



**Installation Guide**

**Note:** Before using this information and the product it supports, read the information in "Notices" on page 77.

**First Edition (August, 2005)**

This edition applies to IBM® Lotus® Domino 7 for z/OS®, and to all subsequent releases and modifications, until otherwise indicated in new editions.

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# Chapter 1 - Preparing your z/OS system

Domino for z/OS

## About the Domino install and setup procedure

You must use these instructions to install your Domino for z/OS Server. The installation and setup process for Domino for z/OS requires expertise in many areas, including z/OS software and Lotus Domino administration. Specifically, the installation and setup procedures require skills in the following:

- System programming in z/OS, including z/OS UNIX System Services (z/OS UNIX)
- Dataset allocation and placement on DASD
- Establishing a secure operating environment
- The TCP/IP component of the Communications Server
- The file transfer protocol (ftp) function
- Administering a Domino system

Few people have **all** of these skills, so we recommend and encourage a team approach when preparing for your Domino for z/OS installation.

Domino for z/OS

## Where to find more information

Throughout this *Install Guide*, references are made to IBM documentation for detailed information.

### Domino 7 for z/OS reference material

*Domino 7 for z/OS Installation Guide*

*z/OS-related items in the IBM Lotus Notes/Domino 7 Release Notes*

*z/OS Console Support Guide for Domino*

The Domino for z/OS & Notes Documentation Library can be found at  
<http://www.lotus.com/idd/notesua.nsf?OpenDatabase>

Lotus Notes/Domino Knowledge bases

<http://www.ibm.com/software/lotus/support/domino/support.html>

<http://www.ibm.com/software/lotus/support/notes/support.html>

### z/OS Publications

#### 3990

*3990/9390 Planning, Installation, and Storage Administration Guide*

**IBM Document Number**  
GA32-0100

#### z/OS

*z/OS MVS Initialization and Tuning Reference*

SA22-7592

*z/OS Planning for Installation*

GA22-7504

*z/OS MVS Planning: Workload Management*

SA22-7602

*z/OS RMF Report Analysis*

SC33-7991

*z/OS RMF User's Guide*

SC33-7990

#### zFS

*V1R2.0 Distributed File Service zFS Administration*

SC24-5989

#### TCP/IP

*z/OS CS: IP Configuration Guide*

SC31-8775

*z/OS CS: IP Configuration Reference*

SC31-8776

*z/OS CS: IP Migration*

GC31-8773

**DB2**

<i>DB2 UDB for OS/390 V6 Installation Guide</i>	GC26-9008
<i>DB2 UDB for OS/390 V6 ODBC Guide &amp; Reference</i>	SC26-9005
<i>DB2 UDB for OS/390 and z/OS V7 Installation Guide</i>	GC26-9936
<i>DB2 UDB for OS/390 and z/OS V7 ODBC Guide and Reference</i>	SC26-9941

**UNIX System Services**

<i>z/OS UNIX System Services Planning</i>	GA22-7800
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**WebSphere**

WebSphere® Application Server for z/OS and OS/390: Installation and Customization	GA22-7834
WebSphere® Application Server for z/OS and OS/390: Messages and Diagnosis	GA22-7837
HTTP Server Planning, Installing, and Using	SC34-4826

Domino for z/OS

**Installation Overview**

Installing Domino includes the following procedures.

**Before you install Domino**

1. Review the IBM Lotus Notes/Domino Release Notes for any updates or corrections to the Installation Guide
2. Review the readme.txt file for any last-minute changes to the Installation Guide.
3. Review Hardware and Software Requirements
4. Obtain the latest copy of the PTF Checker from the Web to verify you have all service applied to your system.  
<http://www.ibm.com/servers/eserver/zseries/software/domino/servchoice.html>
5. Review WLM Considerations
6. Review TCP/IP Requirements
7. Decide if you will be running with any of the following:
  - MVS Jobnames
  - SMF 108 records
  - Platform Statistics
  - Fault Recovery and Auto Restart
  - z/OS Console Support for Domino
  - Domino HTTP DSAPI filter for host authentication
  - WebSphere plugin for Domino Connectivity
  - Domino SNMP agent
8. Setup parameters for z/OS and Unix System Services
9. Review RACF Requirements and Considerations
10. If you are upgrading from a previous release, complete the migration instructions, "Migrating from a previous release of Domino."
11. Review zFS Migration Considerations

**Installation**

12. Transfer files from the Domino CD to the server and set up the file systems for z/OS. (For more information, see the topic "Preparing to run the install.")
  - Allocate an z/OS partitioned dataset (PDS) on the server to hold sample files from the CD-ROM on the workstation.
  - Transfer the sample files from the CD-ROM to the PDS on the server.
  - Define RACF User ID's
  - Define BPX.FILEATTR.SHARELIB facility class and Grant Read Access to the User ID used to do the Install.
  - Define RACF Facility Classes and Program resource class based on the options being installed.
  - Modify the sample files using the directions within each file.

- Submit the modified ALOCHFS or ALOCZFS job to allocate the file systems.
  - From CD ,1 transfer the following files from the CD-ROM on your workstation to a z/OS Unix file system: Install, Install.dat, ZOS.taz.aa and ZOS.taz.aa.cks. From CD 2, transfer the following files from the CD-ROM on your workstation to the same z/OS Unix file system: ZOS.taz.ab, ZOS.taz.ab.cks.
  - From the z/OS UNIX shell, run the *Install* program.
  - Copy the MOUNT statements from the sample, MDFYBPXP into SYS1.PARMLIB(BPXPRMxx).
13. Run the install program either by script or interactively
  14. Set the Path environment variable
  15. Verify current BPXPRMxx matches Install Guide recommendations using dom\_verify\_os

## Server Configuration

The steps you use to configure the server depend on whether you are migrating to a new release of Domino from a previous release, setting up the first server in a Domino domain, or setting up additional servers in a Domino domain.

16. If this is a migration to a new release of Domino and no additional servers are required, continue with:
  - Implement optional Features
    - DECS
    - Jobnames
    - Fault Recovery and Auto Restart
    - Domino SNMP agent
  - Start the Server
  - Implement optional post Installation tasks
    - Domino Server Security
    - Domino Management Agents
    - Certifier ID File
    - z/OS Console Support for Domino
    - Domino HTTP DSAPI filter for host authentication
    - WebSphere plugin for Domino connectivity
    - Domino SNMP agent
17. If this is the first server in a domain, continue with:
  - Verify you are running the Domino Administrator or you have Java Runtime Environment 1.4.2 on your workstation
  - Running the Domino Server Setup
  - Implement optional features
    - DECS
    - Jobnames
    - Fault recovery and auto-restart
    - Domino SNMP agent
  - Start the Server
  - Implement optional post Installation tasks
    - Domino server security
    - Domino management agents
    - Certifier ID File
    - z/OS Console Support for Domino
    - Domino HTTP DSAPI filter for host authentication
    - WebSphere plugin for Domino connectivity
    - Domino SNMP agent
  - If you have additional servers to configure in the same Domino domain, continue with:
    - Registering additional server for a domain
    - Setting the Path environment variable
    - Be sure the first server in the domain is still running
    - Running the Domino Server Setup
    - For each server you want to configure in the domain, continue with Setting the Path environment variable and Running the Domino Server Setup until all servers are configured.
  - Implement optional Features
    - DECS
    - Jobnames
    - Fault Recovery and Auto Restart
    - Domino SNMP agent

- Start the Server
- Implement optional post Installation tasks
  - Domino Server Security
  - Domino Management Agents
  - Certifier ID File
  - z/OS Console Support for Domino
  - Domino HTTP DSAPI filter for host authentication
  - WebSphere plugin for Domino connectivity
  - Domino SNMP agent
- If you will configure a server in a different Domain return to Setting the Path environment variable, and continue from there.

18. If this is NOT the first server in the domain, continue with:

- Be sure the first server in the domain is up and running
- Verify you are running the Domino Administrator or you have Java Runtime Environment 1.4.2 on your workstation
- Running the Domino Server Setup
- If you have additional servers to configure in the same domain, continue with:
  - Setting the Path environment variable
  - Ensure the first server in the domain is still running
  - Running the Domino Server Setup
  - If you will be configuring additional servers in the domain, continue with Setting the Path environment variable and Running the Domino Server Setup until all Servers are configured.
- When all additional servers have been configured in the same domain, continue with:
  - Implement optional Features
    - DECS
    - Jobnames
    - Fault Recovery and Auto Restart
    - Domino SNMP agent
  - Start the Server
  - Implement optional post Installation tasks
    - Domino server security
    - Domino management agents
    - Certifier ID File
    - z/OS Console Support for Domino
    - Domino HTTP DSAPI filter for host authentication
    - WebSphere plugin for Domino connectivity
    - Domino SNMP agent
- If you will be configuring a server in a different Domain, return to Setting the Path environment variable, and continue from there.

Domino for z/OS

### Required hardware and software

Domino for z/OS requires the following software and hardware:

- Minimum requirement is z/OS Version 1 Release 5 at PUT level 0406 or higher and/or the PTF Checker Tool run clean with no missing PTFs reported.  
If running z/OSe, the minimum requirement is z/OSe Version 1 Release 5 at PUT level 0406 or the PTF Checker Tool run clean with no missing PTFs reported.
- Processors supported: Any processor that supports your release level of z/OS Version 1 Release 5 or higher.  
If running z/OSe, any processor that supports your level of z/OSe Version 1 Release 5 or higher.
- Central storage: 1 GB required; 2 GB or more recommended
- Disk space: 3 3390-3 volumes minimum
- The z/OS C/C++ IBM Open Class Library installed.
  - No license for the C/C++ feature of z/OS is required.
  - SCLBDLL must be in the program search order (for example, in the SYS1.PARMLIB member, LNKLSTxx or PROGxx).

- SCEERUN2 must be available and in the program search order (for example, in the LNKLSTxx or PROGxx PARMLIB member)
- A workstation with a CD-ROM and a connection to the system where Domino will be installed.
- Either the Domino Administrator or the Java Runtime Environment (JRE) 1.4.2 or higher installed on the workstation that performs the installation. If you do not have JRE, you can download it from <http://www.java.sun.com>.
- TCP/IP networking support.
- DASD volumes for the HFS or zFS datasets where Domino data will reside.
- Optional: RMF is required if running Platform Statistics

The following Web site contains the list of z/OS services required to run Domino for z/OS:

<http://www.ibm.com/servers/eserver/zseries/software/domino/servchoice.html>

Additionally, a tool (the PTF checker) is provided that uses SMP/E to verify that required service has been applied on your z/OS system. The PTF checker is available at the Web site above. To use the PTF checker, follow the directions in the comments section of the file.

IBM suggests that you install z/OS preventive maintenance using Recommended Service Upgrades (RSUs). An RSU is an SMP/E SOURCEID (RSUyymm) used to identify a subset of available PTFs. RSUs are available monthly. IBM recommends that you install an RSU every three months if possible, with the RSU level being the current month minus two.

You should also regularly review current HIPER and PE PTFs as part of your preventive maintenance policy. You should roll these fixes into production at least monthly. If you are unable to install RSU maintenance every three months, then it is more important to review the HIPER and PE fixes on a regular basis. For additional information, see *z/OS Planning for Installation* (GA22-7504).

For any third party software that is running in a Domino environment, you will need to contact that vendor for any application fixes that may be needed.

#### **IEFUSI user exit**

If you are currently using an IEFUSI user exit, you must review APAR OW38477 and review the *z/OS Unix System Services Planning* manual (GA22-7800) for IEFUSI considerations.

#### **Enabling the DASD Fast-Write function**

We recommend that your installation enables the DASD fast-write function that provides control unit caching for all DASD. You might also consider enabling the SUBSYSTEM, CACHEFASTWRITE, NVS and DEVICE functions. See *3990/9390 Planning, Installation, and Storage Administration Guide* (GA32-0100) for more information. See the following samples to assist you with these tasks.

#### **Sample for checking DASD status:**

```
//CACHE JOB <Installation Job Card >
//CACHLST EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
LISTDATA VOL(volser) UNIT(3390) STATUS
LISTDATA VOL(volser) UNIT(3390) COUNTS SUBSYSTEM
//*
```

#### **Sample to enable the suggested DASD functions:**

```
//CACHEON JOB <Installation Job Card>
//CACHE EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
SETCACHE VOL(volser) UNIT(3390) SUBSYSTEM ON
SETCACHE VOL(volser) UNIT(3390) CACHEFASTWRITE ON
SETCACHE VOL(volser) UNIT(3390) NVS ON
SETCACHE VOL(volser) UNIT(3390) DEVICE ON
SETCACHE VOL(volser) UNIT(3390) DASDFASTWRITE ON
```

Domino for z/OS

## Migrating from a previous release of Domino

### Migrating From Domino 6.0.x/6.5.x to Domino 7 for z/OS: Tasks specific to S/390 and zSeries

There are no unique issues when migrating from Domino 6.0.x/6.5.x to Domino 7. Follow the standard Domino 7 install procedure.

Always use the most current version of the *Install Guide*, the Release Notes, JCL and samples that come with the release you are installing. To upgrade your Lotus Domino for S/390 and zSeries servers from earlier releases to this release, we recommend that you do the following:

1. Add high-level-qualifier.SCEELPA to your LPALSTxx parmlib member if it is not currently their. SCEELPA data set contains a subset of the SCEERUN modules that are re-entrant and resides above the line which are heavily used.
2. Enter the following command on your z/OS Console and verify successful execution. For details, see the topic "Setting parameters for z/OS and Unix System Services" in Chapter 1.

```
SETPROG LPA ADD,DSN=high-level-qualifier.SCEERUN2,MOD=(CELHV003,CELHDCPP,SCECPP)
```

3. Add the SETPROG LPA ADD command to your COMMNDxx PARMLIB member for future IPL's. For details, see the topic "Setting parameters for z/OS and Unix System Services" in Chapter 1.
4. For Domino 7 for z/OS, the Product HFS size is as follows:

Action and Description	Default Mount Point	Default Dataset Name	Size in Cylinders
			Domino 7
Unmount Product files	/usr/lpp/lotus	NOTES.PROD.HFS	3300
Continue Using Control files, databases, templates	/notesdata	NOTES.DATA.HFS	1200
Continue Using Notes mail file	/notesdata/mail	NOTES.MAIL	500

### Migrating From Domino Release 5.x to Domino 7 for z/OS: Tasks specific to S/390 and zSeries

There are no unique issues when migrating from Domino 5.x to Domino 7. Follow the standard Domino 7 install procedure.

Always use the most current version of the *Install Guide*, the Release Notes, JCL and samples that come with the release you are installing. To upgrade your Lotus Domino for S/390 and zSeries servers from earlier releases to this release, do the following:

1. Shut down the Domino server by entering **exit** or **quit** from the Server console.
2. Run the latest level of the PTF Checker tool for Domino 7. For details, see the topic "Prerequisites" in Chapter 1.
3. Verify you have either the Domino Administrator or the Java Runtime Environment (JRE) 1.4.2 or higher installed on the workstation that will run the Domino Server Setup program. For details, see the topic "Prerequisites" in Chapter 1.
4. Verify your BPXPRMxx parmlib settings are accurate for Domino 7. AUTOCVT, MAXMMAPAREA, SHRLIBRGNSIZE, and SHRLIBMAXPAGES requirements have been added. For details, see the topic "Setting parameters for z/OS and Unix System Services" in Chapter 1.
5. Verify SYS1.SERBLINK is in your LNKLSTxx or PROGxx parmlib member and the dataset is added to RACF PROGRAM General Resource Class if you will be running the optional Platform Statistics. For details, see the topic "Setting parameters for z/OS and Unix System Services" in Chapter 1.
6. Verify your LNKLSTxx or PROGxx PARMLIB member is setup correctly for *high-level-qualifier.SCEERUN2* and is cataloged and available on your system. For details, see the topic "Setting parameters for z/OS and Unix System Services" in Chapter 1.
7. Add high-level-qualifier.SCEELPA to your LPALSTxx parmlib member. SCEELPA data set contains a subset of the SCEERUN modules that are re-entrant and reside above the lines which are heavily used.

8. Enter the following command on your z/OS Console and verify successful execution. For details, see the topic "Setting parameters for z/OS and Unix System Services" in Chapter 1.

```
SETPROG LPA ADD,DSN=high-level-qualifier.SCEERUN2,MOD=(CELHV003,CELHDCPP,SCEECPP)
```

9. Add the SETPROG LPA ADD command to your COMMNDxx PARMLIB member for future IPL's. For details, see the topic "Setting parameters for z/OS and Unix System Services" in Chapter 1.
10. The Domino Java setup default TCP/IP port is 8585. You may select a different port during the setup process. Please make sure the port is not in use by another application when configuring a new Domino server. Domino 7 for z/OS does not require exclusive use of port 8081 (as Domino Release 5 did). For details, see the topic "Configuring TCPIP" in Chapter 1.
11. Back up your Domino data and program directories. If you created or modified any databases, back them up.
12. Unmount the /usr/lpp/lotus hierarchical file system (HFS) that contains the existing Domino product files (executables). Because of the requirement for additional space, you will be directed during the install to use the ALOCHFS or ALOCZFS job that reallocates the dataset and mounts the HFS or zFS files.

Continue using the existing /notesdata and /notesdata/mail directories. The default size of /notesdata and /notesdata/mail that is shipped with the product is the minimum amount of space required to run Notes successfully. It is very important to monitor the used space of these directories and, when necessary, to increase the size of the dataset.

13. For Domino 7 for z/OS, the Product HFS size is as follows:

Action and Description	Default Mount Point	Default Dataset Name	Size in Cylinders
			Domino 7
Unmount Product files	/usr/lpp/lotus	NOTES.PROD.HFS	3300
Continue Using Control files, databases, templates	/notesdata	NOTES.DATA.HFS	1200
Continue Using Notes mail file	/notesdata/mail	NOTES.MAIL	500

14. Domino 7 for z/OS does not use the Dynamic Link Pack Area. Domino 7 for z/OS uses the Unix system services system shared library support to share executable programs between processes. The Install user ID must have READ access to the BPX.FILEATTR.SHARELIB facility class.
15. The PUTINLPA job and the PROGxx Parmlib member is not required in Domino 7 for z/OS. Note that the Domino Release 5 server may run in the same LPAR as a Domino 7 LPAR. Domino Release 5 servers still require the PUTINLPA job and the PROGxx Parmlib member.

If you'll be running only Domino 7 for z/OS in this LPAR, do the following:

- Update your Dynamic LPA PROG member and remove all the LPA ADD DSNAMES cards for domliba, decsxt, ftgr/34, libnotes. Only keep the LPA DELETE MODNAME cards for these modules.
- From the z/OS operator's console, activate the dynamic LPA by entering: SET PROG=xx. Check the z/OS system log to verify that all four modules were deleted successfully.
- Remove the COMMNDxx parameter COM='SET PROG=xx' which points to your Dynamic LPA PROG member.

16. The owning user ID of the Domino 7 server is not required to have LIBPATH and CLASSPATH set.

**Important Notes**

The installation steps have directions for a first-time install. The following are important points to remember for an upgrade:

- Domino 7 for z/OS supports only ASCII HTML pages. If you have EBCDIC HTML pages, use the z/OS Unix System Services **iconv** command to convert the encoding of the HTML files from EBCDIC to ASCII. If **DefaultFsCp** and **DefaultNetCp** are specified in an existing **httpd.cnf** file in the Domino data directory, they will be ignored.
- The sample ALOCHFS and ALOCZFS jobs are set up for a new install. They will allocate and provide mount points for /usr/lpp/lotus, /notesdata, and /notesdata/mail. You need to modify whichever job you run so that only /usr/lpp/lotus is allocated and mounted.

- You must periodically check the size of /notesdata so that it does not reach the currently allocated space.
- For existing partitioned servers, all of the original partitioned server configurations will be in effect after running the install program.
- If you are not adding another Domino Server, skip the procedure defined in the topic "Configuring a new Domino Server" in Chapter 3.
- Back up the original notes.ini files on all servers being migrated.

Domino for z/OS

### **zFS migration considerations**

Before you can install Domino with the zFS file system, you must have already completed all of the installation and setup steps outlined in the *Distributed File Service zFS Administration* (SC24-5989) and be able to create a zFS (compatibility mode) file system.

#### **Migration Considerations**

- Back up your system prior to migrating to zFS.
- Make sure you have enough free HFS space to store the tar files on your system.
- Create temporary mount points for the new zFS file systems you are creating that will replace your old Domino HFSs.
- Use the following tar command to preserve ownership and special attributes:

```
tar -cvpUf /location_of_temporary_tar/filename.tar .
```

example:

```
cd /notesdata
```

```
tar -cvpUf /tmp/example.tar .
```

- Use the following tar command to preserve ownership and special attributes:

```
tar -xvpUf /location_of_temporary_tar/filename.tar .
```

example:

```
cd /tempzfs
```

```
tar -xvpUf /tmp/example.tar .
```

- When you tar the Domino data directory, be careful that you do not include additional HFSs mounted off of it. For example /notesdata/mail.

Domino for z/OS

### **WLM recommendations**

For Domino 7 releases, you will have to migrate to goal mode. Based on IBM's experience, the following should result in acceptable performance:

- For goal mode with Workload Manager, assign the Domino address space to a service class of importance 1 with a velocity of 60 or 70.
- For compatibility mode, IPS/ICS settings consistent with a velocity of 60 or 70

See *z/OS MVS Planning: Workload Management* (SA22-7602) for more information about workload management.

Domino for z/OS

## Configuring TCP/IP

TCP/IP is a requirement for Domino for z/OS.

Place the TCP/IP high level qualifier, SEZALPA in LPALSTxx parmlib. To run Notes successfully, verify that you have a working /etc/resolv.conf file. In addition, the permission bits for the resolv.conf file need to be set at 755.

Include the following statements in the /etc/resolv.conf file:

TCPIPJOBNAME Specify the member name of the cataloged procedure used to start the TCPIP address space.

DATASETPREFIX The high-level qualifier of the TCP/IP datasets.

HOSTNAME Specify the TCP host name of the z/OS server.

NAMESERVER The IP address or addresses of a particular nameserver to query. The addresses are queried

in order. Domino for z/OS and zSeries SMTP use up to three nameserver addresses.

DOMAIN The default domain of the resolver.

The following is a sample /etc/resolv.conf file:

```
TCPIPJOBNAME TCPIP
DATASETPREFIX TCPIP
HOSTNAME      SYSTEM1
NAMESERVER    1.2.3.4
NAMESERVER    5.6.7.8
NAMESERVER    9.8.7.6
DOMAIN        POK.IBM.COM
```

Where DOMAIN is the domain name, NAMESERVER 1.2.3.4 is the first nameserver that should be queried, NAMESERVER 5.6.7.8 is the second nameserver queried and NAMESERVER 9.8.7.6 is the third and final nameserver queried.

### Important notes:

1. SMTP requires that port 25 not be reserved to other jobs or users. Update the TCPIP PROFILE PORT parameter, and comment out PORT 25 if it is defined. Remember to recycle TCP/IP after making this change. If SMTP does not have exclusive use of port 25, Domino SMTP generates a listener error message.
2. Verify that you have an /etc/magic file available with the permission bits set to 644. If you do not have this file, you can copy it from /samples/magic to /etc/magic.
3. The Domino Java setup default TCP/IP port is 8585. You may select a different port during the setup process. Please make sure the port is not in use by another application when configuring a new Domino server.

For more information, consult the following documentation:

- *z/OS Communications Server: IP Migration*, GC31-8773
- *z/OS Communications Server: IP Configuration Guide*, SC31-8775
- *z/OS Communications Server: IP Configuration Reference*, SC31-8776
- *TCP/IP Performance Tuning Guide*, SC31-7188

### Running with the Domino SNMP agent

If you plan on running with the Domino SNMP Agent, the following additional TCP/IP configuration changes will need to be completed.

Domino on zSeries only supports SNMP community-based security (SNMPv1 / SNMPv2 formats).

If you do not have SNMP configured on your LPAR, please read the following IBM manuals to configure SNMP:

- *z/OS Communications Server: IP Configuration Guide* SC31-8775
- *z/OS Communications Server: IP Configuration Reference* SC31-8776

The SNMP agent and the SNMP subagents record trace information via the z/OS UNIX System Services syslog daemon using the *daemon* facility. IBM strongly urges you to set up the syslog daemon if using SNMP. For detailed information regarding syslogd and specifying the daemon facility in the `/etc/syslog.conf` configuration file, please read the z/OS Communications Server manuals listed above. There is also a "Syslogd How To" informational APAR (I112021) which you may find useful.

To verify SNMP is configured correctly, enter the following command from within Unix System Services:

```
osnmp -h <host name> walk system
```

Output should look similar to the following:

```
1.3.6.1.2.1.1.1.0 = SNMPv3 agent version 1.0 with DPI version 2.0
1.3.6.1.2.1.1.2.0 = 1.3.6.1.4.1.2.3.13
1.3.6.1.2.1.1.3.0 = 1192800
1.3.6.1.2.1.1.4.0 = <userid>
1.3.6.1.2.1.1.5.0 = <hostname>
1.3.6.1.2.1.1.6.0 = <location>
1.3.6.1.2.1.1.7.0 = 76
1.3.6.1.2.1.1.8.0 = 950000
1.3.6.1.2.1.1.9.1.2.1 = 1.3.6.1.4.1.2.11.7.1
1.3.6.1.2.1.1.9.1.2.2 = 1.3.6.1.4.1.2.11.7.2
1.3.6.1.2.1.1.9.1.3.1 = z/OS SNMP Agent
1.3.6.1.2.1.1.9.1.3.2 = z/OS TCP/IP SNMP Subagent
1.3.6.1.2.1.1.9.1.4.1 = 0
1.3.6.1.2.1.1.9.1.4.2 = 1800
```

If your output from the `osnmp` command does not resemble the above output, then SNMP is not configured correctly. We strongly encourage you to verify you have SNMP configured correctly by reviewing the z/OS Communications Server manuals prior to continuing.

In addition, be careful of the following items when setting up SNMP for Domino:

1. If you are running with a `SACONFIG` statement in your TCP/IP profile, verify that it is similar to the following example:

```
SACONFIG ENABLED COMMUNITY public AGENT 161 SETSENABLED
```

You can replace `public` with any password you prefer. If you choose to change this, you will need to verify that you have also changed this in `/etc/pw.src` if one is being used.

2. Verify that you have port 161 reserved in your TCP/IP profile:

```
PORT
161 UDP OMVS ; SNMP Agent
```
3. Verify the Started procedure `OSNMPD` is configured correctly, and started after every IPL. Before setting up the `OSNMPD` procedure, please review the "z/OS Communications Server: IP Configuration Guide" for important information about data set naming and search sequences.

Example of a working OSNMPD EXEC card:

```
//OSNMPD EXEC PGM=EZASNMPD,REGION=4096K,TIME=NOLIMIT,
// PARM=(' POSIX(ON) ALL31(ON) ',
// 'ENVAR("RESOLVER_CONFIG=/etc/resolv.conf"',
// '"OSNMPD_DATA=/etc/osnmpd.data"',
// '/-d 0')
```

4. `mibs.data`, `osnmpd.data`, `pw.src` and `snmptrap.dest` are not required for running the Domino SNMP agent. However, if you choose to use these members, they must be set up correctly. Verify that these members in `/etc` have read access for user, group, and other. (`rwxr--r--`)

If `mibs.data` and `osnmpd.data` are not currently in `/etc`, or they are back level, you can pick up the current level from TCPIP samples located in `/usr/lpp/tcpip/samples`.

Please ensure that `osnmp.conf` is not located in `/etc`. This is only for user-based security.

Trap destinations are defined in the `SNMPTRAP.DEST` dataset. You will want to configure appropriate trap destinations and community names for your remote management infrastructure.

5. If you are using `/etc/pw.src` or `/etc/snmpd.conf`, make sure they have the correct hostname and the IP address that the Domino Server is configured on. Be mindful of upper and lower case.

If you enter the following command from within Unix System Services, you will see the correct host name for your system and if it is upper or lower case:

```
hostname
```

The `pw.src` should look similar to the following:

```
HOSTNAME 9.1.2.3      255.255.255.255
public 9.1.0.0      255.255.0.0
test1 9.1.0.0      255.255.0.0
```

If you changed `SACONFIG` in the TCP/IP profile not to use public, replace `HOSTNAME` with the password used in the `SACONFIG` statement.

6. Verify that `snmptrap.dest` has the correct hostname, and that the hostname is in the correct case (upper or lower):

```
HOSTNAME UDP
```

Domino for z/OS

### MVS Jobnames

This optional feature enables you to better identify address spaces used by Domino for z/OS. You can assign unique job names to every task associated with the server by overriding the default jobname prefix (your server user ID) with a name of your choice.

The MVS Jobname consists of a prefix variable, `Notes_OS390_JOBNAME_PREFIX`, that you can set by including an export statement in the `.profile` of the owner of the `notesdata` directory.

For example: `export Notes_OS390_JOBNAME_PREFIX=MAIL1`

The MVS Jobname also consists of a suffix that is explained in the following table:

Table

server name prefix	server name suffix
Server name prefix defined in <code>Notes_OS390_JOBNAME_PREFIX =</code>  <i>Value Range</i> from 1 to 5 characters in length First character must be alphabetic Second - fifth characters can be alphanumeric	<b>If this is the main server task:</b> The suffix will be SER  <b>If this is an addin task started by the main server:</b> The suffix will be the first two characters of the name of the addin task plus a one-character suffix (1-9, A-Z) for each additional occurrence of the addin task.  <b>If this is an addin task started independently from the main server:</b> The suffix is the first three characters of the name of the addin task.

If not set, the default job name of the server user ID is used as in the past.

**Note** If a prefix is set which is not valid, an informational message is displayed on the server console.

Notes\_OS390\_JOBNAME\_PREFIX is not valid.  
It must be five characters or less, the first character must be alphabetic and the rest alphanumeric.  
Default of userid will be used for MVS Jobname

If z/OS Console Support for Domino is implemented, then the alias name assigned in the domino\_global\_env file will overwrite the Notes\_OS390\_JOBNAME\_PREFIX.

To implement MVS Jobnames, the server user ID must have read access to the BPX.JOBNAME facility class.

```
RDEFINE FACILITY BPX.JOBNAME UACC(NONE)
SETROPTS RACLIST(FACILITY) REFRESH
PERMIT BPX.JOBNAME CLASS(FACILITY) ACCESS(READ) ID(server_user_id)
SETROPTS RACLIST(FACILITY) REFRESH
RLIST FACILITY BPX.JOBNAME ALL
```

The DOMSAF sample JCL can also be used to set up this facility class.

Here is sample Display and SDSF output when

```
export Notes_OS390_JOBNAME_PREFIX=MAIL1
```

is set before starting the server:

```
D OMVS,U=SERV01
BPX0040I 13.30.00 DISPLAY OMVS 622
OMVS      000E ACTIVE          OMVS=(96)
USER      JOBNAME  ASID          PID          PPID STATE   START   CT_SECS
SERV01    MAIL1SER 0080      67109330    83886543 HS      23.54.15 2843.869
  LATCHWAITPID= 0 CMD=/usr/lpp/lotus/notes/latest/os390/server
SERV01    MAIL1RO1 005A      33554902    67109330 HS      23.58.44  770.496
  LATCHWAITPID= 0 CMD=/usr/lpp/lotus/notes/latest/os390/router
SERV01    MAIL1UP1 007C      33554903    67109330 1S      23.58.49 2138.349
  LATCHWAITPID= 0 CMD=/usr/lpp/lotus/notes/latest/os390/update
SREV01    MAIL1AM1 0060          472          474 1R      23.59.01 1365.523
  LATCHWAITPID= 0 CMD=/usr/lpp/lotus/notes/latest/os390/amgr
SERV01    MAIL1AM1 0055          474    67109330 1S      23.59.00  551.929
  LATCHWAITPID= 0 CMD=/usr/lpp/lotus/notes/latest/os390/amgr
SERV01    MAIL1AD1 0094          475    67109330 1S      23.59.06  267.719
  LATCHWAITPID= 0 CMD=/usr/lpp/lotus/notes/latest/os390/adminp
SERV01    MAIL1CO5 0084    67109538    67109330 1R      05.00.49 2780.087
  LATCHWAITPID= 0 CMD=/usr/lpp/lotus/notes/latest/os390/compac
```

---

SDSF DA

```
NP      JOBNAME      CPU% ASID  ASIDX
MAIL1AM1 0.00  85  0055
MAIL1RO1 0.00  90  005A
MAIL1AM1 3.32  96  0060
MAIL1UP1 0.37 124 007C
MAIL1SER 0.00 128 0080
MAIL1CO5 1.29 132 0084
MAIL1AD1 0.00 148 0094
```

Domino for z/OS

### SMF 108 Records (optional)

Domino for z/OS can create SMF 108 records. SMF record type 108 provides data for a Domino Server running on zSeries. The type of data reported is defined by the subtype field on the record (SMF108STP) in the standard record header.

Type 108 Subtypes:

- 1 - Server Load, reports on global activity by the server
- 2 - User activity
- 3 - Monitoring and Tuning contains some statistics and certain configuration parameters used for tuning Domino
- 6 - Provides data on Domino database activity, such as reads, writes, bytes read and written, indexing, and replication

Domino for z/OS

### Platform Statistics (optional)

Platform statistics show information about the CPU and storage usage that the Domino server drives on the LPAR. These statistics are calculated for each Domino process associated with a given server, and in aggregate form at the LPAR level. These statistics are useful on their own, but they also form a base of information that is utilized by the IBM Tivoli Analyzer for Lotus Domino for performance monitoring and tuning purposes. The IBM Tivoli Analyzer for Lotus Domino is a separate product offering from Tivoli Systems.

The platform statistics interface acquires information from z/OS via RMF Monitor I through SMF record type 79, and records this information as a collection of Domino statistics that can be used or displayed using existing Domino mechanisms. RMF monitor I is the realtime performance monitoring interface that Domino calls on an interval that is configurable through the Domino server. It is not necessary to configure SMF to collect any specific record types, since type 79 records are acquired by Domino on demand. It is necessary to have RMF and SMF installed and configured to enable these statistics.

Domino for z/OS

### Fault recovery and automatic restart (optional)

After a failure, Domino for z/OS can create an SVC dump, run NSD to collect additional Domino service information, and automatically restart the server. In addition, the Domino NSD program runs a service program called memcheck. The memcheck program formats much of Domino's memory. For example, any open databases for the failing virtual thread are reported by memcheck.

To implement the fault recovery feature, see the topic "Fault Recovery and Automatic Restart after Panic" in Chapter 3.

Domino for z/OS

### z/OS Console Support for Domino

**z/OS Console Support for Domino** is an optional feature that is included as part of the z/OS Domino server product. This console support, previously named OS/390 Console Support for Domino, is provided separately from the Domino for z/OS product. It enables you to manage Domino servers from the z/OS operator's console and to send commands from UNIX Systems Services. z/OS Console Support for Domino provides:

- The ability to manage multiple Domino partitioned servers from the same z/OS console or from a single UNIX System Services telnet or rlogin session.
- The capability to do an orderly shutdown of the Domino server from the z/OS operator's console.
- RACF protected dataset to store Domino passwords (server.id) and the ability to automatically feed them into the server's input stream at startup.
- Automated startups with secure server.id files.
- The ability to start and terminate the messages sent to the console independently of starting and stopping your Domino server.
- The ability to establish filters to limit what information is sent to the z/OS operator's console.
- An interface to automation systems that can start, stop, or send commands to the server in response to error situations.

- Synchronized zSeries resource utilization - signal the Domino server to start replications at the completion of the batch processing (may be variable on end-of-month/week).
- The ability to support servers operating in different locales in the same LPAR.
- A non-intrusive tool for your Domino servers. The z/OS Console Support for Domino does not require changes to the basic server configuration. You can still start and run the server from a telnet or rlogin session if desired.
- Use of Domino 6 Fault Recovery option may be used with z/OS Console Support for Domino

The manual *z/OS Console Support Guide for Domino* describes how to install and use the console support. It is available in a variety of formats and locations:

- Notes Database Format (domcnsl.nsf) on the install CD-ROM's root directory and downloadable over the Internet.
- Adobe Portable Document Format (domcnsl.pdf) on the install CD-ROM's root directory and downloadable over the Internet.
- Viewed with a Web browser over the Internet.

For all of the above, see: <http://www.lotus.com/ldd/notesua.nsf?OpenDatabase>

Domino for z/OS

### Domino HTTP DSAPI filter for host authentication

Host authentication to Domino's HTTP server task is supported via DSAPI filter. When this optional Domino configuration is in effect, any credentials (name and password, or X.509 certificate) supplied on an authentication challenge will be checked by host authentication services (RACF). This applies to any browser client connecting to Domino's HTTP server task.

#### Setup

Enabling host authentication consists of 4 parts:

- Setting up a program-controlled environment for the DSAPI filter
- Setting up access to host authentication services
- Setting up host user ID <-> Domino user name bindings
- Configuring the Domino Server document

These may be done in any order.

#### Setting up a program-controlled environment for the DSAPI filter

We include sample JCLs that perform all of the required and optional RACF commands for installing this product. Please see the JCL DOMSAF sample for instructions on its use. Use the RACF Special Attribute to run this JCL. Please read the instructions in the JCL very carefully if you choose to use it.

The Domino HTTP DSAPI filter for host authentication requires z/OS UNIX security. The following steps presume that z/OS UNIX-level security is already implemented, and that the BPX.DAEMON class is already defined. If this is the first time you will be using BPX.DAEMON, refer to *z/OS UNIX System Services Planning, GA22-7800*; this publication describes how to implement z/OS UNIX-level security. The DOMSAF sample JCL has some of the required RACF commands for setting up the BPX.DAEMON facility class.

The user ID to be used for setting up the Domino HTTP DSAPI filter for host authentication **must** be UID 0, and have read access to the BPX.FILEATTR.PROGCTL facility class. This is required so the installer can set the HFS executables' extended attributes to "program-controlled". The ID may be an install id, or another UID 0. Use the name of the appropriate ID in place of the install\_id designator in the commands below.

```
RDEFINE FACILITY BPX.FILEATTR.PROGCTL UACC(NONE)
SETROPTS RACLIST(FACILITY) REFRESH
PERMIT BPX.FILEATTR.PROGCTL CLASS(FACILITY) ACCESS(READ) ID(install_id)
SETROPTS RACLIST(FACILITY) REFRESH
```

The host authentication services which the DSAPI filter must invoke require a program-controlled environment. This requires that certain system datasets and also certain HFS-resident programs be marked as program controlled.

The following set of MVS datasets must be marked as program-controlled.:

- SYS1.LINKLIB
- SYS1.CSSLIB
- CBC.SCLBDLL
- CBC.SCBCCMP
- CEE.SCEERUN
- CEE.SCEERUN2
- SYS1.LINKLIB
- TCPIP.SEZALINK

**Example:**

```

SETROPTS WHEN(PROGRAM)
RDEFINE PROGRAM * ADDMEM('SYS1.LINKLIB'/'*****'/NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM('SYS1.CSSLIB'/'*****'/NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM('CEE.SCEERUN'/'*****'/NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM('CEE.SCEERUN2'/'*****'/NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM('CBC.SCLBDLL'/'*****'/NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM('CBC.SCBCCMP'/'*****'/NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM('TCPIP.SEZALINK'/'*****'/NOPADCHK) UACC(READ)
SETROPTS WHEN(PROGRAM) REFRESH
RLIST PROGRAM * ALL

```

The Domino executables need to be marked as program-controlled. Mark the executables as program controlled by issuing the following extattr command. Note that this will need to be done every time you upgrade the server code since the installation will reset these settings. Substitute the actual program library name for the target code version (for example, /usr/lpp/lotus) for the designation *program\_library* in the commands below.

- **cd /program\_library/notes/latest/os390**
- **extattr +p \***
- **ls -E \*** (to verify extended attribute is set)
- **cd /program\_library/notes/latest/os390/jvm/bin**
- **extattr +p \***
- **ls -E \*** (to verify extended attribute is set)
- **cd /program\_library/notes/latest/os390/jvm/bin/classic**
- **extattr +p \*.so**
- **ls -E \*.so** (to verify extended attribute is set)

The UNIX services ID you are using must be permitted to BPX.FILEATTR.PROGCTL facility class.

All programs loaded into an address space that requires daemon authority must be defined to program control. If a program that is not a controlled program is loaded, the address space is marked dirty and cannot perform daemon activities. Use information from system messages to identify and resolve the source of the program controlled problem.

**Setting up access to host authentication services**

The process under which the DSAPI filter runs must have read access to the IRR.RUSERMAP Facility class (RACF) profiles. This process will run with the same host user ID as that of the owning server user ID.

In this example, with an owning server user ID of "DOMINO", the appropriate (RACF) administrative commands would be:

```

PERMIT BPX.DAEMON CLASS(FACILITY) ID(DOMINO) ACCESS(READ)
RDEFINE FACILITY IRR.RUSERMAP UACC(NONE)
PERMIT IRR.RUSERMAP CLASS(FACILITY) ID(DOMINO) ACCESS(READ)
SETROPTS RACLIST(FACILITY) REFRESH

```

### Setting up host user ID <-> Domino user name bindings

Access control decisions made by Domino are based on the distinguished name of a user. So while the user ID specified by the browser client is authenticated by the host, it must be bound to a Domino distinguished name in order to have meaning.

This binding is accomplished using the LNOTES segment of the host user ID's (RACF) User Profile. The SNAME field of that profile segment must be set to specify the user's Domino shortname; the Domino distinguished name is inferred from this.

#### Notes:

- If the browser client specifies a user ID which is not known to host authentication services, then host authentication will not be applied, and normal Domino authentication will proceed with the supplied credential.

This may come, for example, from a direct client connection, or be proxied from a front-end such as the IBM HTTP Server, which has not been configured to pre-authenticate the client. This would be the case if the IBM HTTP Server's httpd.conf file specifies the directive:

```
Userid PUBLIC
```

- If the browser client specifies a user ID which is known to host authentication services, but which is not bound to a Domino shortname, then the user ID will be treated as if bound to the distinguished name "Anonymous".

This may come, for example, from a front-end such as the IBM HTTP Server which has been configured to pre-authenticate the client. This would be the case if the IBM HTTP Server's httpd.conf file specifies the directive:

```
Userid %CLIENT%
```

The appropriate (RACF) administrative commands for this are:

```
ADDUSER newuser LNOTES( SNAME( 'newshortname' ) )
ALTUSER olduser LNOTES( SNAME( 'oldshortname' ) )
```

### Configuring the Domino Server document

Open the appropriate Server document in the Domino Name and Address Book.

In the DSAPI section of the Internet Protocols => HTTP tab, enter the name of the DSAPI filter ("libhauth.so") in the DSAPI filter file names field (if this field is non-empty, prepend the name).

Additionally, the following lines may be added to the notes.ini file:

- HTTPHostIdMapping=1

If pre-authenticated client credentials are known to be accompanying requests forwarded by a proxy (such as the IBM HTTP Server when the %CLIENT% directive is configured), this will cause requests which (being already authenticated) would not pass thru the DSAPI interface to still pass thru libhauth.so, such that the host userid in the client credential is still mapped to their corresponding Domino name. Remove or comment out this line in notes.ini if you decide to disable this feature.

- HTTPTraceHostAuthentication=1

If trace messages generated by libhauth.so are desired, these messages will appear in the ebcdic-format file libhauth.trace. This trace file will not externalize any password in any format, but will record each incoming host userid and the resulting mapped (Domino) name, or the reason why no mapped name was produced.

Domino for z/OS

### WebSphere plug-in for Domino connectivity (optional)

Domino 7 for z/OS now supplies a general-purpose plug-in, WebSphere HTTP Plug-in for z/OS, which can be used for IBM HTTP Server to pass selected URL requests to remote application servers, such as Domino. This plug-in passes to Domino any URL requests from browser clients which include the file extension .nsf (indicating a request for data in a Domino database), while allowing the IBM HTTP Server to process all other requests (HTML files, CGI scripts, etc.).

Version 5.3 IBM HTTP Server for z/OS should be used for this plug-in.

#### Note

The same plug-in code can also be found in WAS 6.0.1 for zOS. By default the plugin will be located at /usr/lpp/zWebSphere/V6Rx/bin/ihs390WAS60Plugin\_http.so (where V6Rx is the WAS Release).

### Configuration Steps

Configuration of the WebSphere plug-in may be thought of as a four-step process.

1. Copy the WebSphere HTTP Plug-in for z/OS file, ihs390WAS60Plugin\_http.so, to any path where it can be accessed later, e.g., /usr/lpp/lotus/notes/latest/os390. The file will be under plugins/WAS6/zOS on the installation CD.
2. Directives must be placed in the IBM HTTP Server's httpd.conf file. Directives of this kind are needed to do the following:
  - Inform the IBM HTTP Server of such plug-in information as its location, initialization and termination routine names.
  - Define the set of URLs that the IBM HTTP Server passes to the plug-in.

These directives are:

ServerInit		<plugin path>:init_exit	<plugin config file path>
ServerTerm		<plugin path>:term_exit	
Service	/*.nsf*	<plugin path>:service_exit	
Service	/icons/*	<plugin path>:service_exit	
Service	/domjava/*	<plugin path>:service_exit	
Service	/domino/java/*	<plugin path>:service_exit	

where:

<plugin path> is the absolute path within the HFS where the WebSphere HTTP plug-in, ihs390WAS60Plugin\_http.so in the previous step, resides (for example, /usr/lpp/lotus/notes/latest/os390/ihs390WAS60Plugin\_http.so)

<plugin config file path> is the absolute path within the HFS where the WebSphere plug-in (XML) configuration file resides (for example, /usr/lpp/WebSphere/WebServerPlugin/config/plugin\_config.xml)

The WebSphere HTTP plug-in for z/OS must be marked within the HFS as program-controlled. Do this with the `extattr` command.

```
cd <directory where ihs390WASPlugin_http.so resides>
chmod 777 ihs390WAS60Plugin_http.so
extattr +p ihs390WAS60Plugin_http.so
```

The UNIX services ID you are using must be permitted to BPX.FILEATTR.PROGCTL facility class.

- The second phase of configuration for the WebSphere plug-in is the creation of an XML file that specifies which remote application servers are to receive which requests, on which port(s), and by which protocol (http/https). The XML file is in ASCII format.

**Note:** Due to a change in the WebSphere Application Server Version 6.0.1 plug-in, the plug-in configuration file is now in ASCII format (ISO-98859-1). You may need to use the `iconv` command to convert the plug-in configuration file from EBCDIC format to ASCII format if you have installed previous Domino 6 releases. For more information, see [http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.websphere.express.doc/info/xp/ae/rwsv\\_plugincfg.html](http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.websphere.express.doc/info/xp/ae/rwsv_plugincfg.html)

This XML must adhere to the syntax defined by WebSphere for plug-in configuration files. See the WebSphere InfoCenter for information on the use of plug-ins with WebSphere. See the WebSphere Studio Application Developer Programming Guide (<http://publib-b.boulder.ibm.com/Redbooks.nsf/RedbookAbstracts/sg246585.html?Open>) for a description of the syntax of this file.

Here is an example of what a typical plug-in configuration file might look like:

```
<?xml version="1.0"?>
  <Config>
    <!-- The LogLevel controls the amount of information that gets written to
         the plug-in log file. Possible values are Error, Warn, and Trace. -->
    <Log LogLevel="Warn" Name="/trace/plugin.trace"/>

    <!-- Server groups provide a mechanism of grouping servers together. -->
    <ServerGroup Name="default_group">
      <Server Name="default_server">
        <!-- The transport defines the hostname and port value that the web server
             plug-in will use to communicate with the application server. -->
        <Transport Hostname="myserver.com" Port="8080" Protocol="http"/>
      </Server>
    </ServerGroup>

    <!-- Virtual host groups provide a mechanism of grouping virtual hosts together. -->
    <VirtualHostGroup Name="default_host">
      <VirtualHost Name="*:*"/>
    </VirtualHostGroup>

    <!-- URI groups provide a mechanism of grouping URIs together. Only
         the context root of a web application needs to be specified unless
         you want to restrict the request URIs that get passed to the application
         server. -->
    <UriGroup Name="default_host_URIs">
      <Uri Name="/*.nsf*"/>
      <Uri Name="/icons/*"/>
      <Uri Name="/domjava/*"/>
      <Uri Name="/domino/java/*"/>
    </UriGroup>

    <!-- A route ties together each of the above components. -->
    <Route ServerGroup="default_group" UriGroup="default_host_URIs" VirtualHostGroup="default_host"/>
  </Config>
```

- The third phase of configuration is done on the Domino server side. The notes.ini file of the Domino server which is to handle the proxied requests must be modified. Verify that the following:

```
HTTPEnableConnectorHeaders=1
```

is in notes.ini to enable requests from the plug-in to be accepted and processed. Change or remove this setting if for any reason you wish to disallow such requests (the plug-in will consistently receive rc = 400 responses in this case).

Also, settings in the Server document of the Domino Name and Address book which pertain to HTTP persistent connections should also be scrutinized for performance considerations.

Domino for z/OS

### Domino SNMP agent (optional)

The Domino SNMP agent enhances the monitoring and control features of Domino by enabling third-party management stations, which use industry standard SNMP, to manage aspects of the Domino server. It consists of:

- LNSNMP -- An independent application that receives trap notifications from the Event Interceptor and then sends them to the management station using the platform-specific, master SNMP Agent. LNSNMP also handles requests for Domino-related information from the management station by passing the request to the QuerySet Handler and responding back to the management station. LNSNMP includes the:
  - Recent Trap Table -- A dynamic table stored in LNSNMP containing the last ten trap notifications sent from the Event Interceptor.
  - Trap Generator -- Part of the Domino SNMP Agent that receives Domino events from the Event Interceptor and sends them to the management station using the master SNMP Agent.
- QuerySet Handler -- An add-in task that queries server statistics information and sets the value of configurable Domino-based parameters. The QuerySet Handler returns Domino statistics information to LNSNMP, which then forwards the information to the management station using the platform-specific, master SNMP Agent.
- Event Interceptor -- An add-in task that responds to the SNMP Trap notification for Domino Event Handlers by instructing the Trap Generator to issue a trap.

### The Domino SNMP agent's main functions

The agent provides:

- Out-of-band server status through the MIB
- Control of a Domino server through SNMP
- Real-time alerts on server status
- Forwarding of Domino events as SNMP traps
- Domino statistics through the MIB

To implement the Domino SNMP agent, verify that you have SNMP configured correctly by reviewing "Configuring TCP/IP" in Chapter 1 and "Running the Domino SNMP agent" in Chapter 3 of this Installation Guide.

Domino for z/OS

### Setting parameters for z/OS and UNIX System Services

Use the following tables to set z/OS parameters to the recommended values for these members of SYS1.PARMLIB:

- IEASYSxx
- BPXPRMxx
- IVTPRMxx
- LNKLSTxx or PROGxx
- COMMNDxx
- SMFPRMxx

### Important Notes

1. BPXPRMxx parameters IPCSHMSPAGES, IPCSHMMPAGES, and MAXSHAREPAGES control the amount of shared memory pages used. These parameters interact with the setting of the Notes\_SHARED\_DPOOLSIZ environment variable.
2. If you use the SETOMVS command to set parameters, those parameters remain at that value only until the next IPL. To set a parameter permanently, update the BPXPRMxx member used during IPL or have the SET command run after each IPL. You can do this by putting it in as a command in COMMNDxx PARMLIB member. Some changes may not become effective until an IPL is done. Read the appropriate z/OS publication to verify which parameters require an IPL.

**To verify you have the correct settings, enter the following from the z/OS Console: D OMVS,0  
This displays the active BPXPRM parameters on which you are currently running.**

3. For more information, see:
  - *z/OS MVS Initialization and Tuning Reference*, SA22-7592
  - *z/OS Planning for Installation*, GA22-7504
  - *z/OS UNIX System Services Planning*, GA22-7800

**IEASYSxx**

It is extremely important that ESQA and ECSA settings be kept to a minimum to provide maximum extended private space in all Domino address spaces. A good general starting point for Domino is to set ECSA to 120MB and set ESQA in the range of 65 MB to 100 MB. For optimal Domino performance, keep these values to a minimum.

For each Domino server at a different maintenance release, plan for an additional 10 megabytes of ESQA. Both Domino memory mapped files and user shared library (SHRLIBMAXPAGES) consume ESQA storage.

We recommend you monitor the ECSA and ESQA size before and after you have installed the latest level of the Domino code for any additional tuning. Based on your own configuration, you will probably have to tune this value for your own environment. As with all other applications that run on z/OS, you should monitor your CSA, ECSA, SQA, and ESQA usage on a regular basis. You can do this by reviewing your RMF reports.

See the *z/OS MVS Initialization and Tuning Reference*, SA22-7592, for additional information on the CSA and SQA parameters in your SYS1.PARMLIB IEASYS member.

**BPXPRMxx**

This parmlib member defines your z/OS UNIX environment:

PARAMETER	DEFINITION
AUTOCVT	<p><b>PURPOSE</b> On z/OS V1R2 and higher, AUTOCVT enables automatic conversion of data between code sets (EBCDIC and ASCII). Files are tagged for automatic conversion using UNIX System Services chtag command and other UNIX System Services APIs that support file tagging. AUTOCVT enables automatic conversion for the entire system. By using the AUTOCVT statement in BPXPRMxx every tagged file becomes subject to conversion by any program that reads from or writes to those tagged files.</p> <p><b>REQUIRED SETTING</b> OFF or default to OFF.</p> <p><b>Notes:</b> Domino server will fail to run in an LPAR where AUTOCVT(YES) is specified.</p>
FORKCOPY	<p><b>PURPOSE</b> Specifies how user storage is copied between processes. This parameter affects the use of additional ESQA.</p> <p><b>REQUIRED SETTING</b> COPY (on ALL systems)</p>
IPCSEMNIDS	<p><b>PURPOSE</b> Specifies the maximum number of semaphore sets in the system.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 20000</p>
IPCSEMNOPS	<p><b>PURPOSE</b> Specifies the maximum number of operations for each semaphore operation call.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 32767</p>
IPCSHMMPAGES	<p><b>PURPOSE</b> Specifies the maximum number of pages for a shared memory segment. This parameter affects DPOOLSIZE.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 25600</p>
IPCSHMNIDS	<p><b>PURPOSE</b> Specifies the maximum number of unique shared memory segments in the system.</p> <p><b>RECOMMENDED SETTING</b> IPCSHMNIDS = 250 multiplied by the number of Domino servers (DPARs) running in the LPAR</p>

PARAMETER	DEFINITION
IPCSHMNSEGS	<p><b>PURPOSE</b> Specifies the maximum number of shared memory segments attached for each address space.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 1000</p>
IPCSHMSPAGES	<p><b>PURPOSE</b> Specifies the maximum number of pages for shared memory segments in the system.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 2621440</p>
MAXPROCUSER	<p><b>PURPOSE</b> Specifies the maximum number of processes that a single z/OS UNIX user ID can have concurrently active.</p> <p><b>RECOMMENDED SETTING</b> Minimum value of 50. Larger values are also acceptable and may be required depending on how many users log onto the server user ID.</p>
MAXASSIZE	<p><b>PURPOSE</b> Specifies the address space region size.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 2147483647</p>
MAXCPU TIME	<p><b>PURPOSE</b> Specifies the CPU time that a process is allowed to use, in seconds.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 2147483647</p>
MAXFILEPROC	<p><b>PURPOSE</b> Specifies the maximum number of files that a single process is allowed to have concurrently active or open.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 65535</p>
MAXMMAPAREA	<p><b>PURPOSE</b> Specifies the maximum amount of system wide data space storage that is allocated for memory mapping of files (in 4096 byte pages). Storage is not allocated until memory mapping is active.</p> <p><b>REQUIRED SETTING</b> 33000</p> <p>The value 33000 pages is equivalent to 129 Megabytes.</p> <p><b>Notes</b> System ESQA is not affected by Domino's memory mapped files. Domino takes advantage of __MAP_MEGA option on large memory mapped files to avoid system ESQA usage.</p>
MAXQUEUEDSIGS	<p><b>PURPOSE</b> Specifies the maximum number of queued signals, which are used by Domino whenever asynchronous I/O read/write to a client session completes.</p> <p><b>REQUIRED SETTING</b> 100000</p>

PARAMETER	DEFINITION
MAXSHAREPAGES	<p><b>PURPOSE</b> Specifies the maximum number of shared storage pages that can be concurrently in use by z/OS UNIX functions. This parameter can be used to control the amount of ESQA consumed.</p> <p><b>RECOMMENDED SETTING</b> Maximum value 32768000</p>
MAXTHREADS	<p><b>PURPOSE</b> Specifies the maximum number of threads that a single process can have currently active.</p> <p><b>RECOMMENDED SETTING</b> 1000</p>
MAXTHREADTASKS	<p><b>PURPOSE</b> Specifies the maximum number of MVS tasks that a single process may have concurrently active.</p> <p><b>RECOMMENDED SETTING</b> 1000</p>
NETWORK	<p><b>PURPOSE</b> Identifies information needed by the socket physical file system.</p> <p><b>RECOMMENDED SETTING</b></p> <ul style="list-style-type: none"> <li>• DOMAINNAME(AF_UNIX) MAXSOCKETS -- 10000</li> <li>• DOMAINNAME(AF_INET) MAXSOCKETS -- 35000</li> </ul> <p>Note that you need only modify the "active" AF_INET value.</p>
SHRLIBRGNSIZE	<p><b>PURPOSE</b> Identifies maximum amount of system shared library space for all address spaces that use system shared libraries. It is important that this setting provide enough room for Domino's libnotes DLL to be loaded.</p> <p><b>RECOMMENDED SETTING</b> SHRLIBRGNSIZE = 50000000 multiplied by each Domino program directory.</p> <p><b>Important:</b> If running multiple Domino partitioned servers with different Domino program directories in the LPAR, then set to 50000000 (fifty million) times the number of Domino program directories. If running a single Domino partitioned server or multiple partitioned servers with the same program directory release level, then set to 50000000.</p> <p>It should be noted that a larger SHRLIBRGNSIZE consumes more virtual storage and real storage for each partitioned server. Therefore, it's best not to create different program directories unless you are installing Domino servers at different release levels.</p>
SHRLIBMAXPAGES	<p><b>PURPOSE</b> Identifies maximum amount of system shared library space for all address spaces that contain user shared libraries.</p> <p><b>RECOMMENDED SETTING</b> SHRLIBMAXPAGES = 4096 pages for Domino's DLLs ending in ".so "</p> <p>It is recommended that you ignore the following message to maximize the number of virtual addresses and Domino performance: BPXI039I SYSTEM LIMIT SHRLIBMAXPAGES HAS REACHED 90% OF ITS CURRENT CAPACITY OF nnnnn</p>

PARAMETER	DEFINITION
SYSPLEX	<p><b>PURPOSE</b>                      Specifies whether a system should join the SYSBPX XCF group to share HFS resources across the sysplex.                      If SYSPLEX(NO) is specified, the system does not participate in shared HFS.</p> <p>For more information on shared HFS, see "Shared HFS in a Sysplex" in <i>z/OS UNIX System Services Planning</i>, GA22-7800. IBM recommends that you review this chapter before using any shared HFS specific parameters. If you plan on using SYSPLEX(YES), it is imperative that you read the notes that follow in order to avoid unscheduled Domino server outages.</p> <p><b>RECOMMENDED SETTING</b>                      NO or default to no</p> <p><b>Notes:</b>                      Domino servers do not take advantage of the shared HFS functions, although there may be other advantages to enabling shared HFS on the LPARs that support your Domino servers. If you decide to enable shared HFS on an LPAR that is home to a Domino server, be aware that outages of other LPARs in the Sysplex can cause your Domino server to terminate.</p> <p>One of the basic services provided by a file system is a locking mechanism, which is used to serialize access to files, and protect data integrity. The Byte Range Lock Manager (BRLM) is the locking mechanism for the z/OS file system. In order to provide serialized access to files in a shared HFS environment, the current implementation of the BRLM will choose one of the shared HFS LPARs within the Sysplex as its home. If this home LPAR experiences a scheduled or unscheduled outage, the BRLM will automatically re-establish itself on one of the other LPARs in the Sysplex that are shared HFS enabled. However, the integrity of all byte range locks that are held across all processes running on LPARs with shared HFS enabled at the time the BRLM went down will be lost. As a result, any product or application that is holding a byte range lock at the time of the BRLM outage must not perform any subsequent file I/O to a locked file or risk compromising the integrity of the data in that file. The z/OS file system automatically prevents such I/O by processes that hold a compromised lock in two ways: by simply failing all subsequent I/O requests, and by terminating these processes on all LPARs in the Sysplex that have shared HFS enabled.</p> <p>Domino acquires byte range locks on assorted files that it uses in the course of its operation. As a result, the Domino server is exposed to unintended termination by the BRLM if the LPAR on which it is running has shared HFS enabled, and the home LPAR for the BRLM has an outage. The most likely cause of this scenario is when periodic scheduled maintenance is performed on the BRLM home LPAR, and an IPL is required. Such an IPL on the home BRLM LPAR will result in the termination of Domino servers on all other LPARs in the Sysplex that have shared HFS enabled. In order to prevent this from happening, you must shut down all of your Domino server partitions running on any LPAR with shared HFS enabled before IPLing the BRLM home LPAR. The MVS console command <b>DISPLAY OMVS,O</b> may be used to display the name of the home BRLM LPAR.</p> <p>When making use of shared HFS, understand that the actions taken on one LPAR are likely to affect the operation of products on other LPARs within the Sysplex. You need to take extra care to plan your administrative actions with a global perspective in this kind of a shared environment.</p>

**IVTPRMxx**

The recommended values for this member are:  
 FIXED MAX(120M)  
 ECSA MAX(30M)

**LPALSTxx**

*high-level-qualifier*.SEZALPA should be placed in LPALSTx · For TCP/IP

*high-level-qualifier*.SCEELPA should be placed in LPALSTxx · For LE

**LNKLSTxx or PROGxx**

*high-level-qualifier*.SCLBDLL should be placed in LNKLSTXX or PROGxx.

*high-level-qualifier*.SCEERUN2 should be placed in LNKLSTXX or PROGxx.

Optional for Platform Statistics

SYS1.SERBLINK should be placed in LNKLSTxx or PROGxx

**COMMNDxx (Set Dynamic LPA for XPLINK LE-RTL)**

Ensure high-level-qualifier.SCEERUN2 is cataloged and available on your driving System.

From your z/OS Console or SDSF enter the following command:

```
SETPROG LPA ADD,DSN=high-level-qualifier.SCEERUN2,MOD=(CELHV003,CELHDCPP,SCEECPP)
```

Verify successful execution.

Enter the following in your COMMNDxx SYS1.PARMLIB member so this will be set after every IPL

```
COM='SETPROG LPA ADD,DSN=high-level-qualifier.SCEERUN2,MOD=(CELHV003,CELHDCPP,SCEECPP)'
```

**SMFPRMxx (Optional)**

Domino for z/OS can create SMF 108 records. SMF record type 108 provides data for a Domino Server running on zSeries. The type of data reported is defined by the subtype field on the record (SMF108STP) in the standard record header. For more information, see *SMF 108 records*.

To enable this:

- Include SYS(TYPE(108) ) in the SMFPRMxx Parmlib member.
- z/OS Security Server (RACF) users must define the user ID of the server to have at least READ access to the BPX.SMF FACILITY class.

We also recommend collecting the following Record Types on a regular basis

- 30 · Common Address Space Work
- 42 · DFSMS Statistics and Configuration
- 72 · RMF Workload Activity and Storage Data
- 73 · RMF Channel Path Activity
- 74 · RMF Activity of Several Resources
- 75 · RMF Page Data Set Activity
- 76 · RMF Trace Activity
- 77 · RMF Enqueue Activity
- 78 · RMF Virtual Storage and I/O Queuing Activity

For additional information, see the *z/OS Resource Measurement Facility (RMF) Report Analysis (SC33-7991)* and the *z/OS Resource Measurement Facility User's Guide (SC33-7990)*.

Domino for z/OS

**RACF**

Domino for z/OS contains sample JCL that performs all of the required and optional RACF commands for installing the product. Please see the JCL DOMSAF sample for instructions on its use.

For detailed information on the RACF requirements, see the topic "Preparing to run the install" in chapter 2.

Domino for z/OS

## Hardware Cryptography (optional)

### Hardware Setup

To use Hardware Cryptography (System SSL) with Domino, you must have a PCI Cryptographic Coprocessor and/or a PCI Cryptographic Accelerator card installed and configured.

For an overview of ICSF please see z/OS ICSF Overview Manual Number SA22-7519.

For installation and configuration information, refer to z/OS ICSF System Programmer's Guide, Manual Number SA22-7520.

### Domino Setup

The following text describes how to setup and use hardware cryptography (System SSL) with Domino on z/OS once your Domino server is installed

### GSKKYMAN Utility

First run the z/OS gskkyman utility to create your z/OS key file and stash file. A z/OS gskkyman key file and stash file are required in order to take advantage of System SSL. In order to create the stash file you must choose the store password option in gskkyman. Once these are created you can place them in the directory of your choice (notesdata for example). If you do not place these files in your notesdata directory, then you must specify the full path when defining the notes.ini variables for the key file and stash file (See the "Notes.INI Variables" section below for more information. If you create a self signed certificate, then you must create an end certificate (not a CA certificate). In addition, make sure that a default key is defined when creating your certificate. Additional information on gskkyman can be found in [System SSL Programming SC24-5901](#) for the z/OS release that is currently being used to run gskkyman.

### Notes.ini Variables

The following are the notes.ini variables that can be set for using System SSL. The variables that have 'Y' under the "REQ?" column indicate that it is a variable that must be set in order to use System SSL.

NOTES.INI VARIABLE NAME	REQ?	DESCRIPTION
SYSTEM_SSL_HTTP=1	Y	Tells Domino to use the System SSL API instead of SSLPlus for HTTP
SYSTEM_SSL_KEYFILE=key.kdb	Y	The z/OS key file to be used (created by gskkyman). If an absolute path is not specified, notesdata is assumed
SYSTEM_SSL_STASHFILE=key.sth	Y	The z/OS stash file to be used (created by gskkyman). If an absolute path is not specified, notesdata is assumed
SYSTEM_SSL_CACHE=512	N	The maximum number of session ID elements that can be stored in the SSL V3.0 cache. The range is 0-64000 entries. An entry number of 0 will cause a full SSL handshake to be done for each connection. The Default is 512.
SYSTEM_SSL_TIMEOUT=30000	N	The number of seconds until the SSL V3.0 session identifier expires. The range is 0-86400 (1 day) seconds. System SSL will remember SSL V3.0 session identifiers for up to this amount of time. By remembering these SSL V3.0 session identifiers, the amount of data exchanged during the SSL handshake can be reduced for peer applications where a complete initial handshake has already been performed. The default is 30000 seconds (8 hours)

### Domino SSL Setup

Now you can setup SSL on the Domino server just as you normally would. Follow the instructions in the Domino Help database, there is nothing specific to System SSL that you need to do. Once you setup SSL on Domino, you should have a Domino key file and stash file.

**IMPORTANT NOTE:** The Domino key and stash SSL files are different from the z/OS key and stash files created with gskkyman and must be placed in the notesdata directory. Whenever Domino asks for a key file or stash file name, always provide the Domino key or stash file names and not the z/OS gskkyman key or stash file names.

You may want to merge your Domino certificate into your z/OS key file. This can be useful if you use certificate authentication. Users that have personal certificates created by Domino won't be able to authenticate with HTTP using System SSL unless you merge your Domino certificate into the gskkyman key file. To do this, follow these steps:

Step 1: Load HTTP on the server and open certreq.nsf through your web browser

Step 2: Click "Accept This Authority In Your Browser"

Step 3: For IE 6 go to Tools -> Internet Options -> Contents Tab and click "Certificates"

Step 4: Go to "Trusted Root Certification Authorities" and find the Domino Certificate

Step 5: Choose "Export" and begin the wizard.

Step 6: For "Export File Format" choose 'Base 64 Encoded X.509'

Step 7: Enter the file name with a .arm extension and then click "Ok" then "Finish"

Step 8: You should now have a .arm file, similar to the example below:

```
----- BEGIN CERTIFICATE -----
MiMFdfthUBBsJFidnUMVaJFEfweDVMLA3ppFDSVnopIeInkdh2hgDSd0mINo7IFf
fjfQUrrEI0vnmXCIVuyvJpD+iS1jaVAjIMQWIVDSofNHvvNHdi7BvjMhIUVDhsui
APBgEw1UEBhMCVVMxETxQb3VnL+AkGAgTCE51dyBZb3JrMRUwEwNVBAaJEYDVQqH
UECxeLv1sX1iVEsH1c3QEMABGxaGt1XBzaWxDdAIzMSBgFRaAD1CTTA1EDA0BgNV
TwHhcBDxSySsL1iS+c001Q10TAWjHVzDMMzXTDT5hMcMUMxMBqMqkVbwTBAMNM
CQDFBdIFDnVEwVDInvi+MZifdonVQGRMBG+1HYTcmiNs4fAtTcsxFTATBgNVBAcT
cAoGA1UEChMa1EeMEDDSJwYdGVzdDZvMzkwDEQMA4GA1UEAxMHHNpZTEqQLEwhMM
BA0zpcASIWdQY5wE+10vEXspRs4ggEPADgCHoUCMNzMPfLYJoIhvcNAAQoCguTD
Sn3edBaC52pCtXRAiSeQrJe9sDys3+zJgd4YDd92bLc+UUnEeD9mDRe4s3rVeRSD
wghwe6H6GcHapSu1W3EZHHNUnaXbnqB4Ag5TDIh17ZuLNxSbzNkk+qm1pdV1yCMS
----- END CERTIFICATE -----
```

Step 9: Transfer your .arm file to your z/OS system as a TEXT file

Step 10: Run gskkyman and select "Store a CA certificate"

Step 11: Enter your .arm file name to import the certificate

The Domino certificate should now be merged into your gskkyman key file. Users that have personal certificates created by that Domino trusted root certificate will now be able to authenticate with HTTP using System SSL.

Now you can enable SSL for the individual protocols you desire through the server document. Note that System SSL can only be used for the HTTP protocol. If SSL is already enabled on your server, you can skip this step.

**Notes****The System SSL API does not support the thread pool model**

System SSL can only be enabled for HTTP. Therefore, all other internet protocols (such as POP3, IMAP) will use the software SSL library, SSLPlus, as they always have.

**The System SSL API has limited CRL support**

Domino has its own CRL storage process and since System SSL only supports Tivoli PKI Trust Authority, CRLs cannot be used at this time.

**System SSL and SSLPlus only support SSL V3**

SSLPlus (the current SSL package) only supports V3 on z/OS for Domino 6 and 7. Likewise, System SSL only uses the SSL V3 protocol.



## Chapter 2 - Installing and setting up Domino for z/OS

Domino for z/OS

### A description of the files on the CD

You will find the following files on the root of CD 1:

File Name	Information
ALOHFS	Sample JCL <ul style="list-style-type: none"> <li>● Allocate product, mail, and data HFS datasets.</li> <li>● Create mount points in the HFS.</li> <li>● Perform temporary mounts.</li> </ul> You must run this job from a user ID with SUPERUSER authority, UID 0.
ALOCZFS	Sample JCL <ul style="list-style-type: none"> <li>● Allocate product, mail, and data zFS datasets.</li> <li>● Format product, mail and data zFS datasets</li> <li>● Create mount points in the HFS.</li> <li>● Perform temporary mounts.</li> </ul> You must run this job from a user ID with SUPERUSER authority, UID 0.
DOMCNLS.NSF	z/OS Console Support for Domino documentation. Notes Release 6 or above is required to view the nsf file on this CD.
DOMINC	Sample JCL Contains a JCL Procedure for z/OS Console Support for Domino. Please see the <i>z/OS Console Support for Domino Guide</i> for a description.
DOMINK	Sample JCL Contains a JCL Procedure for z/OS Console Support for Domino. Please see the <i>z/OS Console Support for Domino Guide</i> for a description.
DOMINM	Sample JCL Contains a JCL Procedure for z/OS Console Support for Domino. Please see the <i>z/OS Console Support for Domino Guide</i> for a description.
DOMINS	Sample JCL Contains a JCL Procedure for z/OS Console Support for Domino. Please see the <i>z/OS Console Support for Domino Guide</i> for a description.
DOMSAF	Sample JCL Contains the RACF commands needed for the setup of the Domino 7 for z/OS in conjunction with the z/OS Console Support for Domino and the Domino for IBM HTTP Server. You must have RACF special attribute set to run this JCL.
INSTALL	Install program
INSTALL.DAT	Information needed by Install program
LICENSE.TXT	License file for the Domino Server. This is an ASCII (DOS) formatted file.
LICENSE_ZOS.PDF	License Program Specifications for Domino 7 for z/OS. Viewable using Adobe Acrobat.
MDFYBPXP	Sample JCL MOUNT statements for the Domino HFS datasets, used to update the installation's SYS1.PARMLIB(BPXPRMxx).
README.TXT	Contains late-breaking updates to the documentation and information pertinent to this release. This is an ASCII (DOS) formatted file.
README.NSF	Contains the <i>Domino 7 Release Notes</i> . Notes Release 6 or above is required to view the .NSF file on this CD.
START.TXT	Contains tips on getting started with online information. This is an ASCII (DOS) formatted file.
ZOS70OCLIENT.TAR	Client code for Domino Java Setup to be put on your workstation.
ZOSINST.NSF	Contains the <i>Domino 7 for z/OS Install Guide</i> . Notes Release 6 or above is required to view the .NSF file on this CD.
ZOS.TAZ.AA	Contains the Domino 7 for z/OS product image.
ZOS.TAZ.AA.CKS	Check file need for Multi-CD install.

You will find the following files on the root of CD 2:

File Name	Information
ZOS.TAZ.AB	Contains the Domino 7 for z/OS product image.
ZOS.TAZ.AB.CKS	Check file need for Multi-CD install.

Each sample JCL file is provided to aid in the installation and setup of Domino 7 for z/OS. Each file contains instructions for its use.

Domino for z/OS

### Preparing to run the install

1. Allocate a z/OS partitioned dataset (PDS) to store samples: ALOCHFS, ALOCZFS, DOMSAF, and MDFYBXP.

Logon to z/OS TSO and use ISPF (option 3.2) to specify the following dataset attributes:

Space units	BLOCKS
Primary quantity	60
Secondary quantity	5
Directory blocks	5
Record format	FB
Record length	80
Block size	3120

You can specify any permitted PDS name. *DOMINO.JCL* was used in the following instructions.

2. Transfer the sample files from the CD-ROM on your workstation to the pre-allocated z/OS PDS using the ftp service on your workstation. These files must be transferred to the z/OS server in **binary** mode.

#### FTP Example:

- a. On the workstation, start an FTP session to the z/OS UNIX Services FTP server.
- b. Enter: **bin** to have the file transferred in binary.
- c. Enter: **cd 'DOMINO.JCL'** to change to the target location of the PDS.
- d. Using the LCD command, change to the appropriate drive where the CD is located.
- e. Enter: **put ALOCHFS ALOCHFS** to transfer this file.
- f. Enter: **put ALOCZFS ALOCZFS** to transfer this file.
- g. Enter: **put DOMSAF DOMSAF** to transfer this file.
- h. Enter: **put MDFYBXP MDFYBXP** to transfer this file.

After the file transfer, check that the PDS contains these files and that they are readable.

```
DOMINO.JCL(ALOCHFS)
DOMINO.JCL(ALOCZFS)
DOMINO.JCL(DOMSAF)
DOMINO.JCL(MDFYBXP)
```

3. We include a sample JCL that performs all of the required and optional RACF commands for installing the product. Please see the JCL DOMSAF sample for instructions on its use. Use the RACF Special Attribute to run this JCL. Please read the instructions in the JCL very carefully if you choose to use it.

The following user IDs are required for installation:

USERID with an OMVS segment with a UID of 0 to run the install. Please ensure that you create a valid home directory.

Example:

```
ADDGROUP NOTES SUPGROUP(SYS1) OMVS(GID(nnnnnn))
ADDUSER INSTALL DFLTGRP(NOTES) PASSWORD(password) OMVS(UID(0) PROGRAM('/bin/sh')
HOME('/u/install'))
LISTUSER INSTALL OMVS
LISTGRP NOTES OMVS
```

USERID with an OMVS segment with a non UID of 0 to run the server. Please ensure that you create a valid home directory. You must use a different user ID to start each Domino server partition (DPAR).

Example:

```
ADDUSER DOMINO DFLTRGRP(NOTES) PASSWORD(password) OMVS(UID(nnnnnn) PROGRAM('/bin/sh')
HOME('/u/domino'))
LISTUSER DOMINO OMVS
```

The following facility class is **required** for the install process.

Allow the Install User ID read access to the SHARELIB facility class.

```
RDEFINE FACILITY BPX.FILEATTR.SHARELIB UACC(NONE)
SETROPTS RACLIST(FACILITY) REFRESH
PERMIT BPX.FILEATTR.SHARELIB CLASS(FACILITY) ACCESS(READ) ID(INSTALL)
SETROPTS RACLIST(FACILITY) REFRESH
```

For Performance Statistics, SYS1.SERBLINK needs to be added to the PROGRAM general resource class.

Example:

```
RALTER PROGRAM * ADDMEM('SYS1.SERBLINK/'*****'/NOPADCHK) UACC(READ)
SETROPTS WHEN(PROGRAM) REFRESH
RLIST PROGRAM * ALL
```

The following facility classes are optional:

Set up the user ID of each server to have at least READ access to the BPX.SMF facility class, if you want to collect SMF 108 records.

Example:

```
RDEFINE FACILITY BPX.SMF UACC(NONE)
SETROPTS RACLIST(FACILITY) REFRESH
PERMIT BPX.SMF CLASS(FACILITY) ACCESS(READ) ID(DOMINO)
SETROPTS RACLIST(FACILITY) REFRESH
```

Set up the user ID of each server to have READ access to the BPX.JOBNAME Facility class if you will use MVS JOBNAME. See the section, "MVS Jobnames" in Chapter 1 for how to implement this optional feature. If you are implementing z/OS Console Support for Domino, MVS JOBNAME is a requirement. See *z/OS Console Support for Domino* for more information.

Example:

```
RDEFINE FACILITY BPX.JOBNAME UACC(NONE)
SETROPTS RACLIST(FACILITY) REFRESH
PERMIT BPX.JOBNAME CLASS(FACILITY) ACCESS(READ) ID(DOMINO)
SETROPTS RACLIST(FACILITY) REFRESH
RLIST FACILITY BPX.JOBNAME ALL
```

If you will be implementing the z/OS Console Support for Domino, then you can permit the installer ID READ access to the BPX.FILEATTR.PROGCTL and BPX.FILEATTR.APF facility class now.

```
RDEFINE FACILITY BPX.FILEATTR.PROGCTL UACC(NONE)
RDEFINE FACILITY BPX.FILEATTR.APF UACC(NONE)
SETROPTS RACLIST(FACILITY) REFRESH
PERMIT BPX.FILEATTR.PROGCTL CLASS(FACILITY) ACCESS(READ) ID(INSTALL)
PERMIT BPX.FILEATTR.APF CLASS(FACILITY) ACCESS(READ) ID(INSTALL)
SETROPTS RACLIST(FACILITY) REFRESH
```

For z/OS Console Support for Domino RACF requirements, see *z/OS Console Support for Domino* (domcnsl.nsf/pdf) included with the CD. For Domino HTTP DSAPI filter for host authentication requirements, see "Domino HTTP DSAPI filter for host authentication (optional)" in Chapter 1. For WebSphere plug-in for Domino connectivity requirements, see "WebSphere plug-in for Domino connectivity (optional)" in Chapter 1.

4. If you are creating HFS systems - Modify the contents of the sample ALOCHFS job using the instructions in the file and these guidelines.  
If you are creating zFS systems - Modify the contents of the sample ALOCZFS job using the instructions in the file and these guidelines.

- If this is the first-time Domino install, the job will allocate and provide mount points for /usr/lpp/lotus, /notesdata, and /notesdata/mail. You can modify the amount of DASD space allocated for /notesdata and /notesdata/mail. The default size of /usr/lpp/lotus, /notesdata, and /notesdata/mail that is shipped with the product is the minimum amount of space required to run Notes successfully, see the table below.

**Note** It is very important to monitor the used space of these directories, and when necessary, to increase the size of the datasets.

Description	Default Mount Point	Default Dataset Name	Cylinders
Product files	/usr/lpp/lotus	NOTES.PROD.HFS	3300
Notesdata	/notesdata	NOTES.DATA.HFS	1200
Mail	/notesdata/mail	NOTES.MAIL	500

- If this is a migration (upgrade) from a previous release, modify the job so that only /usr/lpp/lotus dataset is allocated. You will use the existing /notesdata and /notesdata/mail directories.
  - If the last directory in your install directory path is not **/lotus**, the install adds **/lotus** to the given program directory. For example, if the program directory is /usr/newcode, the install makes the program directory /usr/newcode/lotus. Due to a hard coded 80 character command buffer used by the ps command, the length of the program directory path should not exceed 42 characters.
5. Submit the ALOCHFS or ALOCZFS job to allocate the product HFS or zFS datasets. Additionally, ALOCHFS or ALOCZFS will create the mount points and temporarily mount the file systems at these mount points. Check the results of the ALOCHFS or ALOCZFS job to ensure no errors have occurred.
  6. Create a directory to hold the files from CD 1 and CD 2 (/usr/lpp/lotus/mkdir cdcontents)
  7. From CD ,1 transfer the following files from the CD-ROM on your workstation to the z/OS Unix file system created above: Install, Install.dat, ZOS.taz.aa and ZOS.taz.aa.cks. From CD 2, transfer the following files from the CD-ROM on your workstation to the same z/OS Unix file system: ZOS.taz.ab, ZOS.taz.ab.cks.

#### FTP Example:

- a. On the workstation, start an FTP session to the z/OS UNIX Services FTP server.
  - b. Enter: **bin** to have the file transferred in binary.
  - c. Enter: **cd /usr/lpp/lotus** to change to the target location of the HFS.
  - d. Using the LCD command, change to the appropriate drive where the CD is located.
  - e. Enter: **put ZOS.taz.aa** to transfer this file.
8. Ensure the file sizes match that of the originals on both CD 1 and CD 2.
  9. If you will be using HFSs, Integrate the MOUNT statements from MDFYBXP into SYS1.PARMLIB(BPXPRMxx) so that the product, data, and mail HFS data sets will be mounted at each subsequent IPL.
  10. If you will be using zFS file systems, integrate the MOUNT statements from MDFYBXP into SYS1.PARMLIB(BPXPRMxx) so that the product, data, and mail zFS data sets will be mounted at each subsequent IPL. Make sure you follow the instructions in the JCL to change "HFS" to "ZFS".
  11. Run the Install program. Continue at *Running the Install program*.

Domino for z/OS

### Running the Install program

Install should be run with the system Language set to use the default C language. If it is not, unpredictable results may occur.

To verify the Language, issue the following: **echo \$LANG**

The response should be: **C**

If the value is not C, remember the value displayed and change the language by issuing the following: **export LANG=C**

.

Prior to starting the server, set the LANG variable back to its original value by issuing the following:

**export LANG=<original value>**

### Running the Install program

1. Log on to your system using telnet or rlogin with the Install User ID that was set up with read access to the SHARELIB facility class and a UID of 0.
2. Switch to the directory that contains the Install program.
3. From the directory that contains the Install program, enter

#### Install

4. Respond to the prompts to complete Install.

After Install completes, you will be asked if you want to start Domino installation now. Answering yes will start the interactive install. See below for details on installing interactively. If you choose not to continue installing the Domino Server, answer no and continue with the section: There are two ways to use the Lotus Domino for UNIX Install Program below.

There are two ways to use the Lotus Domino for UNIX Install Program:

1. Script Mode: You specify the installation settings in a script file
2. Interactive Mode: You are prompted for the installation settings

Using the Script mode, you identify the install settings prior to the actual running of the install. This is a text file that makes it easy to edit the install options. With the settings saved in a file, it then can be used for reinstalling later or installing similar configurations for other Domino installations. The feature "add\_data\_directories\_only" is an advanced install option and is only available in this mode. Most customers find the reusability and the ease of defining the install parameters as the reason for choosing this install method.

The interactive install method does not use a template file as mentioned above. Instead, it prompts you for responses to questions. Your responses are not saved for later use. If you choose this method, pay attention to the keys that the panels require you to use.

### Running the install program using the script

1. Logon to your system using telnet or rlogin with the Install User ID that was set up with read access to the SHARELIB facility class and a UID of 0.
2. The script file version has changed for this release. It is important that you do not use an older copy of the script file. Make a copy of the script file. For example:

```
cp script.dat /tmp/xscript.dat
```

3. Edit the script and modify the values, following the instructions contained in the file. For example, to edit the file, enter:

```
vi /tmp/xscript.dat
```

In the script.dat file, there is the ability to enable the following features. Please read the appropriate sections in the script.dat file to enable them. The defaults are:

1. installation\_type=2 (Domino Enterprise Server)
2. template\_install\_option=1 (Enables this install feature)
3. asp\_install\_option=0 (Disables this install feature)
4. opt\_lotus\_softlink=0 (Disables this install feature)
5. add\_data\_directories\_only=0 (Does not add another data directory)
6. start\_server\_setup=0 (Manual Server Setup)

4. Run the install program using the script, for example:

```
cd /usr/lpp/lotus
install -script /tmp/xscript.dat
```

5. This is a lengthy process. After the install has completed successfully, exit and continue at *Setting the PATH environment variable*.

### Running the install program interactively

1. Logon to your system using telnet or rlogin with the Install User ID that was set up with read access to the SHARELIB facility class and a UID of 0.

2. Switch to the directory that contains the install program.

```
cd /usr/lpp/lotus
```

3. If you want to run the install program interactively, enter:

```
install
```

4. Respond to the prompts to complete the install. At the conclusion of the install program, the settings you have chosen are displayed. You can accept or modify the settings.

5. This is a lengthy process. After the install has completed successfully, exit and continue at *Setting the PATH environment variable*.

Domino for z/OS

### Setting the PATH environment variable

After installing the Domino server, you must verify the PATH is set up correctly for the user ID that owns the server. (You specified this ID during the install procedure.) For each Domino server, update the home directory profile of the user ID that owns the server by adding the product's bin and tools directories to the PATH.

#### Example:

- **export PATH=**  
/usr/lpp/lotus/bin:/usr/lpp/lotus/bin/tools:/notesdata:/bin:.\$PATH

To verify that you have the correct PATH, issue the command: **echo \$PATH**. We recommend that the PATH be  
/usr/lpp/lotus/bin:/usr/lpp/lotus/bin/tools:/notesdata:/bin:.\$PATH

If it is not, issue the command: `export PATH=/usr/lpp/lotus/bin:/usr/lpp/lotus/bin/tools:/notesdata:/bin:.$PATH`  
where "/usr/lpp/lotus" is where the server is installed and "/notesdata" is the data directory for the server.

**What To Do Next:**

- If this is an upgrade to a new release (migration), go to: "Starting and stopping the Domino server" in Chapter 3.
- If this is not the first server of the Domain, make sure that the first server is started.
- If this is not an upgrade to a new release (migration), go to "Running the Domino Server Setup" in Chapter 3.

Domino for z/OS

**Verifying BPXPRMxx with dom\_verify\_os**

The `dom_verify_os` program will verify that SYS1.PARMLIB(BPXPARMxx) values documented in the topic "Setting Parameters for z/OS and Unix System Services" in Chapter 1 are correct. If the BPXPARMxx values are not set to the documented values, `dom_verify_os` will display severe error and warning messages with the current BPXPARMxx value and the recommended value.

After setting the PATH environment variable, invoke the following UNIX program:

```
dom_verify_os
```



## Chapter 3 - Server configuration and administration

Domino for z/OS

### Running the Domino Server Setup program

After installing a new Domino server, follow these instructions to set up the server using the Domino Server Setup program.

The Domino Server Setup program must be run remotely using a workstation with either of the following installed:

- **Domino Administrator 6 or higher with Remote Server Setup** - During the installation of the Domino Administrator client, you must select Remote Server Setup. To verify that Remote Server Setup was installed on your workstation desktop, select Start -> Programs -> Lotus Applications. You should see "Remote Server Setup" as a choice.
- **Java Runtime Environment 1.4.2 or higher** - To display the version number of the Java Runtime Environment, issue the following command from your workstation:

```
java -fullversion
```

The Java Runtime Environment can be downloaded from <http://www.java.sun.com>.

**Note** If you are migrating to Domino 7 and no additional Domino servers or features are required, you will use your existing ID files and databases. You will not execute Domino Server Setup. Instead, continue at the topic "Starting and stopping the Domino server" in Chapter 3.

#### Procedure:

1. Log on to the z/OS system as the owner of the notesdata directory specified during the install. This user ID should **not** be UID=0.
  - a. Change to the notesdata directory you want to set up.
  - b. Back up the original notes.ini file in case you want to restart the Domino Server Setup over again. Otherwise you will have to redo the Install process to rerun the Domino Server Setup.

**Note** If you are trying to rerun the Domino Server Setup, remove the following files: names.nsf, admin4.nsf, setupdomwizard.nsf if they exist. Also remove the server, certifier, and administrator ID files, if you want to create new ID files. Restore the original notes.ini saved above.

- c. Verify the location for the server code by executing:

#### whence server

You should find the server program at the bin directory of the server's program directory (for example, /usr/lpp/lotusbin/). If it is not the bin directory, go to *Setting the PATH environment variable* in Chapter 2.

- d. Enter the following to start the Domino Server Setup in remote mode by using the default port 8585:

**server -listen**

If you want to use a port other than the default, specify the port number after '-listen'. For example, if you want to use the port 8500, enter the following:

**server -listen 8500**

When the "Listener" program is ready, the following lines are displayed on the server console:

```
The Domino setup server is now in listening mode.
A remote client can now connect to this server and configure Domino.
```

```
To connect to this server, launch the Remote Domino Setup program
from a command-prompt as follows:
From a Domino administrator client: serversetup -remote
From a Domino server: server -remote
```

```
To end this server, launch the Remote Domino Setup program
from a command-prompt as follows:
From a Domino administrator client: serversetup -q hostname
From a Domino server: server -q hostname
```

For more information, see the printed guide **Setting Up Domino Networks and Servers**.

**Note** Launching the Remote Domino Setup program from a Domino server is not applicable for z/OS. Please follow the steps below to set up the server.

2. From the remote workstation, follow one of the procedures below to start the Server Setup program, then go to step a.

**Running the Server Setup program from a workstation with Domino Administrator**

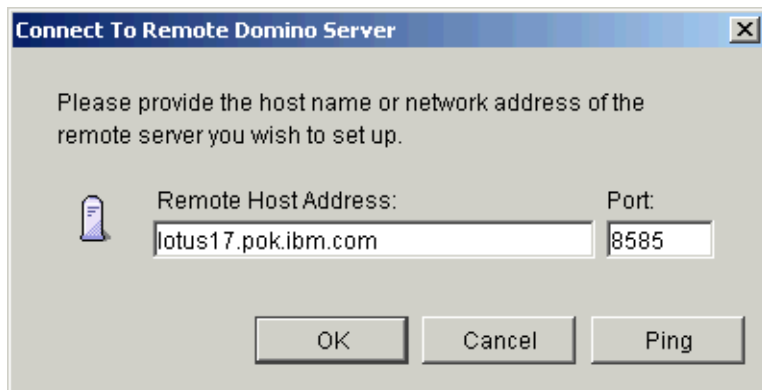
Do one of the following:

- On the client system, choose Start · Programs · Lotus Applications · Remote Server Setup.
- At the command prompt on the workstation, from the Notes program directory, enter: **serversetup -remote**  
**Note** The Notes program directory is c:\lotus\notes, unless you installed the program files to a different location.

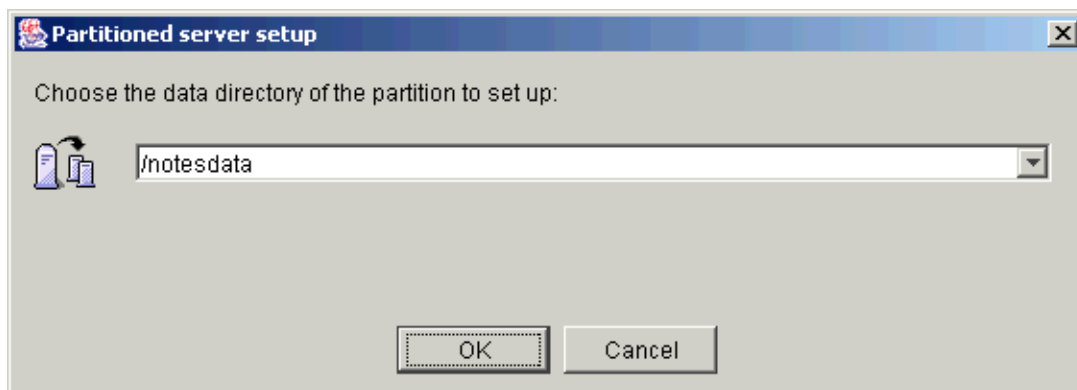
**Running the Server Setup program from a workstation without Domino Administrator**

- Make sure that Java Runtime Environment is installed.
- Create a directory on your workstation where you want to unpack and run the remote Domino Server Setup program.
- Unpack ZOS7xxxClient.TAR from the CD, using an appropriate tool (for example: Winzip for Intel workstations or tar for UNIX workstations).
- Bring up a command-line interface (either a UNIX terminal or a Windows Command Prompt) and change to the directory used in the above.
- Enter: **remotesetup**

- a. The Connect to Remote Domino Server panel is displayed. Enter the host name or network address of the remote server. Enter the port number of the listening machine if you have specified a port number other than the default in step 1d above. Click 'Ping' to ensure that you can connect to the remote server. Click 'OK' to start the Domino Server Setup program.

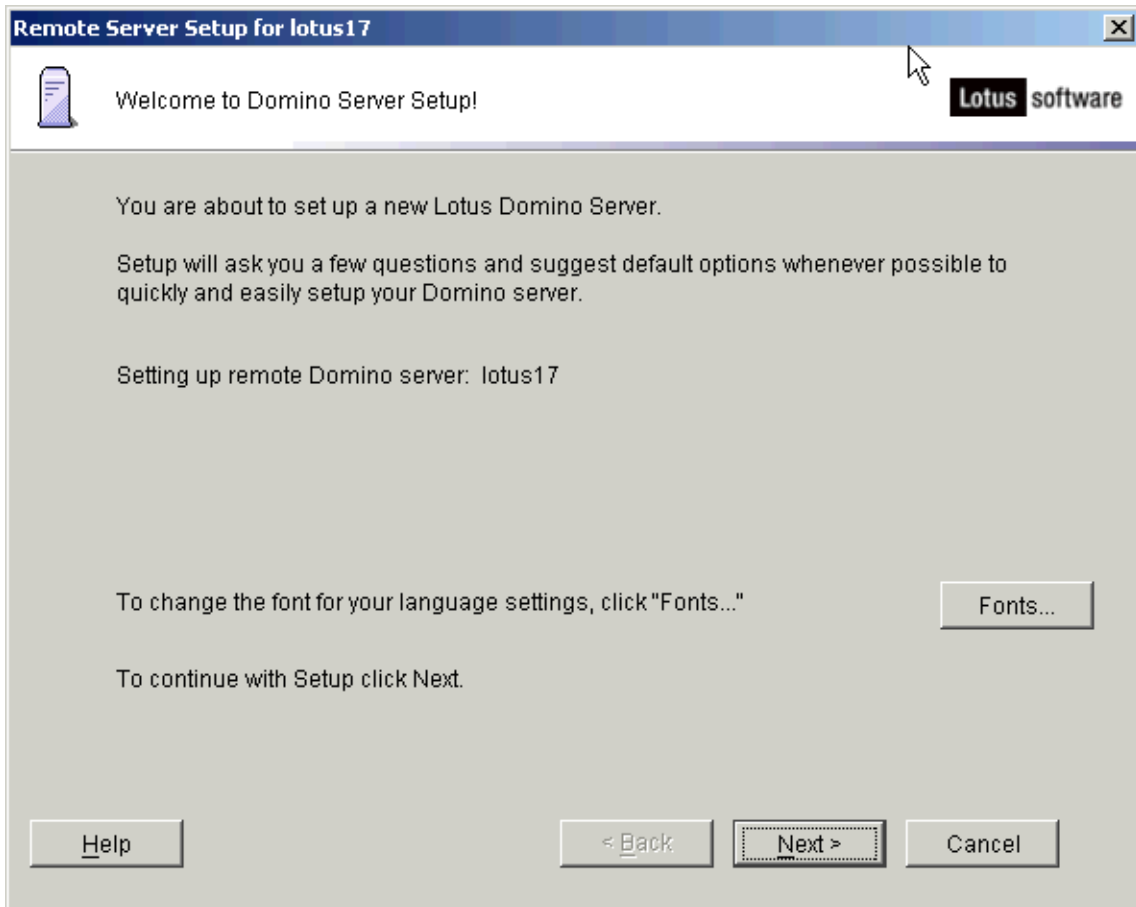


- b. If the server was installed as a partitioned server, the Partitioned server setup panel is displayed. Make sure the selected data directory is correct and click 'OK'.

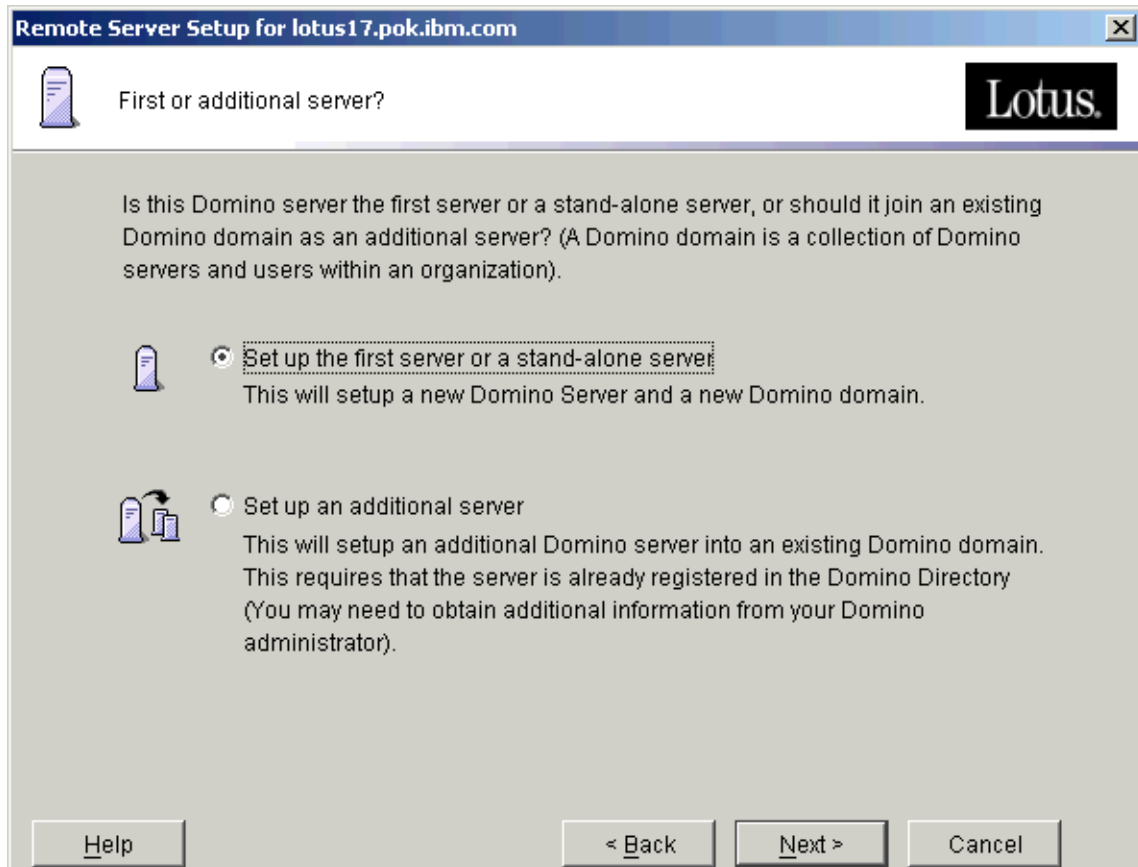


- c. While the Domino Server Setup program loads, it displays the Lotus Domino 7 panel. Wait until the program finishes loading.

- d. When the setup program is loaded, it displays the following. You can change the font for your language setting by clicking 'Fonts'. Click 'Next' to continue.



- e. The setup program displays the following. If you are configuring the first Domino server in your organization or are configuring the first server in a new Domino domain, select "Set up the first server or a stand-alone server" and click 'Next'. If you are configuring an additional Domino server in a domain, select "Set up an additional server" and click 'Next'.



- f. The setup program displays the following. Supply a server name and click 'Next'.

**Remote Server Setup for lotus17.pok.ibm.com**

Provide a server name and title

You must provide a unique name for your new Domino server. Carefully choose the server name; you cannot easily change it later. By default, Setup recommends that you use the computer's host name as the server name.

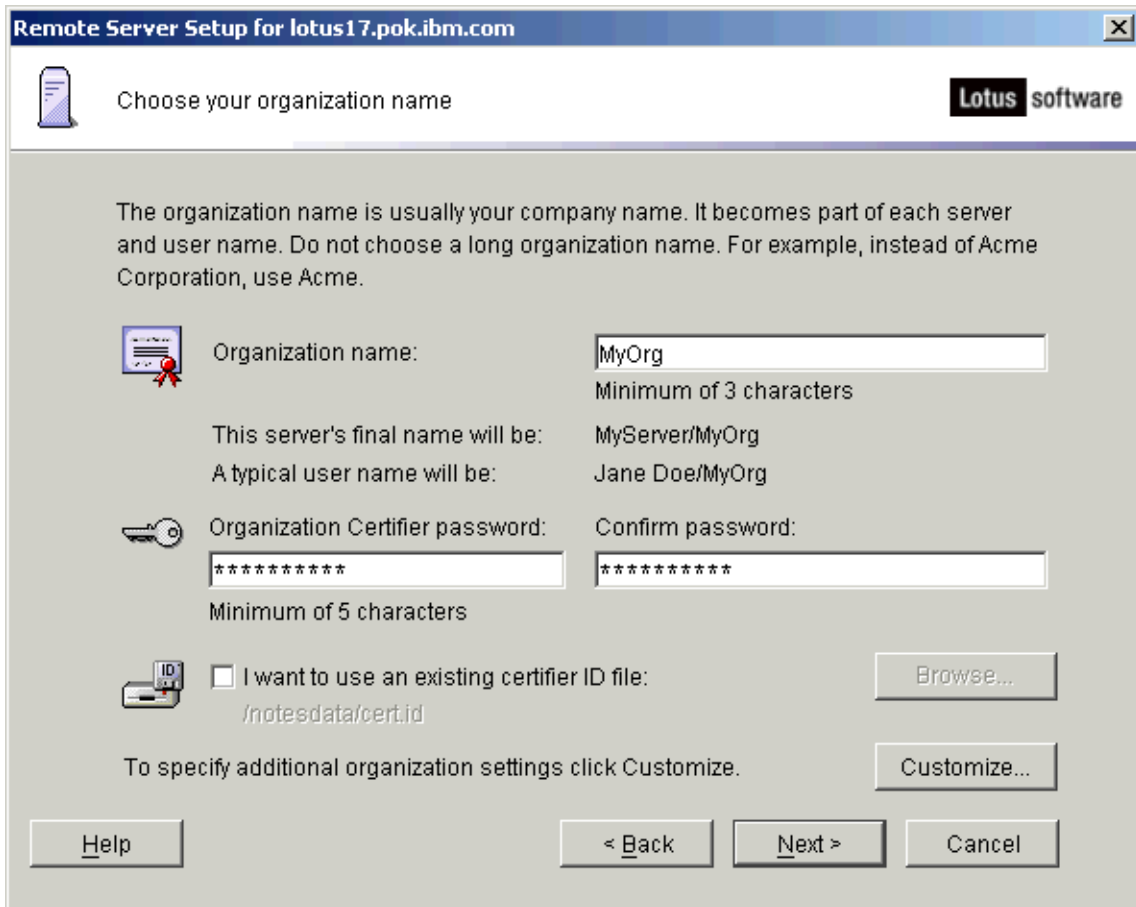
Server name:   
For example: Sales1

Optional: Provide a short title which describes the purpose or function of this server. (You can always change this information later in the Domino Directory)

Server title:   
For example: Corporate Sales Server 1

I want to use an existing server ID file:   
*/notesdata/server.id*

- g. The setup program displays the following. To specify additional organization settings, click on the 'Customize...' button. Otherwise, click 'Next'.



- h. If you selected 'Customize...', the setup program displays the Advanced Organization Settings panel. Enter the information you want to add, click 'OK', then click 'Next'.

Remote Server Setup for lotus17.pok.ibm.com

**Advanced Organization Settings**

Optional: To implement your company's hierarchical name scheme, specify an organizational unit. (It is recommended to thoroughly plan your naming convention first before using this feature)

Organizational Unit name:   
For example: Sales

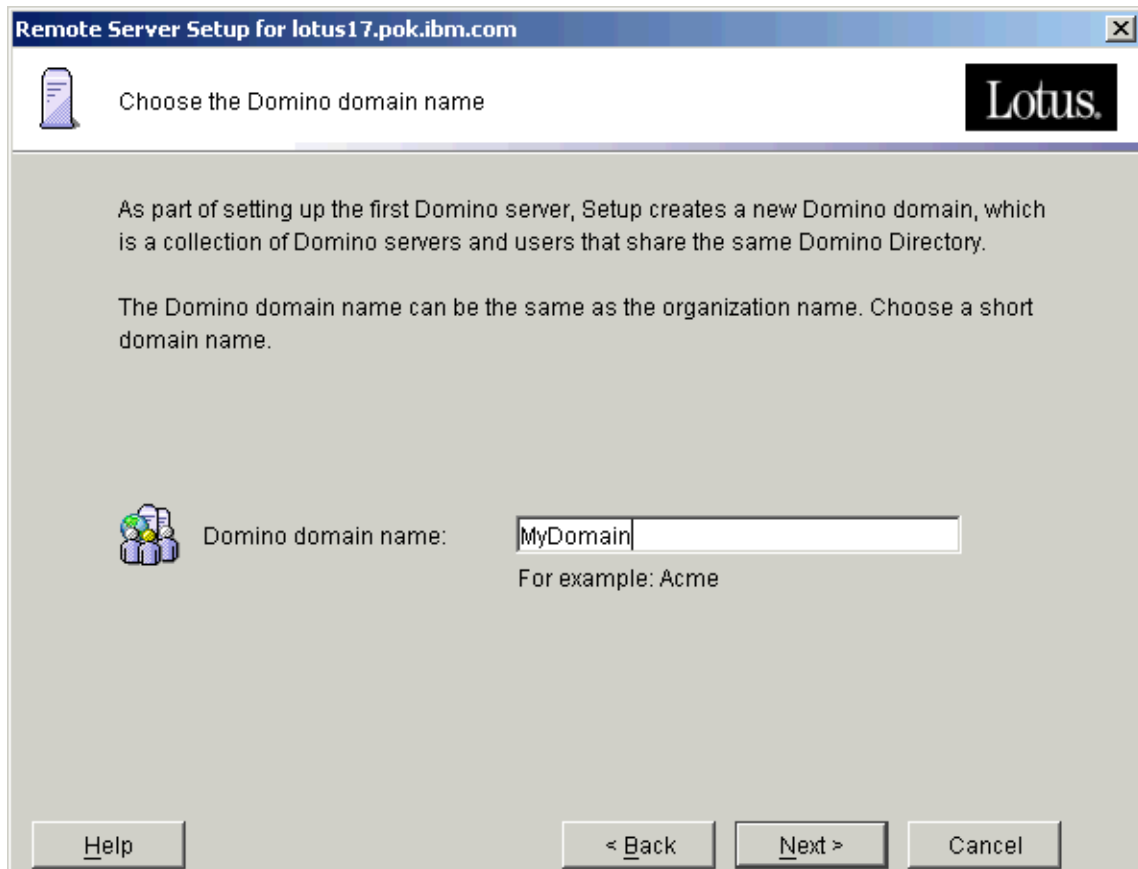
Org. Unit Certifier password:  Confirm password:   
Minimum of 5 characters

I want to use an existing organizational unit certifier ID file:   
*/notesdata/oucertyd*


If you plan to deploy Domino in different countries, choose a Country code.  
Country code:

OK Cancel Help


- i. The setup program displays the following. Provide a Domino domain name and click 'Next'.




- j. The setup program displays the following. Provide an Administrator name and password, then click 'Next'.

 Specify an Administrator name and password **Lotus** software

To create the Administrator's ID, you must provide the administrator's name and password. You can use the name of a specific person, or a last name only to create a generic Administrator ID that can be used by several people.

	First name:	Middle:	Last name (or generic account name):
	<input type="text" value="Admin"/>	<input type="text"/>	<input type="text" value="MyServer"/>

	Administrator password:	Confirm password:
	<input type="password" value="*****"/>	<input type="password" value="*****"/>

Minimum of 5 characters

The Administrator ID file will be stored inside the server's Domino Directory.

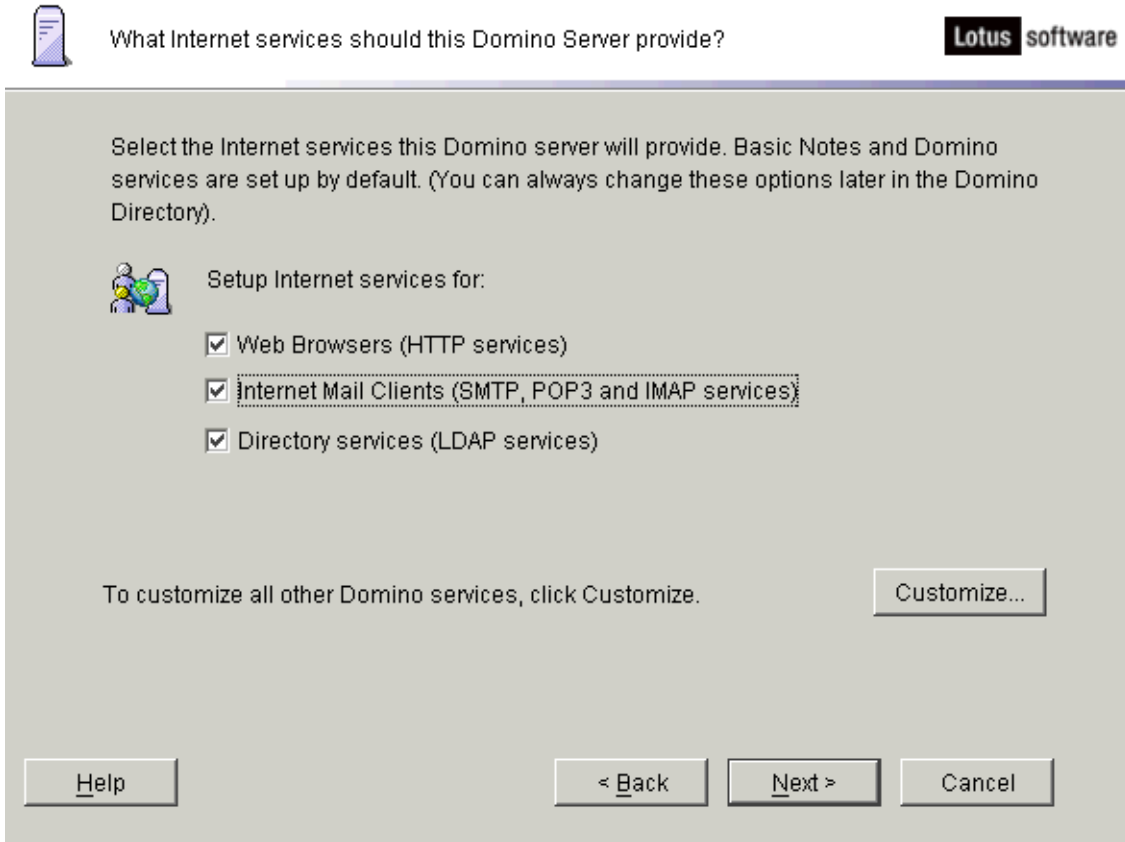
Also save a local copy of the ID file:

I want to use an existing Administrator ID file:

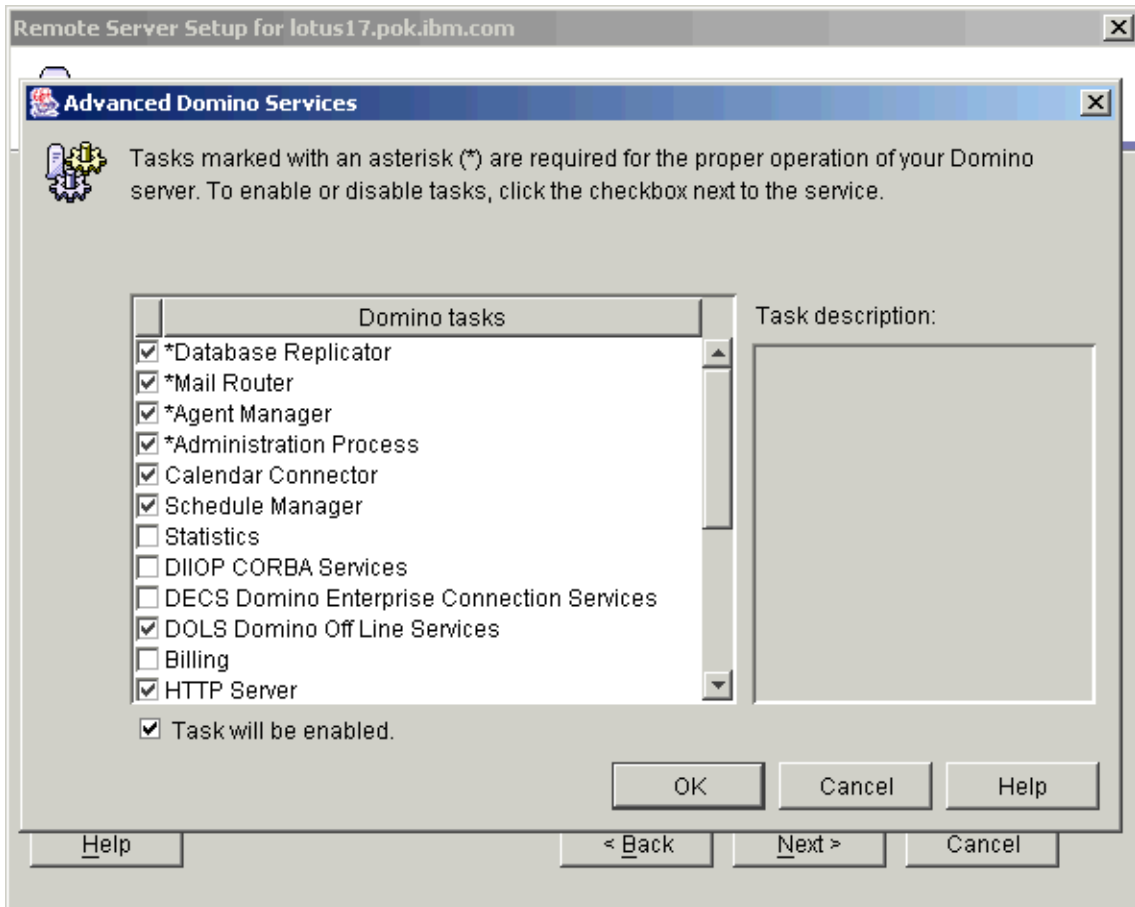
*/notesdata/admin.id*

*/notesdata/admin.id*

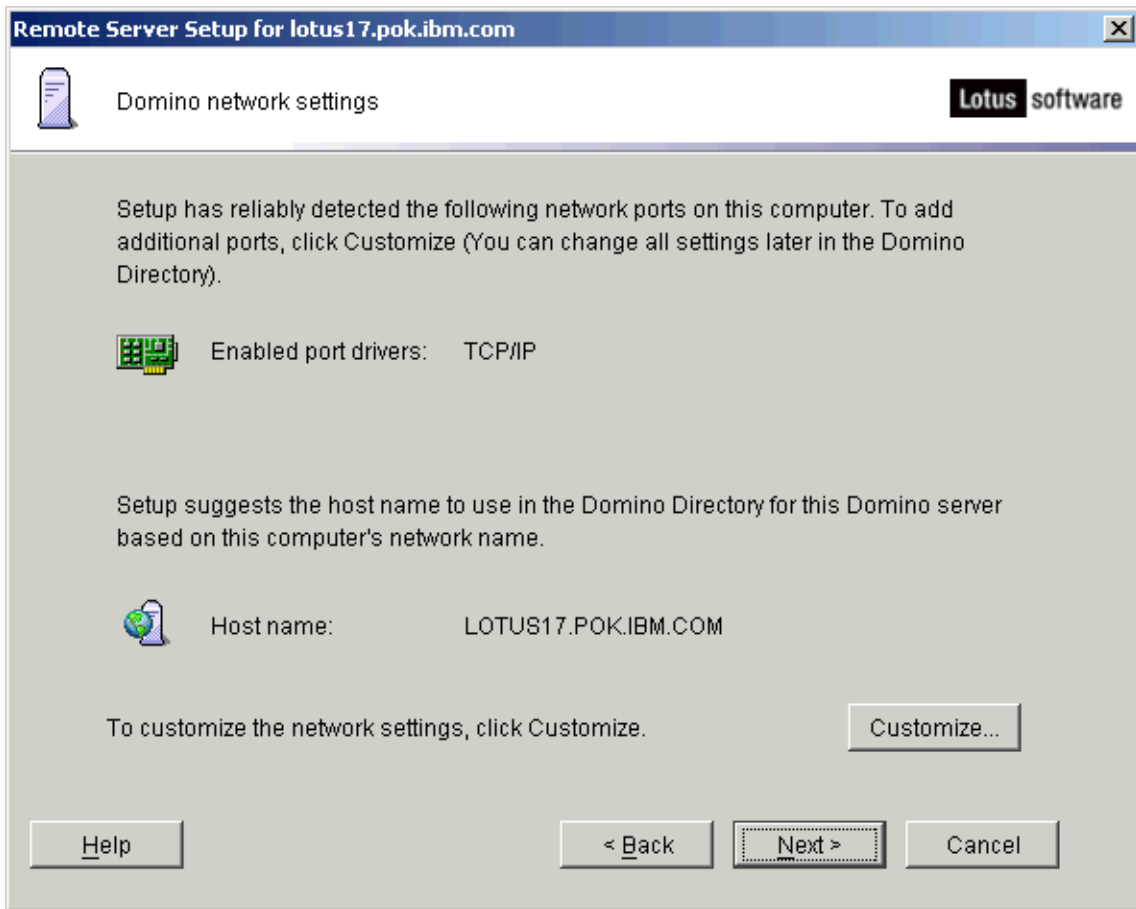
- k. The setup program displays the following. Select the internet services this Domino server should provide and enable tasks by clicking 'Customize'.



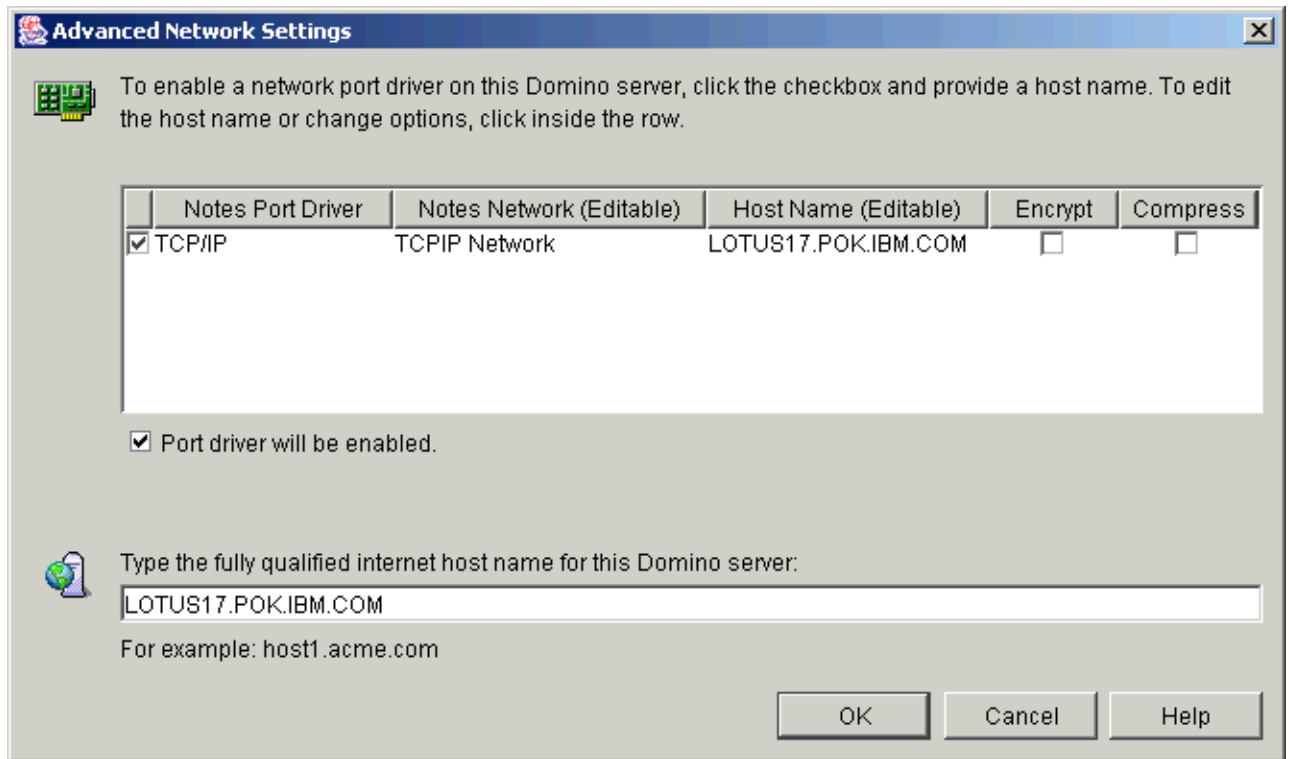
- I. The setup program displays the Advanced Domino Services window. Select the tasks you want to enable, click 'OK', and click 'Next'.



- m. The setup program displays the following. Confirm or customize the network settings, then click 'Next'.

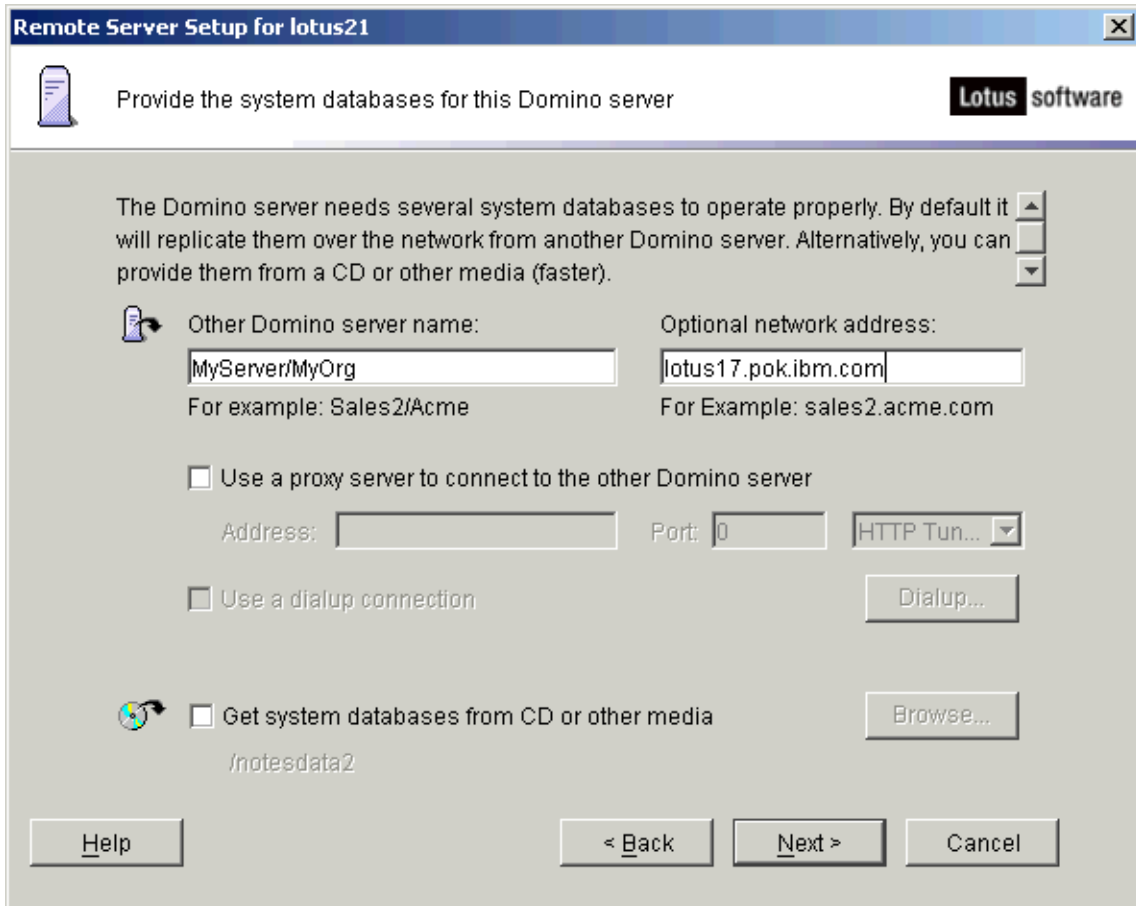


- n. You can specify the port number preceded by ":" after the host name by clicking the editable Host Name field.

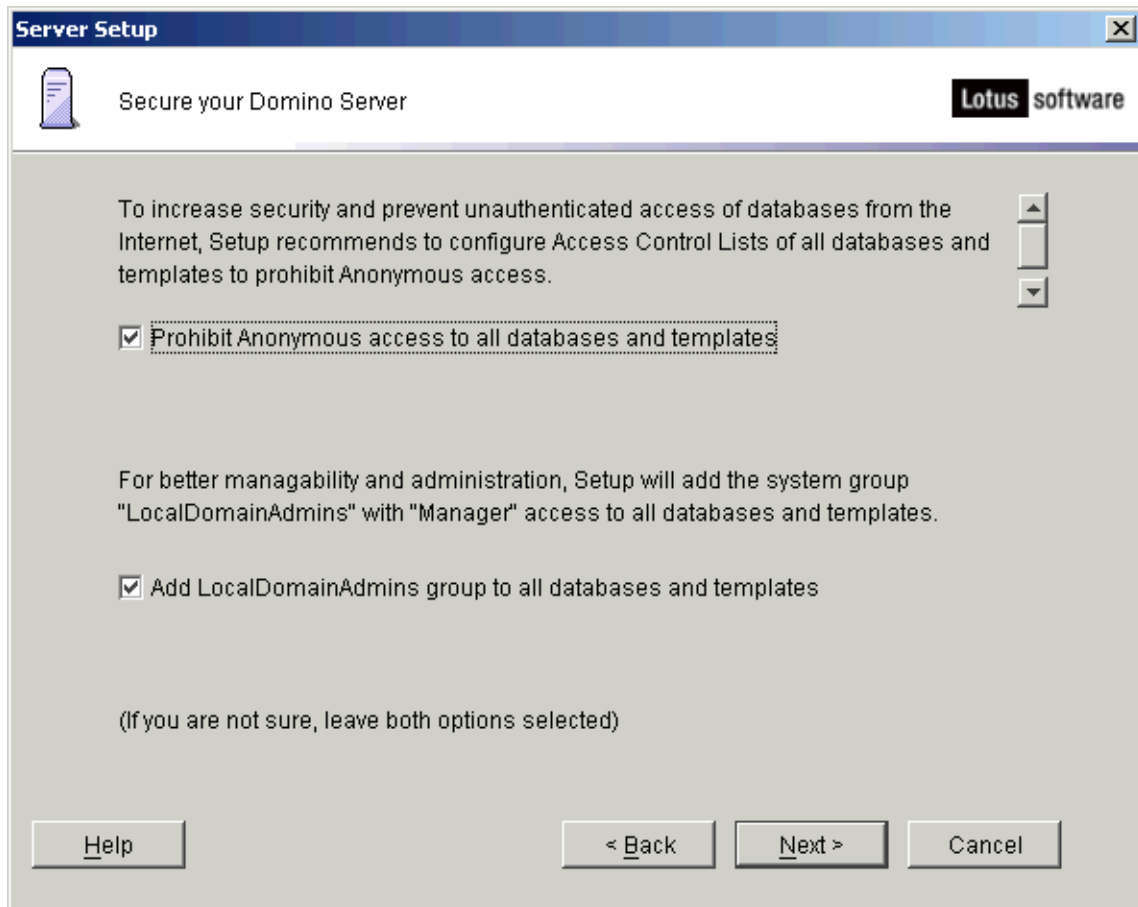


- o. If you are setting up an additional server, the setup program displays the following:

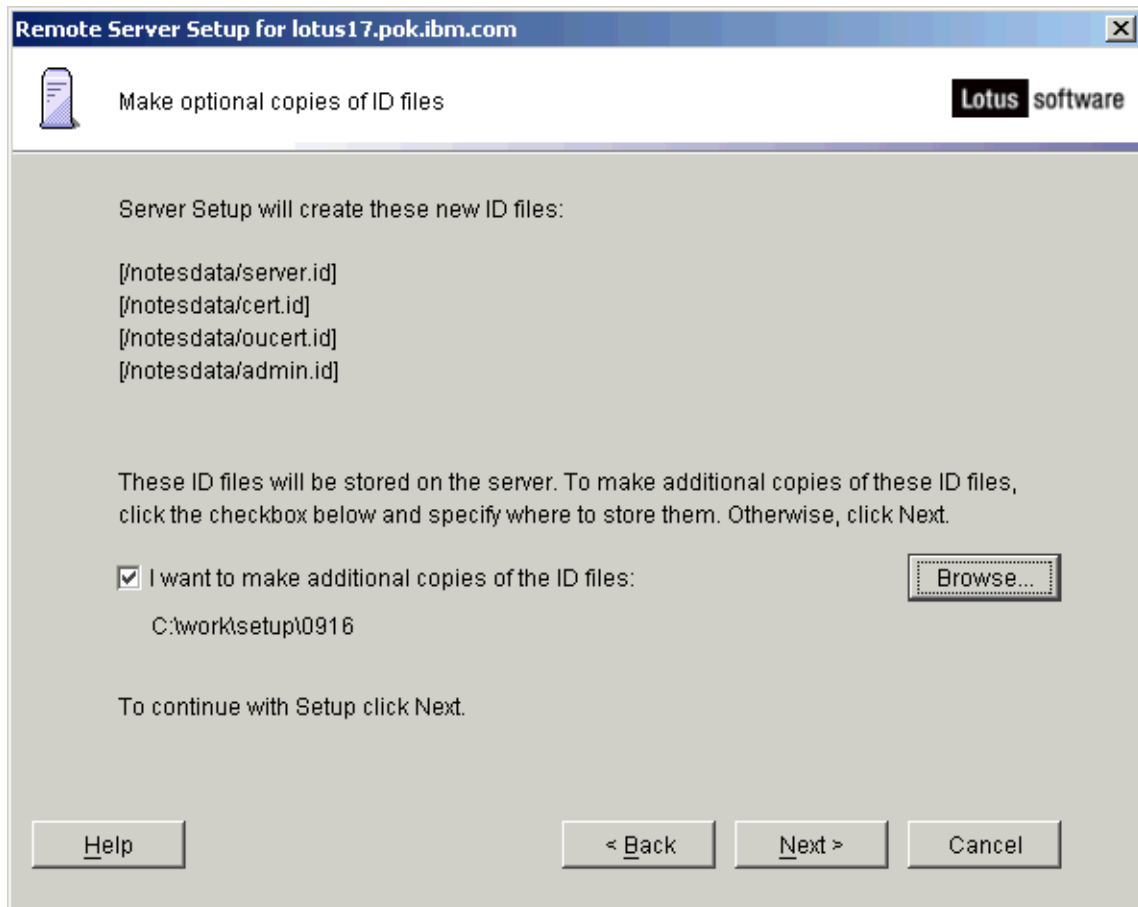
**Note** If the server name is different than the host name, you must enter the network address in the "Optional network address" field. Also, if the first server is running on a port other than the default port 1352, specify the port number as well as its network address in the "Optional network address" field.



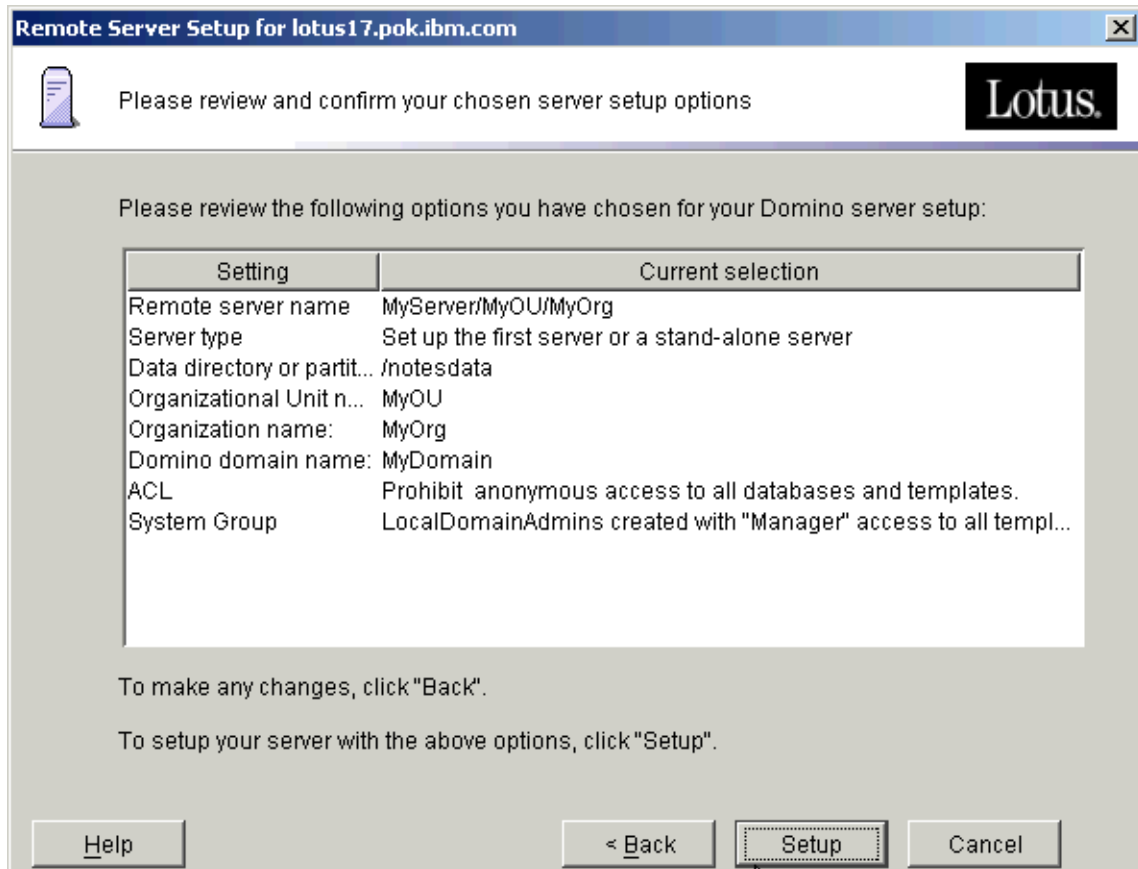
- p. The setup program displays the following. Configure the Access Control Lists and click 'Next'.



- q. The setup program displays the following. Make optional copies of ID files if you want. Then click 'Next'.

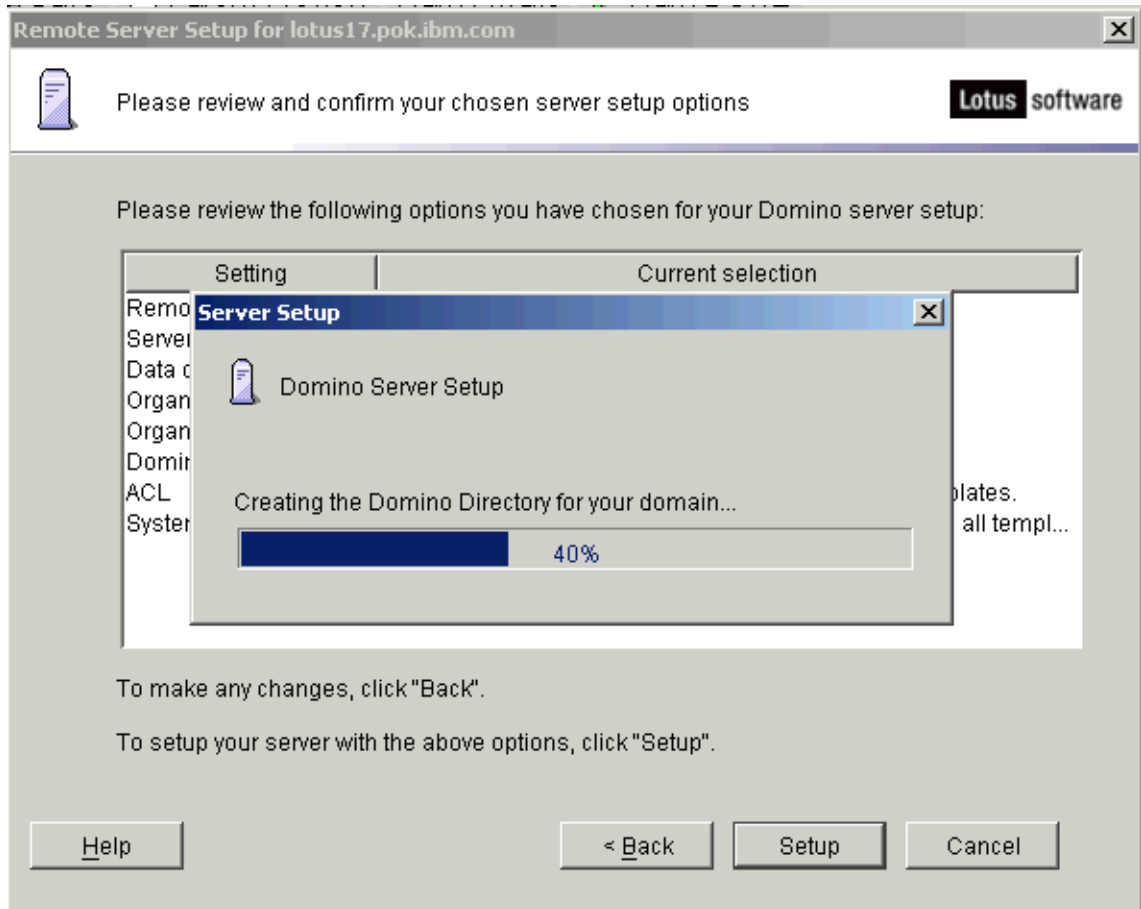


- r. The setup program displays the following. Verify your chosen settings and click 'Setup' to execute the server setup or click 'Back' to change a setting.

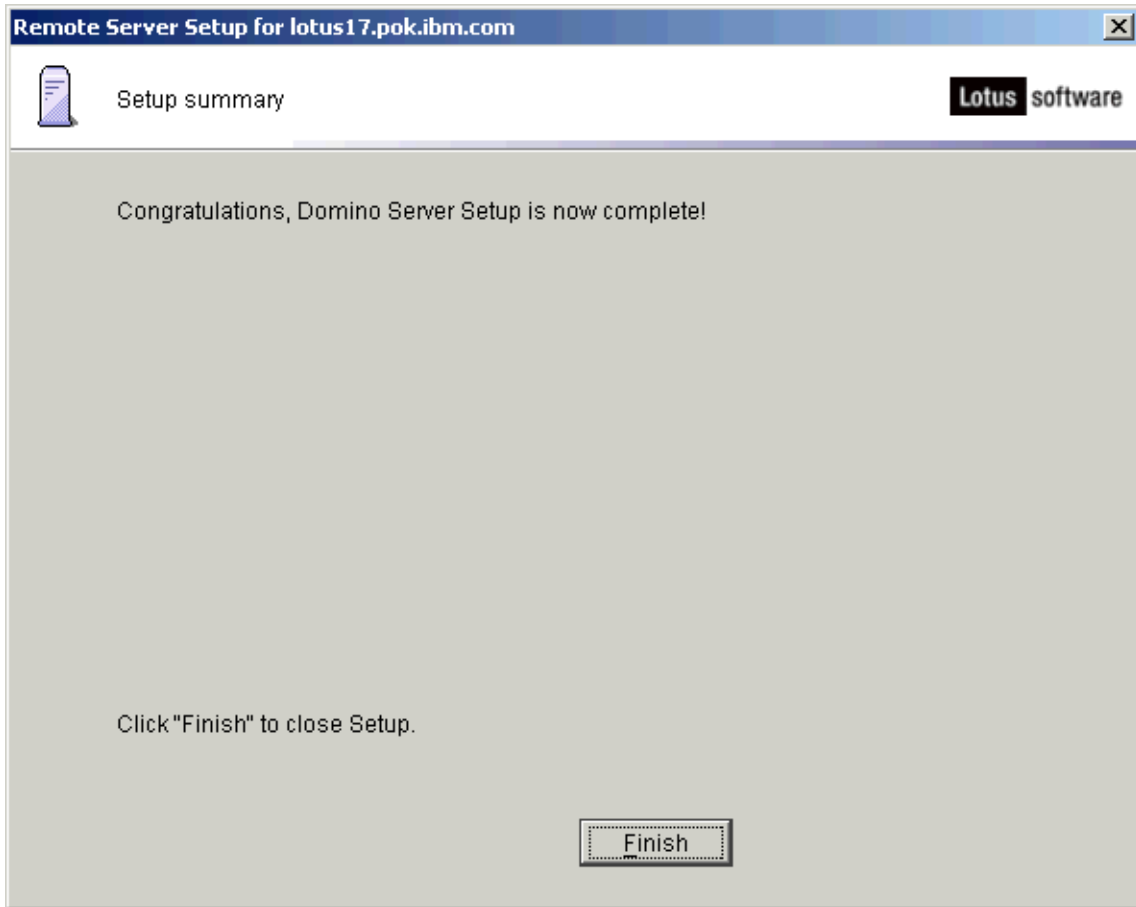


- s. The setup program displays the server setup progress bar.

**Note** This step may take several minutes to complete.



- t. When the setup program is finished, it displays the following. Click 'Finish' to close the setup program.



- u. After completing setup, the setup program prompts you to shut down the Listener process on the remote z/OS system. Click 'Yes'.



**What to do next**

- If this is the first server of the domain, go to the topic "Starting and Stopping the Domino Server."
- To configure additional servers which have been installed but not configured yet, register each server, verify the PATH, and then run the Domino Server Setup program. It must be run from the notesdata directory for each server being set up. If three notesdata directories were populated during install, /notesdata1, /notesdata2, /notesdata3, it should be run for each notesdata directory. Log on as the owner of a particular notesdata directory and go to Setting the PATH environment variable to start the configuration for the next server.

Domino for z/OS

### Preparing the Domino server environment on zSeries to run DECS

DECS on Domino for z/OS supports DB2 Version 7 and above. The following Web site contains a list of DB2 services required to run DECS:

<http://www.ibm.com/servers/eserver/zseries/software/domino/servchoice.html>

Make sure the datasets DSNxxx.SDSNEXIT and DSNxxx.SDSNLOAD are APF authorized, and part of the LNKLST. Do this by adding these datasets to your SYS1.PARMLIB PROGxx parmlib member or your IEAAPFxx and LNKLSTxx parmlib members.

The user ID used to start the Domino server must set the following environment variables in the user ID's .profile before starting the Domino server in order to access DB2.

```
export DSNAOINI=userid.DB2CLI.CLIINI
```

This file pointed to by DSNAOINI can be either a FB(80) dataset or a file in the hfs.

**Note** If running multiple DB2 releases, you will need to include a steplib for the DB2 release you are running within the user ID profile above:

```
export STEPLIB=DSNxxx.SDSNEXIT:DSNxxx.SDSNLOAD
export DSNAOINI=userid.DB2CLI.CLIINI
```

The DSNxxx.SDSNEXIT and the DSNxxx.SDSNLOAD are the APF authorized DB2 runtime libraries.

Contact your local DB2 administrator for the actual names of the datasets. The *userid.DB2CLI.CLIINI* is the DB2 CLI initialization file that must be defined as a FB(80) dataset when defined as a OS390(MVS) dataset. For more details, see the *DB2 UDB for OS/390 ODBC Guide and Reference* (SC26-9005), Chapter 4, "Configuring DB2 ODBC and Running Sample Applications."

If the DB2 Coded Character Set ID (CCSID) is not the same as the Domino locale, you need to specify DECS\_DB2\_CODEPAGE in the notes.ini file. For example, if you start Domino with LANG=Ja\_JP.IBM-939 and your DB2's CCSID is Ja\_JP.IBM-930, you will need to specify DECS\_DB2\_CODEPAGE=IBMCP930 to get the proper translation.

**Note** The password field in the DECS connection document is ignored running DB2 Version 7.

Domino for z/OS

### MVS Jobnames setup

If you will be using the MVS Jobname, update the .profile to include the following:

```
export Notes_OS390_JOBNAME_PREFIX=prefix
```

Review the topic "MVS Jobnames" in Chapter 1 for a detailed explanation of this feature.

Domino for z/OS

### Fault Recovery and Automatic Restart after Panic

By default, fault recovery is disabled. You enable it in the Server document. Follow this procedure.

1. From the Domino Administrator, click the Configuration tab.
2. In the Task pane, expand Server, and click All Server Documents.
3. In the Results pane, select the Server document you want, click Edit Server, and then click the Basics tab.
4. In the Fault Recovery section, choose "Enabled" in the "Automatically Restart Server After Fault/Crash" field.

5. Complete any of the following fields that you want.
  - In the "Run This Script After Server Fault/Crash" field, enter the name of a cleanup script.
    - Note** Do not try to activate NSD from this field. You activate NSD from the field "Run NSD To Collect Diagnostic Information."
  - In the "Run NSD To Collect Diagnostic Information" field, choose "Enabled" to activate NSD when there is a fault or crash.
    - Note** Enabling NSD is required by the Domino service.
  - In the "Cleanup Script / NSD Maximum Execution Time" field, enter the maximum time for a cleanup script to run before being terminated. The maximum time you can specify is 1,800 seconds.
    - Note** If the Domino server supports 1000s of users or more than 10 Domino tasks, it is a good idea to change the maximum execution time to 600.
  - In the "Maximum Fault Limits" field, enter the maximum number of restarts allowed during the specified period. If the number of restarts exceeds the limit, the server won't restart.
  - In the "Mail Fault Notification to" field, enter the names of people or groups to receive an e-mail notification message each time the server restarts.
6. Make any other changes you want to the Server document, and then click Save & Close.

It is suggested that you also enable the Domino SVC dump by setting the following environment variable before starting the Domino server:

```
export OS390_DOMINO_SVC_DUMP=1
```

**Note:** Domino 7 also allows for OS390\_DOMINO\_SVC\_DUMP to be set in the notes.ini file. If the environment variable is set, Domino will use it. If the environment variable and the notes.ini are set, the notes.ini value is used. Using the set config command the OS390\_DOMINO\_SVC\_DUMP notes.ini value can be set dynamically after the server is started.

The OS390\_DOMINO\_SVC\_DUMP environment variable makes it possible to take SVC dumps for server panic and other failures. It is recommended that you enable a SLIP for **ABEND=SOEC6,REASON=07020582**. Following is an example SLIP command set on the z/OS system console to ensure SVC dumps are captured for Domino panics:

```
SLIP SET ,A=SVCD ,C=ECB ,RE=07020582 ,ID=ECB ,ML=50 ,JL=(0MVS) ,
DSPNAME=( '0MVS' .* ) ,SDATA=( CSA ,GRSQ ,LPA ,NUC ,PSA ,RGN ,SQA ,TRT ,SUM ) ,END
```

With fault recovery enabled, the server will automatically restart after the SVC dump and cleanup script is run. See the Troubleshooting section in the z/OS chapter of the Domino Release Notes.

For more information about fault recovery, see the Domino Release Notes and the book *Administering the Domino System*.

Domino for z/OS

### Running the Domino SNMP agent

Using the Domino SNMP agent consists of two steps. The first is to start the SNMP agent program, followed by the start of the Domino add-in programs that communicate to the Domino SNMP agent.

#### Starting the Domino SNMP agent:

To start the Insnmp process, type the **Insnmp.sh** command from an OpenEdition command line. You must be a uid=0 user.

```
Insnmp.sh start
```

To stop the Insnmp process, enter this command as a uid=0 user:

```
Insnmp.sh stop
```

### Starting the Domino server add-in tasks

1. To support SNMP queries, start the QuerySet add-in task. Enter this command on the Domino Server console:  

```
load quryset
```
2. To support SNMP traps for Domino events, start the Event Interceptor add-in task. Enter this command on the Domino Server console:  

```
load intrcpt
```
3. To support Domino statistic threshold traps, start the Statistic Collector add-in task. Enter this command on the Domino Server console:  

```
load collect
```
4. Arrange for the add-in tasks to be restarted automatically when Domino is next restarted. Add quryset and/or intrcpt and collect to the ServerTasks variable in Domino's notes.ini file.

For additional information on the Domino SNMP agent, see the Domino Administrator Help panels.

Domino for z/OS

### Sample jobs and tools provided with the product

Sample jobs and tools are provided in /usr/lpp/lotus/bin/tools and /usr/lpp/lotus/bin/tools/diag directories.

The following is a list of tools that may be invoked assuming /usr/lpp/lotus/bin and /usr/lpp/lotus/bin/tools directories are specified in the PATH environment variable.

- rc.notes -- Allows the server to be started in a background process.
- nsd -- Displays verbose problem determination data for Lotus service.
- nsd -kill -- Cleans up the environment if the server ends abnormally.
- concom -- Used in conjunction with **rc.notes**, provides the ability to issue Domino Console commands remotely via a telnet or rlogin session.
- viascii -- A vi ascii editor used to update the notes.ini file.
- /usr/lpp/lotus/bin/tools/oeditascii -- An OS/390 UNIX ascii editor that can be used in the OMVS shell to update the notes.ini file.
- domps -- On OS390 V2R7 or later, this tool displays per thread information such as address space ID, wait time, semaphore wait information, CPU time per thread, and last kernel syscall.
- catascii -- Enables you to view the contents of an ASCII file.

Domino for z/OS

### Starting and stopping the Domino server

The server runs from a UNIX user ID that is logged on to z/OS.

Before starting the server, verify the following:

- The user ID that is used to start the server (the server owner's ID) must be defined to the z/OS Security Server (RACF) or equivalent security product with a valid OMVS segment. This user ID must be authorized to access all Domino files on the HFS, but should NOT have superuser authority. See *z/OS Security Server (RACF) Security Administrator's Guide*, SC28-1915, for additional information.
- The user ID that is used to start the server must also have write authority to the /tmp directory.
- When "echo \$PATH" is issued, it should display something like the following:  

```
/usr/lpp/lotus/bin:/usr/lpp/lotus/bin/tools:/notesdata:/bin:$PATH
```

**Note** The path statement is installation-dependent.

Use one of the following methods to start the Domino server:

- Issue the command: **server**
- Use the z/OS Console Support for Domino. Please review the *z/OS Console Support for Domino Guide* for additional information.
- Use the Server - Domino Console feature. Please review the Domino Release Notes and Domino Administration Help. Use the commands **server -jc -c**

**Note:** -c means no Domino console will be started (just the Domino controller and server). The Domino console ships with the client, and can connect to the Domino server remotely. If you intend to run the Domino console from z/OS, then remove the -c option and set `export DISPLAY=target-ip-address:0`.

- Allow the server to run as the background process. See the **rc.notes** sample that is shipped in `/usr/lpp/lotus/notes/latest/os390`.

To shut down the Domino server:

- Type **exit** or **quit** and press Enter.

Sometimes after the server terminates with an error or Panic you may have a UNIX command prompt but are not able to see anything that is typed. In this case the TTY setting will need to be reset. To reset the TTY setting entering the following UNIX command:

- Type **stty sane** and press Enter

To restart the Domino server:

- Use the `ipcs -bo` shell command to verify that all server processes and Interprocess Communication (IPC) resources are removed. (IPC resources are not automatically released when a process terminates.)
  - If no IPC resources are displayed for the user ID, then start the server as described previously.
  - If IPC resources are displayed, issue `nsd -kill` to remove them, after which you can start the server.
  - If `nsd -kill` does not remove the IPC resources, follow local procedures for reporting problems to z/OS service or Lotus service.
- Additional steps if `nsd -kill` does not remove IPC resources:
  - Use `ipcrm` command to remove IPC resources still in use by the server displayed by `ipcs -bo`.
  - Use `ipcs -xm` command to display which processes are attached to the shared memory segments being removed. Shared memory segments cannot be removed until all processes attached to the shared memory have terminated or detached from the shared memory segment. Use z/OS system operator console command `D OMVS,U=xxxxx` and `CANCEL` commands to terminate the server processes.

**Note** `nsd -kill` removes all resources from all servers started from the issuing user ID. Therefore, when partitioned servers are installed, it is recommended that each server be started using a different user ID.

#### What to do next

- If this is a migration upgrade, the installation is complete.
- If there are no more servers to configure, the installation is complete.
- If you have additional servers to add to the same domain, return to the topic "Registering additional Servers for a Domain" to register the servers and start the server configuration.
- If you want to register the first server in a new domain, return to the topic "Setting the PATH environment variable."

Domino for z/OS

### Using Domino server security

It is crucial to keep the Domino server secure. To prevent unauthorized users from accessing sensitive information on the server, keep the Domino server in a locked room or in a location where you can watch it. Also, use the Set Secure command to password-protect the server console to prevent unauthorized changes while the server is running.

When you password-protect the console, you can't use the Load, Tell, Exit, Quit, and Set Configuration server commands or other programs that aren't run automatically through Program documents in the Domino Directory or through the notes.ini file. Console security remains in effect until you clear the password by entering a second Set Secure command with the same password.

#### To set the password

Enter the following server command at the console:

```
Set Secure password
```

where *password* is any password that you specify.

#### To clear the password

Using the same password, enter the same command at the console:

```
Set Secure password
```

For more information on setting passwords and on other types of Domino security, see the Domino book *Administering the Domino System*.

Domino for z/OS

### Location of the certifier ID file

By default, the Server Setup program stores the certifier ID file in the directory you specify as the Domino data directory. For security reasons, you should move the certifier ID to a more secure location -- such as on a floppy disk locked in a secure area. It is possible that the certifier ID may not be in the Domino data directory when you certify a new user or server, depending on your organization's level of security.

Domino for z/OS

### Registering additional servers for a domain

While the first server (or the registration server) is running, start the Domino Administrator and register additional servers in the domain. During registration, you can set a password for each server, if you want. For each server you register, Domino creates a Server document in the Domino Directory and creates a server ID. The Server document includes the server name and other information about the server.

Save each server ID file locally, and then FTP it to the associated Domino data directory, or save the server ID file in the Domino Directory. Then set the PATH environment variable.

While the first server of the domain is running, initiate the Domino Server Setup program from the data directory associated with the additional server. While setting up the server, specify the following in the Remote Server Setup dialog box as you complete step 2, substep "o" in the topic "Running the Domino Server Setup program."

- In the "Other Domino Server Name" field, specify the server name and organization name of the first Domino server.
- In the "Optional network address" field, specify the network address of the first server. Also, if the port number is not the default port, 1352, follow the network address with a : (colon) and then the port number.

Domino for z/OS

### Standalone OEM and customer Domino C/C++ applications

A standalone Domino C/C++ application is one that is started outside of the Domino server. Applications that are started using the Domino server's console command "load *application-program*" are not standalone Domino applications. It is important to note that the following applies only to Domino C/C++ applications that were built using the Domino SDK C API tool kit or C++ API tool kit.

Legacy standalone Domino C/C++ applications that ran under Domino Release 5 will continue to run under Domino 7. Domino 7 for z/OS was built with the XPLINK compiler option that significantly improved Domino scalability and performance. Legacy Domino Release 5 C/C++ applications that ran under Release 5 were not built with the XPLINK compiler option. Therefore, to run legacy standalone Domino Release 5 C/C++ applications on Domino 7, you must do one of the following:

- Before running the application, the environment variable `_CEE_RUNOPTS` must include `XPLINK(ON)`. It is important to note that the performance of UNIX System Service shell scripts and shell commands may be degraded when `_CEE_RUNOPTS` includes `XPLINK(ON)`. Therefore, it is important to set environment variable `_CEE_RUNOPTS` with `XPLINK(ON)` only when running legacy Domino C/C+ standalone applications on Domino 7. The following is an example of setting environment variable `_CEE_RUNOPTS` to include `XPLINK(ON)`:

```
export _CEE_RUNOPTS=$_CEE_RUNOPTS XPLINK(ON)
```

- The preferred method in running standalone Domino C/C++ applications is to use the Domino 7 startup shell script to set all the appropriate environment variables required to run a Domino application. The startup shell script is a script that all Domino standalone applications use at run time. The idea is to have the Domino 7 startup shell script invoked in front of your application, setting up the environment variables and then having it exec your program. To do this, the following setup is required. This setup must be performed while running with a user ID of `uid=0`:

- The application needs to be copied into the `Notes_Execdirectory`. The default `Notes_Execdirectory` is `/usr/lpp/lotus/notes/latest/os390`.
- Create a symbolic in the `/usr/lpp/lotus/bin` directory so that when your application is invoked, the startup script runs.
 

```
cd /usr/lpp/lotus/bin
ln -s tools/startup program-name
```
- Ensure `PATH` environment variable contains `/usr/lpp/lotus/bin` before the `Notes_Execdirectory` value.

**Note** `/usr/lpp/lotus` is the default root directory. Your installation may be different.

## Chapter 4 - Installing additional Domino partitioned servers

Domino for z/OS

### Adding Domino partitioned servers at a later time

When you install Domino, the Domino Install program asks how many partitioned servers you want to create. If you want to add more partitioned servers at a later time, you must use the Install program again.

This topic describes the steps for installing and configuring additional Domino partitioned servers in a z/OS LPAR.

### Installing additional Domino partitioned servers

The procedure you follow to install additional partitioned servers varies depending on the method you used to install or update Domino. Use one of the three methods that follow.

#### If you used the Domino CD to install or update to your current version of Domino

If you installed or updated Domino from a CD and you have not applied any Hotfixes or Fixpacks, you can add a new partitioned server. Keep the following in mind:

- This process does not change the program directory and does not change any previously installed partitioned servers. Therefore, you can keep your previously installed servers running.
- You must use script mode. You cannot use the interactive install process. Do the following while setting up script mode:
  - Check to be sure that you are using the appropriate version of the script.dat file.
  - Set **add\_data\_directories\_only = 1**. Otherwise, the program directory will be overwritten during the install procedure.
  - Set the **"installation\_type"** settings the same as they were set during the original install.
  - Specify the location of the existing Domino program directory.
  - Identify only the new partitioned servers in the "data\_directories" section. Do not mention previously installed partitions, or they will be written, too.
- For more details about using script mode, see the topic "Running the Install program" in chapter 2.
- Configure the new partitioned servers. See "Configuring Additional Domino Partitioned Servers" below.
- For each new partitioned server, set the PATH environment variable and run the Domino Server Setup program. For details, see the topic "Setting the PATH environment variable" in chapter 2 and the topic "Running the Domino Server Setup program" in chapter 3.

#### If you used the incremental install feature to update to your current version of Domino

If you performed an incremental install to update to your current version of Domino and you have not applied any Hotfixes or Fixpacks, you can do the following.

- Stop all partitioned servers in this instance of Domino (that is, the partitioned servers that share this instance of the Domino program directory).
- Using the CD for your current version of Domino, add one or more partitioned servers, as described above.
- You can now restart your original partitioned servers, but do not start the partitioned servers that you just added.
- Run Domino Server Setup for each new partitioned server. For details, see the topic "Starting the Domino Server Setup" in chapter 3.
- Configure the new partitioned servers. See "Configuring Additional Domino Partitioned Servers" below.

#### If you applied a Hotfix or a Fixpack to your current version of Domino

If you applied a Hotfix or a Fixpack to Domino, you must remove the Hotfix or Fixpack before installing a new partitioned server.

- Stop all partitioned servers in this instance of Domino (that is, the partitioned servers that share this instance of the Domino program directory).
- Remove all Hotfixes and Fixpacks. Follow the instructions included with the Hotfixes and Fixpacks.
- Using the CD for your current version of Domino, add one or more Domino partitioned servers, as described above.
- Reinstall the Hotfixes and Fixpacks you removed.
- You can now restart the original partitioned servers, but do not start the partitioned servers that you just added.
- Run Domino Server Setup for each new partitioned server. For details, see the topic "Starting the Domino Server Setup" in chapter 3.
- Configure the new partitioned servers. See "Configuring Additional Domino Partitioned Servers" below.

### **Configuring Additional Domino Partitioned Servers**

You use the Domino Administrator to register additional servers in the domain. While the first server (or the registration server) is running, start the Domino Administrator, and register the additional servers. During registration, Domino generates an ID file for each server. Optionally, you can specify a password for each server. When you register a server, Domino adds a Server document to the Domino Directory. The Server document contains the name of the server, as well as other server information and settings.

Save each server ID file locally, and then FTP it to the associated Domino data directory, or save the server ID file in the Domino Directory.

While the first server (or the registration server) of the domain is running, start the Domino Server Setup program from the data directory associated with the additional server. When you supply an organization name for the new server during server setup, make sure that it is the same as the organization name you assigned to the first server in the domain.

## Chapter 5 - National language support

Domino for z/OS

### Installing National Language Version via Language Pack

For Worldwide Domino 7 for z/OS orders, you should receive multiple CDs:

- The Domino 7 for z/OS (Global English) CD
- The Domino 7 for z/OS NLS (Global English and Language Pack) CD

The Domino 7 for z/OS CD contains the English version of the server and the Domino 7 for z/OS NLS CD contains translated parts (templates, html files, etc) for several languages. To install the Domino for z/OS server with translated files from the NLS CD, refer to the README file in the root directory on any of the NLS CDs.

Domino for z/OS

### Languages supported

The following table defines the languages that are supported by Domino for z/OS.

Language	Country/Region	Locale	Symbolic Link	Code Page
English		C	none	1047
Arabic	Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, U.A.E., Yemen	Ar_AA.IBM-425	Ar_AA	425
Bulgarian	Bulgaria	Bg_BG.IBM-1025	Bg_BG	1025
Catalan	Spain	Ca_ES.IBM-924	none	924
Catalan	Spain	Ca_ES.IBM-924@euro	none	924
Czech	Czech Republic	Cs_CZ.IBM-870	Cs_CZ	870
Danish	Denmark	Da_DK.IBM-277	none	277
Danish	Denmark	Da_DK.IBM-924	none	924
Danish	Denmark	Da_DK.IBM-924@euro	none	924
Danish	Denmark	Da_DK.IBM-1047	Da_DK	1047
Danish	Denmark	Da_DK.IBM-1142	none	1142
Danish	Denmark	Da_DK.IBM-1142@euro	none	1142
German	Austria	De_AT.IBM-924	none	924
German	Austria	De_AT.IBM-924@euro	none	924
German	Switzerland	De_CH.IBM-500	none	500
German	Switzerland	De_CH.IBM-1047	De_CH	1047
German	Switzerland	De_CH.IBM-1148	none	1148
German	Switzerland	De_CH.IBM-1148@euro	none	1148

Language	Country/Region	Locale	Symbolic Link	Code Page
German	Germany	De_DE.IBM-273	none	273
German	Germany	De_DE.IBM-924	none	924
German	Germany	De_DE.IBM-924@euro	none	924
German	Germany	De_DE.IBM-1047	De_DE	1047
German	Germany	De_DE.IBM-1141	none	1141
German	Germany	De_DE.IBM-1141@euro	none	1141
German	Luxembourg	De_LU.IBM-924	none	924
German	Luxembourg	De_LU.IBM-924@euro	none	924
Ellinika	Greek	El_GR.IBM-875	El_GR	875
English	Belgium	En_BE.IBM-924	none	924
English	Belgium	En_BE.IBM-924@euro	none	924
English	United Kingdom	En_GB.IBM-285	none	285
English	United Kingdom	En_GB.IBM-924	none	924
English	United Kingdom	En_GB.IBM-924@euro	none	924
English	United Kingdom	En_GB.IBM-1047	En_GB	1047
English	United Kingdom	En_GB.IBM-1146	none	1146
English	United Kingdom	En_GB.IBM-1146@euro	none	1146
English	Ireland	En_IE.IBM-924	none	924
English	Ireland	En_IE.IBM-924@euro	none	924
English	Japan	En_JP.IBM-1027	En_JP	1027
English	United States	En_US.IBM-037	none	037
English	United States	En_US.IBM-1047	En_US	1047
English	United States	En_US.IBM-1140	none	1140
English	United States	En_US.IBM-1140@euro	none	1140
Spain	Spanish	Es_ES.IBM-284	none	284
Spain	Spanish	Es_ES.IBM-924	none	924
Spain	Spanish	Es_ES.IBM-924@euro	none	924
Spain	Spanish	Es_ES.IBM-1047	Es_ES	1047
Spain	Spanish	Es_ES.IBM-1145	none	1145
Spain	Spanish	Es_ES.IBM-1145@euro	none	1145
Estonian	Estomina	Et_EE.IBM-1122	none	1122
Finnish	Finland	Fi_FI.IBM-278	none	278
Finnish	Finland	Fi_FI.IBM-924	none	924
Finnish	Finland	Fi_FI.IBM-924@euro	none	924
Finnish	Finland	Fi_FI.IBM-1047	Fi_FI	1047
Finnish	Finland	Fi_FI.IBM-1143	none	1143
Finnish	Finland	Fi_FI.IBM-1143@euro	none	1143
French	Belgium	Fr_BE.IBM-500	none	500
French	Belgium	Fr_BE.IBM-924	none	924
French	Belgium	Fr_BE.IBM-924@euro	none	924
French	Belgium	Fr_BE.IBM-1047	Fr_BE	1047
French	Belgium	Fr_BE.IBM-1148	none	1148
French	Belgium	Fr_BE.IBM-1148@euro	none	1148
French	Canada	Fr_CA.IBM-037	none	037
French	Canada	Fr_CA.IBM-1047	Fr_CA	1047
French	Canada	Fr_CA.IBM-1140	none	1140
French	Canada	Fr_CA.IBM-1140@euro	none	1140
French	Switzerland	Fr_CH.IBM-500	none	500
French	Switzerland	Fr_CH.IBM-1047	Fr_CH	1047
French	Switzerland	Fr_CH.IBM-1148	none	1148
French	Switzerland	Fr_CH.IBM-1148@euro	none	1148

Language	Country/Region	Locale	Symbolic Link	Code Page
French	France	Fr_FR.IBM-297	none	297
French	France	Fr_FR.IBM-924	none	924
French	France	Fr_FR.IBM-924@euro	none	924
French	France	Fr_FR.IBM-1047	Fr_FR	1047
French	France	Fr_FR.IBM-1147	none	1147
French	France	Fr_FR.IBM-1147@euro	none	1147
French	Luxembourg	Fr_LU.IBM-924	none	924
French	Luxembourg	Fr_LU.IBM-924@euro	none	924
Croatian	Croatia	Hr_HR.IBM-870	Hr_HR	870
Hungarian	Hungary	Hu_HU.IBM-870	Hu_HU	870
Icelandic	Iceland	Is_IS.IBM-871	none	871
Icelandic	Iceland	Is_IS.IBM-1047	Is_IS	1047
Icelandic	Iceland	Is_IS.IBM-1149	none	1149
Icelandic	Iceland	Is_IS.IBM-1149@euro	none	1149
Italian	Italy	It_IT.IBM-280	none	280
Italian	Italy	It_IT.IBM-924	none	924
Italian	Italy	It_IT.IBM-924@euro	none	924
Italian	Italy	It_IT.IBM-1047	It_IT	1047
Italian	Italy	It_IT.IBM-1144	none	1144
Italian	Italy	It_IT.IBM-1144@euro	none	1144
Hebrew	Israel	Iw_IL.IBM-424	Iw_IL	424
Japanese	Japan	Ja_JP.IBM-920	none	920
Japanese	Japan	Ja_JP.IBM-939	Ja_JP	939
Japanese	Japan	Ja_JP.IBM-1027	none	1027
Japanese	Japan	Ja_JP.IBM-920	none	920
Japanese	Japan	Ja_JP.IBM-1399	none	1399
Korean	Korea	Ko_KR.IBM-933	Ko_KR	933
Korean	Korea	Ko_KR.IBM-1364	none	1364
Lithuanian	Lithuania	Lt_LT.IBM-1112	Lt_LT	1112
Macedonian	Macedonia	Mk_MK.IBM-1025	Mk_MK	1025
Dutch	Belgium	Nl_BE.IBM-500	none	500
Dutch	Belgium	Nl_BE.IBM-924	none	924
Dutch	Belgium	Nl_BE.IBM-924@euro	none	924
Dutch	Belgium	Nl_BE.IBM-1047	Nl_BE	1047
Dutch	Belgium	Nl_BE.IBM-1148	none	1148
Dutch	Belgium	Nl_BE.IBM-1148@euro	none	1148
Dutch	Netherlands	Nl_NL.IBM-037	none	037
Dutch	Netherlands	Nl_NL.IBM-924	none	924
Dutch	Netherlands	Nl_NL.IBM-924@euro	none	924
Dutch	Netherlands	Nl_NL.IBM-1047	Nl_NL	1047
Dutch	Netherlands	Nl_NL.IBM-1140	none	1140
Dutch	Netherlands	Nl_NL.IBM-1140@euro	none	1140
Norwegian	Norway	No_NO.IBM-277	none	277
Norwegian	Norway	No_NO.IBM-1047	No_NO	1047
Norwegian	Norway	No_NO.IBM-1142	none	1142
Norwegian	Norway	No_NO.IBM-1142@euro	none	1142
Polish	Poland	Pl_PL.IBM-870	Pl_PL	870
Portuguese	Brazil	Pt_BR.IBM-037	none	037
Portuguese	Brazil	Pt_BR.IBM-1047	Pt_BR	1047
Portuguese	Brazil	Pt_BR.IBM-1140	none	1140
Portuguese	Brazil	Pt_BR.IBM-1140@euro	none	1140

Language	Country/Region	Locale	Symbolic Link	Code Page
Portuguese	Portugal	Pt_PT.IBM-037	none	037
Portuguese	Portugal	Pt_PT.IBM-924	none	924
Portuguese	Portugal	Pt_PT.IBM-924@euro	none	924
Portuguese	Portugal	Pt_PT.IBM-1047	Pt_PT	1047
Portuguese	Portugal	Pt_PT.IBM-1140	none	1140
Portuguese	Portugal	Pt_PT.IBM-1140@euro	none	1140
Romanian	Romania	Ro_RO.IBM-870	Ro_RO	870
Russian	Russia	Ru_RU.IBM-1025	Ru_RU	1025
Serbian (Latin)	Serbia	Sh_SP.IBM-870	Sh_SP	870
Slovak	Slovakia	Sk_SK.IBM-870	Sk_SK	870
Slovenian	Slovenia	Sl_SI.IBM-870	Sl_SI	870
Albanian	Albania	Sq_AL.IBM-500	none	500
Albanian	Albania	Sq_AL.IBM-1047	Sq_AL	1047
Albanian	Albania	Sq_AL.IBM-1148	none	1148
Albanian	Albania	Sq_AL.IBM-1148@euro	none	1148
Serbian (Cryllic)	Serbia	Sr_SP.IBM-1025	Sr_SP	1025
Swedish	Sweden	Sv_SE.IBM-278	none	278
Swedish	Sweden	Sv_SE.IBM-924	none	924
Swedish	Sweden	Sv_SE.IBM-924@euro	none	924
Swedish	Sweden	Sv_SE.IBM-1047	Sv_SE	1047
Swedish	Sweden	Sv_SE.IBM-1143	none	1143
Swedish	Sweden	Sv_SE.IBM-1143@euro	none	1143
Turkish	Turkey	Tr_TR.IBM-1026	Tr_TR	1026
Simplified Chinese	People's Republic of China	Zh_CN.IBM-935	Zh_CN	935
Simplified Chinese	People's Republic of China	Zh_CN.IBM-1388	none	1388
Traditional Chinese	Taiwan	Zh_TW.IBM-937	Zh_TW	937
Thai	Thailand	th_TH.IBM-838	th_TH	838

## NOTES:

1. The values in the "Locale" column are those that are specified as parameters to the export LANG= command.
2. The values in the "Symbolic Link" column can be used as the operand when setting the LANG environment variable. A symbolic link is a shortened name for the complete locale name.
3. PLATFORM\_CSID is no longer needed; it is automatically set based on the LANG setting when the server is started.
4. ScriptCountryID=xx is no longer needed; it is automatically set based on the LANG setting when the server is started.
5. Check the "C/C++ Programming Guide" for the release that you are running to determine whether Arabic is supported. You can still use a client in that language to connect to the z/OS server and create documents, etc., that contain national language characters. However, these characters cannot be used anywhere where they may interact with the operating system (file names, in console, etc.).
6. Ar\_AA.IBM-420 is no longer supported.

CCSID list for DBCS Countries

- DBCS-capable terminals such as PCOMM (Personal Communications for AS/400 + 3270) support three types of input and output fields:
  1. SBCS only fields,
  2. DBCS only fields,
  3. SBCS/DBCS mixed fields.

For example, Japanese Katakana extended terminal can support SBCS fields (CCSID 290), DBCS only fields (CCSID 300) and SBCS/DBCS mixed fields (CCSID 930).

OS/400 mainly uses 5026 to represent Japanese Katakana extended environment while OS/400 can equally treat 5026 and 930. OS/400 mainly uses 5035 to represent Japanese Latin extended environment while OS/400 can equally treat 5035 and 939.

- Please note that Microsoft uses the term "code page" instead of CCSID. MS-932 should mean MS code page 932. IBM assigns CCSIDs corresponding to MS code pages. For example, IBM CCSID 932 is identical to MS code page 932.
- CCSID 1388 replaces CCSID 935 for Simplified Chinese Host-Mixed, CCSID 1386 replaces CCSID 1381 for Simplified Chinese PC-Mixed.

	z/OS, OS/400 user interface	Notes user interface		
	EBCDIC terminal (DBCS-capable)	OS/2 client/server	AIX client/server	Win client/server
Japanese	930, 300, 290 939, 300, 1027	932,942 943	932, 943 5050 (IBM-eucJP)	MS-932 (CCSID 943)
Korean	933, 833, 834	949	970 (IBM-eucKR)	MS-949 (CCSID 949)
Simplified Chinese	1388, 4933, 836	1386	1383 (IBM-eucCN)	MS-936 (CCSID 1386)
Traditional Chinese	937, 835, 28709	950	950 964 (IBN-eucTW)	MS-950 (CCSID 950)

Double-byte Character Set Coded Character Set Identifiers

National Language	MCCSID	SCCSID	DCCSID	User-defined Characters+
Japanese, extended Katakana	930	290	300	4370
Japanese, extended Katakana	5026	290	4396	1880
Japanese, extended English	939	1027	300	4370
Japanese, extended English	5035	1027	4396	1880
Korean	933	833	834	1880
Chinese, Simplified	1388	13124	4933	1880
Chinese, Traditional	937	28709	835	6204

Notes:

1. SCCSID=single-byte coded character set identifier
2. MCCSID=mixed coded character set identifier
3. DCCSID=DBCS coded character set identifier

Domino for z/OS

## Customizing the server for your environment

### NLS and character sets

Domino for z/OS in Global English supports language clients (for example, Lotus Notes and Internet browsers) and English clients that are configured for a different language.

### To provide HTTP language support

Specify the desired language in the default character of the HTTP server section in the server document in NAMES.NSF

### Customizing your notes.ini file

The Domino language settings are determined by the value of the LANG variable when the server started. You set the language by exporting the LANG variable before you start the Domino server. For example:

```
export LANG=Ja_JP
```

The following entries can be added to your notes.ini file in the /notesdata directory to override those set automatically based on the LANG setting.

- **DateOrder=XXX**

To set date format, where XXX is:

```
DMY   for Day/Month/Year
YMD   for Year/Month/Day
MDY   for Month/Day/Year
```

Use

```
YMD     for Simplified Chinese
YMD     for Traditional Chinese
YMD     for Korean
DMY     for Thai
YMD     for Japanese
        as appropriate for other European languages
```

By default, the Global English version of Domino sets the date order to DMY (Day Month Year) .

- **dateseparator=x**

To override the default date separator, you can specify the following in the notes.ini file:

```
dateseparator=any character
```

For example, **dateseparator=.** sets the date separator to a '.' (period).

By default, the Global English version of Domino sets the date separator to a '/' (forward slash),

- **timeseparator=y**

To override the default time separator, you can specify the following in the notes.ini file:

```
timeseparator=any character
```

For example, **timeseparator=.** sets the time separator to a '.' (period).

By default, the Global English version of Domino sets the time separator to a ':' (colon).

- **clocktype=12\_HOUR | 24\_HOUR**

To override the default time format, you can specify the following in the notes.ini file:

```
ClockType = 24_HOUR
or
ClockType = 12_HOUR
```

By default, the Global English version of Domino sets the clock type to 24\_HOUR.

- **ScriptLanguageID=cc  
ScriptCountryID=xx**

To identify country information for Lotus Script where **cc** is your language ID.

Language	cc value
English	en
Japanese	ja
Taiwanese	zh
Chinese	ch
Korean	ko

#### Important notes

- ScriptLanguageID is supported only to preserve compatibility with prior releases and should no longer be specified. However, if you do specify it, then you need to follow the instructions in the following note.
  - When you run install, directories are created under `/usr/lpp/lotus/notes/latest/os390/res` for every supported language. These directories are symbolic links back to the directory `/usr/lpp/lotus/notes/latest/os390/res/C`
  - If you add `ScriptLanguageID=cc` to your notes.ini file, then you also need to ensure that the `/usr/lpp/lotus/notes/latest/os390/res/C` directory contains file `nsku40cc.res`. You can do this by renaming `nsku40en.res` to `nsku40cc.res`. In both cases, the `cc` is the two characters specified in `ScriptLanguageID=`.
  - `ScriptCountryId` is no longer required for z/OS; the correct value is set based on the locale when the server is started.
- **DominoDisableNbsp=1**  
To disable NBSP(Unicode 00A0) for multiple space characters for Korean.

Domino for z/OS

### Starting the Domino Server in a locale other than C

Domino partitions running in the same LPAR (logical OS/390 partition) are not restricted to running in the same locale. To change the locale of a Domino server:

- Set the locale, as follows:

```
export LANG=locale-value      - Sets the locale
locale                        - Displays the locale to verify that it is set correctly
```

**Note** \$LANG can be any International locale; for example, `De_DE` or `De_DE.IBM-1047` for German, `Fr_FR` or `Fr_FR.IBM-1047` for French, `Ja_JP` for Japanese, etc.

- Change to the `/notesdata` directory, as follows:

```
cd /notesdata
```

- Start the server, as follows:

```
/usr/lpp/lotus/bin/server
```

Domino for z/OS

### Accessing data from relational databases

Lotus Script:Data Objects (LS:DO) allows access (read and write) to DB2 data from the Domino server. The CCSIDs used for the data in each DB2 sub-system are defined when DB2 is installed. LS:DO will support all the CCSIDs supported by DB2. See the *DB2 Installation Guide* (GC26-8970) for details.

Domino for z/OS

## Considerations for LS:DO

### Open Database Connectivity

This topic contains considerations for Open Database Connectivity (ODBC) with Lotus Script: Data Object (LS:DO).

**Note** Tables used in LS:DO ExecProcedure calls must be EBCDIC.

### LS:DO considerations for all users, for all languages:

To use LS:DO to access DB2 databases, you (the user ID used to start the Domino server) must set environment variables by adding three lines to your logon profile or by executing them after logon. These environment variables define the following:

1. Your language locale
2. The DB2 CLI initialization file
3. The DB2 runtime libraries

These variables can be set in the user's logon profile, some other script that is run before starting the server, or manually before starting the server. The rest of this section describes how to define these variables.

#### 1. Defining your language locale

To define the language locale, add the following to your logon profile or execute it after logon:

```
export LANG=xx_xx
```

where:

**xx\_xx**

is the locale for your language, as defined in "Appendix F. Locale Objects, Source Files, and Charmaps" in the *OS/390 UNIX System Services User's Guide SC28-1891*.

#### 2. Defining the DB2 CLI initialization file

To define the DB2 CLI initialization file, add the following to your logon profile or execute it after logon:

```
export DSNAOINI=USER1.DB2CLI.CLIINI
```

where:

**USER1.DB2CLI.CLIINI**

is the DB2 CLI initialization file which must be defined as an FB(80) dataset.

Refer to *DB2 UDB for OS/390 V6 ODBC Guide and Reference (SC26-9005-02)*, Chapter 4 "Configuring DB2 ODBC and running sample applications". Contact your local DB2 administrator for information on DB2 CLI initialization file, DB2 runtime libraries and the actual names of the datasets.

#### 3. Defining the DB2 runtime libraries

You must export a STEPLIB environment variable for DSNxxx.SDSNEXIT. If you are running multiple DB2 releases, you also need to concatenate the DSNxxx.SDSNLOAD to the STEPLIB environment variable for the DB2 release with which you are running. For example, to define the DB2 runtime libraries, add the following to your logon profile or execute it after logon:

```
export STEPLIB=DSNxxx.SDSNEXIT:DSNxxx.SDSNLOAD
```

where:

**DSNxxx.SDSNEXIT** and **DSNxxx.SDSNLOAD**

are the DB2 runtime libraries. **xxx** is the DB2 version.

**Note** If DSNxxx.SDSNLOAD is not part of the STEPLIB, then make sure it is APF authorized and is part of the LNKLST. Do this by adding this dataset to your SYS1.PARMLIB IEAAPFxx and LNKLSTxx parmlib members or your PROGxx parmlib members.

**LS:DO considerations for accessing non-English DB2 databases:**

To access non-English DB2 databases, you will need to set up LotusScript for a non-English locale as described in "Customizing the Server for Your Environment".

Domino for z/OS

**Considerations for double-byte characters**

Following are some considerations with regard to double-byte characters:

**Database (file) names:**

PC and UNIX platforms support double-byte file names for Domino database names, but Domino for z/OS does not support double-byte database names. DBCS is locale and codepage dependent; file names should be limited to the POSIX filename subset of characters to make them invariant across (EBCDIC) locales and codepages.

The following are some of the problems you may encounter due to this restriction:

1. **New Replicas** -> When a user creates a new replica, the default is to use the same database name for the new replica. If this database name contains DBCS characters and the new replica is to be placed on an z/OS, the user will need to know this and override the defaults manually. If you replicate a database with a file name that uses a double-byte character set from a PC or UNIX platform to z/OS, you must change the file name to a single-byte character set. Otherwise, full text indexing cannot be created.
2. **New User** -> When a new user is defined, the default mail database name is <shortname>.nsf. If a user's short name contains DBCS characters and the user is being defined on an z/OS server, the default mail box name needs to be manually overridden.
3. **Move User** -> The Notes Admin client has a new function which allows an Administrator to move a mail file to a different server without end user intervention. This was a requirement from many Domino customers. However, if the user's mail file contains DBCS characters, the administrator will have to change this to an SBCS name (as will the end user) before using this function.

**User IDs:**

As the short form of the user ID is used to create the mail nsf for each user, and file names should not contain double-byte characters, this also means that the short form of a user ID should not contain double-byte characters.

**Mail File Names:**

When a user is defined with a name that contains national characters, it is necessary to override the default mail file name with a name that does not contain national characters. This is because the user name is used to develop the mail file name and, on z/OS, file names must conform to the restrictions defined in the "Unix System Services User's Guide".

**Japanese code pages IBM-930 and IBM-939:**

Note that z/OS UNIX System Services supports Ja\_JP.IBM-939 locale but it does not support Ja\_JP.IBM-930 locale. As Domino S/390 runs on z/OS UNIX System Services, the locale that Domino should support is Ja\_JP.IBM-939. As to the databases, there are two kinds of databases CCSID 939 and 930. LS:DO or NotesPump or whatever needs to support Japanese databases, and thus should support both CCSID 939 and 930 and support the code conversion for CCSID 939 and 930.

IBM-930 and IBM-939 are "mixed" host codesets, each of which has an SBCS and a DBCS component. IBM-300 (host Japanese Kanji) is the DBCS component for both. For IBM-939, the SBCS component is IBM-1027 (Japanese extended Latin). IBM-1027 is a POSIX compliant codepage; namely, it contains all required POSIX characters at the right code points for the z/OS C/C++ compiler. However, for IBM-930, the SBCS component is IBM-290 (Japanese Katakana) which is NOT POSIX compliant. IBM-290 has all requisite POSIX characters. However, the lower case alphabets (a-z) do NOT have the right encodings for the z/OS C/C++ compiler.

Because IBM-290 is non-POSIX, i.e., commands and programs encoded by IBM-290 are not interpreted properly by the shell and utilities (including the compiler), IBM-290 and IBM-930 (which has IBM-290 as its SBCS component) are NOT supported (or usable) by UNIX System Services. There is NO workaround other than converting programs, scripts, and any other files which are parsed by the UNIX System Services to IBM-1027 (the SBCS component of IBM-939).

Domino for z/OS

### Considerations for names, addresses, and passwords

Lotus recommends that you use only characters that are in the standard ASCII character set (that is, non-accented and English) for the following:

- Domain name
- Organization name
- Domino server name
- Notes ID file names (for portability across various operating systems)
- Database file names (for portability across various operating systems)
- Mail file names (some browsers / mail client releases only support file names with ASCII characters)
- Short name (some browsers / mail client releases only support short names with ASCII characters)
- Internet Address (RFC restriction)
- Passwords (some browsers / mail client releases only support passwords with ASCII characters)

Domino for z/OS

### Considerations for server console

To display the server console output properly in the case of non-C locale on the system console, enter the following before starting the server:

```
chcp -a ASCII codepage -e EBCDIC codepage
```

For example, if LANG=Ja\_JP.IBM-939, enter the following commands:

```
chcp -a IBM-932C -e IBM-939  
server
```

## Chapter 6 - Glossary

Domino for z/OS

### Understanding Domino terms

Before you configure your Domino server, familiarize yourself with the following Domino terms:

#### Certifier ID

Each grouping of Domino servers, known as a domain, has an organization certifier ID that is stored in a file named CERT.ID. This certifier automatically certifies the first server's ID and the administrator's ID. When you register new users or servers, you use the certifier ID to give access to the domain. You also use the organization certifier ID when you create organizational unit certifiers for a hierarchical name scheme.

Domino creates the organization certifier ID automatically during the first server Setup program using the name you specify and an optional country code. You can only add a country code if your country's clearinghouse for X.500 names has approved your organization's certifier ID. Doing this minimizes the chance that another organization has the same name as yours. A multinational organization requires only one certifier ID, even if a country code is specified; it's not necessary to have separate certifier IDs for each country in which Domino is deployed.

#### Domain

A domain is a group of Domino servers that share the same Domino Directory.

#### Domino Directory

Each domain has a Domino Directory. The Domino Directory is the control and administration center for Domino servers in the domain. It contains a Server document for each server and a Person document for each user. In addition, you can create Group documents to establish relationships among servers and users for mailing and security purposes, and create Connection documents to schedule replication and mail routing among servers.

For more information, see *Administering the Domino System*.

#### Domino server ID

Each Domino server has a unique name that is maintained in its own ID file. Domino creates the server ID automatically during the server configuration program. This user ID has a UID of non-zero.

#### IBM HTTP Server User ID

This user ID is used to start and run the IBM HTTP server.

#### LPAR

z/OS logical partition.

#### Notes user ID

Each Notes user has a unique name that is maintained in its own Lotus Notes ID file. Domino creates the user ID when you register new Lotus Notes users.

#### Partitioned server

A Domino partitioned server is a Domino server that shares the Domino program directory (the Domino executable files) with other Domino servers. Each partitioned server has its own Domino data directory and notes.ini file, as well as its own copy of the Domino Directory and other administrative files.

#### Server Install User ID

This user ID is used to install the Domino server. This user ID must have a UID of zero.



## Chapter 7 - Notices and trademarks

Domino for z/OS

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Domino for z/OS

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