4. 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 diagnostics" on page 55](#).
5. 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 the 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.
6. Select **Migrate** if you want the utility to migrate the data you've identified. When you are satisfied with your settings, click **Next**.

If you are migrating from an Exchange Server, you'll see the following dialog box.



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

Enter the user name and password for the Microsoft® Exchange administrator account you are using to open your users' mail stores. This is the same user name you entered in [Step 1](#). (We recommend that this user name be the same user name you used to log into the client computer on which you're running the utility.)

Select the **Remember my password** to bypass this step in future migrations.

Click **OK**.

7. If you selected the **Run Diagnostics** checkbox, the Validation Settings screen appears. See "Run diagnostics" on page 55.

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

## Migrate a subset of users

GAMME version 3.0 and later allows you to migrate a subset of users. If you're doing this, you need to enable two settings in GAMME:

1. **Enable resource calendar migration** in step 2.

Step 2 of 3: User and Domain information

Google Apps Migration For Microsoft® Exchange [Help](#)

File of users to migrate: C:\users.csv

Google Apps domain name: sloarmora.com

Google Apps Two-legged OAuth Details

Consumer key: solarmora.com

Consumer secret: .....

Show Consumer Secret

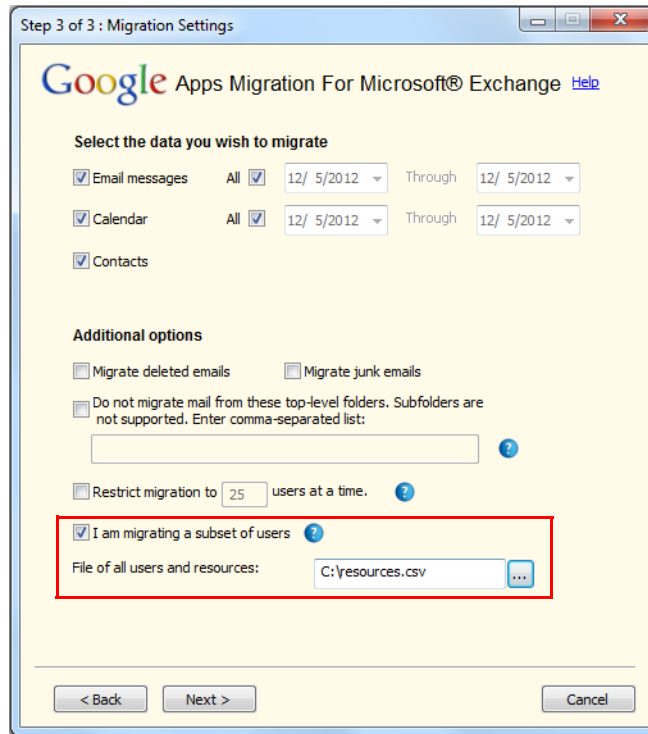
Enable resource calendar migration

Google Apps Admin user: admin@sloarmora.com

Help me configure my domain for migration

< Back Next > Cancel

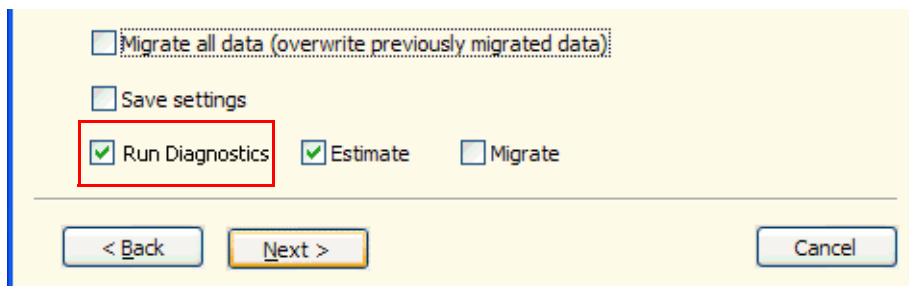
2. Check **I am migrating a subset of users**. Upload a CSV file containing **all** of the users and calendar resources in your organization in step 3.



If your users' addresses are changing from Exchange to Google Apps, the mapping file should contain all users and calendar resources in your organization. This mapping list should be exhaustive and cover all users and resources - even if some of the users are not being migrated at this time, as they may be listed as attendees for calendar events that you're currently migrating. For more information on formatting CSV files, see [How to create a CSV file for GAMME](#).

## Run diagnostics

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 is validated

The diagnostic tests validate the following:

- Connection to Microsoft Exchange Server or IMAP server
- Administrator privileges for the credentials you provided
- Format of the users list CSV file
- Whether users in the users list exist on the Exchange or IMAP server, and whether their mailboxes are accessible using the administrator credentials you provided

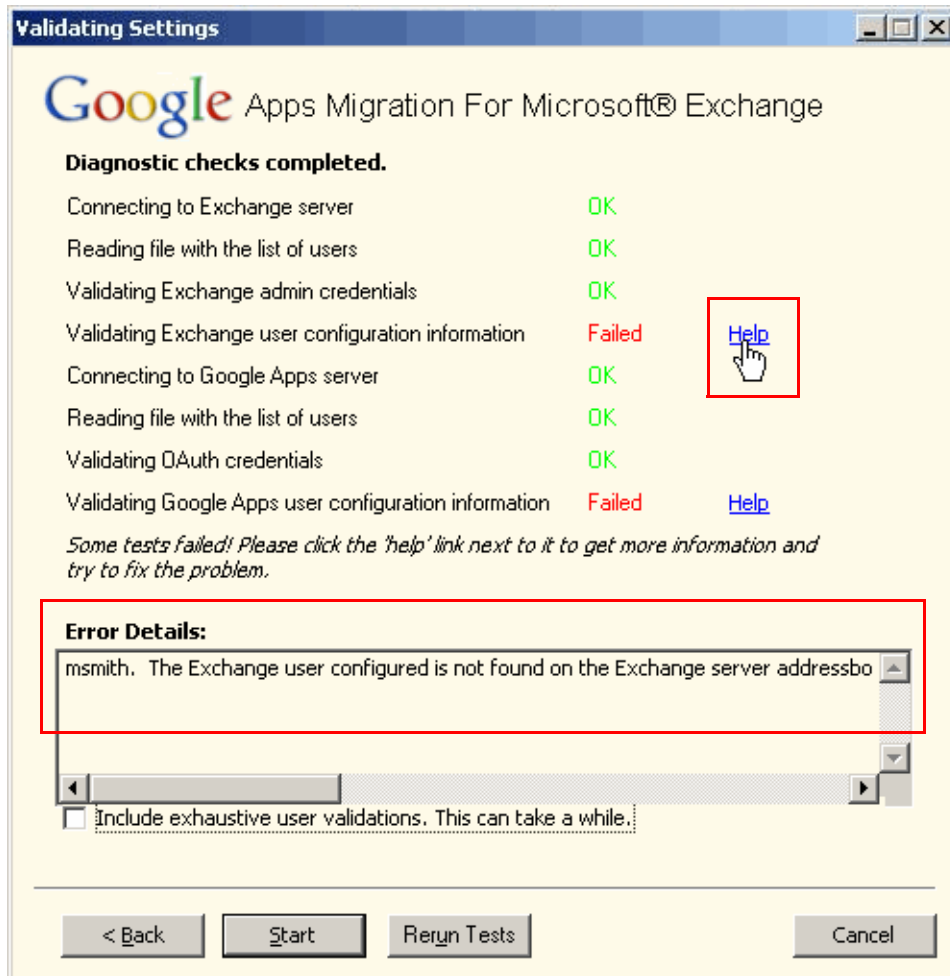
**Note:** The utility initially checks only the first 10 users in your users list. After the diagnostic test completes, you can validate the entire user list. See “Validate entire users list” on page 58.

- Whether users in the users list also exist in Google Apps
- Connection to the Google Apps server
- OAuth consumer key and secret you provided, if applicable



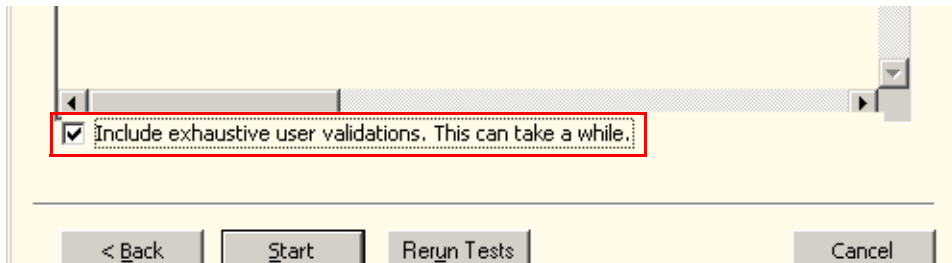
## Diagnostic test results

Once you click **Next** on the Review screen, the Validation Settings screen shows the progress of the diagnostic test. If the utility encounters an error, the text “Failed” appears to the right of the validation that failed. For more information about a failed validation, click **Help**. Additional information appears in the Error Details box:



## Validate entire users list

The utility initially checks only the first 10 users in your user list. After the diagnostic test completes, you can rerun the test to validate the entire user list, by selecting **Include exhaustive user validations**. If you select this option, however, the diagnostic test can take much longer.



If you select the **Include exhaustive user validations** option, the utility will perform the exhaustive validations for any migrations you run later, until you deselect the checkbox.

## Monitor migration

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

### Estimate

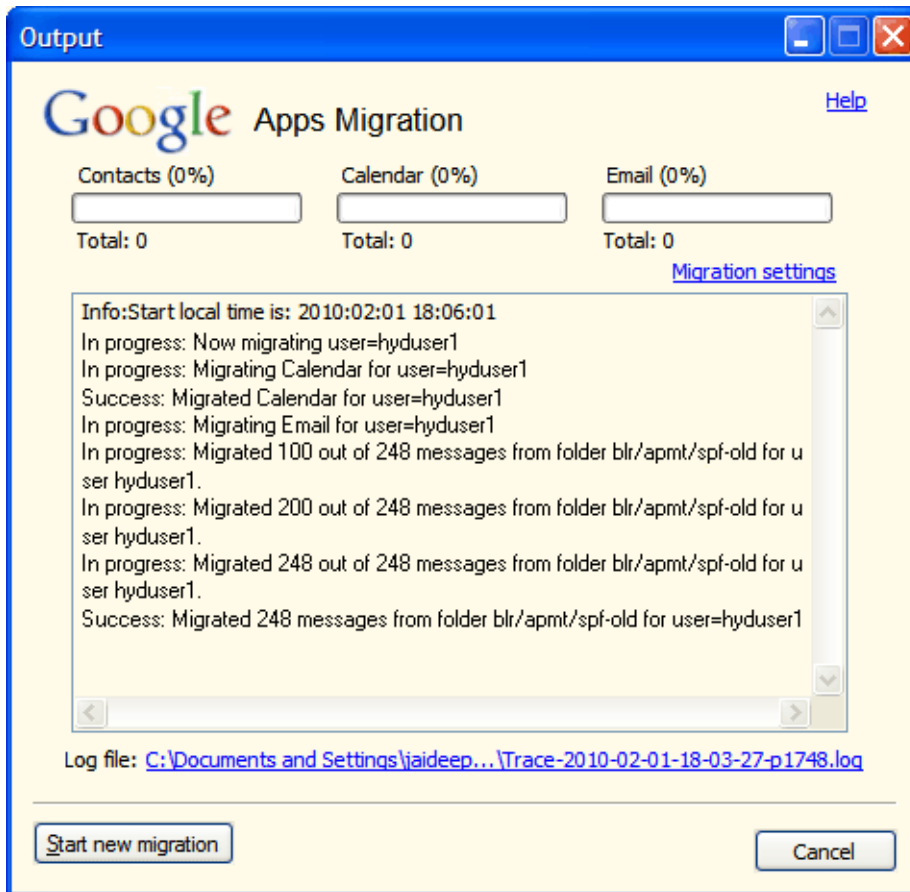
If you selected **Estimate** on the Review screen, the utility performs an estimate before it performs the migration. When the estimate has finished, click **Migrate** to start the migration.

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

If you want to migrate data when the estimation has finished, click **Migrate**.

## Migrate

If you selected Migrate in the Review screen, or clicked Migrate in the Estimation screen, you can monitor your migration here:



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.

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

When the migration has 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 work with their Google Apps accounts during migration.

If a user in the list is not also provisioned in Google Apps, the migration moves on to the next user. If the migration encounters a mail store it cannot 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, and 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
```

*username* in the path identifies the administrator who logged in and ran the utility.

## Migration considerations and best practices

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Avoid remigrating contact and calendar data that you have already migrated. If you remigrate contact data, you end up with duplicate contacts. The utility re-migrates this data if you choose the **Migrate all data** option when setting up the configuration for your migration.

If you remigrate calendar data, you might encounter problems. For example, if you migrated a recurring event, made a change to it in Google Apps, and then remigrated that same event, the change you made in Google Apps would be lost.

If you need to remigrate contact and calendar data for some reason, you need to first delete the data you migrated originally, and then run a new migration. When planning your migration, take the following considerations into account.

### Groups/distribution lists

- The e-mail migration tools do not migrate your organizations distribution lists / groups into Google Apps.
- The e-mail migration tools do migrate e-mails sent to groups or distribution lists. You will need to ensure these groups are provisioned into Google Apps before users start to use Google Apps to ensure properly e-mail flow when users reply to messages sent to these groups.

### E-mail

- When a domain is configured for dual delivery at the email gateway, mail between users within the same organization will not be routed to external gateways and dual delivered. If you are running in this configuration you may want to consider also migrating e-mail to Google Apps for the period of time you have dual delivery enabled.
- 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.

## Calendar

- To avoid migration issues, make sure you provision **all users** in Google Apps before migrating calendars. For details, see “Avoid Calendar issues” on page 18.

## Multiple domain aliases

- If your organization has multiple domains and/or multiple email aliases for user accounts, these email addresses should be provisioned on the user account in Google Apps before migrating Calendar data. If these aliases are not defined in Google Apps, Calendar event data may not be properly reflected or migrated to Google Apps.
- Calendar event modifications not migrated for migrated events
- Calendar migration does not support migrating delta changes to existing events that have already been migrated to Google Apps. For example if the details of a meeting are updated after migrated to Google Apps even if you configure the migration tool to “Migrate all data (overwriting previously migrated data)” these events are not be updated. Because of this, consider carefully when best to migrate Calendar data.
- The Calendar migration will pick up new meeting requests created since your last migration, as with contacts and email.

## Contacts

- When migrating contacts, if you remigrate and choose “Migrate all data (overwriting previously migrated data)” duplicate contacts will be created in Google Apps. If this occurs, the user can use the “Find Duplicates” option in Google Apps contacts to merge duplicate contacts.
- The contact migration tool will migrate new contacts created since your last migration, but does not migrate contacts that have been modified since the last migration.

## Run a migration from the command line

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For details on how to do this, see the help center article [Run GAMME from the command line: http://support.google.com/a/bin/answer.py?&answer=2790147](http://support.google.com/a/bin/answer.py?&answer=2790147)

## Migrate Public Folders from Exchange

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You can migrate Public Folders from Exchange to Google Groups using the command line. Do this after you’ve migrated your users’ mail, calendar, and contacts. For instructions, see the help center article [Migrate Public Folders with GAMME](#).



# Viewing Migration Reports

## Migration reports overview

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Google Apps Migration for Microsoft® Exchange provides detailed reports about the migrations you run. You can view an aggregate report that includes information from all your migration runs or a separate report for each migration run. Use these reports to determine whether errors occurred during a migration and why they occurred.

In addition to migration reports, Google Apps Migration for Microsoft® Exchange 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 these logs to Google support for analysis. For details, see “Interpreting log files” on page 73.
- **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 diagnostics” on page 55.

## Report IDs

Whenever you run a migration, Google Apps Migration for Microsoft® Exchange 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 A.M., with a process ID of 5172.

## Migration report views

There are two types of migration report views, which are available for both the aggregate report 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.

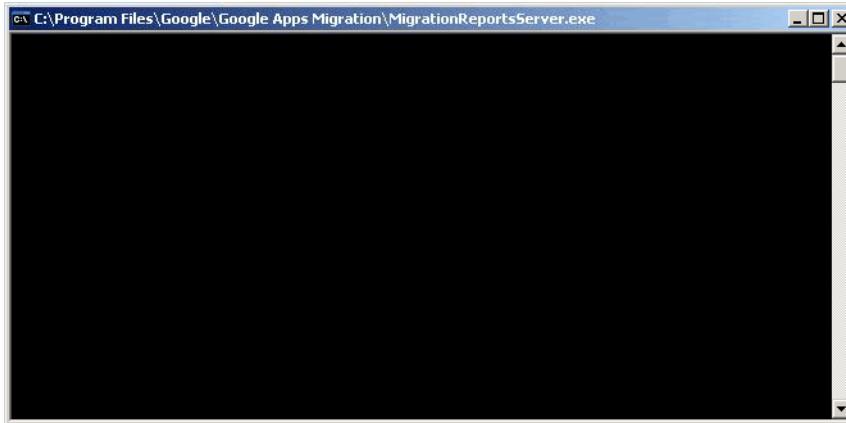
**Note:** Be aware of the following limitations to viewing reports:

- To generate reports, Google Apps Migration for Microsoft® Exchange first opens a command console window, which then starts a reports server on the machine on which you run the utility. Be sure to leave this console window open.
- If you open a report while you are running a migration, the migration may fail.

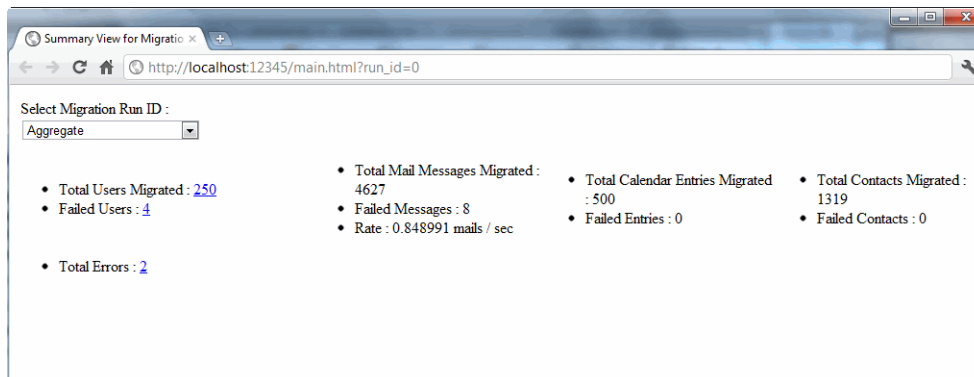
### To open a report:

1. On the machine on which the utility is installed, click **Start > All Programs > Google > Google Apps Migration > Show Report**

The command console window opens, which starts the reports server. Do not close this window:

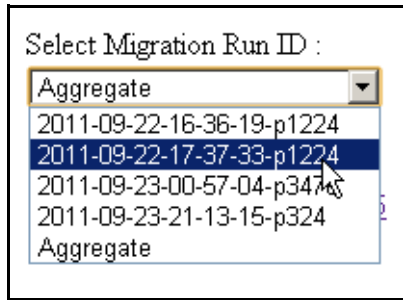


After the reports server starts, the Aggregate Report opens in a browser window:





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



**Note:** For details about report IDs, see “Report IDs” on page 63.

## Report pages

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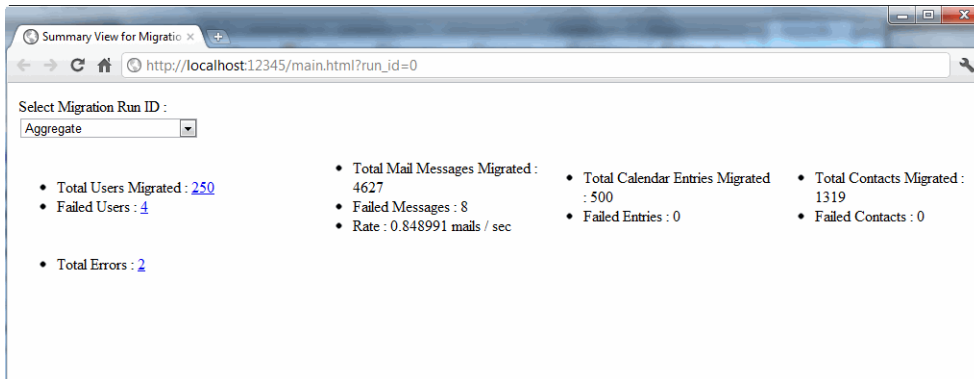
After you open an aggregate report or a specific migration report, you can navigate to additional pages to determine which users were affected by errors, which errors occurred, and details about the errors.

### Summary page

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

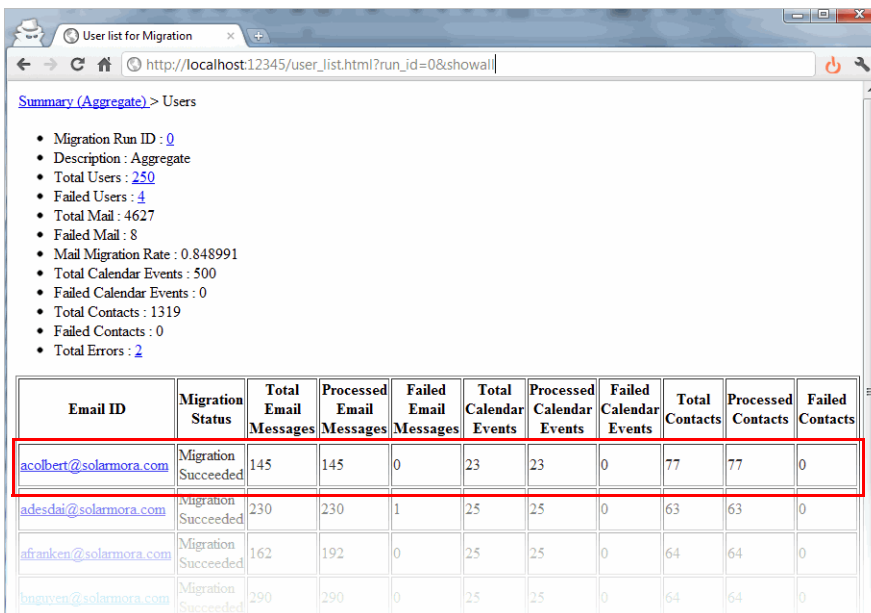
- Total users
- Failed users
- Number of emails, calendar entries, and contacts migrated
- Number of failed emails, calendar entries (events), and contacts

- Email migration rate



## User List for Migration page

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

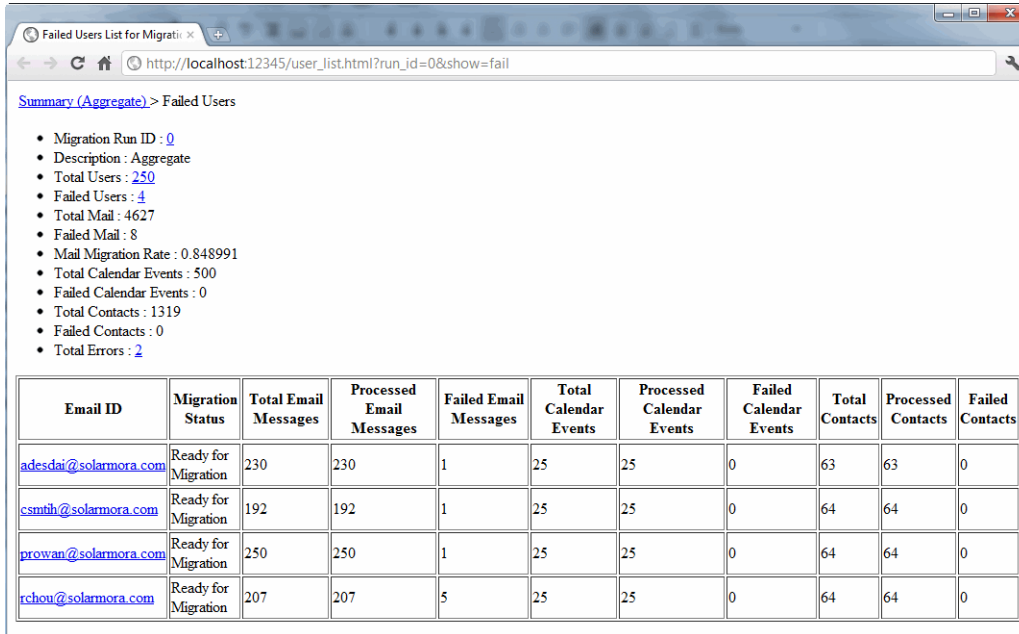


Path to this page

**Summary page > Total Users Migrated**

## Failed Users List for Migration page

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



Summary (Aggregate) > Failed Users

- Migration Run ID : 0
- Description : Aggregate
- Total Users : 250
- Failed Users : 4
- Total Mail : 4627
- Failed Mail : 8
- Mail Migration Rate : 0.848991
- Total Calendar Events : 500
- Failed Calendar Events : 0
- Total Contacts : 1319
- Failed Contacts : 0
- Total Errors : 2

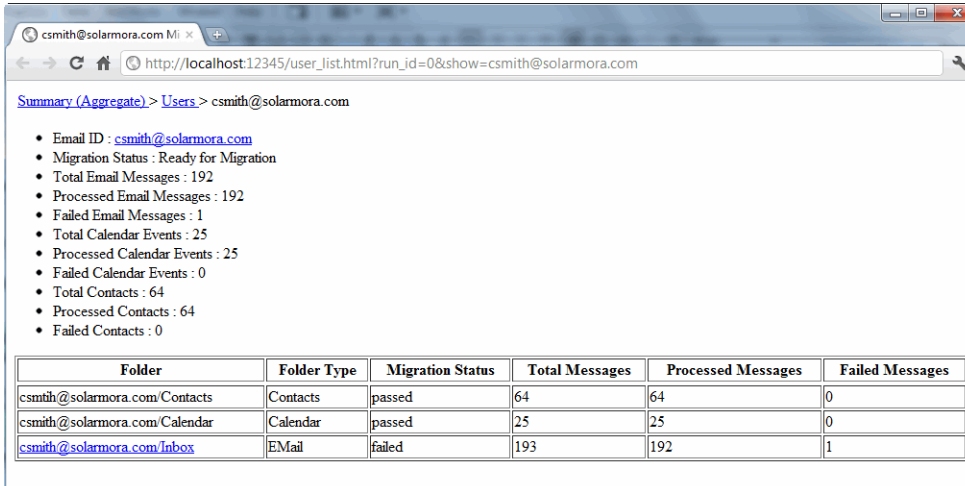
Email ID	Migration Status	Total Email Messages	Processed Email Messages	Failed Email Messages	Total Calendar Events	Processed Calendar Events	Failed Calendar Events	Total Contacts	Processed Contacts	Failed Contacts
<a href="#">adesdai@solarmora.com</a>	Ready for Migration	230	230	1	25	25	0	63	63	0
<a href="#">csmth@solarmora.com</a>	Ready for Migration	192	192	1	25	25	0	64	64	0
<a href="#">prowan@solarmora.com</a>	Ready for Migration	250	250	1	25	25	0	64	64	0
<a href="#">rchou@solarmora.com</a>	Ready for Migration	207	207	5	25	25	0	64	64	0

Path to this page

Summary page > Failed Users

## User Migration Summary page

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 linked name of a folder to view the **Folder Details** page.



Summary (Aggregate) > Users > csmith@solarmora.com

- Email ID : [csmith@solarmora.com](#)
- Migration Status : Ready for Migration
- Total Email Messages : 192
- Processed Email Messages : 192
- Failed Email Messages : 1
- Total Calendar Events : 25
- Processed Calendar Events : 25
- Failed Calendar Events : 0
- Total Contacts : 64
- Processed Contacts : 64
- Failed Contacts : 0


Folder	Folder Type	Migration Status	Total Messages	Processed Messages	Failed Messages
<a href="#">csmith@solarmora.com/Contacts</a>	Contacts	passed	64	64	0
<a href="#">csmith@solarmora.com/Calendar</a>	Calendar	passed	25	25	0
<a href="#">csmith@solarmora.com/Inbox</a>	EMail	failed	193	192	1

## Paths to this page

- Summary page > Total Migrated Users > user name
- Summary page > Failed Users > user name
- Summary page > Total Errors > Users Affected > user name

## Folder Details page

The Folder Details page shows details about each error that occurred in a specific folder that was migrated for a user. Click the linked message to view the **Message Summary** page. Click the linked error code to view the **Users Failed by Error** page.



Summary (Aggregate) > Users > [csmith@solarmora.com](#) > Folder: 3

- Folder : [csmith@solarmora.com/Inbox](#)
- Folder Type : EMail
- Migration Status : failed
- Total Messages : 193
- Processed Messages : 192
- Failed Messages : 1

From	To	Subject	Date	Error Code	Severity
<a href="#">bjohnston@solarmora.com</a> < <a href="#">bjohnston@solarmora.com</a> >	<a href="#">csmith@solarmora.com</a> < <a href="#">csmith@solarmora.com</a> >	<a href="#">New sales report.msg</a>	1970-01-13T03:28:40.000Z	<a href="#">0x8004106c</a>	high

## Paths to this page

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

## Message Details page

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/response information if a Google API error occurred while the message was being uploaded to Google Apps.

Message Details

http://localhost:12345/user\_summary.html?run\_id=0&show=fail&user\_id=csmith@solarmora.com/Folder%3/New\_Sales\_Report

Summary (Aggregate) > Failed Users > http://localhost:12345/user\_summary.html?run\_id=0&show=fail&user\_id=csmith@solarmora.com > Folder: 3 > Subject: New sales report

- From : bjohston@solarmora.com >
- To : csmith@solarmora.com >
- Subject : [New sales report](#)
- Date : 1970-01-13T03:28:40.000Z
- Error Code : [0x8004106c](#)
- Severity : high

Error Message	Error Description
The MAPI message could not be translated to MIME format.	GLOOK_MAPI_TO_MIME_TRANSLATION_ERROR

Request	Response

## Paths to this page

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

## Error List for Migration page

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 linked number of errors under **Users Affected** to view the **Users Failed by Error** page. To get to this page, go to **Summary page > Total Errors**.

Summary (Aggregate) > Errors

- Migration Run ID : [0](#)
- Description : Aggregate
- Total Users : [250](#)
- Failed Users : [4](#)
- Total Mail : 4627
- Failed Mail : 8
- Mail Migration Rate : 0.848991
- Total Calendar Events : 500
- Failed Calendar Events : 0
- Total Contacts : 1319
- Failed Contacts : 0
- Total Errors : [2](#)

Error Code	Severity	Error Summary	Error Description	Users Affected	Messages Affected
0x00000000	0			<a href="#">2</a>	2
0x8004106c	1	The MAPI message could not be translated to MIME format.	GLOOK_MAPI_TO_MIME_TRANSLATION_ERROR	<a href="#">4</a>	8

## Users Failed by Error page

The Users Failed by Error page shows the users for which an error occurred during a migration and details about each user's migrated messages. Click the linked name of a user to view the **Failed User Migration Summary** page for that user. To get to this page, go to **Summary page > Total Errors > Affected Users**.

Summary (Aggregate) > Errors > 0x8004106c

- Error Code : 0x8004106c
- Severity : 1
- Error Summary : The MAPI message could not be translated to MIME format
- Error Description : GLOOK\_MAPI\_TO\_MIME\_TRANSLATION\_ERROR
- Users Affected : [4](#)
- Messages Affected : 8

Email ID	Migration Status	Total Email Messages	Processed Email Messages	Failed Email Messages	Total Calendar Events	Processed Calendar Events	Failed Calendar Events	Total Contacts	Processed Contacts	Failed Contacts
<a href="#">adesdai@solarmora.com</a>	Ready for Migration	230	230	1	25	25	0	63	63	0
<a href="#">csmth@solarmora.com</a>	Ready for Migration	192	192	1	25	25	0	64	64	0
<a href="#">prowan@solarmora.com</a>	Ready for Migration	250	250	1	25	25	0	64	64	0
<a href="#">rchou@solarmora.com</a>	Ready for Migration	207	207	5	25	25	0	64	64	0

# Troubleshooting Issues

## Troubleshooting

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You can find the latest troubleshooting information at:

<https://www.google.com/support/a/bin/answer.py?hl=en&answer=173653>

## How to get support

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You can [contact support here](#) or through the Support tab in your Google Apps control panel. Please provide the information at the bottom of [Troubleshoot an Exchange Migration using GAMME](#).

For additional resources provided by Google to help you with your move to Google Apps, see the [Google Apps Technical Transition Guide](#) (PDF). Available support includes [deployment resources](#), [Help Center articles](#), [deployment training and certification](#), and [technical support](#).

## Common issues

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### **How to cleanly remigrate a user's calendar.**

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

1. Delete the user's Google Apps account to remove their calendar.
2. Configure the Migration tool to migrate the Calendar and select the option "Migrate all data (overwriting previously migrated data)".

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

1. In the control panel, go to **Advanced Tools > Manage API client access** to view your authorized API clients.

## 2. Make sure your list of URLs looks like this:

Dashboard Organization & users Groups Domain settings Reports **Advanced tools** Setup Support

« Back to Advanced tools Your settings have been saved

### Manage API client access

Developers can register their web applications and other API clients with Google to enable access to data in Google services like Calenda having to individually give consent or their passwords. [Learn more](#)

**Authorized API clients** The following API client domains are registered with Google and authorized to access data

Client Name	One or More API Scopes
<input type="text"/> Example: www.example.com	<input type="text"/> <input type="button" value="Authorize"/> Example: http://www.google.com/calendar/feeds/ (comma-delimited)
<b>solarmora.com</b>	<b>Email Settings (Read/Write)</b> <a href="http://apps-apis.google.com/a/feeds/emailsettings/2.0/">http://apps-apis.google.com/a/feeds/emailsettings/2.0/</a> <b>Groups Provisioning (Read only)</b> <a href="https://apps-apis.google.com/a/feeds/group/#readonly">https://apps-apis.google.com/a/feeds/group/#readonly</a> <b>Email Migration (Write only)</b> <a href="https://apps-apis.google.com/a/feeds/migration/">https://apps-apis.google.com/a/feeds/migration/</a> <b>User Provisioning (Read only)</b> <a href="https://apps-apis.google.com/a/feeds/user/#readonly">https://apps-apis.google.com/a/feeds/user/#readonly</a> <b>Calendar (Read/Write)</b> <a href="https://www.google.com/calendar/feeds/">https://www.google.com/calendar/feeds/</a> <b>Contacts (Read/Write)</b> <a href="https://www.google.com/m3/feeds/">https://www.google.com/m3/feeds/</a> <a href="https://www.googleapis.com/auth/apps.groups.migration">https://www.googleapis.com/auth/apps.groups.migration</a>

## 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, such as the following

- Users in your user list can't be found on your Microsoft® Exchange or IMAP server
- Users in your users list are suspended, deleted, or not yet provisioned in Google Apps
- Incorrect login credentials or other information about your Microsoft® Exchange or IMAP server
- An incorrect email address or Microsoft® Exchange alias for a user
- Failed OAuth requests caused by an incorrect OAuth key, secret, or Windows Time

For information on running diagnostic tests on your configuration and users list, see "Run diagnostics" on page 55.

## Viewing migration reports

If message errors occur during a migration run, you can check the migration reports for details about which errors occurred, why they occurred, and which users were affected them. For more information, see "Viewing Migration Reports" on page 63.



# Interpreting log files

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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 Google Apps Migration for Microsoft® Exchange. The analyzer can scan your Trace log files and identify many types of migration issues. To use the analyzer, go to the following URL and upload your log files:

<https://toolbox.googleapps.com/apps/loganalyzer/?productid=gamme>

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

## Types of log files

Google Apps Migration for Microsoft® Exchange produces two log files:

- **Status**, which contains a summary of the overall status of a completed migration run
- **Trace**, which contains 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

*user-name* in the path identifies the administrator who logged 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” on page 29.

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 run is created on and named by the date and time that the migration run 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 A.M., with a process ID of 5172.

The file contains summary information for each user who was processed during that migration run, and information about each type of data you elected to migrate (Contact, Calendar, Email).

The information for a user includes:

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

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

- Information about the success/failure of migrating Contact data for that user:

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

- Information about the success/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/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

The Trace log file for a given migration run 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 P.M., with a process ID of 8108. The file is updated as the migration run progresses.

The Trace file begins with entries similar to the following:

```
Configuration: Exe name: C:\Program Files\Google\Google Apps  
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 EXE, the Exchange Migration product version, operating-system information about the computer on which the utility is running, and the process ID for this particular migration run.

Subsequent entries in the Trace log 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**: The date and time the 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 Microsoft® Windows registry. For more information, see “Enable Trace logging” on page 76.
- **Migration**: Module name (for example, Migration, Generic, Sync, Calendar)
- **ServerMigrationSource / ServerMigrationConfig**: Class name
- **ProcessUser / LogConfig**: Method name
- **@ 88/@ 343**: Line number
- **sourceuser:drafts**: User name on the source server
- **googleuser:drafts**: User name in Google Apps

- **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:** Google Apps domain to which data was migrated
- **GoogleConsumerKey:** Consumer key for Google Apps domain to which data was migrated
- **ForceRestart:** Whether migration runs 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 is migrated (0=no, 1=yes)
- **IsMigrateContacts:** Whether or not contacts are migrated (0=no, 1=yes)
- **IsMigrateCalendar:** Whether or not calendar events are 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

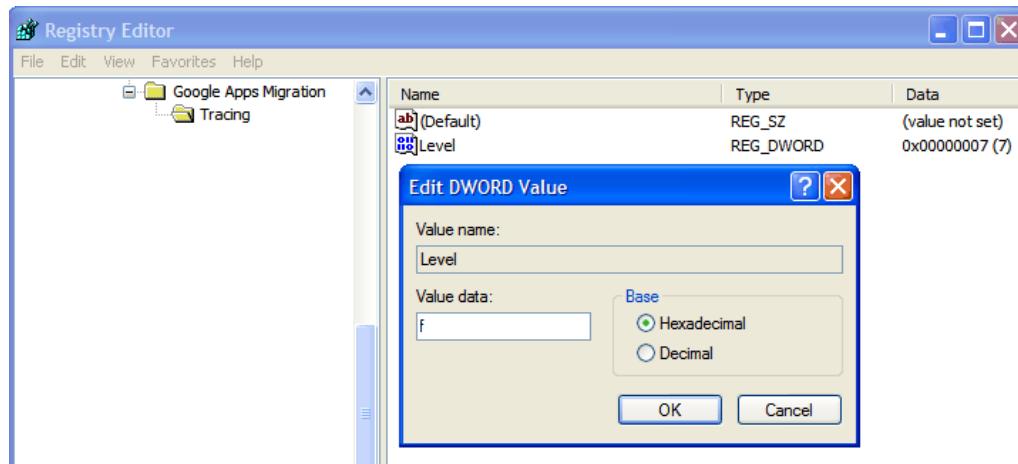
## Enable Trace logging

**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 Google Apps for Business or Education customer, find your Customer PIN and Support PIN. Information on how to collect this information is available in the Help Center:

<http://www.google.com/support/a/bin/answer.py?answer=60233>