



Google Apps IMAP Migration: Best Approaches for Large Migrations

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IMAP Migration Overview

IMAP server email migration to Google Apps enables administrators to migrate the existing contents of users' mailboxes to GMail accounts within Google Apps. This allows administrators to upgrade to GMail while keeping users' emails and email organization intact. IMAP server email migration is only available to Google Apps Education and Premier users.

This document focuses on best approaches for managing large-scale migrations for businesses, educational institutions, ISPs and portal domains. The target audience for this document includes systems administrators and email administrators who require technical guidance on how to address migration issues.

IMAP Migration Prerequisites

IMAP migration requires you to obtain the following information to set up your migration:

- A list of usernames and passwords in plain text CSV format for accounts to be migrated, or an administrator password if migrating from Microsoft Exchange.
- A corresponding list of user accounts already provisioned within Google Apps.
- A hole in your network firewall for Google's IMAP fetcher.

For large-scale migrations, there are several other considerations that have to be made while transferring email in order to maintain business uptime and/or customer satisfaction. For example, administrators should have plans for maintaining network speed and email uptime during business hours, as well as knowledge of how long the migration will take. To this end, this document contains additional sections to help administrators create and manage the following:

- [A user notification strategy.](#)
- [A method for estimating the time to completion for migrating email.](#)
- [A coexistence strategy.](#)

Pre-migration preparation

Obtaining usernames and passwords

Migrating batches of user accounts requires administrators to make a list of user account names and passwords within a plain text CSV file. The CSV file must be formatted as a table and include a header defining the columns. There should be three columns:

```
New email address, old username, old password
user.name@example.com, user.name, fgh789
user.name2@example.com, user.name2, fgh790
```

Since passwords aren't stored in plain text, a few solutions to gather this information are detailed below depending on which IMAP server you are using.

Microsoft Exchange Migration

For Microsoft Exchange 2003, the simplest method for creating a CSV of usernames and passwords is to use the Exchange server administrator password to authenticate all user accounts to be migrated.

First, specify a username in the following format:

```
YourDomain/AdminUserName/UserMailbox
```

- `YourDomain` is your domain,
- `AdminUserName` is an Exchange Server user name with administrator rights to the user's mailbox that you wish to migrate, and
- `UserMailbox` is the name of the user to migrate.

Write in the "source password" field the password for the `AdminUserName` of the account you designated. Create your CSV containing every account to be migrated using the Exchange administrator account password. Once email accounts are migrated, users should create new account passwords within Google Apps.

Note: For a Microsoft Exchange 2003 server migration, users' folders with slash characters ("/") will not be migrated. To ensure a consistent transfer, you can modify the folder names to replace the slash characters with another separator.

Other IMAP Servers

In addition to Microsoft Exchange, we support the following IMAP servers:

- Cyrus IMAP

- Courier-IMAP
- Dovecot

If you are using one of these servers (or an unsupported server), you must create a CSV containing old usernames and passwords for every account to be migrated to GMail. Since operating systems do not store passwords in plain text and most sites have no way to retrieve them, gathering this list can be a daunting task.

This list details the most commonly used ways of collecting user passwords and account information.

1. **If users are currently using your old email system:** Before the migration is set to begin, have all users "register for their new Google Apps account". This registration will involve setting an initial password which administrators can capture. You will then have to set each legacy email account to the user's new Google Apps GMail password. This allows administrators to access old user email accounts with new user passwords and allow a bulk migration CSV file to be populated with plain text passwords.
2. **If users already have access to their Google Apps accounts:** Have an administrator change all passwords for old user accounts, recording the new passwords in a plain text CSV file. Use this CSV for migration, and inform the migrated users that their old email will be in their GMail mailbox as soon as migration completes.
3. **As an alternative on UNIX systems:** You can save the password hash from existing accounts, change the passwords (see #2), perform the migration, then restore the password hashes. Users will then keep their original passwords. This method involves writing some scripts to grab and save hashes from LDAP.

Provisioning new accounts

There are three methods of creating new user accounts:

- For small accounts (under 50 users), administrators can manually generate accounts for each user.
- For large accounts, we offer a bulk upload method of creating new user accounts. The bulk upload screen is located under "Advanced Tools." Administrators can generate new accounts by uploading a CSV file containing all of the new user names, user's first and last names, and new user passwords.
- New user accounts can also be created programmatically via the [Google Apps Provisioning API](#).

Planning your migration

Pre-Migration User Notification

Before migration begins, users should be notified of the following:

1. Your email accounts cannot exceed the space allotted by GMail. This limit depends on the Google Apps account you have purchased. Google will reject additional items that exceed this limit, and the user won't be able to receive new mail until existing mail is deleted. Please verify that mailboxes aren't breaking their account size limit before transferring email.
2. Messages larger than 20 megabytes will not be transferred. Ask users to backup these large attachments before you begin migration.
3. Questionable, potential virus attachment types (.ini, .exe, .vbs) will not be transferred. Users should back up these data types before the migration.
4. User accounts with more than 1800 folders on the IMAP server will not be transferred. Instead, they will be skipped so that the scheduled transfer can continue.
5. Notify users of excluded folders (such as "trash" or "spam") that will not be migrated.

6. Users should disable forwarding rules so that the migrated mail isn't forwarded in a loop or to a different account.
7. Users may not be able access to Google Apps mail accounts while their account is being migrated.

Managing network security

In order to migrate email via IMAP, a hole in the network firewall must be opened for a set of IP addresses through which Google pulls your email information.

Google pulls IMAP information from the following server IPs:

- 64.233.160.0/19
- 66.102.0.0/20
- 66.249.80.0/20
- 72.14.192.0/18
- 74.125.0.0/16
- 209.85.128.0/17
- 216.239.32.0/19

Planning blackout windows and time constraints

Google allows migration speed to be throttled by setting limits on the number of simultaneous connections we can make to your servers to pull mail. Only one mailbox transfers at a time for each connection. Since time constraints and blackout windows rely on how fast we can pull mail from your servers to ours, it's a good idea to first test the speed of your system in order to determine how long migration will take.

Select a migration sample of appropriate size by selecting the number of simultaneous connections your mail server can handle while maintaining sufficient upload speed. Some trial and error might be required in order to determine this number. Then, calculate the average size of your email accounts and verify that the migration sample accurately represents this number.

The total estimated migration time (T_{total}) should equal the time it takes to migrate your sample (T_{sample}) times the ratio of total mailboxes to be migrated (X_{total}) over the number of mailboxes used in the sample (X_{sample}).

$$T_{total} = \frac{X_{total}}{X_{sample}} T_{sample}$$

For example, a company has 10,000 users, each user has an average mailbox size of 1GB. The company migrates a 200 user sample batch, which takes 1 hour. Plugging these values into our equation, we get the following:

$$T_{total} = \frac{10,000 \text{ accounts}}{200 \text{ accounts}} 1 \text{ hour}$$
$$T_{total} = 50 \text{ hours}$$

The estimated total time for migration is 50 hours.

Once you have an estimated total for migration you can determine your blackout windows. Blackout windows need to be set for each day of the week you want to halt migration. If you wanted to limit this migration to only non-business hours, and your company is open from 9:00 A.M. to 5:00 P.M., you can set your blackout windows to be Monday through Friday, 9:00 A.M. to 5:00 P.M.

Keep in mind that this number is an estimate and not a definite number. It's important to calculate some buffer time within your migration due to fluctuations in bandwidth available for migration. This is especially true if you are planning on performing multiple migrations over a set period of time since connections add across migrations. If one migration doesn't finish before the next one starts, we will try to access your mail servers over to total number of connections allotted to both connections. This can have severe consequences for your network.

Coexistence and transfer strategies

A coexistence and transfer strategy is required for transferring to Gmail within Google Apps. Your coexistence and transfer strategy depends on where your MX records currently point and how long your migration will take.

If your MX records already point to Google, or through some other routing mail is being actively delivered to Gmail, you should simply begin migration and inform your users. No major coexistence strategies are involved in this situation, since your users are already on Google Apps. An example of this situation is a company that has archived mail on old servers but has already asked its employees to start using Gmail.

If your MX records don't point at Google already, then your coexistence strategy will depend on the length of time migration will take.

If migration will be relatively quick, involving only one or two batch migration for the entire domain:

1. Change your MX records prior to starting migration.
2. Point your users to their new mailboxes immediately.

If migration will require a small batches over a period of time:

1. Set up a mail router.
2. Point the MX records at the mail router.
3. Add rules to route the migrated group's mail to Google prior to starting migration.
4. As each batch of migrations begins, point the users in that batch to their new mailbox within Google Apps.

If migration will be lengthy, involving large batches over a period of time:

1. Set MX record to dual-deliver email to both Google and your current IMAP server for users prior to migration.
2. Point user to their new mailbox after the batch migration completes.

Note: If you use this method, you will lose sent mail sent over the course of the migration.

Errors and Failed Migrations

Failed migrations are marked "Failed" in the "Email Migration" screen under "Advanced Tools" on your Google Apps administration screen.

Common reasons for errors:

1. If you attempt to transfer more than your allotment per mailbox to one user account, Google will reject additional items. The user won't be able to receive new mail until

existing mail is deleted. Please verify that mailboxes aren't breaking the limit for your accounts before migrating email.

2. User accounts with more than 1800 folders on the IMAP server will not be transferred.
3. User accounts with mail attachments that are too large or contain possible viruses can cause an error.

Failed accounts should be checked for errors and re-queued in a separate migration.

IMAP Migration FAQ

What are the prerequisites for IMAP migration?

You must have the following information on hand before you can bulk migrate email.

- A list of user names and passwords of accounts to be migrated.
- Corresponding user accounts already provisioned within Google Apps.
- A hole in your firewall for Google's IMAP fetcher to pull email from your current IMAP server.

In addition, you should also have the following information on hand:

- A rough estimate of your system load capacity and upload bandwidth.
- A user notification strategy.
- A coexistence strategy.

Are there any network or email concerns I should keep in mind while performing migration?

There are a few network and email concerns to keep in mind while performing migration. First of all, connections add across migrations. If one migration starts while another one is in progress, then the number of connections being made to your servers will be equal to the number of connections assigned to both migrations. If you are breaking up your migrations into several groups be mindful of how you schedule them and allow some buffer time for each migration to complete.

Secondly, the email delivered to your old accounts will not be transferred if it is received after migration begins. Make sure your MX records point to Google before you switch on migration.

What about security? Can migrated email be sent over a secure link?

If the customer's IMAP server supports SSL or STARTLS, email will be migrated over a secure connection.

Does IMAP migration provide the ability to "throttle" the rate at which partners migrate data?

We provide the ability to throttle the number of simultaneous connections Google opens to their mail servers. We also provide the ability to specify 'blackout windows' in which no traffic between Google and your mail servers will occur.

What happens if, at the end of a time window, the program is mid-way through a users mailbox?

Extraction will pause until the blackout window ends. We will continue indexing the mail we've extracted over the course of the blackout window, so the user's mail might appear in their new mailbox during the blackout window.

Does any other data get transferred along with the mail data? (folder information, contacts, etc.)

Folder structure, original received date, original sender, and follow up flag are preserved. No mail settings or contacts are transferred.

Are there any data objects I should be aware of that might not transfer as attachments?

Messages larger than 20 megabytes and messages flagged as potential viruses will not be transferred.

What happens to mailboxes that have failed migration?

Failed mailboxes are marked "Failed" in on the migration progress screen. Mailboxes that failed migration should be re-queued in a separate migration.

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