

HCL Notes and Domino

Version 11.0

Planning your upgrade to HCL Notes and Domino 11.x

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Chapter 1 Introducing Notes and Domino 11.x

HCL Notes and Domino 11.x introduce many new features for administrators, users, and developers alike. This guide will help you deploy this release so that you can take advantage of them. But first, read about what's new.

What's new for administrators in 11.0.1?

[What's new in HCL Domino 11.0.1](#)

Domino 11.0.1 includes the following new features:

- New command to run Domino Server Setup from Windows for IBM i
- Domino for Linux Docker container
- Auto Update (AUT) supports future HCAA upgrades
- Configuration enhancements for DAOS tier 2 storage
- Support for Subject Alternative Name (SAN) field in X.509 certificates
- Domino Web Server support for Server Name Indication (SNI)
- New Notes IDs must have 1024-bit or stronger RSA keys
- Register multiple Active Directory users in Domino
- Configuring a custom image for the Notes Workspace background
- Disabling SwiftFile
- MarvelClient Essentials version 11.0.3
- New Java Runtime Environment

What's new for administrators in 11.0.0?

Domino 11 includes the following new features. The links below take you to descriptions of each in the Domino documentation.

- [New Domino licensing model](#)
- [Product rebranding](#)
- [New InstallAnywhere platform for Domino](#)
- [Directory Sync](#)
- [DAOS tier2 storage](#)
- [New Java Runtime Environment](#)
- [IBM GSKit cryptographic libraries replaced with the OpenSSL equivalents](#)
- [Limiting ID file downloads from the ID vault is disabled for SAML federated login](#)
- [Authenticating web users against the Notes ID passwords in the ID vault](#)

What's new for users in 11.0.1?

[What's new in HCL Notes 11.0.1](#)

Notes 11.0.1 includes the following new features:

- SwiftFile
- AES for database encryption
- Changes to attachment viewing and importing
- Support for JAWS 2019

What's new for users in 11.0.0?

Notes 11 includes the following new features. The links below take you to descriptions of each in the Notes documentation.

- [New look](#)
 - [Inbox action bar](#)
 - [Side navigator menu](#)
 - [Client status notifications](#)
 - [Missed alarms](#)
 - [New calendar form](#)
 - [New contact form](#)
 - [New HCL Notes 11 theme](#)
- Feature Enhancements
 - [Language spell check](#)
 - [Export to PDF](#)
 - [24+ hour meeting support](#)
 - [Three click support](#)
 - [Other enhancements in HCL Notes 11](#)

What's new for developers in 11.0.1?

CreateDocumentCollection method for the NotesDatabase class

This new method for the LotusScript NotesDatabase class allows you to create a new document collection.

See [CreateDocumentCollection \(NotesDatabase - LotusScript\)](#) for more details.

ContactNoteID property for the NotesRegistration class

This new property for the LotusScript NotesRegistration class allows you to register a user who has an existing Person document that was synced from Active Directory.

See [ContactNoteID \(NotesRegistration - LotusScript\)](#) for more details.

Domino Query Language enhancements

Domino 11.0.1 includes the following Domino Query Language (DQL) enhancements:

- Numeric and date-only terms in full text index queries are now supported.

- If DQL is deployed on a Domino server, the show stat query command can be used to report statistics about DQL.

What's new for developers in 11.0.0?

New properties in Designer to support HCL Nomad

New properties are available in Domino® Designer to support applications that are used with the mobile client HCL Nomad. These features are supported as of Nomad for iOS 1.0.6 and Nomad for Android 1.0.

These properties include:

- Hide a column
- Hide an action or field
- Choose a sequence for navigating frames
- Include actions in the Mobile Actions button

See [New properties in Designer to support HCL Nomad](#) for all details.

New NotesGPS LotusScript classes

The following new NotesGPS LotusScript® classes are available. They are currently supported for HCL Nomad beginning with Release 1.0.4.

- [NotesGPS](#)
- [NotesGPSPosition \(LotusScript\)](#)
- [NotesGPSCoordinates \(LotusScript\)](#)

New shared action settings in Designer to support mobile clients

When a Notes application includes a shared action that is used in a Mobile Outline style view, control whether and how it is displayed in mobile clients. For all information, see [New shared action settings in Designer to support mobile clients](#).

New methods for NotesJSONArray LotusScript class

The following new methods are available for the NotesJSONArray LotusScript® class:

- [AppendElement method](#)
- [AppendArray method](#)
- [AppendObject method](#)

New methods for NotesJSONNavigator LotusScript class

The following new methods are available for the NotesJSONNavigator LotusScript® class:

- [Stringify method \(NotesJSONNavigator – LotusScript\)](#)
- [AppendElement method \(NotesJSONNavigator – LotusScript\)](#)
- [AppendArray method \(NotesJSONNavigator - LotusScript\)](#)
- [AppendObject method \(NotesJSONNavigator - LotusScript\)](#)

New methods for NotesJSONObject LotusScript class

The following new methods are available for the NotesJSONObject LotusScript® class:

- [AppendElement method](#)
- [AppendArray method](#)
- [AppendObject method](#)

New properties and methods for NotesDominoQuery LotusScript class

The following new properties and methods are available for the NotesDominoQuery LotusScript® class:

- [RebuildDesignCatalog property](#)
- [RefreshDesignCatalog property](#)
- [RefreshFullText property](#)
- [CreateIndex method](#)
- [ListIndexes method](#)
- [RemoveIndex method](#)

New methods for DominoQuery Java class

The following new methods are available for the DominoQuery Java class:

- [IsRebuildDesignCatalog method \(DominoQuery - Java\)](#)
- [SetRebuildDesignCatalog method \(DominoQuery - Java\)](#)
- [IsRefreshDesignCatalog method \(DominoQuery - Java\)](#)
- [SetRefreshDesignCatalog method \(DominoQuery - Java\)](#)
- [IsRefreshFullText method \(DominoQuery - Java\)](#)
- [SetRefreshFullText method \(DominoQuery - Java\)](#)
- [CreateIndex method \(DominoQuery - Java\)](#)
- [ListIndexes method \(DominoQuery - Java\)](#)
- [RemoveIndex method \(DominoQuery - Java\)](#)

New properties for NotesViewColumn class

The following new properties for the NotesViewColumn LotusScript class related to Domino Query Language are available:

- [IsValidDominoQueryColumn](#)
- [IsValidDominoQueryField](#)

Domino Query Language enhancements

Domino® Query Language (DQL) provides the following enhancements in Domino 11:

- The design catalog is now maintained within hidden views of the individual databases against which queries are processed. Previously, a separate database, GQFdsgn.cat, stored and maintained design elements for multiple databases. New updall command flags, -e and -d, are used to add and update the design catalogs.
- The ability to do DQL processing against full text indexes has been added. This is typically the fastest DQL processing method. The new contains operator is used to query full text indexes.
- DQL processing of views is significantly faster.

The Domino Query Language (DQL) documentation is moved to the Domino Designer documentation for Domino 11. For more information, see [Domino Query Language](#).

What's been removed?

The following components are no longer part of Notes and Domino 11.x.

Components no longer included in Domino 11.x:

- XWork Server
- Console mode installation on Windows™
- Express® mode installation on Windows
- GUI mode installation on AIX® and Linux®
- Remote installation on AIX and Linux
- XSP mode (Application Service Provider). This is NOT related to XPages, which remains in the product.
- DOTS (Domino OSGi Tasklet Service)

Chapter 2 Planning the Domino 11 server deployment

Time spent doing a thorough evaluation of your environment prior to upgrading is time well spent. Capturing baselines of your existing server infrastructure allows you to compare how the upgraded environment is performing.

Evaluate and monitor your existing environment

Evaluate

As a starting point, do a thorough investigation of the state of your current environment. Use tools to capture data about the following aspects:

- Server infrastructure (including baseline stats, performance, etc)

- Clients / workstations
- Applications
- 3rd party Products

Document pre-existing conditions and problems:

- Try to resolve outstanding issues and problems prior to upgrading.
- No matter how tenuous the link, an upgrade can be held responsible for any problem whether old or new.

Document things you want or need to address while you have the opportunity, focus, and resources available:

- There is always clean-up that can be done ahead of time

Monitor

Monitoring your current environment is a critical part of any upgrade, even an upgrade to a point release. The goal is to understand the cost of running the current environment and to predict a problem before it happens in the new environment. Monitoring is particularly important when you are moving users and/or consolidating servers

1. Capture the available raw data from the servers:
 - Operating system capacity and performance metrics
 - CPU, memory (usage, paging), disk (usage, I/O rates, performance), network
 - Domino server specific statistics
 - Other components (for example, SAN switches and disk metrics)
2. Interpret/analyse the data and create baselines for your current environment:
 - What are the typical operating parameters for your servers?
 - What is the data telling you about your environment?
3. Monitor your user baselines.
4. Create daily/weekly/monthly reports based on your baselines.
5. Create a remediation process to address results that exceed baselines.

Evaluate operating system and hardware requirements for R11

System requirements

Evaluate system requirements. (See Chapter 6). Then, ask these questions:

Should a hardware refresh be included...

- because it has to be?

- because it is time for an update?

- Is the current platform still supported?
- Does the current platform fit the strategic needs?
- Do you need more or different storage?
- Can you or should you consolidate?
- Do workstations need upgrades?

- What is the support position of each vendor of third-party products?

For links to system requirements, see [System requirements](#) in Chapter 6.

Are you moving from a 32-bit operating system to a 64-bit operating system?

If so, the following things will happen:

- All existing full text indexes will be discarded and rebuilt
- On Windows, all existing views currently built will be discarded and rebuilt

Because of the two items mentioned above, if the updall process is used during upgrading it will take much longer to run so you should plan for it. This is a one-time occurrence.

See the following link(s) for additional information:

Technote #1506430 - [Steps to upgrade a 32-bit Domino server to 64-bit server on Windows platform](#)

Evaluate coexistence of features across versions

Support for Subject Alternative Name (SAN) field in X.509 certificates

SAN for TLS connections and SMIME signature verification is supported only on Domino 11.0.1 server or Notes 11.0.1 clients.

DAOS tier 2 storage

DAOS tier 2 storage requires the 11.0 Domino directory (pubnames.ntf) and Credential store (websecuritystore.ntf) design. Downgrading the database design to an earlier release after configuring tier 2 storage has not been tested but doing so might disable tier 2 storage.

Directory sync

For the Directory Sync feature to work with Active Directory you must upgrade your Admin Server to 11.0.0. All other servers can remain at versions 9.x or 10.x. The primary address book template needs to be upgraded to 11.0.0 for all servers.

You must also upgrade your Notes Admin Client to V11. All other Notes clients can be earlier versions (9.x or 10.x).

Authenticating web users against the Notes ID passwords in the ID vault

Your Authentication server and Vault Servers must be 11.0 or higher.

Clustered Servers

Upgrading servers in a cluster at different times is supported, so that you can have a mixed R9 and R10 server cluster during the coexistence period of your project. Note the following in a mixed environment:

- Cluster replication does not restrict the replication of design elements. The Domino directory 11 design (pubnames.ntf) is backward compatible with Notes and Domino 10. However other databases may cause issues on earlier Domino servers and Notes clients. To keep design

elements for databases at the same version as their server, keep Domino 10 servers in a separate cluster from Domino 11 servers.

Additional resources

See [Release interoperability information](#) in Chapter 6.

Plan HCL Traveler upgrades

If upgrading a Domino server that runs Traveler, keep the following points mind:

- If you plan to upgrade Domino and Traveler at the same time, upgrade Domino first.
- You can install and run Traveler on any version of Domino that Traveler supports. Best practice is to use the latest maintenance level of the Domino version you choose.
- If you upgrade the Domino server major version you must re-run the HCL Traveler install to ensure proper binary files are installed. For example, if running Traveler 11.0.0 on Domino 9.0.1 and you upgrade to Domino 11.0.0, re-run the HCL Traveler 11.0.0 installer.

For additional information and steps, see the topic [Upgrade considerations and overview](#) in the Traveler documentation. For Traveler system requirements, see [System requirements for Traveler 10.x and later releases](#).

Plan whether to upgrade Domino on an existing machine or move to a new one

As part of the Domino server upgrade, you have a good opportunity to make some other changes to your Domino infrastructure. There are some choices you need to make at this point, such as if you want to upgrade an existing server or install a new server with a new identity, or install a new server and inherit identities. Here are some things to consider at this point in the process:

Will this be an upgrade or a new installation? After defining your server requirements, you should determine if servers should...

- be upgraded in place?
- be replaced with new servers?
- be some combination of these approaches?
 - Should new servers inherit existing identities or have new ones?
 - Consider what impacts there could be on the client configuration.

There are a range of options depending on the answers to those questions above. For all options, the upgrade process and configuration testing needs to be done in a test environment first.

Option 1 - Upgrade the existing Domino server

This is the easiest approach. This is an "in place" software upgrade of an existing server

- The server identity remains the same
- No change of underlying hardware or operating system
- If clustered...
 - upgrade one server at a time in the cluster

- remember that ACLs and replication settings do not prevent designs from propagating in a cluster

Option 2 - Move existing Domino server to new hardware

Note: Upgrading hardware and Domino at the same time is not recommended. You should upgrade the hardware before or after the Domino upgrade, but not at the same time unless you have no other choice. Upgrading them separately makes it much easier to troubleshoot when problems arise, isolating the issue to the hardware upgrade versus the Domino upgrade.

The server identity remains the same, but will be moved to a new machine:

- Bring down the current server.
- Move all data to the new hardware to the same position (same file locations and directory structure) as the old hardware.
 - Domino program directory
 - Domino data directory
 - Domino transactional logs

Note: If you are changing file locations and directory structure during this move, refer to the Support article: [Changing directory locations when moving a Domino server to new hardware](#) for more information.

- Rerun install of the current version of the Domino server and point to all of the same file locations to mirror your previous configurations.
- Once you start the copy of data to the new hardware, you should never bring up the server on the old machine.
- Before bringing up the server for the first time, switch the server host and network identities to that of the old server.
- Run this configuration for a few days to make sure everything runs correctly. If so, then you can safely upgrade this Domino server

Option 3 - Install new Domino servers (Inherit identities)

- Build new server independently.
- Create a new temporary server identity.
- Permits change of underlying hardware and operating system.
- Permits testing of the configured state before cut-over .
- Create replicas on temporary server and keep in synch with server to be replaced via replication.
- At desired time, switch server host, network and Domino server identities. The change is transparent to clients.
- If clustered...
 - repeat process for each server
 - do not add temporary Domino server into cluster

Option 4 – Install new Domino server (New identity)

- Build a new server independently.
- Create a new server identity.
- Permits change of underlying hardware and operating system
- Permits testing of the configured state before cut-over
- For mail users, requires some migration of users and client configurations from existing to new server.
- Permits monitoring as you ramp up users to verify that you don't overload the "new" server.
- For applications, requires migration of applications to new server and redirection from old server.
- If clustered...
 - create new servers and new cluster
 - migrate users and client configurations to distribute users across the members
 - migrate applications to the new cluster

Create a server test environment

If you do not have a test environment, it is highly recommended that you create one. You will want to incorporate all the decisions that you have made up to this point and create a test environment that is representative of your current and target platforms, including hardware and software resources. Creating this environment is very important if you want to do any kind of performance or capacity planning.

For your basic test environment:

- Install Domino 11.0.
- Create copies of applications.
- Use test IDs and access applications just as you would in production.
- Customization work is done during testing. Get access to all the templates and applications from your test server and customize them as needed.

Pilot the upgrade in the production environment

Pilot the upgrade in the production environment, considering the following as you do:

- Document EVERYTHING during your pilot upgrade. For example, record in detail the operations, commands, the hours required to perform the upgrade, and any error messages you encounter.
- Imaging: Because some testing should focus on sets of steps that are to be executed, imaging saves time by enabling you to reset your environment to a known position. For example, VMWare with its snapshot capability can be a useful tool for this purpose. If VMWare is not ideal for your specific platform, implementing a robust backup and restore program is another way to achieve this.

- Determine the feedback needed from pilot users and determine success criteria.
- Choose pilot groups carefully. Start with immediate IT staff, then add lowest risk user populations. Grow the pilot population over time, adopting new audiences. Target diverse roles: technical, power user, assistants, application users.
- Perform the upgrades necessary for the pilot. Start with Administration servers, Hubs and SMTP Gateways with no users. Begin your pilot with one Domino mail server. Once working properly, continue to add/upgrade more mail servers.
- Run a steady state environment for a defined pilot duration.
- Review and update procedures after pilot feedback.
- Leverage clustering. If there are any issues during upgrading, your users can fail back over to the "down-level" server.

Domino versions supported for upgrade

Upgrading from Domino 9.0 and later Domino versions to Domino 11 has been tested and certified. Although not certified explicitly, HCL will make best efforts to support customers upgrading directly from pre-Domino 9.0 servers to Domino 11.

If you have a pre-9.0 Domino server, you may want to do your own certification of upgrading it to Domino 11, in a test environment and/or on one production Domino server. If you're not satisfied with the results, you then have the option to do an interim upgrade from pre-Domino 9.0 server to Domino 9.0 before upgrading to Domino 11.

Here are the steps to do an interim upgrade of pre-Domino 9.0 server to 9.0, if you decide to go that route:

1. Make backup copies of all files, include transactional logs if appropriate.
2. Install the 9.0.0 or 9.0.1 server.
3. Apply a fixpack to it if desired (latest is 9.0.1 Fix Pack 10)
4. Enable `DEBUG_OUTFILE=` in the notes.ini file to capture console output.
5. If time permits, run fixup against all databases, validating their integrity and repairing if necessary:
(n)fixup -f -j -v

Note:

-f Exhaustive fixup, all documents are checked.

-j Include transaction-logged databases if you have transaction logging enabled. Without this option, fixup does not repair logged databases.

-v Exclude database views (faster) Also, all views will be rebuilt later during the 11.0 upgrade anyway. You can use indirect files (.IND) to run multiple fixup processes concurrently to complete in a more timely manner.

For more information on how to create and run indirect files refer to the article: [Using indirect files to run maintenance tasks.](#)

Check the DEBUG_OUTFILE for any errors, possibly indicating data corruption. Query the HCL Support site and/or work with HCL Support to get them resolved.

6. If you decide to run the Domino server at release 9.x before upgrading to release 11 add the following steps:

a) Run the updall process against all databases on the Domino server:

(n)updall

You can use indirect files (.IND) to run multiple updall processes concurrently to complete in a more timely manner.

b) Start the 9.0.x Domino server

Prepare your production environment before you upgrade

Before upgrading to 11.x, perform these steps:

1. Normalize your environment. Resolve any major issues or crash/hang conditions before you upgrade. Don't assume the upgrade will fix these issues, unless documented.
2. Investigate the compatibility of vender-supplied applications and companion products with Domino 11.x.
3. Make backup copies of all files, include transactional logs if appropriate.
4. Enable DEBUG_OUTFILE= in the notes.ini file to capture console output.
5. If time permits, run fixup against all database validating their integrity and repairing if necessary.

(n)fixup -f -j -v

Note:

-f Exhaustive fixup, all documents are checked.

-j Include transaction-logged databases if you have transaction logging enabled. Without this option, fixup does not repair logged databases.

-v Exclude database views (faster) Also, all views will be rebuilt later during the 11.x upgrade anyway.

You can use indirect files (.IND) to run multiple fixup processes concurrently to complete in a more timely manner. For more information on how to create and run indirect files refer to the article: [Using indirect files to run maintenance tasks](#)

Check DEBUG_OUTFILE for any errors possibly indicating data corruption. Query Knowledge Base and/or work with Support to get them resolved

Note: If you don't have time to run fixup on all databases, at a minimum, run fixup on your system

databases.

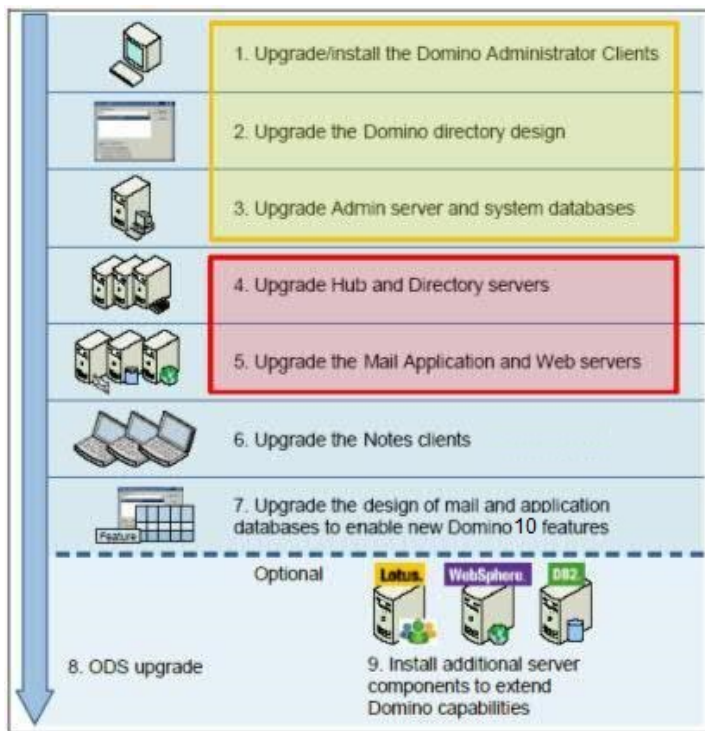
6. Verify all system databases have inheritance turned on:

- NAMES.NSF (StdR4PublicAddressBook)
- LOG.NSF (StdNotesLog)
- EVENTS4.NSF (StdR4Events)
- ADMIN4.NSF (StdR4AdminRequests)

This is so the Design task can be utilized to refresh the system database designs with the Domino server down. If you skip this, later you may need to manually replace the design of some system databases using the Domino Administrator client.

Plan your deployment sequence

The following picture and the information that follows describes the classic deployment sequence. This sequence does not account for organizational, demographic, or other constraints in your environment. Use this information as a guiding principle while taking other factors of your business into account.



Steps 1-3, highlighted in yellow, need to occur regardless of the overall strategy and sequence of server/client upgrades.

If you decide to upgrade the design of the Domino directory in your domain in step 2 before upgrading any Domino servers to 11.x, you must first get a copy of the Domino directory template (PUBNAMES.NTF). Install Domino 11.x on a test server and retrieve the template from there and copy to your admin client.

Important Note: The following are the Domino directory changes in Domino 11.x:

- IBM branding changed to HCL throughout.
- AUT configuration fully implemented, including HCAA.
- Added ability to specify policy for 4096 bit keys in Registration Policy Settings form.
- Fixed a bug preventing the specification of header expiration for web rule.
- Active Directory Password Sync settings were added to the Server Tasks UI (\$ServerTasks subform).
- Added a view, PWSyncProcessors, to support password sync operations.
- (German) Holiday names were corrected in Holiday documents.
- Rearranged the router SMTP settings (\$RouterSMTPSettings subform)
- Changed the "Save and Exit" action everywhere to not try to exit if the save failed.
- A couple of additional SSL ciphers (e.g. DHE_RSA_WITH_AES_128_CBC_SHA) were added to the "deprecated" list.
- Removed references to SSL v2
- Virtual Server document enhanced with better SSL ciphers.
- The default setting for "out of office" agent is now "as a service" rather than agent.
- Ability to create cross certifiers from Certificates view.
- Improved validation for group names to prevent groups having the same name as people.
- Added ability to sort by ID Vault sync column in People view.

Another option is to upgrade the design of the directory along with other system database designs when you upgrade the administration server of the Domino directory.

Important Note: Some customers, especially enterprise customers with thousands of users in their Domino directory, may want to control the flow of the new Domino directory design out into the domain. For more information, see [Control the flow of the Domino directory design](#) in Chapter 4.

Steps 4-5, highlighted in red, can be achieved in various ways. The picture depicts all non-user facing servers upgraded before those that users access. In larger organizations, it may make more sense to upgrade all servers in a location before moving to the next location in which case some infrastructure and some user-accessed servers will be upgraded at the same time.

Most Domino upgrades are relatively straightforward and cause minimal disruption to your production environment. However, you are strongly encouraged to plan the order and pace of Hub and Mail Server upgrades. Planning these steps wisely can minimize risk of service problems, while still maintaining your upgrade schedule. When upgrading software, many enterprises follow the principle of stepwise upgrade. The basic idea is to at each step of the process, preserve the opportunity to back off to the previous step, until you are confident in the current step.

HCL recommends choosing a single, or small number of servers for the first step of the process. The server(s) should be chosen based on a tradeoff between being representative of your production environment but also involving less business risk, if possible. This allows you to ensure configuration and tuning of the upgraded environment is optimal for the broader deployment. Criteria for success should

be set for this and each subsequent step. It is recommended that one of the criteria be delta change in key parameters you monitor routinely, but especially these parameters should include CPU, virtual memory usage, and storage operations (reads and writes). Compare CPU, virtual memory and storage operations for a period of several days before and after upgrade and investigate significant differences unaccounted for by component changes in the upgrade. enterprises with passive (fail over) servers should consider deploying one of these as a first step to further reduce risk.

Subsequent steps should be small enough (for example involve the appropriate level of change, say the number of servers) to enable back out to the previous step, if necessary, at least in the earlier stages of a deployment. Again, providing an opportunity for additional optimizations for your specific environment. As more servers are upgraded, and confidence increases, enterprises usually increase the rate of change and size of particular steps.

HCL also recommends wise use of any failover architecture you may have implemented to reduce risk during upgrades. Some enterprises, for example, delay upgrading both pairs in two-way clusters until all of one side is upgraded. If a problem occurs with an upgraded server, failover to a clustermate is a possibility with high probability of success. Consider upgrade of the Active side of Active/Passive pairs first. This enables deployment on production loads, while preserving failover opportunity. Larger enterprises also do well to consider a production failover test to validate previous hardware sizing assumptions for clustermates. Failover test criteria should also include monitoring.

Steps 6-9 are important steps to take advantage of the new features in Notes and Domino 11. Depending on the size of your Notes client base, communication needed, training required, etc. these steps are often carried out months after the server upgrades. This allows time for production testing before rolling out to hundreds or thousands of users.

The 10.x ODS level, ODS 53, supports larger databases and folders and better performance and stability. Upgrading to ODS 53 is strongly recommended.

Chapter 3 Upgrading applications

Start planning and testing application upgrades at the outset of your Domino 11 upgrade planning.

Create an inventory of applications.

Creating an inventory of your applications allows you to get an understanding of your application landscape as input for requirements and architectural discussions. It also gives you an opportunity to clean up your application environment.

As you create the inventory, identify the following information:

- The current user population: executives, managers, entire organization, small groups of people.
- Nature of the applications: template-based, custom, back-end integration and connectivity, level of complexity.
- Any current issues. After an upgrade, it is important to know if the upgrade caused an issue in an application or if the issue existed prior.

Follow best practices for application upgrades

- If there are current application issues, decide if any need to be fixed before the upgrade, and if so, plan for the resources needed to do so. Concentrate your efforts on issues that are simple and easy to fix.
- Notify users in advance and provide training on any application changes.
- Upgrade applications that are based on standard templates
- Change the design of applications to incorporate new Notes & Domino 11.x features, if appropriate

Testing application upgrades

Test an upgrade of a sampling of applications

Include in your upgrade testing:

- Mission-critical applications that are based on different designs
- Applications used by executives
- Complex or custom applications that include:
 - back-end integration
 - reliance on third-party software
 - undocumented functions and features
 - extensions or add-in tasks using `nsf_hooks`, `ext_mgr`, and home-grown APIs
 - use recompile all (LotusScript) to check for LotusScript issues
- Sample of applications that use a common or standard template

Leverage tools to assist with your testing

Get the Domino 11.0.x specific rule sets for the tools you're using.

Good at pointing out the most prevalent areas that could result in problems

Use the results in prioritization effort

Documents the results

Document the results of testing and convey them to the application developers.

Resolve issues

Resolve issues found based on your priorities and testing results:

- Decide which application problems to fix before deploying to production.
- Create a small team to address problems that arise after deploying to production.
- Put applications into the pilot test environment for acceptance testing.
- On successful testing, archive copies of new templates.

Chapter 4 Deploying Domino 11 servers

Depending on the size of your organization and the number of Domino servers involved, an organization upgrade schedule may range from a few hours to a few months. An organization with a small number of users and a handful of Domino servers can easily be upgraded in a single day and even in a matter of hours. However, an enterprise with hundreds of thousands of users in multiple domains on hundreds of Domino servers located throughout the world will implement an upgrade plan that spans several months. Fortunately, one of the great strengths of Notes & Domino is that it maintains a very strong interoperability story between releases that makes this all possible.

The number of ways to perform a Notes and Domino upgrade is almost limitless. This document will cover only a few of these ways and hopefully give administrators several ideas they may decide to incorporate in their own upgrade plans. This chapter discusses best practices for upgrading small and medium businesses as well as how large enterprises may go about it.

It is always highly recommended, as time permits within your organization, to keep as close to the most current release of Notes and Domino. Keeping up with maintenance releases (MRs) and FixPacks (FPs) for each major release as they become available is also recommended.

Review your deployment planning

Note: When upgrading Domino servers to version 11, the program and data directories from the previous version are retained, for example C:\Program Files\IBM\Domino and C:\Program Files\IBM\Domino\Data. On fresh installations, the default directories are C:\Program Files\HCL\Domino and C:\Program Files\HCL\Domino\Data.

Before upgrading servers as described in this chapter, it is VERY important that you read and follow the steps in [Chapter 2 Planning the Domino 11 Server Deployment](#). There is a lot of prerequisite information covered there that positions you for success during this phase of the deployment.

If you have already followed the steps in chapter 2, you should feel pretty comfortable at this point because you have tested the upgrade in a test environment and you have completed an upgrade pilot. The following things cannot be stressed enough:

- Make backups of all files (ID files, notes.ini files, system databases, applications, etc.) and validate the integrity of the backups if you have not done this already.
- Although it can be time consuming, performing maintenance on your databases before or during the upgrade process is very important. Repairing any database corruption before you upgrade is the best way to avoid big headaches later. Ideally, you run at least fixup -j and possibly compact -c on ALL of your databases when instructed to. If you don't have the time to do that, you should try to run the maintenance tasks on at least your system databases. You can use indirect files to save time in this process.
- To have the least end-user impact, upgrade your environment during off-hours or over a weekend.

Domino maintenance tasks

Here are tips for performing Domino database maintenance during the upgrade.

Running Domino maintenance tasks when the server is shut down

The upgrade sections in this chapter include steps for running some Domino maintenance tasks while the server is down. Here is information on how to do that.

UNIX: ["Running compact, fixup, and updall on AIX, Linux, and Solaris when a Domino server is down" \(#1303727\)](#)

Windows: To run Domino maintenance tasks while the server is shut down (offline), add the letter "n" to the beginning of the Domino server command (required when Domino is shut down, Windows platforms only).

1. Open a command window (Start -> Run -> type "cmd" -> click Enter).
2. Navigate to the file system folder where the Domino server is installed (same directory where nserver.exe is located).
3. From that path, type the Domino server command in the command window, adding the letter "n" before the name of the Domino server task. For example:

```
x:\HCL\Domino\nfixup.exe names.nsf -f -j -v
```

```
x:\HCL\Domino\ncompact.exe names.nsf -c
```

```
x:\HCL\Domino\nupdall.exe admin4.nsf -R
```

```
x:\HCL\Domino\nupdall.exe admin4.nsf -X
```

Use indirect files to save time running maintenance tasks

To save time, you can use multiple indirect files to run the same maintenance task multiple times concurrently. Fixup, compact, updall, design and the convert tasks all support using indirect files. Additionally, you can create batch/scripts that run several maintenance tasks serially against different indirect files to help complete them more quickly.

Article: [Using indirect files to run maintenance tasks](#)

Upgrading small and medium business environments

Small and medium businesses (SMBs) are generally defined as ones having 10,000 users or less and 50 servers or less.

SMB deployment sequence

The recommended deployment sequence for this type of environment is:

1. Upgrade the Notes clients that administrators will use to edit and operate on the Domino directory.
2. Upgrade the administration server of the Domino directory.
3. Allow the new Domino directory design to replicate freely to the other servers.
4. Upgrade hub servers.
5. Upgrade Resource and Reservations (R&R) servers.
6. Upgrade Domino mail servers.
7. Upgrade SMTP servers.
8. Upgrade application and web servers.
9. Upgrade third-party and companion product servers.
10. Upgrade the general population to Notes 11.x.
11. Replace design of mail files with MAIL11.NTF

Upgrading Domino servers

1. Make sure the Domino server to be upgraded is shut down “cleanly” (no errors or hangs).

If the Domino server does not shut down cleanly:

a) Run `nsd -kill`.

b) With the Domino server down, run a Domino maintenance task against a non-existent database name. This step flushes the transactional logs to disk and essentially simulate a clean Domino server shutdown.

Here is an example:

```
c:\domino> nfixup.exe fred.nsf
Restart Analysis (117 MB): 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Recovery Manager: Recovery being performed for DB d:\notefile\mail.box
Recovery Manager: Recovery being performed for DB
d:\notefile\names.nsf
Recovery Manager: Recovery being performed for DB d:\notefile\log.nsf
Restart Replay (116 MB): 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
04/22/2018 04:33:03 PM Recovery Manager: Restart Recovery complete.
(3/2 databases needed full/partial recovery)
```


04/22/2018 04:33:07 PM Informational, rebuild view needed - collection object was deleted (reading d:\notefile\names.nsf view note Title:'(\$Servers)')

04/22/2018 04:33:08 PM Informational, rebuilding view - container integrity lost (reading d:\notefile\names.nsf view note Title:'(\$Servers)')

04/22/2018 04:33:08 PM Informational, rebuild view needed - collection object was deleted (reading d:\notefile\names.nsf view note Title:'(\$Servers)')

04/22/2018 04:33:10 PM Database Fixup: Started

04/22/2018 04:33:10 PM Database Fixup: The pathname 'd:\notefile\fred' was not found: File does not exist

04/22/2018 04:33:10 PM Database Fixup: Shutdown

2. Install Domino 11.

3. Copy customized templates into place.

4. Run the design task to refresh the design of system databases.

Note: Ensure that inheritance is enabled on the system databases. See [Preparing your production environment before you upgrade](#) in Chapter 2 for more information.

5. Run the updll task to rebuild views with design or collation changes.

Note: Use [indirect files](#) to save time.

6. Restart the Domino server.

7. Repeat the steps for the next server to be upgraded.

Upgrading enterprise environments

An enterprise business is generally defined as one having more than 10,000 users and more than 50 servers. It can easily take many weeks or even months to upgrade all servers while end-users are anxious to use the new 11 interface as soon as possible.

Important information about design changes to the Domino directory

Two critical views, (\$USERS) and (\$SERVERACCESS), are used when a Notes client or a Domino server attempts to authenticate with a Domino server. The design upgrade causes these views to be rebuilt from scratch when first opened. If a Domino server is running when the views are being rebuilt, all authentication attempts to that server are blocked. Users attempting to access a Domino server in this state can experience significant delays or hangs. Domino clustering is also unavailable during view rebuilding. However, if the views are rebuilt with the Domino server down, the Notes client can take advantage of Domino clustering and fail over.

Rebuilding of the (\$USERS) and (\$SERVERACCESS) views takes longer in enterprise environments due to the many more users in the Domino directory, especially if the Domino server is running and the view rebuilds are competing for cycles. Therefore, it is important to allow the new Domino directory design to replicate out during off-hours and/or on the weekend so that the views can be rebuilt with limited end-user impact. Or, you can control the flow of the new Domino directory design within the domain and only upgrade to the new Domino directory design as you upgrade each individual Domino server and assure all critical views are rebuilt prior to restarting the newly upgraded Domino server.

Rebuilding (\$Users) and (\$Server Access) can be time consuming for a very large Domino directory. Therefore it is not uncommon in an enterprise to do all this work once on the directory of the first server upgraded. Then, copy the updated directory on each subsequent server being upgraded after installation of Domino 11.x.

Control the flow of the Domino directory design

As with almost everything in Notes and Domino, there are several ways to control the flow of the Domino directory design. Here a couple of ways:

Enterprise deployment sequence #1

1. Remove all instances of the Domino directory template (PUBNAMES.NTF) from your domain(s).
2. Upgrade the Notes clients that administrators will use to edit and operate on the Domino directory
3. Prohibit Domino directory Design elements from replicating to Domino servers:
 - From the Domino directory choose **File -> Replication -> Options for this Application.**
 - Select the Advanced Tab.
 - In the "Receive these elements from other replicas" section, uncheck "Design elements."

Note: After you upgrade a Domino server, be sure to allow (check) Design elements to be received for the replica of the Domino directory on this server.
4. Upgrade Administration server of the Domino directory.
5. Upgrade hub servers.
6. Upgrade Resource and Reservations (R&R) servers.
7. Upgrade Domino mail servers.
8. Upgrade SMTP servers.
9. Upgrade application and web servers.
10. Upgrade third-party and companion product servers.
11. Upgrade the general population to Notes 11.x.
12. Replace design of mail files with MAIL11.NTF.

Enterprise Deployment Sequence #2

1. Remove all instances of the Domino directory template (PUBNAMES.NTF) from your domain(s).
2. Configure the Domino directory ACL so that a new design can only flow in the following direction:

Administration Server of Domino directory -> Hub Servers -> Spoke Servers.

This ensures there is no backflow of Domino directory changes as you upgrade first spoke servers, then hub servers, then the administration server of the Domino directory.
3. Upgrade the Notes clients that administrators will use to edit and operate on the Domino directory.
4. Upgrade SMTP servers.
5. Upgrade Domino mail servers.
6. Upgrade Resource and Reservations (R&R) servers.
7. Upgrade the general population to Notes 11.x.
8. Replace design of mail files with MAIL11.NTF.
9. Upgrade application and web servers.
10. Upgrade third-party and companion product servers.
11. Upgrade hub servers.
12. Upgrade the administration server of the Domino directory.

Upgrading the first Domino server in an enterprise

1. Make sure the Domino server to be upgraded is shut down cleanly (no errors or hangs).
If the Domino server does not shut down cleanly:
 - a) Run `nsd -kill` to clean up.
 - b) While the Domino server is down, run a Domino maintenance task against a non-existent database name which will flush the transactional logs to disk and essentially simulate a clean Domino server shutdown.

Here is an example:

```
c:\domino> nfixup.exe fred.nsf
Restart Analysis (117 MB): 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Recovery Manager: Recovery being performed for DB d:\notefile\mail.box
Recovery Manager: Recovery being performed for DB
d:\notefile\names.nsf
Recovery Manager: Recovery being performed for DB d:\notefile\log.nsf
Restart Replay (116 MB): 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
04/22/2018 04:33:03 PM Recovery Manager: Restart Recovery complete.
(3/2 databases needed full/partial recovery)
04/22/2018 04:33:07 PM Informational, rebuild view needed - collection
object was deleted (reading d:\notefile\names.nsf view note
Title:'($Servers)')
04/22/2018 04:33:08 PM Informational, rebuilding view - container
integrity lost (reading d:\notefile\names.nsf view note
Title:'($Servers)')
04/22/2018 04:33:08 PM Informational, rebuild view needed - collection
object was deleted (reading d:\notefile\names.nsf view note
Title:'($Servers)')
04/22/2018 04:33:10 PM Database Fixup: Started
04/22/2018 04:33:10 PM Database Fixup: The pathname 'd:\notefile\fred'
was not found: File does not exist
04/22/2018 04:33:10 PM Database Fixup: Shutdown
```

2. Install Domino 11.x

3. Copy customized templates into place.

4. Run the design task to refresh the design of system databases

Note: Ensure that inheritance is enabled on the system databases. See [Preparing your production environment before you upgrade](#) in Chapter 2 for more information.

5. Run the updall task to rebuild views with design or collation changes.

Note: Use [indirect files](#) to save time.

6. Copy the Domino directory and full-text Index where they can later be copied to the next Domino server being upgrade.

7. Restart the Domino server
8. Proceed to Upgrading the next Domino server.

Upgrading the next Domino servers in an enterprise

1. Make sure the Domino server to be upgraded is shut down cleanly (no errors or hangs).
2. Install Domino 11.x
3. Copy customized templates into place.
4. Copy the Domino directory and full-text index, if enabled, saved from the "Administration Server" upgrade.
5. Run the updall task to rebuild views with design or collation changes.

Note: Use [indirect files](#) to save time.

6. Restart the Domino server.
7. Repeat to upgrade the next Domino server.

Enabling new features

For information on new features, see [Chapter 1](#). Before enabling new features, review the topic [Evaluate coexistence of features across versions](#) in Chapter 2.

Chapter 5 Deploying Notes 11 clients

System requirements

See [System requirements](#) in Chapter 6.

Before you being the upgrade

Before you upgrade, take the opportunity to do some client cleanup and maintenance so that you can begin on the right foot with Notes 11.

Automate and standardize

- Relocate client code on the desktop. If data is in a non-standard location, consider moving it to the recommended location for multi-user installs. For users who frequently change machines, consider a roaming user deployment.
- Set or reset mail quotas.
- Update configuration settings.
- Enforce consistency using policies. For example, use consistent install choices, bookmarks, preferences, certification schemes, hierarchies, etc.
- Improve load balancing of users across your environment.

Clean, tighten, and fix

- Remove unneeded applications from desktops.
- Remove notes.ini settings that are no longer required.
- Remove hard-coded server IP addresses from address books.
- Fix any issues with your current deployment.
- Run maintenance on local system databases.
- Defragment user workstations.

Overall upgrade order

The following upgrade order is supported:

1. Domino servers
2. Notes clients
3. Application templates

Notes client install best practices

Follow these install best practices.

Multi-User installs

Multi-user installs are ideal for most Notes users. The exception is users who use Domino Designer or Domino Administrator, which are available for single-user installs only.

A multi-user install provides the following benefits:

- Leverages operating system multi-user profiles.
- Leverages user-independent settings.
- Allows administrators to lock-down control of installed programs by installing in read-only directories.
- Allows multiple Notes users to share a computer while keeping their work stored securely in separate personal data directories.

To switch from single-user to multi-user, see the following topic: [Upgrading from Notes single user to Notes multi-user](#) in the Domino documentation.

Standard client installation

Use the standard client rather than the basic client unless hardware is inadequate. If you need to use the basic client, install the standard client but launch the basic client. To launch the basic client, add the setting UseBasicNotes=1 to the client notes.ini file or configure the installer to use the "-sa" or "-basic" switch in the shortcut.

Roaming users

Enable Notes users to roam so that settings and key Notes files (names.nsf, notes.ini, bookmarks, desktop, journal) stay synchronized across multiple clients. For more information, see the following topics in the Domino documentation:

[Roadmap for registering and configuring Notes roaming users](#)

[Considerations for changing roaming user status](#)

ID vault

If you don't already, store Notes IDs in an ID vault. An ID vault makes recovery of damaged ID files easy and enables administrators to reset passwords when users forget them. For more information, see the [Notes ID vault](#) section of the Domino documentation.

Standardized notes.ini settings

Standardizing notes.ini settings across clients is recommended when possible by deploying the settings through policies. An exception is settings that are needed as part of launching Notes: these you can specify through a custom installer.

For more information, see the following topics in the Domino documentation:

[Assigning Notes.INI settings through user policies](#)

[Creating a customized add-on installer](#)

Replicate notes.ini settings via roaming user functionality

Enable Roaming User functionality to push notes.ini settings replicated after an upgrade. Doing this will allow you to delete user notes.ini settings locally and then all roaming functionality to restore them upon next launch.

Uninstalling before upgrading

Uninstalling a prior version of Notes before upgrading is not required. However, you might want to do so for the following reasons:

- To remove files no longer needed.
- To standardize settings and configuration.

“Low touch” installation and setup

Customize Notes installation and setup so that users aren't required to input information into the install and setup panels (other than passwords). This practice streamlines and standardizes the upgrade across your environment. The following topics in the Domino documentation provides information on options for custom installs:

- [Setting up Notes installation using scriptable setup](#)
- [Using Notes Smart Upgrade](#)
- [Notes Auto Update](#) (Available for upgrading from Notes 10.0.1 or later version).
- [Automating a customized or default Notes deployment using silent install](#)

Steps to deploy Notes 11.x clients

Note: When you upgrade Notes clients to version 11, the program and data directories from the previous version are retained, for example C:\Program Files\IBM\Notes and C:\Program Files\IBM\Notes\Data. On fresh installations, the default directories are C:\Program Files\HCL\Notes and C:\Program Files\HCL\Notes\Data.

Phase 1: Plan the deployment

- Set realistic goals about how long deploying Notes 11.x will take.
- Take an inventory the applications that must be tested with the new version of Notes. Factor in time to test the applications and to respond to any issues.
- Develop a plan to carefully pilot the client. Collect feedback from the pilot to help create a realistic deployment roll-out plan.
- Develop a plan for training and communicating upgrade information to end-users. Goal is to ensure you have user acceptance and that they are prepared for new client.
- Develop a training and support plan for help desk staff.
- Review system requirements
- Review what maintenance releases are scheduled near your planned deployment time.
- Plan to follow the recommended upgrade order: servers first, clients second, templates third.

Phase 2: Download and customize the install kit

For information on the install customization features described here, see the topic [Customizing Notes installation](#) in the Domino documentation.

- Download the multi-user Notes client kit for your required language. Notes Standard clients are pre-packaged in English, French, German, and Japanese. Multilingual User Interface (MUI) packs are required to prepare clients in other languages.
- Customize which features to install, add, or remove.
 - Edit the install manifest to control which features are available and what the user sees on the installation panel.
 - If notes.ini settings must be run before the user initially launches Notes, you can configure a transform file to accomplish this. Otherwise, rely on recommended best practices for standardized notes.ini settings described earlier.
 - Remove default components not used by your company. For example, if your company is not integrating Connections or Sametime with the Notes client, remove those components from the install kit.
 - Add custom plug-ins used by your company. If your company integrates custom plug-ins with the Notes client, add the plug-ins to install kit.
 - For more information,
- Set run-time settings for notes.ini, Domino policies, and plugin_customization.ini.
 - Whenever possible, use Domino policies to manage notes.ini settings
- Configure Notes "Scriptable Setup"
 - Use a "Scriptable Setup" (or Setup Response file) to limit user intervention during both the install and the initial setup of Notes. During the install, the wizard displays only the panels that users need to set up the Notes client.
- Pre-populate cross certificates in deploy.nsf
 - You can prevent users from having to respond to cross-certificate prompts by pre-populating the deploy.nsf with admin-generated cross certificates.
 - Admin-generated certificates are copied to users' address books at first launch.

Phase 3: Build and test the deployment package

- Use a "push" tool to automate the deployment.
- Consider uninstalling earlier clients for a reportedly smoother experience and the added benefit of being able to change the location of install directories.
- Code scripting to shut down client if not already shut down and also reboot the machine before starting the install.
- Use verbose install logging for the pilot.
- Run maintenance on local databases & defragment machine.

Phase 4: Pilot the upgraded client

- Determine pilot length & ideal participants.
 - At minimum, you should allow a month for customer feedback but preferably longer if possible.
 - At least 100 users distributed 80% in main site, 20% in remote site, preferably not all IT users.
 - Target diverse roles such as technical, power user, assistants, specific application users; consider a separate pilot for Notes Citrix users.
- Determine feedback required from pilot users and success criteria.
 - Look for user feedback on issues with the new release.
 - Make sure to check Release Notes for known issues, etc.
 - Use pilot experience to estimate support cost to final rollout.
- Collect ADC fault statistics before and after the pilot and compare the statistics. For more information, see [Setting up automatic diagnostic data collection on clients](#).
- Certify that custom apps work with new release.

Phase 5: Roll out the deployment

- Plan the roll-out based on bandwidth.
 - Consider how many desktops must be upgraded and plan your roll- out based on network bandwidth as well as your IT support capabilities.
 - In case of low WAN bandwidth, consider alternatives such as LAN storage devices or Smart Upgrade Governor
- Provide the support plan to help desk staff.
 - Use the feedback and lessons learned during the pilot to determine how much deskside support may be needed.
- Monitor the deployment.
 - Throughout the deployment, monitor the progress by using the tracking features of the tool in use.
 - Considering using Marvel Client Essentials to help monitor the deployment. For more information, see the Support article [Getting started with Marvel Client Essentials](#).
- Push out initial policy settings.
 - Configure hierarchical policy settings document to control the desktop configuration. The settings are detected automatically at first client launch.
- Update mail templates
 - After the server and client have been upgraded, then upgrade mail templates.
- Update folder designs
 - The mail file folder design is not automatically updated with a template change. You must use a Desktop policy to update the folder design.
 - Prior to updating the folder design, have users empty their Trash folders.

Phase 6: Manage the desktop

- Apply the latest Fix Pack.

- Use Policies to manage desktops.
- If necessary, modify desktops by re-running the Installer in Modify mode.
- Use the Add-On Installer toolkit to build installers for 3rd-party apps.
- As needed, deploy new widgets via the Widget Catalog.

Maintaining Notes clients

Upgrade to the latest maintenance release and fix pack

Upgrading Notes to the latest maintenance release and fix pack is a better choice than applying hotfixes:

- Maintenance releases and fix packs are maintenance deliverables for Notes and Domino that are planned, scheduled, well-tested, and manageable.
- Hotfixes have the following disadvantages:
 - Limited customer eligibility.
 - Intended for only the most critical issues.
 - Extensive testing by customers in their environments is required as they are minimally tested by HCL/IBM.

For more information, see these resources:

- [Notes/Domino 11.0 Fix List](#)
- [Notes/Domino 10.0.1 Fix Pack 3 Release Notice and Fix List](#)

Chapter 6 Upgrade resources

System requirements

For requirements, see the following links:

[Domino 11.0.0 system requirements](#)

[Notes 11.0.0 system requirements](#)

[HCL Client Application Access \(ICAA\) 3.0.0 system requirements](#)

[HCL Mail support for Microsoft Outlook system requirements](#)

Release interoperability information

[Supported version interoperability for HCL Notes, Domino, and mail template 11.0](#)

[Combinations of Domino and Notes versions supported in a Release 10 environment](#)

[Requirements for new features in HCL Notes 11](#)

Download information

[HCL License and Delivery Portal](#)

Known issues

[HCL Customer Support](#)

Fix list (by release)

[Notes/Domino 11.0.1](#)

[Notes/Domino 11.0](#)

Product documentation

[Domino](#)

[Notes](#)

[iNotes](#)

[Designer](#)

[AppDev Pack](#)

[Traveler](#)

[HCL Traveler mail support for Microsoft Outlook \(end-user\)](#)

[HCL client application access \(ICAA\)](#)