

# Google Search Appliance

## Upgrade and Migration Handbook

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This handbook provides an overview of various considerations involved in upgrading or migrating a Google Search Appliance (GSA).

## About this document

The recommendations and information in this document were gathered through our work with a variety of clients and environments in the field. We thank our customers and partners for sharing their experiences and insights.

<b>What's covered</b>	This handbook contains definitions of different types of GSA releases and best practices for applying an upgrade to a GSA or performing a migration from one GSA to another. This handbook does not cover the process of upgrading or migrating GSA Connectors from one version to another.
<b>Primary audience</b>	Solution architects, technical architects and GSA administrators working on the design of an enterprise search solution or performing administration of the Google Search Appliance.
<b>IT environment</b>	Multiple GSA deployment architectures.
<b>Deployment phases</b>	Updating to a new software version and migrating from one GSA to another.
<b>Other resources</b>	<ul style="list-style-type: none"><li>● <a href="#">GSA Software Updates page</a>, including a list of supported versions (requires login)</li><li>● GSA product documentation <a href="#">archive</a>, useful for comparing GSA version features</li><li>● <a href="#">GSA Help Center</a> provides complete information about the GSA</li><li>● <a href="#">Enterprise Support Portal</a> provides access to Google support</li><li>● <a href="#">LearnGSA.com</a> provides educational resources for the GSA</li></ul>

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# Chapter 1 - Understanding GSA releases

## Overview

This chapter provides a definition of a Google Search Appliance release and provides information useful for understanding the content and structure of GSA releases.

## What is a GSA release?

The Google Search Appliance has two major components that are subject to change: software and hardware. Each new release of the GSA refers to a new software update that Google has released and has been made available to all customers.

GSA hardware updates are performed independently from software updates, and are only possible through a license renewal. For an overview of GSA hardware models, refer to “[Determining the Model of Your Search Appliance](#)” in the Appendix of this handbook.

This chapter discusses GSA software updates and how to find information regarding each release. Hardware updates are discussed separately in [Chapter 3, “Migration Planning.”](#)

## Types of GSA releases

There are two types of GSA software releases:

- [Version upgrade releases](#)
- [Patch releases](#)

### Version upgrade releases

Each version upgrade release of the GSA adds new features and functionality to the GSA. For example, version 6.14 introduced Flexible Authorization and version 7.0 introduced Document Previews.

Version upgrade releases are signified by a change to the version number, and are typically referred to by the first two values of the major version number, as shown in the following examples:

- v6.14
- v7.0

In version numbers, the numbers after the point are always even numbers and are incremental, for example, v6.12, v6.14, v7.0.

When a release contains significant changes to existing GSA functionality or a large number of new features, the integer component of the version number is incremented. For example, the move from v6.14 to v7.0 introduced a [large number of new features](#) to the GSA.

## Patch releases

Patch releases primarily provide fixes to outstanding GSA issues, and do not generally contain any major changes to GSA features or functionality. A list of changes contained within each patch release is provided via the Update Instructions of each release.

Patch releases are signified by a change in the “build version” number. That is, v7.0.14.G.114 represents an incremental patch after the original version (v7.0.14.G84). Prior to v7.0, patches were also signified by a “patch number” (eg. v6.14 Patch 8).

## Version numbering

Official GSA release version numbers follow a four-segment naming convention and can include a patch number for the version, as shown in the following format:

<major version>.G.<build number> - P<patch number>

G stands for “General Availability”.

Some examples of this numbering scheme are:

- v6.12.0.G.30-P18 (referred to as version “6.12 Patch 18”)
- v6.14.0.G.28 (referred to as version “6.14,” no patches)
- v7.0.14.G.114

Even though there are four segments to a GSA version number, it is sufficient to refer to a GSA release by its first two version numbers, for example, v6.12, v6.14, v7.0. However, when dealing with Google Enterprise Support, it is important to provide the full version number of the search appliance, for example, “v6.14.0.G.28-P8” (the full version number can be found via the Version Manager on port 9941 or 9942 of the GSA).

## What is contained in a GSA software release?

Each software release of the GSA (both version upgrades and patch releases) contains an change to both the operating system and application software on the search appliance (also referred to as the “system software” and “software version”, respectively). The system software and software version are updated through separate binary packages and always have the same version number as the GSA release.

GSA software releases are incremental. Once you apply a version upgrade or patch to a GSA, it is not possible to downgrade to a previous version. Furthermore, it is critical that both the system software and software version are kept on matching versions for the GSA to operate successfully.

Similarly, you should only update a search appliance to a software release that is supported for the particular appliance model. Using the wrong packages for an update can irrevocably corrupt data and damage software on the Google Search Appliance. You can find a list of supported versions for each model in the [Google Enterprise Support Portal](#).

## Where do I find GSA release information?

GSA releases are available from within the [Google Enterprise Support Portal](#), under the **Resources > Google Search Appliance Software Updates** page. This page provides information about the latest release of the GSA that can help you to:

- Determine the model of the search appliance to be updated or installed
- Find the latest version of the GSA in the table of “Recent Versions” for a particular GSA model
- Ensure that the latest version is supported for that GSA model
- Locate update Instructions containing details and guidelines on updating to that version

## Release Notes and Update Instructions

Each release of the GSA is accompanied by Release Notes and Update Instructions. Release Notes contain a listing of new and outstanding issues in the current release, as well as the major issues that have been fixed since the previous release of the GSA. It is strongly recommended that the New Issues section be thoroughly reviewed prior to moving forward with the update in order to be aware of bugs which might impact the usage of the GSA.

## Release documentation

The GSA documentation website always contains the full set of documentation for the most recent release of the GSA, and can be found via the [GSA Help Center](#).

The documentation for each release contains a “Guide to Software Release X.X” that describes the new features that have been added in that release.

## Comparing features between releases

In some cases, it is important to understand the changes in a specific functionality between GSA releases. Where this is required, a good way to compare functionality between versions is to analyze the documentation differences between each release.

A listing of documentation for each version of the GSA can be found at:  
<http://developers.google.com/search-appliance/documentation/archive>

## Release schedule

The Google Search Appliance does not follow a fixed release schedule. However there are generally two version updates released each year. Patch releases are made available as required, and there are generally multiple patches released on each version each year.

## Chapter 2 - Upgrading a GSA

### Overview

There are various considerations to be taken into account when upgrading GSA software, many of which are dependent on the characteristics of the GSA installation environment and the scope of changes introduced by the new version of the GSA. As such, no two GSA upgrade projects are alike, and each upgrade to the GSA should be prefaced by an level appropriate of analysis and planning.

The following sections provide guidance on how to prepare for and execute a software upgrade to the Google Search Appliance.

### Preparing to upgrade a GSA

#### **Become familiar with the latest version**

Each version of the GSA contains new features and fixes, and it is critical to become familiar with what is included in a new version of the GSA to be able to plan for an effective upgrade. The best way to start finding out about a new version's content is to refer to the "Guide to Software Release X.X" section of the [GSA documentation](#) and the Release Notes of the version via the [Google Enterprise Support Portal](#).

#### **Understand your upgrade path**

Most GSA upgrades only involve one upgrade step, but in cases where a GSA is multiple versions old, an upgrade may require multiple steps.

You can determine the upgrade path by referring to the list of compatible versions on the "Google Search Appliance Software Updates" page of the [Google Enterprise Support Portal](#).

As an example, to upgrade an appliance from v6.12.0.G.30 to v7.0.114.GXXX, the following steps are required:

1. Update from v6.12.0.G.30 to v6.14.0.G.22
2. Update from v6.14.0.G.22 to v7.0.14.G114

For detailed instructions regarding upgrade paths, refer to update instructions for each release.

#### **Determine the scope of the upgrade**

The complexity and level of effort involved with a GSA upgrade project is dependent on the type of new features and functionality that will be integrated into the search solution. Analysis should be performed up-front to identify the full scope of desired features to be included as part of the GSA upgrade, based on the user requirements of the search solution, and the compatibility of new features with the existing search environment.

## Analyze impact and changes required for the upgrade

Once the scope of the upgrade has been defined, an impact analysis should be performed to determine the changes that will be needed to be made to the GSA environment to accommodate for the upgrade.

Common considerations when performing a GSA upgrade include:

### Re-indexing content

- A complete re-index may be a requirement of upgrading to the new GSA software version. The GSA software update instructions typically provide detail on this requirement.
- Some new features require the re-indexing of content. For example, enabling Entity Recognition and Document Previews in v7.0 require re-indexing content since these features involve index-time processing.

### Front-end modification

- Enabling new user interface features will always involve changes to existing GSA front-ends
- For custom user interfaces (custom XSLT or custom application layers) the complexity of these changes may be anything from trivial to highly complex, depending on the feature.
- For implementations involving custom XSLT modifications, it is recommended that the new version's default XSLT stylesheet be used as a starting point, and customizations be re-integrated into it. This is typically a simpler approach than determining the changes required to implement the new feature into an existing XSLT stylesheet.

### Feed changes

- When new features to the GSA feeds protocol are introduced, custom feeds should be analyzed to determine whether they may benefit from the new changes. For example, in v7.0, new ACL features such as DENY ACLs and ACL inheritance were introduced and offer significantly increased flexibility for designing feeds for secure content.
- Whilst updates to the GSA feed protocol are generally backward compatible, changes that are introduced to the protocol should be analyzed to ensure that existing GSA feeds are not impacted.

### Connector upgrades

- New GSA upgrades will typically support any existing versions of Google connectors. However, it is recommended that version compatibility of connectors be confirmed prior to upgrading to a new GSA version.

## Define an upgrade strategy

The goal of defining an upgrade strategy is to determine the best process to upgrade the appliances in a GSA environment whilst having minimal impact to search users and dependent systems.

It is important to understand the potential impacts of the upgrade process to the GSA deployment environment. This section discusses a number of scenarios, where special considerations should be made when upgrading a search appliance.

- [Upgrading multiple environments](#)
- [Upgrading an inter-connected GSA network](#)
- [Upgrading with connectors or feeds](#)

## Upgrading multiple environments

This section applies to deployment architectures involving multiple environments with various purposes, such as development, testing, and production.

Once a version upgrade or patch release is applied to the GSA, it cannot be reverted to a previous version. Additionally, changes/additions to GSA functionality might occasionally impact the existing functionality of a search solution, for example one where the GSA has been tightly integrated within other applications. For these reasons, version upgrades should be applied through development and testing environments, and first be tested rigorously before updating a production search appliance.

In a deployment where a production environment contains one or more backup search appliances for disaster recovery or failover, the following steps are recommended:

1. Switch serving to a backup search appliance
2. Update the production search appliance first, before upgrading a backup search appliance

This process allows users to continue using search on the existing, familiar version of the search appliance while verification and cutover of the new version in production is taking place. If mirroring is in use, refer to [Upgrading an inter-connected GSA network](#).

## Upgrading an interconnected GSA network

Special considerations must be observed when upgrading deployment architectures involving two or more GSAs connected to each other by the use of Mirroring, Distributed Crawling and Serving, or Unification.

In general, the primary GSA(s) in an interconnected GSA network should be upgraded before secondary/backup GSAs are upgraded.

However, each new release has Update Instructions that provide detailed steps for upgrading interconnected GSAs. It is important that these steps are closely followed, as performing an upgrade incorrectly may result in the integrity of the GSA network and search index being compromised, potentially requiring a complete re-indexing of content. If in doubt, contact Google Enterprise Support or a GSA Qualified Deployment Specialist for clarification.

## Upgrading with connectors or feeds

This section applies to deployment architectures involving the use of GSA connectors or feeds.

If your environment uses GSA connectors or feeds, the downtime associated with upgrading a search appliance must be taken into account and planned for. There are two considerations for downtime when using connectors or feeds:

- [Indexing](#) of content
- [Serving](#) of content, where connectors are used for authentication and authorization

### **Indexing considerations**

When upgrading a search appliance that uses connectors or feeds to index documents, the connector or feeds must be stopped or paused for the duration of the update process, as the GSA will not process feeds during the course of an upgrade.

### **Serving considerations**

When connectors are used for authentication and/or authorization, and serving is switched to a mirrored or hot backup search appliance during the upgrade of a master GSA, the connector will need to be configured to respond to authentication/authorization requests from the alternative GSA. This can be achieved by following the instructions in "[Configuring Connectors with GSA Mirroring](#)."

## **Executing a GSA upgrade**

The following steps outline the final preparations recommended prior to executing a version upgrade to the GSA:

### **Become familiar with the Update Instructions**

The Update Instructions for the targeted release version contain critical information related to executing the upgrade, and may include special considerations that apply to certain deployment environments. For example:

- If Mirroring, Distributed Crawling and Serve, or Unification are in use, the Update Instructions for each version will contain specific steps to be followed
- If Policy ACLs or Dynamic Navigation are in use, the Update Instructions may have special considerations for these features.

### **Determine whether to rebuild or migrate the search index**

Most version upgrades will provide the option either to migrate the existing search index to the new version, or wipe the index and force a re-crawl of all content (feeds and connectors will also need to resend all content). In most cases, migrating the index is the most effective means to perform an update.

Situations where rebuilding the index would be appropriate include:

- When re-indexing is required to take advantage of new features. For example, using Document Previews in v7.0 requires content to be re-indexed.
- When updating a Replica search appliance in a mirrored GSA network, the index of the Replica GSA should not be migrated and will need to be synchronized from the Master GSA once the update is complete.

## Performing the upgrade

The actual process of upgrading a GSA generally includes the following steps, which are always provided in detail in the Update Instructions for the GSA release:

1. **Preparing for the upgrade:** Specific tasks to perform in preparation for the upgrade, such as backing up GSA configurations and verifying that the Google Search Appliance can access the location to which upgrade files are downloaded.
2. **Updating the system software:** An update to the GSA operating system.
3. **Rebooting the Google Search Appliance:** This step may or may not be required for each update. The Update Instructions specify whether a reboot is required.
4. **Updating the software version:** An update to the GSA software.
5. **Choosing whether to migrate the index data:** The decision chosen in this step will either launch an automated index migration process, or trigger a recrawl of all content on the GSA. Feeds and connectors cannot be run during this step of the update process.
6. **Update testing and verification:** Once the migration is complete, or content has been recrawled, the Admin Console Test Center can be used to run some basic tests to confirm results are being served appropriately by the new version.
7. **Accepting or reverting the update:** Once the update is accepted, it cannot be reverted.

## Chapter 3 - Upgrading a Connector

### Overview

GSA connector releases generally follow an independent update cycle to GSA software releases. The overall release schedule of the GSA connector suite is marked by the incremental releases of the Google Connector Installer (GCI), which contains an installer for every supported GSA connector.

The list of versions of the GSA Connectors can be found via the [Google Enterprise Support Portal](#) under *Resources > Google Search Appliance Connectors Software Updates*.

The version numbering of each GSA connector follows a three-segment naming convention and can include a special version identifier, as shown in the following format:

*Connector name* <major version> - <special version identifier>

Some examples of this numbering scheme are:

- GSA Connector for Livelink 2.8.4
- GSA Connector for SharePoint 3.0.4
- GSA Connector for SharePoint 3.0.6 - RC1

Versions containing a special version identifier are typically unsupported versions which should not be used in Production. Eg. RC1 is a Release Candidate version.

### General Upgrade Steps

The simplest way to upgrade a connector is to install a new instance of the connector and re-index all content. Unless otherwise stated in connector release notes, re-indexing of all connector content is recommended for every version upgrade of a connector.

The general steps for achieving this with a production environment would include:

- Switch serving to a production backup GSA environment
- Install the new version of the connector and re-index content into the production GSA. If license capacity allows, documents indexed via the old version of the connector can be retained and tested against documents indexed from the new connector (eg. via separate collections). This will allow for comparison of content and simpler rollback if any issues are encountered.
- Test and verify documents from new connector have been indexed successfully and any connector dependent security mechanisms are still functional (eg. connector authentication or authorization, ACL indexing)
- Reinstate and resume serving from production GSAs, and perform upgrade connectors in the production backup GSA environment.

## Upgrade Considerations

Common considerations that should be taken into account when upgrading GSA connectors include:

### Changes to the connector

- Some connector upgrades include major changes to connector design, and may impact the configuration of the overall GSA environment. For example, the GSA Connector for Lotus Notes 3.0 introduced early-binding and if used, requires the correct security mechanisms to be configured for authentication in order for secure search to function correctly. These changes should be determined through analysis of the new connector features and an impact analysis within the existing GSA environment.

### Dependencies on the GSA

- GSA connectors depend on functionality within the GSA to operate, and some new versions of connectors are tied to new features introduced within the GSA. For example, the GSA Connector for File Systems 3.0 relies on new functionality introduced within GSA 7.0.

### Re-indexing

- When re-indexing connector content, a complete re-traversal of the content system is required, and may impact performance through the increased load on the content system.
- Re-indexing with a new connector instance will also increase GSA license count usage, if existing documents are not removed from the index prior to connector upgrade.
- In some special circumstances, re-indexing of all content may not be required when performing a GSA connector upgrade. This circumstance varies for each connector and each version, and should only be determined with expert analysis and guidance.

### Changes to the target content system

- Some connectors require software to be installed onto the target content source (eg. the GSA Connector for SharePoint) and new versions will typically include updates to these components.
- This may also have limitations for running two versions of a connector simultaneously during the upgrade process(eg. the GSA Connector for SharePoint requires an appropriate version of the Google Services for SharePoint to be installed on the SharePoint server).

For complex connector upgrade scenarios, a GSA Qualified Deployment Specialist should be consulted for advice and guidance.

## Chapter 4 - Migration Planning

### Overview

The following sections provide guidance in migrating Google Search Appliances in various deployment scenarios.

### Migration methods

There are two methods of migrating a single search appliance to another:

- [Migrating search index and configurations](#)
- [Migrating configurations only](#)

### Migrating search index and configurations

GSA Mirroring is a feature primarily used to provide high availability and high capacity serving, but it can also be used for migrating configurations and search indexes between appliances. In fact, mirroring is the only means to completely migrate an index from one Google Search Appliance to another, and should be used for GSA migration whenever possible.

This migration method is most appropriate when:

- Re-indexing of all content takes significant time, due to large index size or slow crawl rates
- No changes are planned to deployment architecture and content source integration
- Features in the new software release on the new appliance(s) do not require re-indexing of content (refer to version release notes for guidance)

*Advantages of this migration method:*

- Saves time in content indexing (mirroring is much faster than re-indexing of content)
- Minimal user impact on existing production search experience, as the new appliance's search index will be an exact "replica" of the existing appliance

*Disadvantages of this migration method:*

- Procedure is more complicated than migrating configuration only
- The crawl cycle on the production system will be temporarily paused and new content will not be acquired during the migration process

### Requirements

For mirroring to be configured, both search appliances must meet the following requirements:

- They must be on the same GSA version, and be of v6.8 or higher
- They must be of compatible search appliance models
- The master GSA must be licensed for equal or lower document count than the replica GSA

## Approach

The following steps describe the approach of migrating a search appliance by mirroring:

1. Examine the GSA version of the “target” GSA and check release notes of this version and of any later patches, for issues that may affect the deployment environment. Upgrade the target GSA to the appropriate patch if necessary.
2. Ensure both GSAs are on the same software version, have the same document license count and are of compatible search appliance models (see mirroring link below). In many cases, the “source” GSA will need to be updated to the same version as the target GSA.
3. Pause crawling on the source search appliance, as well as any feeds or connector traversals.
4. Configure mirroring, with the source GSA set up as a master, and the target GSA set up as a replica.
5. Allow the data sync to complete to 100%, to ensure all content and configurations are copied.
6. Disable mirroring between the source appliance and the target appliance.
7. Resume crawl on the target search appliance, and re-configure any feeds or connectors to start sending new content to the new target search appliance.
8. [optional] If a production backup appliance is in use, enable mirroring and setup the already configured appliance as the master, and the new production backup as the replica. Let the replica sync to 100%.
9. Cutover to new appliance(s) and decommission old appliance(s).

For more information on mirroring, including compatible appliance models and data that is copied and not copied during mirroring, see [“Configuring GSA Mirroring”](#).

## Migration configurations only

The alternative method to GSA migration is through exporting the configuration files from one search appliance and importing it into another.

Since importing a configuration file does not copy the search index from one search appliance to another, a full crawl is required to populate the search index. Furthermore, any feeds or connectors must be configured to re-send documents to the new GSA after the configuration has been imported.

This migration method is most appropriate when:

- Changes are planned to deployment architecture, such as new content sources being integrated
- New GSA features are desired that require re-indexing of content

*Advantages of this migration method:*

- Provides ability to control what content is indexed on the new appliance
- Minimal impact to the deployment of existing production GSAs, as the new GSAs can be configured and tested independently before cutting over

#### *Disadvantages of this migration method:*

- More time-intensive than mirroring, as all content needs to be re-crawled or re-fed by connectors and feeds
- Additional connectors or feed clients may need to be set up on new hosts, since existing connectors and feeds may need to continue to send to the production GSA (for content freshness and/or authorization)
- Creates additional load to target content servers during re-crawl

#### **Requirements**

- Configuration file migration is generally recommended only between appliances of the same version
- Configuration file compatibility between different GSA versions is not guaranteed, and if performed, configurations should be verified to ensure all settings are included.

#### **Approach**

The following steps describe the approach of migrating a search appliance by configuration files:

1. Examine the GSA version of the “target” GSA and check release notes of this version and of any later patches, for issues that may affect the deployment environment. Update the target GSA to the appropriate patch if necessary.
2. Export configuration file(s) from existing GSA and import them into the new appliance. If the source and target GSA software versions are the same, the overall GSA configuration file can be exported and imported. If not, choose various components of the admin console to export (eg. front-end XSLT or collection definitions).
3. [optional] If there are feed clients or connectors in use, new instances of the feed clients or connectors need to be setup with the target appliance, to index all content.
4. [optional] If it is critical to have fresh content in production system and the content servers can take on extra load, the existing appliance should be kept crawling. If freshness is not critical, pause the crawl on the existing appliance and any connectors or feed clients.
5. Allow the new appliance to completely crawl and index all content.
6. [optional] If a production backup appliance is in use, enable mirroring and setup the already configured appliance as the master, and the new production backup as the replica. Let the replica sync to 100%.
7. Cutover to new appliance(s) and decommission old appliance(s).

For details on how to perform a configuration file import and export, refer to the GSA Admin Help page for [Administration > Import and Export](#).

## **Migration scenarios**

This section describes considerations and approaches to be taken in common scenarios for migration:

- [Renewing search appliances](#)
- [Promoting a GSA configuration from one environment to another](#)
- [Increasing license count](#)
- [Migrating with existing mirrored GSAs](#)
- [Migrating with a distributed GSA architecture](#)

- [Replacing a failed production search appliance](#)
- [Moving a search appliance to another location](#)

## Renewing search appliances

The most common scenario for migrating a GSA is during the renewal of a GSA license. Since new and more powerful hardware is provided with each renewal, migration planning is a critical component of the renewal process.

With every renewal of appliances, a decision must be made on how to migrate from existing to new appliances. The following table outlines the advantages and disadvantages of each migration method, where new appliances are of a different version to existing appliances.

	<b>Advantages</b>	<b>Disadvantages</b>
<b>Migrating index and configurations</b>	<ul style="list-style-type: none"> <li>- Ensures complete search index replication</li> <li>- Does not require re-indexing of content*</li> <li>- Mirroring index is faster than re-crawling content</li> </ul>	<ul style="list-style-type: none"> <li>- Requires upgrading existing GSAs to same version as new GSAs</li> <li>- Requires appropriate license capacity**</li> <li>- More complex of a process, particularly with distributed architectures</li> </ul>
<b>Migrating configurations only</b>	<ul style="list-style-type: none"> <li>- Allows control over what content is indexed on new GSAs</li> <li>- Can be performed on GSAs with differing versions</li> <li>- Minimal impact to existing GSA configurations</li> </ul>	<ul style="list-style-type: none"> <li>- Requires re-indexing of all content (can be time intensive)</li> <li>- Creates additional load on content servers during re-crawl</li> <li>- May require additional connector and feed clients to be configured</li> </ul>

\* Re-indexing of content may be required in some cases (eg. new features requiring re-index)

\*\* Migrating index via mirroring can be performed if license is increased on new appliances, but not if decreased

## Promoting a GSA configuration from one environment to another

For migrating between environments (eg. test to production), a manual configuration approach is recommended, since server names and URLs to crawl will usually vary. An export of similar configurations (eg. front-end XSLT and collection definitions) should be performed, combined with manual entry of settings in the admin console.

## Increasing license count

In most cases where a GSA license limit is increased, the new license file can be applied to the existing appliance, without any hardware migration being necessary. If a license is increased as part of a GSA renewal however, certain considerations will need to be made, depending on the required changes to deployment architecture.

### **Single-node to Multi-node**

When an architecture changes from a single GSA to multiple GSAs (eg. over 100M documents, requiring two G500 appliances instead of one), Distributed Crawl and Serve will need to be configured. As a result, the search index will either need to be re-indexed on the new architecture, or migrated. In this scenario, when Distributed Crawl and Serve is enabled, the Master GSA node will distribute the index evenly across the GSAs configured in the multi-node GSA network.

### **Multi-node to multi-node**

When an existing Distributed Crawl and Serve architecture is modified (eg. using GB9009s and moving from 60M to 90M documents, requiring three GB9009 appliances instead of two), the new GSA can be added as a new shard/node to the architecture, and the entire search index will be re-distributed evenly across all GSAs. For example, if 54M documents have been indexed across two GSAs, and a third 30M GSA is added to the network as a new shard, the index will be re-distributed and each GSA will have 18M docs.

### **Migrating with existing mirrored GSAs**

The following scenarios describe detailed approaches to migrating to new search appliances where GSA Mirroring is already in use on existing appliances.

#### **Scenario A: New appliances are of the same model and software version**

In a scenario where new appliances are of the same model and software version, mirroring can be used to migrate the index and configurations to a new appliance, which is then used as the master appliance of a new GSA mirroring network. This scenario is the same as that described in the above section, [Migrating search index and configurations](#).

#### **Scenario B: New appliances are NOT of the same model and software version.**

In a scenario where new appliances are not of the same model or software version, the recommended form of GSA migration would be to migrate configurations only, and re-index all content on the new appliances.

However, if migration via mirroring is desired, and assuming that the new GSA model is compatible for mirroring with the existing GSA model in use, an approach that could be taken would be to upgrade an existing appliance (eg. backup replica appliance from the existing mirroring network), then mirror the upgraded GSA to one of the new appliances, and use this GSA as a master in a new GSA mirroring network. In this scenario, the following general steps would be taken:

1. Pause the crawl from the primary master appliance.
2. Remove a backup appliance from the existing mirroring network.
3. Upgrade this appliance to the same version as the new appliance(s).
4. Configure mirroring from this backup appliance to a new appliance, and complete the sync.
5. Disable mirroring between the backup appliance and the new appliance.
6. Configure mirroring on the new appliance to make it the primary master of a new mirroring configuration.
7. Add additional new appliance(s) to the new mirroring network.
8. Cutover to new appliances and decommission old appliances.

## **Migrating with a distributed GSA architecture**

In both Distributed Crawl and Serve, as well as Unification architectures, GSA Mirroring can be used to expedite migration from one set of appliances to a new set of hardware (eg. in renewal), per one of the above methods. In this scenario, it is critical that the node assignment and configuration remains the same for each appliance in the target architecture.

For example, when renewing hardware in a three shard architecture in Distributed Crawl and Serve, shards A, B and C will have temporary mirrors of A2, B2 and C2 (ie. the new hardware). When this new hardware is configured with Distributed Crawl and Serve, they must be assigned the same shards (A2 must be master, B2 should be the second shard, and C2 should be the third shard).

This is however, more complex and an advanced migration option than most GSA environments require, and it is generally recommended that migration by reconfiguration and re-indexing be performed when migrating a distributed GSA architecture.

For details on configuring mirroring in distributed GSA architectures, refer to documentation on "[Configuring Distributed Crawling and Serving](#)" and "[Configuring GSA Unification](#)".

## **Replacing a failed search appliance**

Another common scenario for migrating a search appliance is when a GSA has encountered a hardware failure and needs to be replaced. Migration from a backup or disaster recovery search appliance needs to occur once a replacement GSA is received, and can be done by any of the above mentioned approaches.

Some additional considerations when replacing a failed search appliance include:

- In cases where a failed appliance was part of a mirroring network (eg. a master appliance), a master appliance must be re-established first. For example, one of the replicas must be promoted to be a master appliance, which then can be mirrored to the replacement appliance.
- The appropriate GSA licensing must be applied to the main production serving appliance(s). If a GSA with a production license was the one that failed, the replacement appliance must have a production license to receive the appropriate level of support from Google Enterprise Support.

## **Moving a search appliance to another location**

In some cases, it is required that a search appliance be moved to a new physical location. For example, this may occur with changes to data centers.

Some considerations when physically moving a search appliance include:

- *System availability* - Actions should be taken to assess and handle impacts of system downtime. For example, stopping feeds and connectors, disabling GSA mirroring if configured, and switching search serving to a failover GSA environment.

- *GSA mirroring* - When changing the IP addresses of GSAs, it's best to disable mirroring prior to relocation, then re-configure the GSA setup once the move has been completed, the network has been properly provisioned and service has been resumed on the primary GSA.
- *Network configuration changes* - For versions older than GSA v7.0, new network settings should be configured prior to moving the appliances, by utilizing the *Administration > Networks Settings* page to setup the configuration for the new network whilst the GSA is still on the old network, and then modifying the IP address via the *Installation Wizard* on the address <http://192.168.255.1:1111/> from a laptop connected directly to the appliance. For more information, see [Configuring the Network Settings](#). For versions GSA v7.0 and later, new network settings can be configured once the GSA has been physically moved, via the *Installation Wizard* as described above.
- *Shutting down and powering up the GSA* - The GSA should be shutdown from the admin console prior to moving, via *Administration > Shutdown*. Powering-up the GSA is achieved via the power-up button on the front of the appliance.
- *GSA Bezel key* - Make sure the GSA bezel key from Google is available during the move. If a GSA bezel key has been misplaced, Google Support should be contacted for a replacement.
- *Physical access and Google Support access to the GSA* - For all moves, physical access to the GSA should be made available for the GSA administrator to configure the installation wizard from a laptop physically connected to the GSA on the new LAN. Furthermore, it is best practice that where possible, SSH access be enabled to the GSA prior to moving the GSA, so that remote access may be made possible if needed.

The following links provide some guidance for troubleshooting any network issues that may be encountered:

- [Troubleshooting issues on GSA v6.14 and earlier](#)
- [Troubleshooting issues on GSA v7.0](#)
- [GSA Help Center](#) and an example troubleshooting article on "[Network configuration wizard hanging](#)"

## Summary

This guide provides detailed guidance on the preparation and execution of upgrading and migrating a Google Search Appliance, activities that are critical components of maintaining a GSA deployment environment. Various scenarios have been discussed to cater to different possibilities of upgrading and migration, but because no two deployment environments are the same, there may be certain scenarios that have not been addressed in this guide. For scenarios not covered in this guide, expert advice and guidance should be sought from a GSA Qualified Deployment Specialist.

For further details on any of the topics discussed to within this guide, refer to the [GSA Help Center](#), or contact [Google Enterprise Support](#).

## Appendix - Further Information

### Determining the model of your search appliance

The following table describes how to determine the hardware model of a Google Search Appliance, based on Appliance ID.

Appliance ID Starts With	Google Search Appliance Model
U3	G500
T4	G100
S5	GB-1001
T1, T2, or T3	GB-7007
U1 or U2	GB-9009
C5	GB-5005 or GB-8008
M2	Google Mini