PRONTO Xi

Installation and Upgrade Guide

Pronto Xi on Informix

Version 740.3

Document name and version

Pronto Xi on Informix Installation and Upgrade Guide, version 5.3

Software applications and versions

Pronto Xi version 740.3

Disclaimer

The information contained within this document is provided on an "as is" basis, is subject to change without notice, and is not warranted to be error-free.

While this guide provides specific, practical examples of implementing Pronto Xi features, it cannot cater for all possible requirements of our customers. We hope, nevertheless, that this guide will stimulate ideas for extending or enhancing your Pronto Xi implementation, and we strongly encourage you to seek professional advice regarding your specific business needs.

Each manual provides an overview of the functions available for that module based on the standard settings. Pronto Software does not provide procedural guides and/or work instructions due to the complex and differing nature of business models Pronto Xi currently supports. Permission is granted for information to be copied from the reference guides for the express purpose of writing site-specific procedures/work instructions.

Contents

1 About this guide

This guide provides detailed instructions on:

- Installing Informix and Pronto Xi (p.3)
- Upgrading to IBM Informix 12.10 (p.23)
- Upgrading Pronto Xi data (p.29)
- Migrating from a C-ISAM database to an Informix database (p.37)
- Administering the IBM Informix database (p.63)

The appendix of this guide includes set up instructions to help you:

- Run multiple BMS versions in the same Informix database (p.87)
- Run multiple Informix instances (p.97)

1.1 Audience

This guide is for Pronto Software staff or Resellers involved in an IBM Informix implementation of Pronto Xi on UNIX or Linux.

1.2 Prerequisites

For information about hardware and software prerequisites, see the current *Pronto Xi Software and Hardware Specifications Guide*.

For new Pronto Xi installations or IBM Informix upgrades, see the additional requirements in About report users (p.3).

1.3 Conventions

The following notations are used in this document to indicate specific types of information:

A warning that you could lose data if you perform the task incorrectly or the required prerequisites have not been met.
An important note or caution that you should read and understand before continuing.
A general note.
A Pronto Software recommendation.
An example.
A tip that you might find useful, or an alternative way you can perform the task.
A function or feature that might be unavailable depending on the software settings or configuration.

Task conventions

- Where a field is not explicitly mentioned in the steps of a task for a given screen, you can assume that it is safe to either skip over or enter any allowed value in the field.
- To complete screen entry once you have completed all other screen tasks, press `F4`.
- To see more help for a screen or field, press `F1` to open the Pronto Xi Help.
- To see a list of options for a field, where available, press `F2`.

2 Installing Informix and Pronto Xi

Perform the following tasks to install Pronto Xi for IBM Informix:

- Install the Pronto Xi Client (p.3)
- Install and configure the IBM Informix database (p.3)
- Clean the Informix server (p.9)
- Install the Pronto Xi foundation and applications (p.9)

If you are installing Pronto Xi or upgrading IBM Informix, additionally see About report users (p.3) for information about the new report user passwords.

2.1 About report users

If you are installing Pronto Xi or upgrading IBM Informix will also need to add three **Business Intelligence** report user passwords.

The following Pronto Xi **Business Intelligence** users have been added for increased database security.

All three users are restricted to read-only access to all approved databases.

- rpt_usr
  The standard user, which grants access to all **Business Intelligence** connections except **Payroll**.
- rpt_pay_usr
  The payroll user, which grants access exclusively to the $SYSPAY views for **Business Intelligence**.
- rpt_gl_usr
  The general ledger user, which grants access exclusively to the $SYSGLDATA and all other $SYSGL* views and **General Ledger** views for **Business Intelligence**.

  This user will be in use from version 750.

2.2 Install the Pronto Xi Client

You can streamline the installation of the IBM Informix database and the Pronto Xi foundation and applications by first installing the Pronto Xi Client on a PC that can connect to the Pronto Xi server.

Steps

1. On a PC with a network connection to the Pronto Xi server, insert the Pronto Xi installation DVD.
   The **Installation Wizard** launches automatically. If it does not display, run *setup.exe* in the root directory of the DVD.
2. Click **Install Pronto Xi Thin Client - UNIX/Internet** and then follow the instructions to complete the installation.

2.3 Install and configure the IBM Informix database

Follow the steps below to install and configure the IBM Informix database.

Before modifying any of the recommended settings below, you must contact Pronto Software Support stating the nature and reason for the change. This change will be registered with the Pronto Software Development Centre for reference purposes. Pronto Software staff who change a setting must log the change with the Development Centre directly.

The minimum requirements for new installations are 24GB RAM, four virtual CPUs. If the server does not meet these minimum requirements, the demo mode is automatically installed.

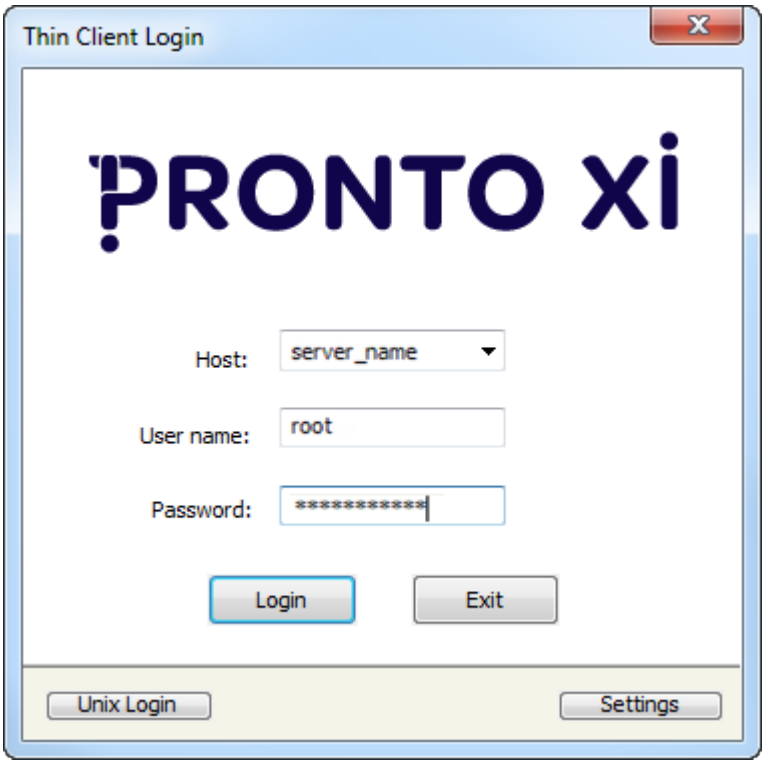
Before you start

On the Migration worksheet (p.84), record the details of the companies being migrated. You can also use the worksheet to record the overall progress of the migration.

Calculate the kernel.shmmax number. This should equal the total amount of memory to be allocated to Informix. For minimum recommendations, see the *System Requirements* section of the *ids_machine_notes_xx.xx.txt* file (where xx.xx is the Informix version, e.g. 12.10), which is located in the *dbs/lin_notes* or *dbs/aix_notes* directory of the Informix installation media.

Steps

1. In kernel.shmmax, enter the calculated value (see above).
2. Run **sysctl-p** to ensure the setting takes effect immediately.
3. Open the Pronto Xi Client and log in to the server as **root**.



4. A Pronto Xi shell is displayed after login.
5. Insert the Pronto Software-supplied Informix installation DVD into the drive of the Pronto Xi server.
6. In the Pronto Xi shell, mount the DVD and navigate to the root directory of the DVD.

```
mount /dev/cdrom /mnt
cd /mnt
```

7. Run the install script.

```
./install
```

```
Do you plan to install Cognos on Linux on this server (y/n) (default n) ?
```

If you are implementing IBM Cognos, the server must be running Linux Red Hat version 6 (if implementing IBM Cognos v10.2.1) or Red Hat version 7 (if implementing IBM Cognos v10.2.2).

8. Enter **y** to continue.
   Some tasks are performed then the required packages are listed.

```
Loaded plugins: product-id, refresh-packagekit, security, subscription-manager
Cleaning repos: dvd
Cleaning up Everything
--------------------------------------------------
Active repository detected!.
Packages below are a prerequisite of Informix and must be installed before the installer can proceed.
------------------------------------------------------------
       Required minimum package list
------------------------------------------------------------
1)  libaio-0.3.107-10.el6.x86_64
2)  libgcc-4.4.4-3.el6.x86_64
3)  libgcc-4.4.4-3.el6.i686
4)  libstdc++-4.4.4-13.el6.x86_64
5)  compat-libstdc++-33-3.2.3-69.el6.x86_64
6)  ncurses-5.7-3.20090208.el6.x86_64
7)  pam-1.1.1-13.el6.x86_64
8)  libhugetlbfs-utils-2.12-2.el6.x86_64
------------------------------------------------------------

All packages listed above will be automatically updated with the latest version present in the repository!
Press Enter to continue with installation/upgrade.
```

If the message "Could not match patches: Cannot retrieve repository metadata (repomd.xls) for repository: RHEL-CD" is displayed, make sure the Red Hat installation CD is mounted then restart the script.

9. Press `Enter` to continue.
   A group and a user named **informix** are created.

```
Attempting to install required packages please wait...
All the required packages successfully installed.


Group 'informix' added.
User 'informix' added - Please set password.
Changing password for user informix.
New password:
```

10. Enter a password for the **informix** user then re-enter the password when prompted.
    The installation script installs the Informix database in the */dbs* directory, and the Pronto Xi application in the */pro* directory. If these directories do not already exist, you are prompted to create them.

```
The directory /pro does not currently exist.
The Pronto-Xi and Informix systems and will be created within /pro.
The directory /dbs does not currently exist.
The Informix data will be stored within /dbs

If you wish to create separate file system/s for this you should do
so now and restart this installation once they have been created
and the file systems mounted.  If you do not create /pro or /dbs as
separate file systems then they will form part of the root file system.

Create missing directories within the root file system [y/n] (default n)? y
```

If you need control over the file system layout for the installation directories so that they are not part of the root file system, exit the script, create the links from */pro* and */dbs* to the relevant locations, and re-run this script.

11. Enter **y** to create the directories */pro* and */dbs*.
    You are asked whether to use the UTF-8 code page, which is a multi-byte implementation of Unicode, or the ANSI code page. In a new installation, we recommend that you enter **y** to select the UTF-8 code page, however if you are migrating from an existing non-UTF-8 system, you must enter **n**.

```
It is recommended that the UTF-8 code page is used by Informix if you need to
store international characters.  UTF-8 supports all international Unicode
characters.  However, if you are migrating existing data with ANSI (non
Unicode international characters) then you should continue to use an ANSI
code page.
Use the UTF-8 code page within Informix [y/n] (default n)?
```

12. Enter **y** to use the UTF-8 code page or enter **n** if you do not.
    If you entered **n** above, the following additional prompt is displayed.

```
If you do not wish to use the default ANSI code page then you should
set the SERVER_LOCALE, DB_LOCALE and CLIENT_LOCALE environments and
restart this installation.
Continue [y/n] (default y)?
```

13. Enter **y** to use the default ANSI code page.
    You are asked for a temporary area to extract the Informix installation software into.

```
Please provide the path to a temporary directory with sufficient space to
extract the Informix Dynamic Server installation software.  An area with at
least 750MB is recommended.

Temporary directory (default /pro/tmp):
```

14. Press `Enter` to accept the default directory, or enter an alternative directory.
    You are now prompted to begin installing the Informix Dynamic Server application.

```
Install Informix Dynamic Server [y/n]? y
```

15. Enter **y**.
    After the extraction is complete, you are prompted to select a suitable initial Informix configuration.
    The following minimum requirements apply:

```
**********************************  WARNING ************************************
To allow Informix to function correctly a minimum total of 24GB
physical memory is required, which includes at least:
   . 16GB database server memory.
   . 8GB operating system memory.
******************************************************************************
```

- If the server does not meet the minimum requirement of 4 virtual CPUs, the demo Informix configuration is automatically selected.

```
********************************  WARNING ************************************
To allow Informix to function correctly the hardware needs to be capable of
supporting 4 Virtual CPUs.
******************************************************************************

------------------------------------------------------------------------------
** Please ignore the above warning message if you want to run in demo mode **
------------------------------------------------------------------------------
Do you really want to continue: [y/n]? y
```

- If the server meets the minimum requirement of 4 virtual CPUs but has less than 24GB of total physical memory, the demo Informix configuration is automatically selected.
- If the server has less than 4GB of total physical memory, the demo mode installation will fail.

  If the server meets both the minimum virtual CPUs and minimum total physical memory requirements, the following is displayed.

```
Please select the required initial Informix configuration based on the
serial number of the following metrix (default is 1).

|--------|-----------|--------|--------------|----------|-----------|---------|
| Serial | Selection | No. of | Transactions | Database | Max Table | No .of  |
| Number | Category  | Users  |   per day    | Size(GB) | Size (GB) |Companies|
| ------ | --------  | -----  | -----------  | -------- | --------- | --------|
|   1    |  Small    | 0 - 49 |    0 - 4999  |  0 - 49  |  0 - 1.99 |   0 - 6 |
|--------|-----------|--------|--------------|----------|-----------|---------|
|   2    |  Medium   |50 - 199| 5000 - 9999  | 50 - 99  |  2 - 4.99 | 7 - 20  |
|--------|-----------|--------|--------------|----------|-----------|---------|
|   3    |  Large    |  199 + |   9999 +     |   99 +   |  5 +      |   20 +  |
|--------|-----------|--------|--------------|----------|-----------|---------|
Enter the selection to continue (default is 1)?
```

- For information on the parameter settings in the onconfig file, see Onconfig parameter settings (p.107).
  - Small setup - 4GB each 4 temp dbspaces
  - Medium setup - 8GB each 4 temp dbspaces
  - Large setup - 16GB each 4 temp dbspaces

16. Enter **1** to accept the default, or make an alternative selection from the menu.

If the number of users expands into a higher category in the future, you will not necessarily need a configuration change. If the customer reports that the system performance is decreasing, the system must be reviewed, for example with regard to log files, server capacity, and so on. The Informix message log reports on the automatic, temporary adjustments made by the DB - these logs must be critically reviewed and assessed, and the database modified if necessary.

The installation script reports on the DB spaces that are created based on your selection and the required disk space.

```
The following database spaces will be created:
Name = rootdbs, Directory = /dbs/pronto/rootdbs, Size(MB) = 4000
Name = prontodbs, Directory = /dbs/pronto/prontodbs, Size(MB) = 4000
Name = livedbs, Directory = /dbs/pronto/livedbs, Size(MB) = 4000
Name = testdbs, Directory = /dbs/pronto/testdbs, Size(MB) = 4000
Name = llog, Directory = /dbs/pronto/llog, Size(MB) = 6001
Name = plog, Directory = /dbs/pronto/plog, Size(MB) = 4097
Name = tmpdbs1, Directory = /dbs/pronto/tmpdbs1, Size(MB) = 16000
Name = tmpdbs2, Directory = /dbs/pronto/tmpdbs2, Size(MB) = 16000
Name = tmpdbs3, Directory = /dbs/pronto/tmpdbs3, Size(MB) = 16000
Name = tmpdbs4, Directory = /dbs/pronto/tmpdbs4, Size(MB) = 16000

You need to ensure that there is sufficient space available for these.
Create the database spaces [y/n] (default y)?
```

17. Enter **y** to continue.
    The required DB spaces and settings for a Pronto Xi implementation are initialised. This can take several minutes, depending on your setup choice and hardware.

```
** WARNING **  A level 0 archive of Root DBSpace will need to be done.
Archive to tape device '/dev/null' is complete.
```

The above warning messages are displayed during this process. These are default Informix messages and can be ignored.

The following is displayed once the installation is complete:

```
Restarting Informix Server with new configuration

pronto Database server creation complete


Informix Dynamic Server installation complete
*********************************************

You should now install Pronto-Xi.
Ensure that the required Informix Dynamic Server environments are set prior to
running the Pronto-Xi installation script.  You can do this by either logging
in again or by issuing the following command:
. /pro/informix/etc/profile.pronto

[root@win-gsdig8je342 mnt]#
```

18. To verify that Informix is running, enter the following:

```
. /pro/informix/etc/profile.pronto
```

    then enter:

```
onstat -
```

    A line similar to the following is displayed indicating that the database is online:

```
IBM Informix Dynamic Server Version [illegible] -- On-Line -- Up 00:02:20 -- 953
5456 Kbytes
```

19. Exit the current Pronto Xi terminal session.
20. Log out and back in again and check that the correct Informix environments are set.
21. Start a new Pronto Xi terminal session and log in as **root**.
22. Enter the following command to unmount the Informix installation DVD.

```
umount /dev/cdrom
```

2.4 Clean the Informix server

If you normally restart the server before installing Pronto Xi, you need to clean the Informix server.

Steps

1. After installing and configuring the Informix database, restart the server.
2. Open the Pronto Xi Client and log in to the server as **root**.
3. Insert the Pronto Software-supplied Informix installation DVD into the drive of the Pronto Xi server.
4. In the Pronto Xi shell, mount the DVD and navigate to the root directory of the DVD.

```
cd /mnt/ids
```

5. Run the script below.

```
./Proper_DB_shut.sh
```

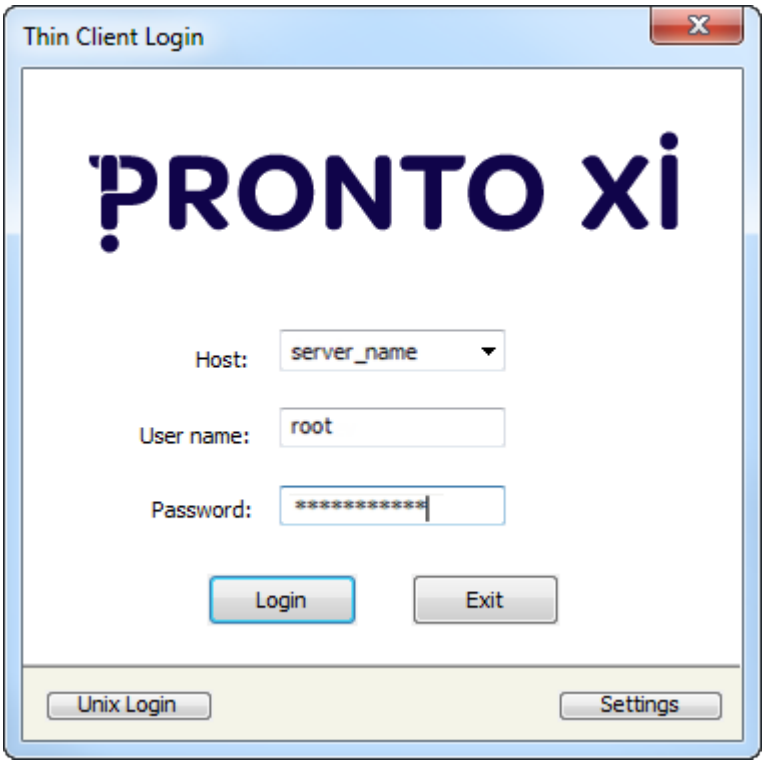
6. Continue installing the Pronto Xi foundation and applications.

2.5 Install the Pronto Xi foundation and applications

Now you can install the Pronto Xi foundation and applications on the Pronto Xi server.

Steps

1. Launch the Pronto Xi Client and log in as **root**.



2. A Pronto Xi shell is displayed after login.
3. Insert the Pronto Xi installation DVD and navigate to the *unix* directory.

```
mount /dev/cdrom /mnt
cd /mnt/unix
```

4. Run the install script.

```
./install
```

```
PRONTO CD-ROM based installation/update for Unix/Linux Systems
================================================================

Enter the directory where the PRONTO-Xi CD-ROM is mounted.

Directory (default /mnt):
```

If you get a permission error, unmount and remount using the following commands:

```
umount /dev/cdrom
 mount /dev/cdrom/mnt
```

5. Press `Enter` if the default mount directory is correct, or enter the actual mount directory.
You are prompted for the directory to install Pronto Xi into.

```
Enter the parent directory where PRONTO-Xi is to be loaded.
e.g. if the PRONTO-Xi directory is /pro/pronto then the parent is /pro.

Parent directory (default /pro):
```

6. Press `Enter` to accept the default directory (recommended), or enter an alternative directory.
You are prompted to identify the operating system and machine type.

```
Select Your Operating System and Machine type.

1) IBM pSeries (AIX)
2) Linux (Intel x86)
3) Sun Sparc (Solaris)
4) SCO OpenServer6 / Unixware
99) Other
q) Quit

System (default 2):
```

7. Press `Enter` if the operating system is correctly detected, otherwise enter **2**.
You are prompted to select the database type for the implementation.

```
Select the database that will be used by PRONTO-Xi in this implementation.

1) Oracle
2) IBM Informix Dynamic Server (IDS)
q) Quit

Database (default 2)?
```

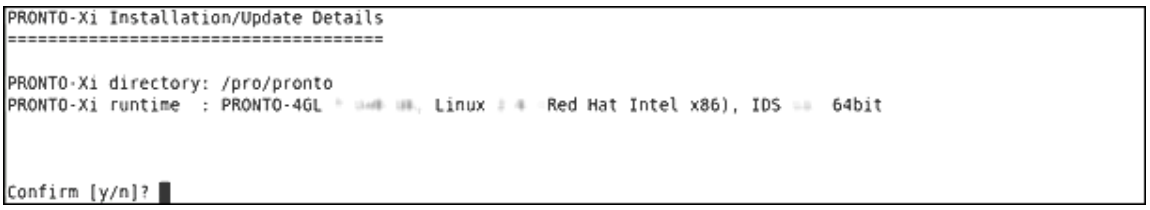
8. Press `Enter` to accept the default database, Informix.
You are prompted to select the runtime version to be installed.

```
The following PRONTO-Xi runtime Linux (Intel x86) IDS versions are defined:

1) PRONTO-4GL [illegible], Linux [illegible] (Red Hat Intel x86), IDS [illegible], 64bit
q) Quit

Enter the required PRONTO-Xi runtime version (default 1):
```

9. Press `Enter` to accept the default runtime version.
   The installation settings are summarised for confirmation purposes.



10. Check the installation details are correct.
11. Enter **y**.
    The Pronto Xi foundation files and tools are extracted.

```
/pro/pronto/java/jre1.8/man/man1/javaws.1       - Melted
/pro/pronto/java/jre1.8/man/man1/jjs.1  - Melted
/pro/pronto/java/jre1.8/man/man1/keytool.1      - Melted
/pro/pronto/java/jre1.8/man/man1/orbd.1 - Melted
/pro/pronto/java/jre1.8/man/man1/pack200.1      - Melted
/pro/pronto/java/jre1.8/man/man1/policytool.1   - Melted
/pro/pronto/java/jre1.8/man/man1/rmid.1 - Melted
/pro/pronto/java/jre1.8/man/man1/rmiregistry.1  - Melted
/pro/pronto/java/jre1.8/man/man1/servertool.1   - Melted
/pro/pronto/java/jre1.8/man/man1/tnameserv.1    - Melted
/pro/pronto/java/jre1.8/man/man1/unpack200.1    - Melted
/pro/pronto/java/jre1.8/plugin/desktop/sun_java.desktop - Melted
/pro/pronto/java/jre1.8/plugin/desktop/sun_java.png     - Melted
/pro/pronto/java/jre1.8/release - Melted
```

12. When extracts are complete, and if not previously set up, you will be prompted to enter and reconfirm the password for each of the following user names for Business Intelligence:
    - rpt_usr
    - rpt_pay_usr
    - rpt_gl_usr

> You should write these passwords down in the *Configuration Worksheet* included with the *Business Intelligence installation and configuration guide* as they will be required again when the Cognos connection strings are set up in this guide.

```
Adding special Pronto Bi user names ...
Create user rpt_usr now ...
Provide the password for rpt_usr:
Retype the password for rpt_usr:
Changing password for user rpt_usr.
New password: BAD PASSWORD: it is based on a dictionary word
Retype new password: passwd: all authentication tokens updated successfully.
Create user rpt_pay_usr now
Provide the password for rpt_pay_usr:
Retype the password for rpt_pay_usr:
Changing password for user rpt_pay_usr.
New password: BAD PASSWORD: it is based on a dictionary word
Retype new password: passwd: all authentication tokens updated successfully.
Create user rpt_gl_usr now
Provide the password for rpt_gl_usr:
Retype the password for rpt_gl_usr:
```

> The image below shows an upgrade process; the install process is the same.

```
Cleaning up Everything
Installing required Linux packages for 2FA and HTML to PDF converter utilities.



Running the standard PRONTO-Xi runtime installation/setup program...


PRONTO-Xi directory : /pro/pronto

PRONTO-Xi Upgrade Procedure.
----------------------------

This upgrade procedure performs the following:

        - Sets up any new PRONTO-Xi control files
        - Sets ownership/modes of PRONTO-Xi files
        - Compiles old style terminal definitions

You should run this with super-user permissions if these are available.


Do you wish to continue the upgrade procedure [y/n] ?
```

13. Enter **y** to start the runtime installation.
    You are prompted for the directory in which to install the runtime programs.

```
Enter the full path for the BMS programs directory
The default is /pro/pronto/bms:
```

14. Press `Enter` to accept the default *BMS* path.
    You are prompted whether to include a *CUS* directory in the Pronto Xi search path.

```
Is a customer directory to be in the PRONTO-Xi search path [y/n] (def. y) ?
```

15. Press `Enter` to include the *CUS* directory in the path.

```
Enter the full path for the customer directory
The default is /pro/pronto/cus:
```

16. Press `Enter` to accept the default *CUS* path.
    You are prompted whether you want to create a distribution dictionary directory.

```
Is a Distribution dictionary (PRODISTDICT) required [y/n] (def. y) ? y
```

17. Enter **y** to create a distribution dictionary directory.
18. You are prompted to enter a path.

```
Enter the full path for the Distribution dictionary
The default is /pro/pronto/cus/dist:
```

19. Press `Enter` to accept the default *PRODISTDICT* path.
    You are asked whether environment variables should be set up globally for all users (recommended), or on a per-user basis.

```
PRONTO-Xi requires certain environment variables to be set up when a
user logs in.  These environment variables can be defined globally
for all users (e.g. in /etc/profile), or locally on a per user basis
(e.g. in the user's .profile).

Are environments to be set globally [y/n] (default is y) ?
```

20. Press `Enter` to set up global environment variables for all Pronto Xi users.
    You are asked whether to set up the standard Pronto Xi users and groups (recommended).

```
By default PRONTO-Xi requires certain special users and groups to be added
to the system for administration and file ownership reasons.
The users are:
        pronto      - (Optional) PRONTO-Xi system admin (super user access)
        psd         - Owner of the PRONTO-Xi system directory and files
The groups are:
        pronto      - Common PRONTO-Xi user group
        probatch    - PRONTO-Xi batch system group

It is strongly recommended (although not essential) that these users be
added to the system.  All PRONTO-Xi system files will be owned by the user who
restored the release if these users are not added.

Add the special PRONTO-Xi users [y/n] (default is y) ?
```

21. Press `Enter` to create the **pronto** and **psd** users.

```
Add the 'pronto' system admin user [y/n] (default is y)?
```

22. Press `Enter` to create a system administrator user.

```
Add the 'appserv' application services user [y/n] (default is y)?
```

23. Press `Enter` to create a user account for running the application service daemon and application service jobs.

```
Add the 'idsconx' user for IDS database connections [y/n] (default is y)?
```

24. Press `Enter` to create a user for Informix database connections.
    You are asked whether to start the Pronto Xi batch system automatically when the system is booted (recommended).

```
PRONTO-Xi contains a batch system that should be started whenever the
system is booted.  If this is not done, the batch system must be
started manually whenever it is required.

Start the batch system automatically [y/n] (default is y) ?
```

25. Press `Enter` to set up the batch system so that it starts automatically.
    You are asked whether to run Pronto Xi programs with setgid permissions.

```
PRONTO-4GL executable programs may run with setgid permissions
if required.  This can provide a higher level of file protection
from users with shell access.  If selected, users should not
be a member of the group: pronto.

Do you wish to run with setgid permissions [y/n] (default is n) ?
```

26. Press `Enter` to accept the default response of **No**.
    You are asked whether you will be using a tape device to perform backups.

```
Do you use a magnetic tape device [y/n] (default is y) ?
```

27. If a tape device is used for backups, enter **y** and enter the name of the tape device, for example */dev/st0*, otherwise enter **n**.
    The installation settings are summarised.

```
The PRONTO-Xi home directory is /pro/pronto
The BMS home directory is /pro/pronto/bms
The customer search path directory is /pro/pronto/cus
The Distribution dictionary path is /pro/pronto/cus/dist
Environments are to be set globally for all users
Special PRONTO-Xi users will be added to the system
The batch system will be started automatically
Programs will not run with setgid permissions

Is this correct [y/n]? y
```

28. Check the runtime installation settings.
29. Enter **y** to start the installation.

```
Installation proceding

Setting up lib directory...

PRONTO Registration

NOTE: Enter Q at any prompt to quit.

        Installation ID    : 27689187

        Serial number      :
```

30. Enter the serial number and key for the current Pronto Xi implementation.
    The entered details are displayed.

```
        Product key 1      : xxxxxxxx
        Product key 2      : xxxxxxxx
        Product key 3      : xxxxxxxx
        Product key 4      : xxxxxxxx
        Activation key     : [redacted]
        Customer name      : Pronto Software Pty Ltd

This is a [redacted] user runtime + full development system

NOTE: This licence expires on Sat Jan  5 [redacted]

Is this information correct (Y/N)?
```

31. Confirm that the details are correct.
32. Enter **y**.
    You are asked to supply a password for the **pronto** user account.

```
PRONTO registration complete
Adding special user names to /etc/passwd file...
useradd: warning: the home directory already exists.
Not copying any file from skel directory into it.

Password setup for new user 'pronto'

Changing password for user pronto.
New UNIX password:
```

33. Enter a secure password for the **pronto** user, and then re-enter it for confirmation.
34. Enter a secure password for the **psd** user, and then re-enter it for confirmation.

```
Password setup for new user 'psd'

Changing password for user psd.
New UNIX password:
```

35. Enter a secure password for the **appserv** user, and then re-enter it for confirmation.

```
Password setup for new user 'appserv'

Changing password for user appserv.
New UNIX password:
```

36. Enter a secure password for the **idsconx** user, and then re-enter it for confirmation.

```
Password setup for new user 'idsconx'

Changing password for user idsconx.
New UNIX password:
```

The final steps of the runtime installation are performed.

```
passwd: all authentication tokens updated successfully.
Adding environment setups to profiles...
Adding batch startup procedure to RC...
Compiling old style terminal definitions...
Changing ownerships...

Installation complete.

Invoke PRONTO-Xi application software installation [y/n]?
```

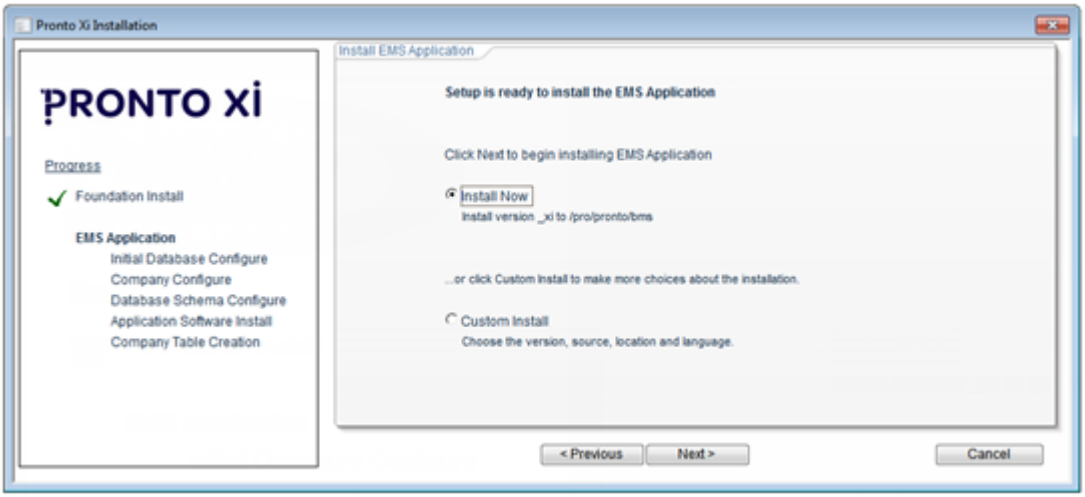
37. Enter **y** to proceed with the installation.

```
Installation complete.

To install the PRONTO-Xi application software, you must:
1) Install and launch the PRONTO-Xi Thin Client on a Windows PC
2) Log in as the user 'psd' and run the following command:
   prospl /mnt/proinst /mnt
```

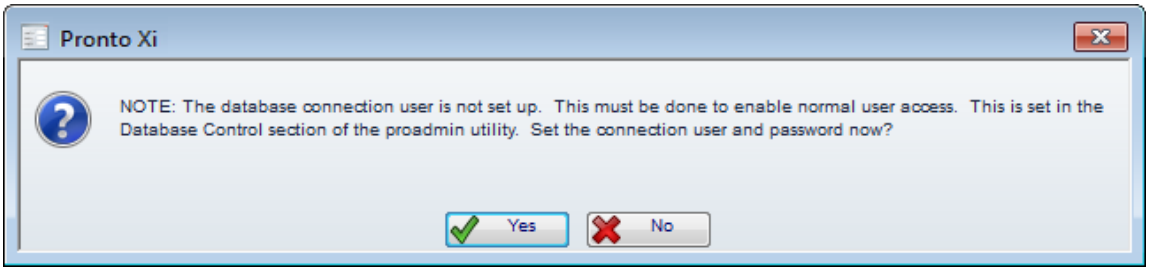
38. Launch the Pronto Xi Client again and log into the server as **psd**.
39. Run the following command to launch the applications installation wizard.

```
prospl /mnt/proinst /mnt
```

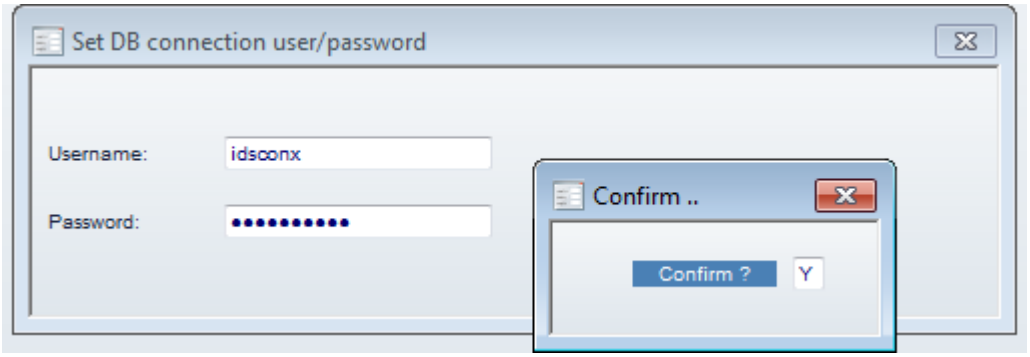


40. Click Install Now.
41. Click Next.

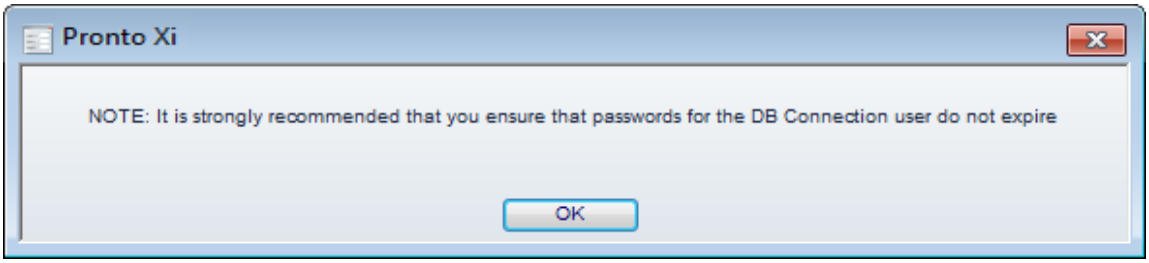
You are asked whether to set up the database connection user (idsconx) that was created during the runtime installation.



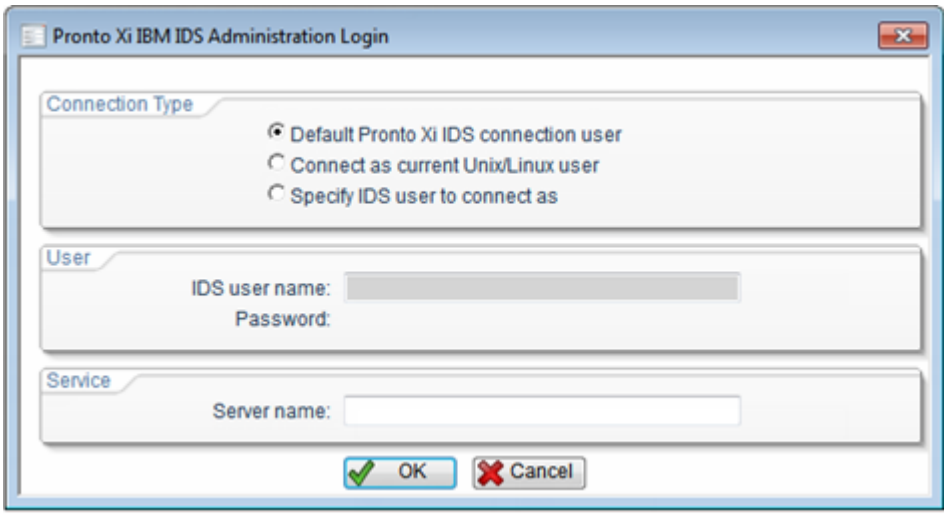
42. Click Yes.



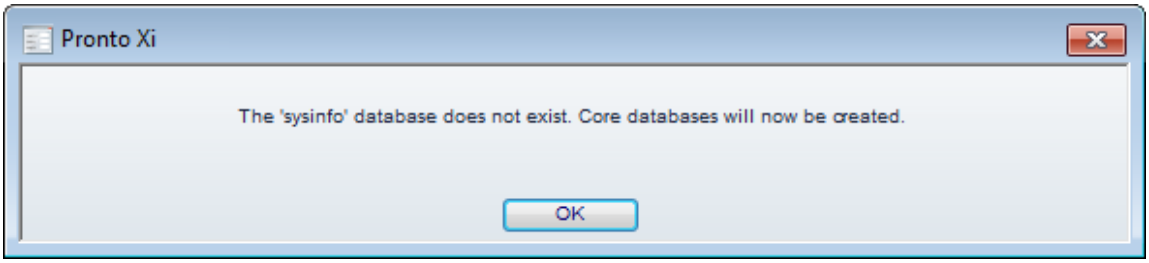
43. Enter the password you set for the **idsconx** user account when it was created during the runtime installation and enter **y** to confirm.
44. Press `Enter`.
The following acknowledgement prompt is displayed. This is an operating system level setting.



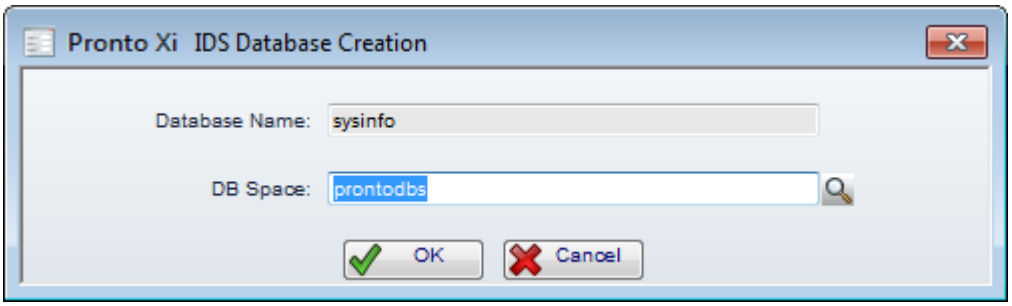
45. Click OK.
You are asked to establish a connection to the Informix database.



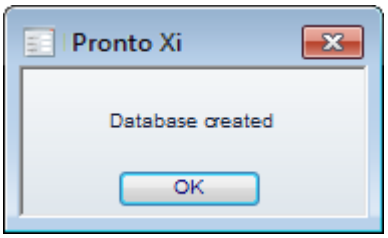
46. If you accepted the database connection user name **idsconx**, click OK to continue, otherwise select Specify IDS user to connect as and enter the required details.
The following message is displayed.



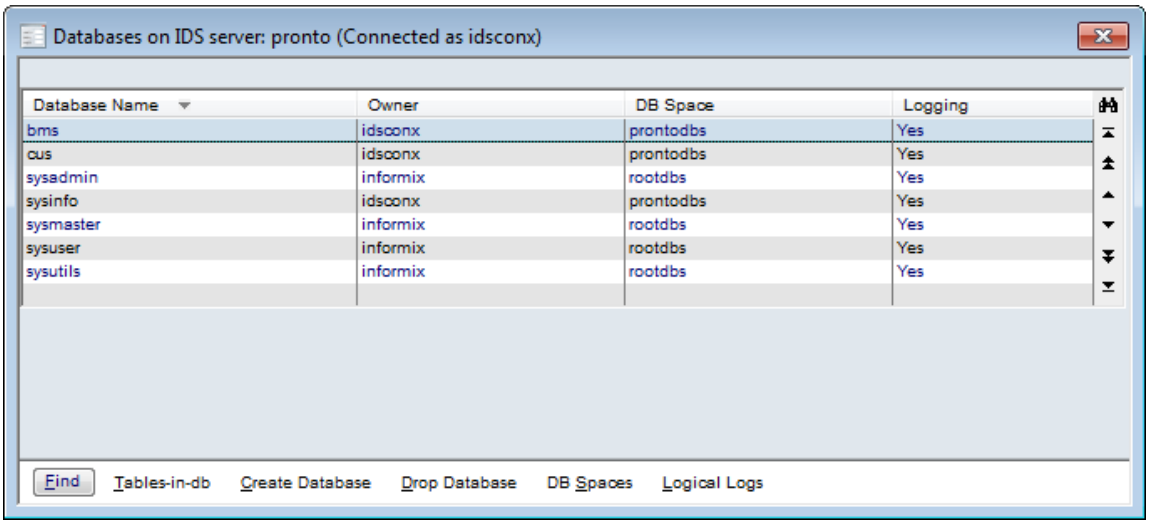
47. Click **OK**.
You are prompted for the name of the **DB Space** in which to create the database.



48. Click **OK** to accept the default.
The database creation is confirmed.



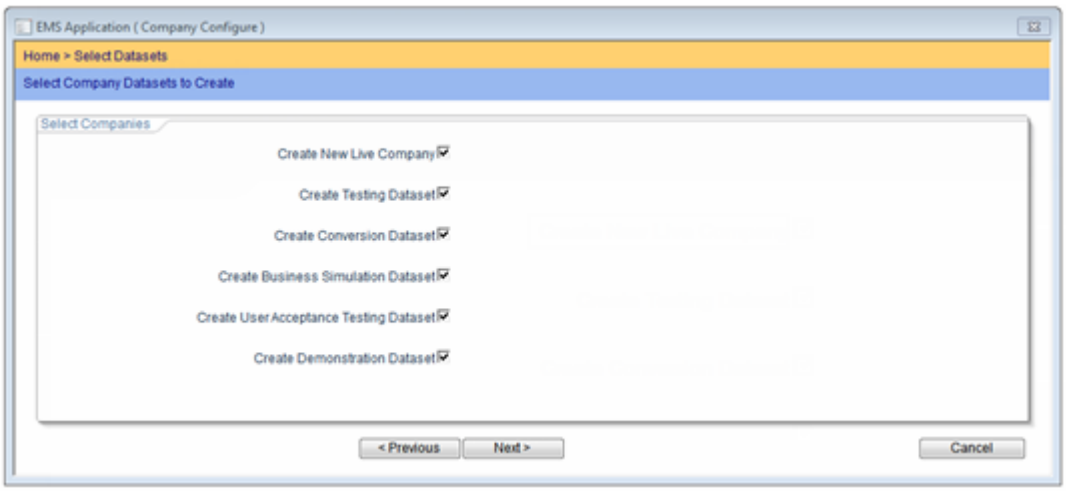
49. Click **OK**.
A list of the created databases is displayed in a data grid.



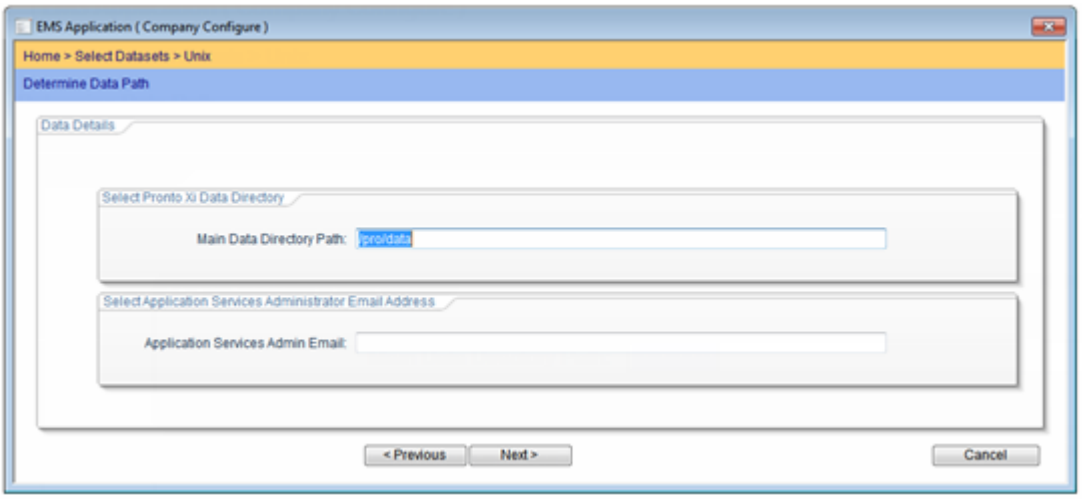
- *sysadmin*, *sysmaster*, *sysuser*, and *sysutils* are Informix system databases that are created by Informix and used by Informix.
- *bms*, *cus*, and *sysinfo* are the databases used to store tables whose path is in *$BMS*, *$CUS* and *$PRONTO/lib/sysinfo* respectively.
- *newbms* is a database provided as a mechanism for storing a new version of the bms dictionary when performing user acceptance testing for a new release.

50. Press `Esc` to exit this screen.

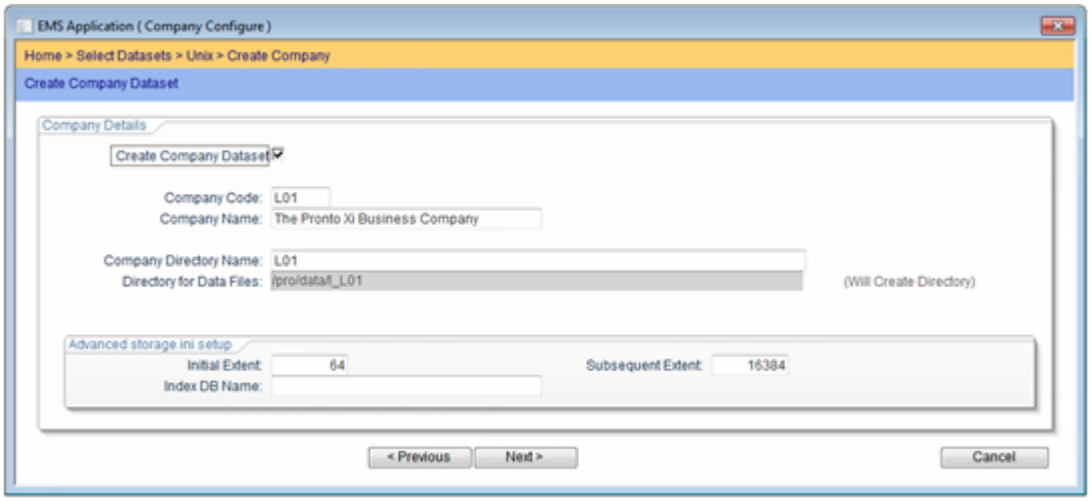
51. Select the companies to create.



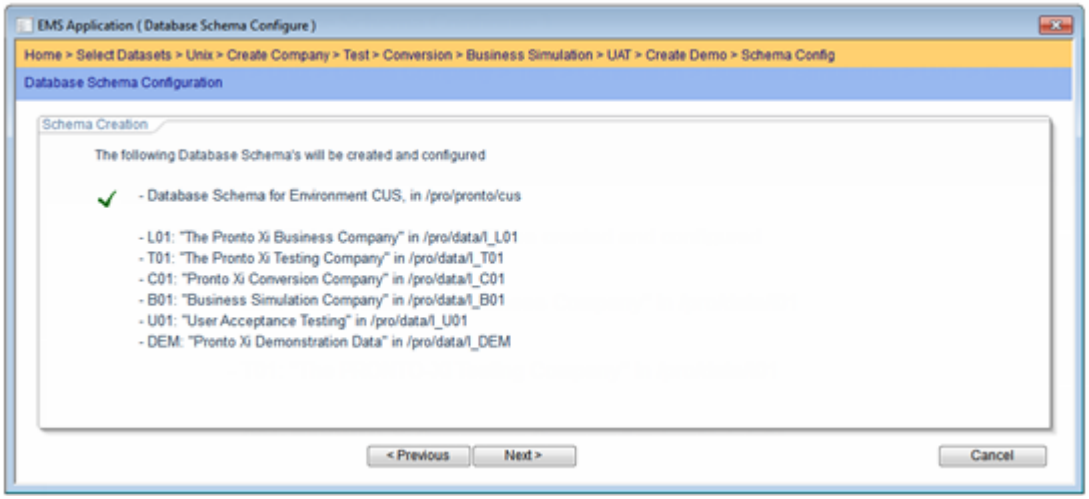
52. For a new installation of Pronto Xi, leave all the options selected and click **Next**.
You are prompted for the parent directory in which to create the companies.



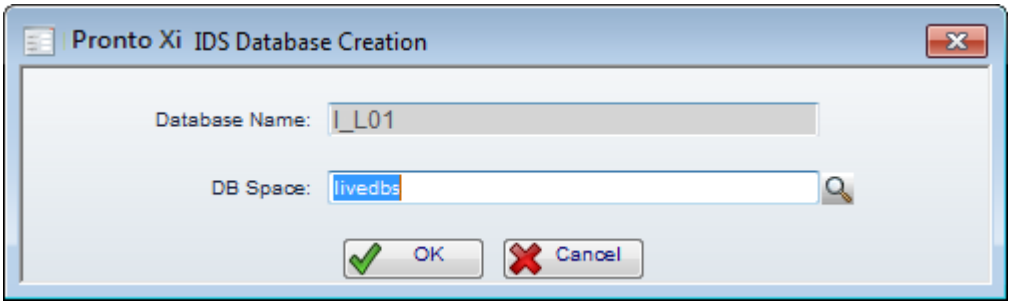
53. Click **Next** to accept the default directory: */pro/data*.
You are prompted for the details of each companies to be created (the following screen is displayed six times, once for each company options you selected).

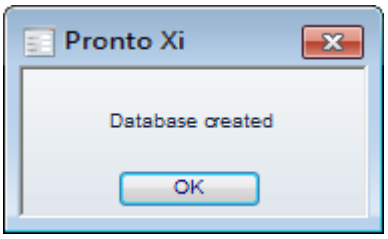


54. For each company to be created, enter the required details and click **Next**.
The companies to be created are summarised on a confirmation screen.

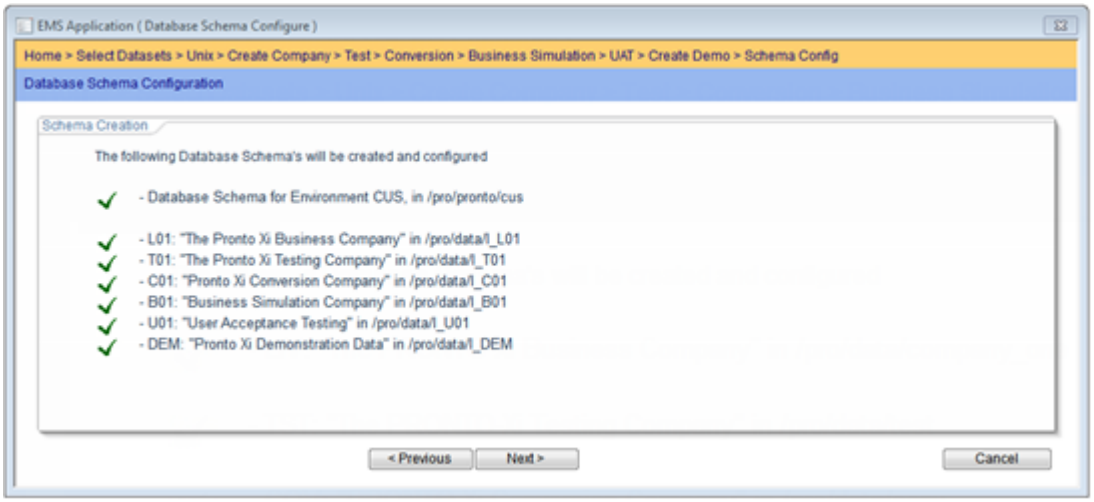


55. Click **Next** to continue.
    As each company is created in Informix, the following two screens are displayed.
56. Click **OK** to continue in each case.

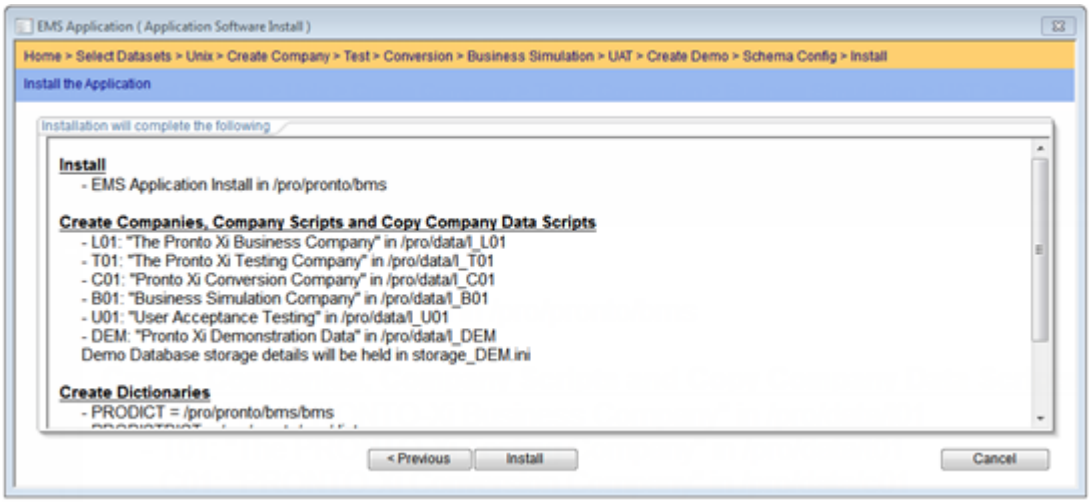




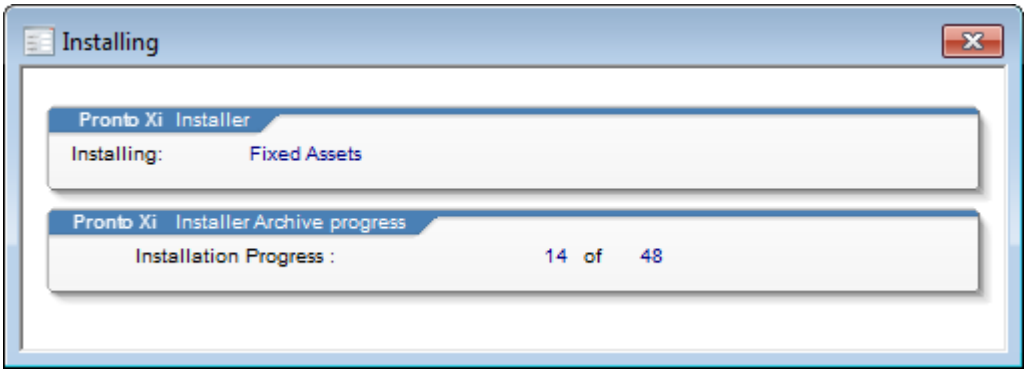
After all the databases are created, you are returned to the wizard.



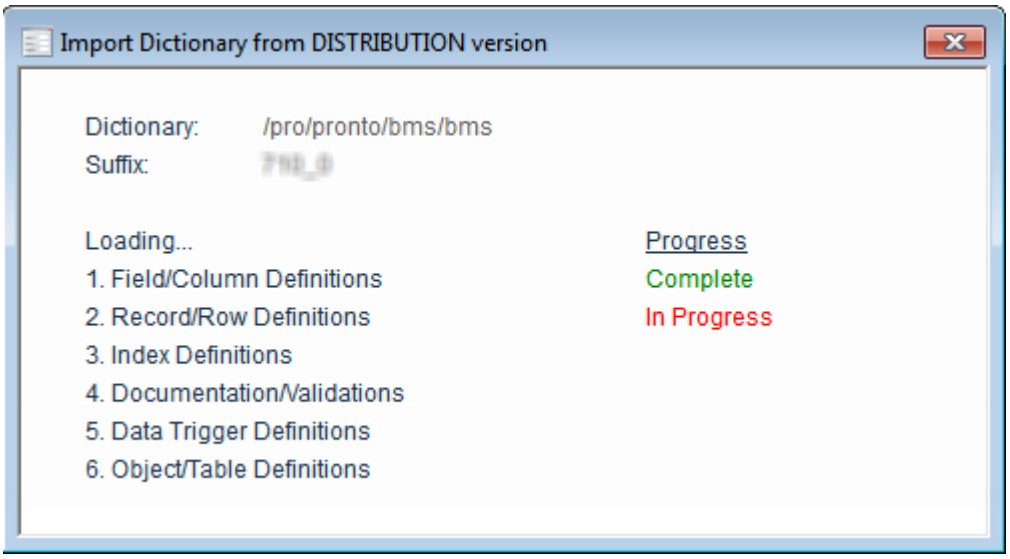
57. Click **Next** to continue.
    The steps for installing the EMS application are summarised.



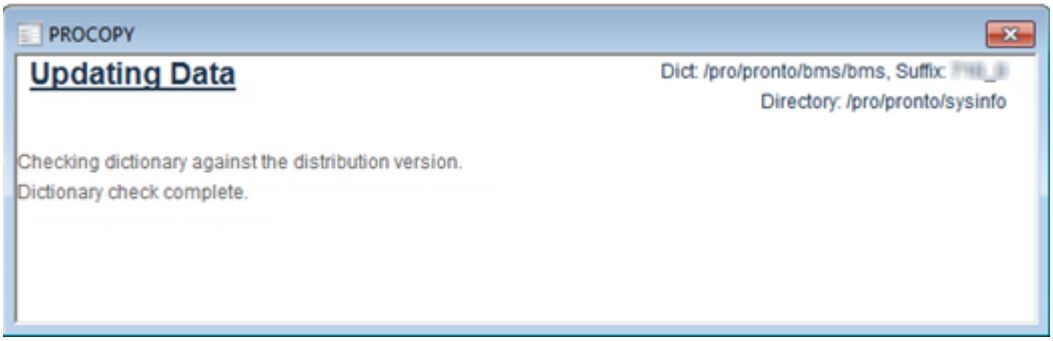
58. Click Install to start the EMS application install.
The installation progress is displayed.



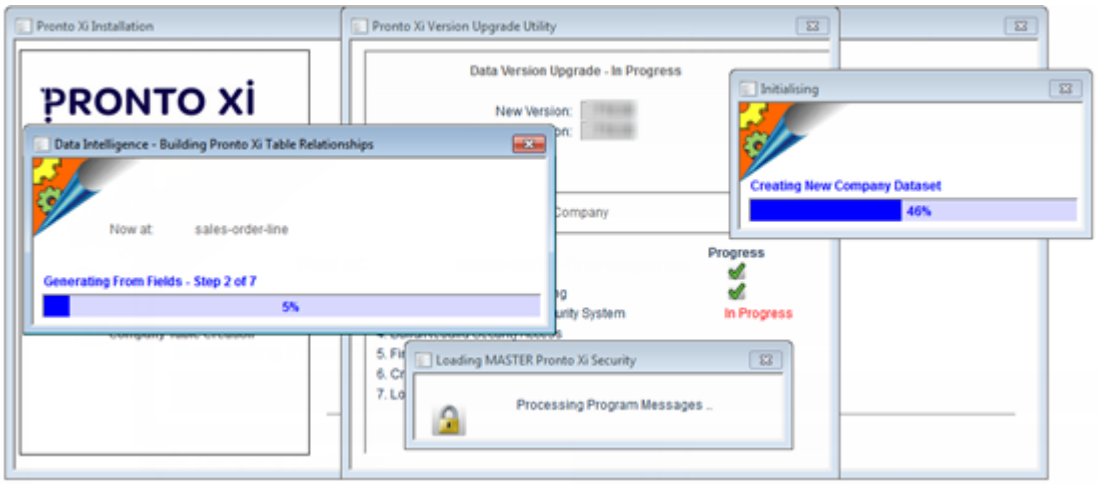
After the applications are installed, the dictionary installation starts automatically.



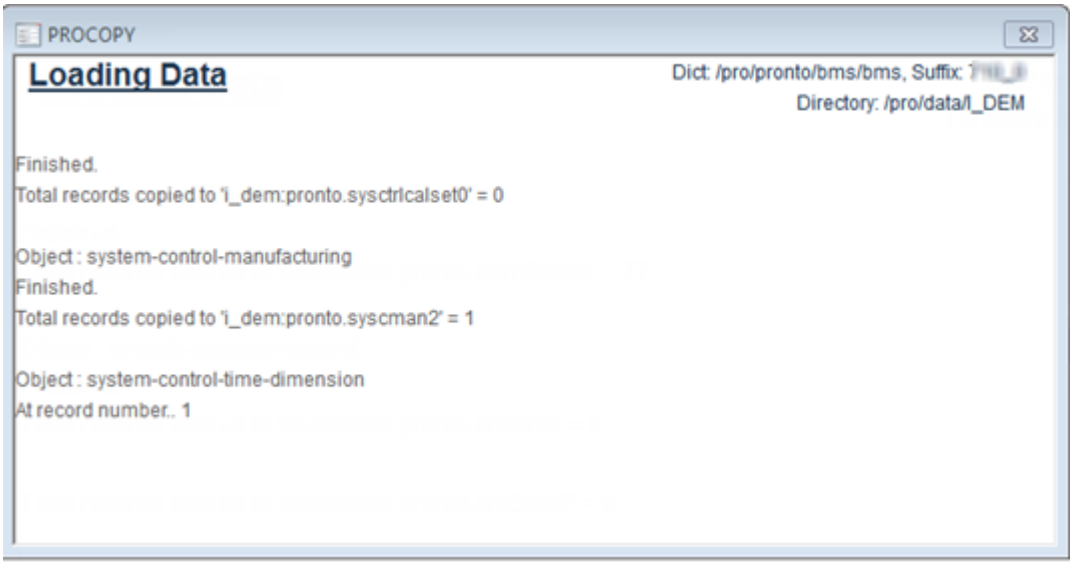
The dictionary is checked.



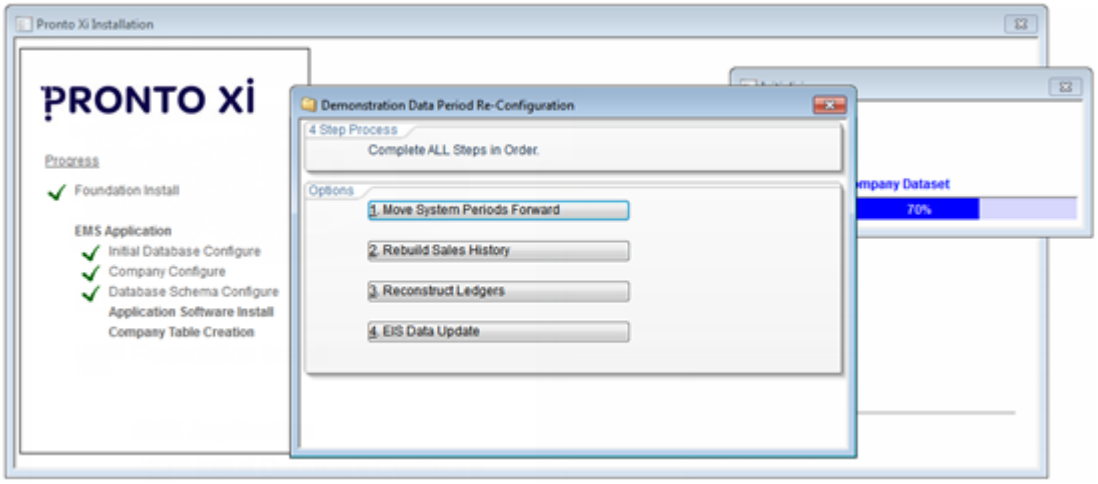
Each of the companies are configured in turn, including the creation of the required Data Intelligence tables.



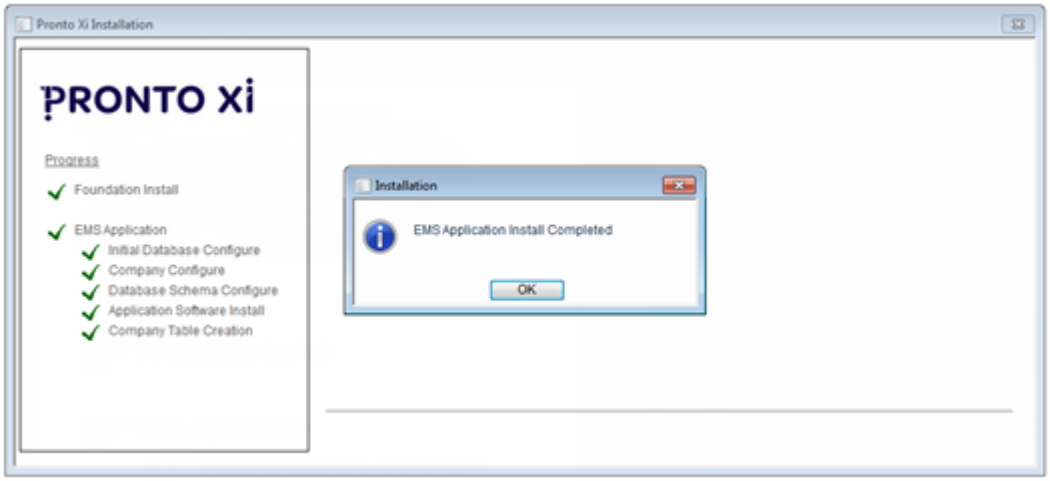
If you selected the option to create a demonstration company, the demonstration data is loaded and, if applicable, upgraded to the current dictionary version.



If applicable, you can optionally perform the following configuration steps for the demonstration company, otherwise press `Esc` to exit the screen.



The wizard confirms that the installation is complete.



3 Upgrading to IBM Informix 12.10

Perform the following tasks to upgrade your database to IBM Informix 12.10:

3.1 Upgrade to Informix 12.10

The following describes the steps for upgrading to Informix 12.10.

Before you start

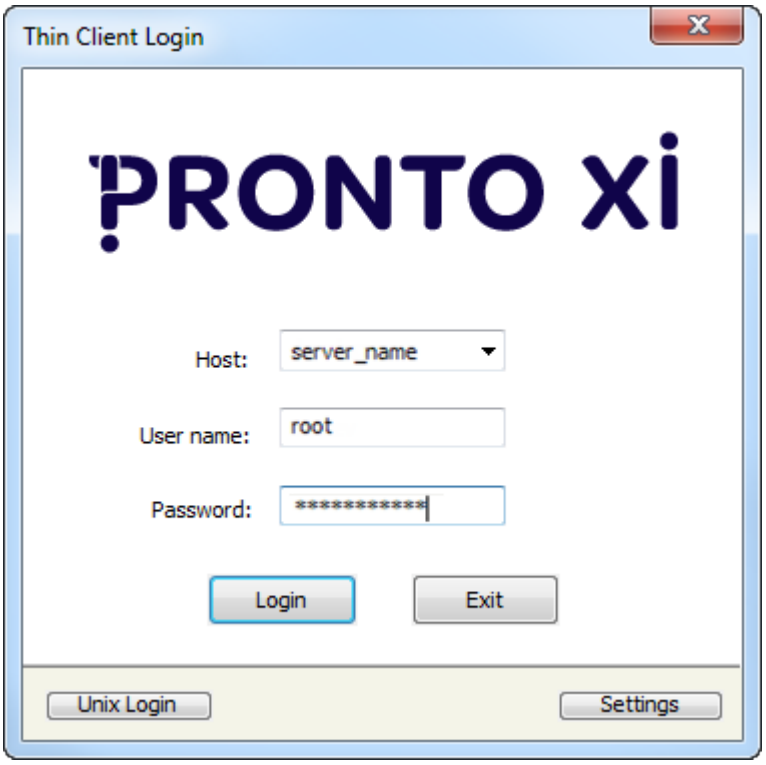
You must:

- perform the required backups. For more information, see Back up the Informix databases (p.70).
- see to the *Pronto Xi Software and Hardware Specifications Guide* and ensure your installation meets the minimum operating system requirements.
- manually shut down all running servers, with the exception of the Pronto Xi server.
- stop the probatch and prodbc application services.
- be logged in as root, flush out the logs with the following code:

```
onmode -l >/dev/null
ontape -a -d >/dev/null
```

Steps

1. Open the Pronto Xi Client and log in as **root**.
   A Pronto Xi shell is displayed.



2. Enter the script below to mount the DVD.

```
mount /dev/cdrom /mnt
```

3. Change the directory to the mount directory.

```
cd /mnt
```

4. Run the following upgrade script.

```
./upgrade.sh
```

```
This script will upgrade Informix Dynamic Server for use with Pronto-Xi.

The current installed version of Informix is  : 12.10.FC5X1
The new version of Informix to be installed is: 12.10.FC5XK

If there are Informix servers running other than the pronto server then
these must be manually shut down prior to continuing with the upgrade.

If there are any Pronto processes active (foreground or background) then these
should be terminated prior to continuing with the upgrade.

If you are using any form of replication then these must be disabled and
additional tasks may need to be performed (refer to the Informix Migration
guide).

You should not attempt to upgrade Informix unless you have an up to date full
level 0 backup.

Continue [y/n]?
```

If your server has less than 24GB of total physical memory, the message below is displayed but you can continue with the upgrade.

```
**********************    WARNING    ************************************
To allow Informix to function correctly a minimum total of 24GB physical
memory is required, which includes at least:
   . 16GB database server memory.
   . 8GB operating system memory.
-------------------------------------------------------------------------
 ** Server hardware does not meet minimum requirements for Informix 12.10 **
 ** Pronto does not support installs that do not meet minimum hardware
    requirements. **
-------------------------------------------------------------------------
*************************************************************************
```

5. Enter **y** to continue and acknowledge that all prerequisites have been fulfilled.
Some tasks are performed then the required packages are listed.

```
Loaded plugins: product-id, refresh-packagekit, security, subscription-manager
This system is not registered to Red Hat Subscription Management. You can use subscrip
Cleaning repos:
Cleaning up Everything
-----------------------------------------------
Unable to detect active repository!
Packages below are a prerequisite of Informix and must be installed before the install
-----------------------------------------------------
       Required minimum package list
-----------------------------------------------------
1)  libaio-0.3.107-10.el6.x86_64
2)  libgcc-4.4.4-3.el6.x86_64
3)  libgcc-4.4.4-3.el6.i686
4)  libstdc++-4.4.4-13.el6.x86_64
5)  compat-libstdc++-33-3.2.3-69.el6.x86_64
6)  ncurses-5.7-3.20090208.el6.x86_64
7)  pam-1.1.1-13.el6.x86_64
8)  libhugetlbfs-utils-2.12-2.el6.x86_64
-----------------------------------------------------

Install ALL packages in the above list and rerun informix installation/update process.
Press Enter to continue with installation/upgrade.
```

6. Press `Enter`.
   The install prompts for the temporary directory to use.

```
All the required packages already installed - nothing to do.

Shutting down the Informix pronto server

Please provide the path to a temporary directory with sufficient space to
extract the Informix Dynamic Server installation software.  An area with at
least 750MB is recommended.

Temporary directory (default /pro/tmp):
```

7. Press `Enter`.
   This initiates the process of self-extracting of the Informix Server software for installation and creating a backup of the current IBM Informix installation.

```
Extracting the Informix Server software for installation...

Creating a backup of current informix installation directory now ..
```

8. Once the extraction and backup is completed, the installation process begins.

```
Upgrading Informix Dynamic Server
This may take a while.  Please wait...

Restarting the Informix pronto server

Informix Dynamic Server upgrade complete
****************************************

Informix data conversions may be running in the background.  While this
is occuring the database will be in Quienscent mode.  Do not attempt to
shutdown/restart the database or system until the mode is On-line.
To see the current Informix mode run: onstat -

IBM Informix Dynamic Server Version 12.10.FC5X1 -- Quiescent (CKPT INP) -- Up 00

[root@win-gsdig8je342 mnt]#
```

   Once the installation is complete, the conversion process is initiated automatically. At this stage, the conversion is processed in the background in quiescent mode.

> Do not attempt to stop or restart the database while the conversion is in progress. The database will automatically return online when the conversion is complete.

   Now you will verify that Informix is running and all databases have been converted.

9. Open a second Pronto Xi shell.
10. Navigate to the *tmp* folder using the following command.

```
cd $INFORMIXDIR/tmp
```

11. Enter the following command.

```
tail -f online.log
```

    You can now see the progress of the upgrade process as shown below.

```
16:33:56  Conversion Completed Successfully
16:33:56  On-Line Mode
16:33:56  SCHAPI: Started dbScheduler thread.
16:33:57  Checkpoint Completed:  duration was 1 seconds.
16:33:57  Wed May  8 - loguniq 9, logpos 0x170d018, timestamp: 0x4baac Interval:
 77

16:33:57  Maximum server connections 1
16:33:57  Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, P
log used 164, Llog used 225

16:33:57  The restore point ended and related data in directory /pro/informix/tm
p/0 were removed.
16:33:57  Auto Registration is synced
16:33:58  SCHAPI: Started 2 dbWorker threads.
```

Now verify the status of the IBM Informix database and that the database is back online after the conversion is complete.

12. Enter the following command.

```
onstat -
```

Once the upgrade is complete, the onstat command shows the following.

```
# onstat -

IBM Informix Dynamic Server Version [illegible] -- On-Line -- Up 00:06:52 -- 521
5792 Kbytes

#
```

3.2 Rebuild the database statistics

After the IBM Informix database upgrade is complete, you should rebuild the statistics in 'force' mode for all databases, or a selected list of databases. The database statistics can be rebuilt using the *./upd_stat_all.sh* script.

You can use the Informix Administration and Investigation tool (idsadmin) version 4 interface to set up the priority order for running update statistics for the databases. In the main screen, select Setup to run update statistics and enter **Y** in the Prioritize running statistics on pronto companies field. In the Prioritize companies screen, click Correct and set the required priority in the Prioritize category field.

Script syntax:

```
./upd_stat_all.sh
 [-d <database names>]
 [-p <record count change percentage>]
 [-f] [-m] [-a] [-b]
```

Parameters include:

-d	Run only on the specified databases The database name list should be a comma separated list
-p	Total record count changed percentage of a table after the last statistics run
-f	Run in force mode
-m	Enable/disable databases to always run statistics on

-a Run on all databases

-b Ignore any setup parameters above and run in force mode
This option could be useful during a database server upgrade, for example, a Pronto Xi upgrade.

The script will attempt to run on all available databases if you do not specify any parameters.

Steps

1. In a Pronto Xi shell, enter:

```
cd $INFORMIXDIR/pronto_scripts
```

2. To update the statistics for all databases, run the script as follows:

```
./upd_stat_all.sh
```

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4 Upgrading Pronto Xi data

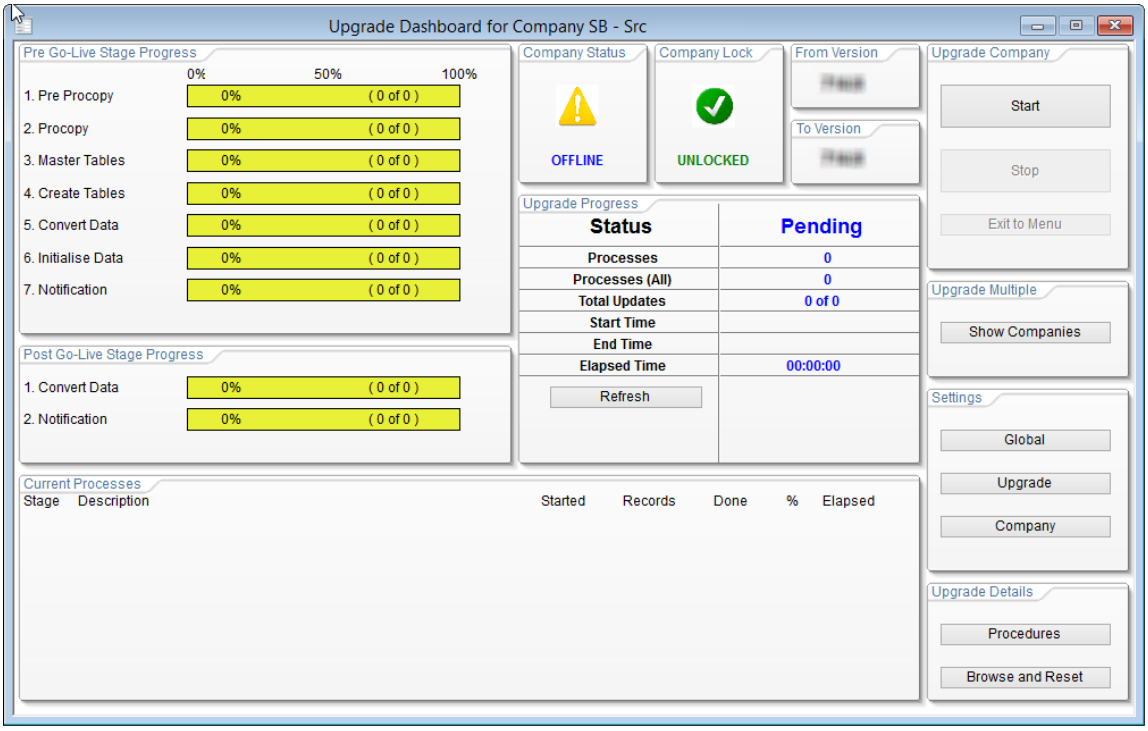
Now you can upgrade the Pronto Xi data for one or more companies.

4.1 Run the upgrade on a single company

You can run an upgrade on a single company only using this method.

Steps

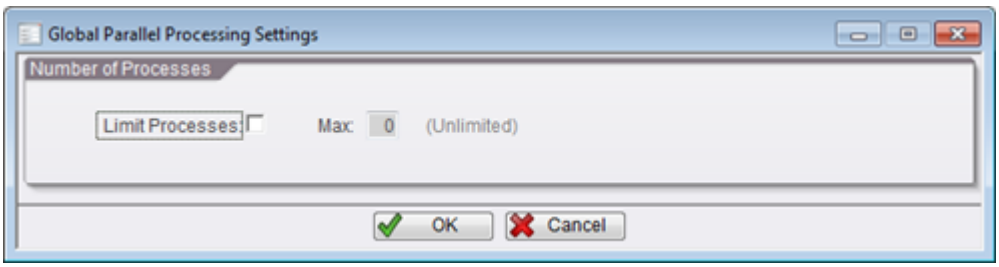
1. Select the company for which you have installed an updated application version.
   The **Upgrade Dashboard** is displayed.



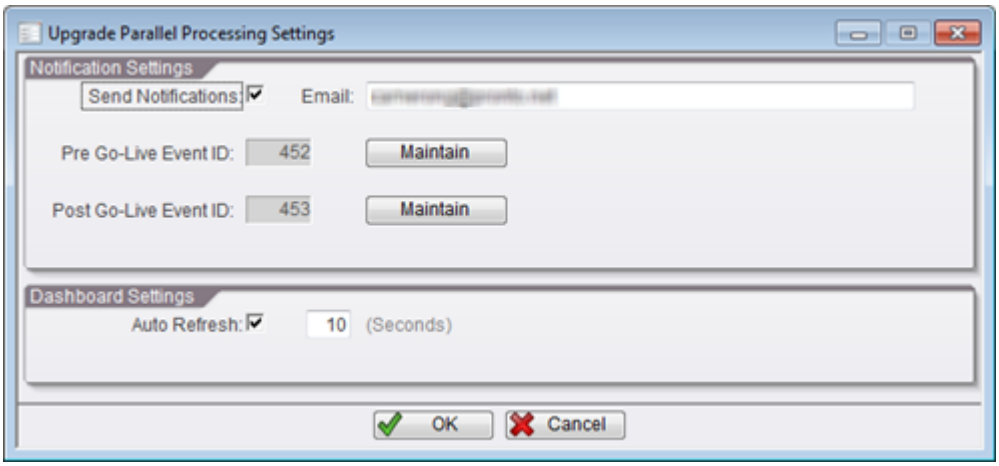
> To run the upgrade from start to end with all the default settings, that is all steps in the pre go-live and post go-live stages, click **Start** and skip to the next topic.

   To customise the upgrade processing settings then run the upgrade, proceed with the following steps:

2. In the **Settings** area of the screen, click **Global**.
   The **Global Parallel Processing Settings** screen is displayed.



3. The setting on this screen applies to all companies on the current machine. You can use this setting to limit the maximum number of concurrently running processes. For more information, press F1 (Help).
4. Click **OK**.
   The **Upgrade Dashboard** screen is displayed.
5. In the **Settings** area, click **Upgrade**.
   The **Upgrade Parallel Processing Settings** screen is displayed.



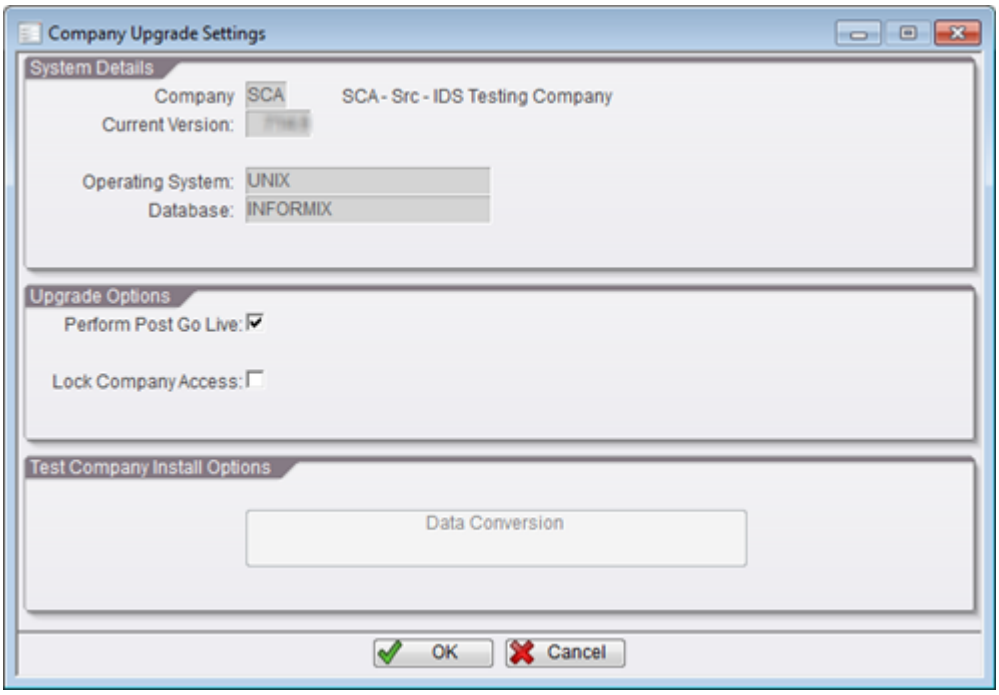
The settings on this screen apply to all upgrades. You can use these settings to specify:

- that you want a notification email to be sent to a specific email address when the pre go-live and post go-live stages of the upgrade have finished. When the upgrade for the first company is started, Pronto Xi sets up two **Alert Intelligence** events using the email details you have displayed here. If you want to customise the email text or change the email recipient, return to this screen after starting the upgrade and click **Maintain**.
- the screen refresh frequency for the dashboard

For more information, press F1 (Help).

6. Click **OK**.
   The **Upgrade Dashboard** screen is displayed.
7. In the **Settings** area of the screen, click **Company**.

The Company Upgrade Settings screen is displayed.



The settings on this screen apply to the current company only. You can use these settings:

- to specify that you do not want the post golive processing to be started automatically once the pre golive processing has completed
- to lock unauthorised users out of the company while the upgrade is in progress
- to access a set of data conversion options that apply to the standard demonstration company only

For more information, press F1 (Help).

8. Click OK.
   The Upgrade Dashboard screen is displayed.
9. Click Start to run the upgrade.

4.2 Run multiple upgrades at the same time

The upgrade processing engine supports running the upgrade on more than one company at the same time on the same machine.

If the companies share the same data, the upgrade program will only run a procedure that affects that shared data once. It is possible, therefore, for the upgrade of one or more companies to pause while a shared data area task is being performed in another company. Once that task is complete, the upgrades will run independently again.

If you do not limit the maximum number of processes in the Global Parallel Processing Settings screen, an upgrade can potentially create up to 20 parallel processes. As a rule of thumb, do not allow more processes than the number of concurrent users. Single user systems, such as PCs or laptops used for sales, demonstration or testing purposes, should *always* be set to single process only.

If you click **Procedures** on the **Upgrade Dashboard** screen before starting the upgrade, the **Procedures for Company** screen (and the underlying database table) is populated and all procedure dependencies involving that company are activated immediately. If you have already started the upgrade in one or more other companies, it is possible for other upgrades to come to a halt waiting for a procedure to complete in this company even though you have not yet started the upgrade for it.

Step

- To start the upgrade of a second or subsequent company:
  - In the **Upgrade Dashboard** screen for a company upgrade that is already running, click **Show Companies**, select the company and click **Start Upgrade**

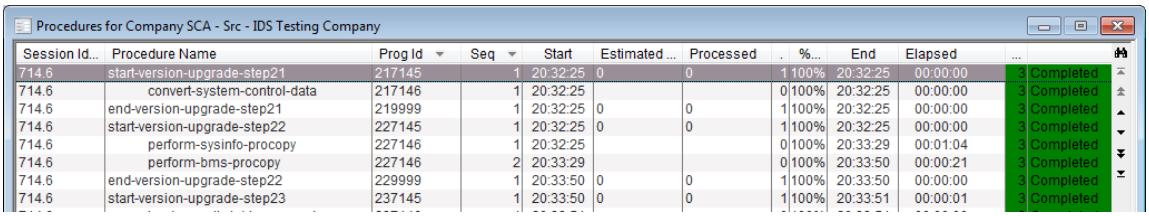
    or
  - In the Pronto Xi menu, click the company you want to upgrade to display the **Upgrade Dashboard** screen for the company, then click **Start**.

4.3 Pause a running upgrade

If you need to stop an upgrade in order to resume it at a later time, you can pause it while it is running.

Steps

1. On the **Upgrade Dashboard** screen, click **Stop**.
   All currently running processes are allowed to run to completion and no new processes are started.
2. To view a list of the procedures that have completed and those that are yet to run, click **Procedures** in the **Upgrade Details** area of the screen.
   The **Procedures for Company** screen is displayed.



For a description of the each of the columns in this data grid, press `F1` (Help).

Each procedure that you must run to complete the upgrade will have one of the following statuses:

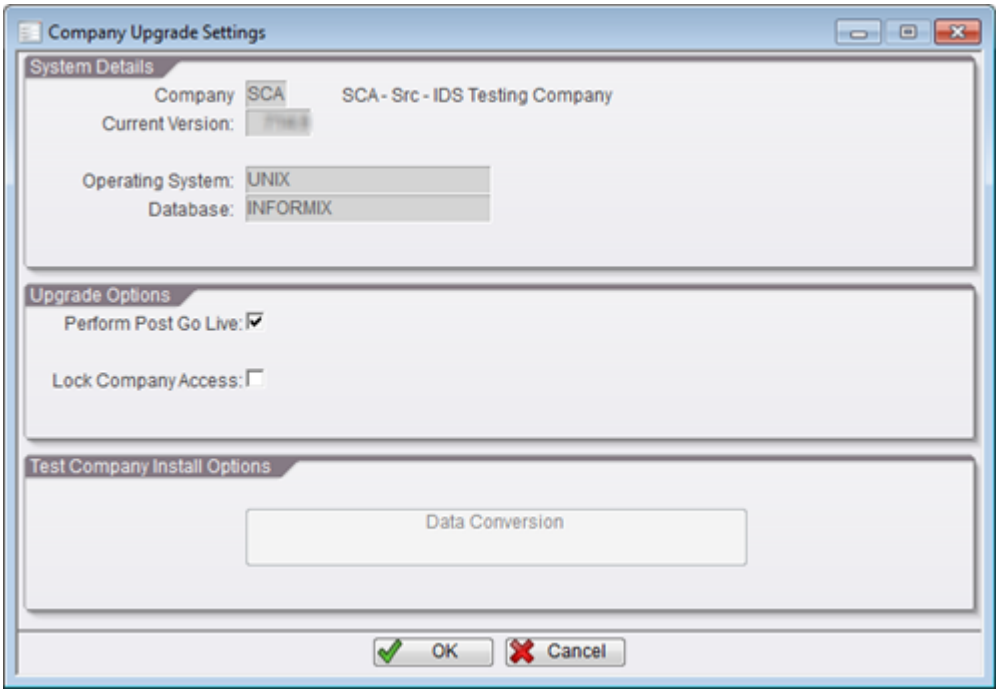
- **Queued (0)**
  The procedure is waiting for the upgrade to be started, or all prerequisite procedures to complete.
- **Started (1)**
  The procedure has been started; shortly after the status of the procedure changes to *In Progress*.
  Complete (3)
- The procedure has completed successfully.
- **Error (4)**
  The procedure failed due to an error.
- **Stopped**
  The procedure has been stopped.
- **Hold**
  The upgrade will stop when it reaches this procedure.

4.4 Run custom code before post go-live processing

If you need to run custom code on the data, for example to populate or process data in user-defined fields, you can do this after the pre go-live.

Steps

1. In the **Upgrade Dashboard for Company** screen for the company you are upgrading, click **Company** in the **Settings** area.
   The **Company Upgrade Settings** screen is displayed.



2. Clear the **Perform Post Go Live** check box.
3. Click **OK**.
4. Click **Start** to run the upgrade.
   The upgrade will stop automatically at the end of the pre go-live processing stage, and all post-go live procedures are assigned the status *Stopped*.
5. Run your custom code to make the necessary data changes.
6. In the **Upgrade Dashboard for Company** screen, click **Start** and the upgrade will continue with the post go-live processing stage.

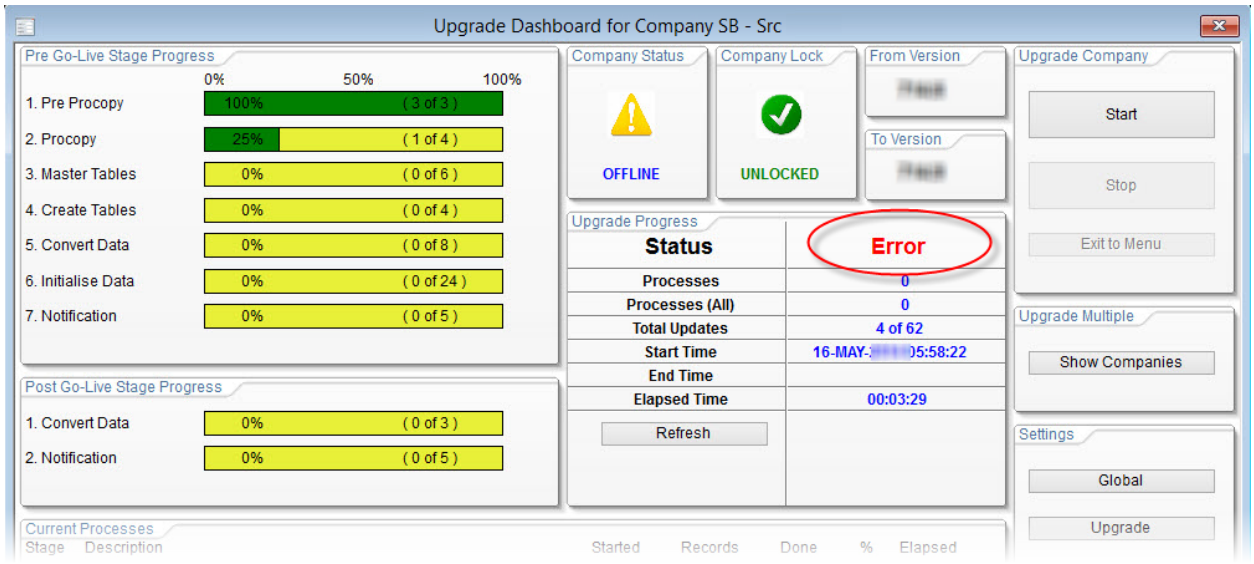
4.5 Troubleshooting upgrade errors

If you encounter any errors during the upgrade, see the following topics:

- Troubleshoot procedure errors (p.35)
- Unable to perform open create on a table (p.36)

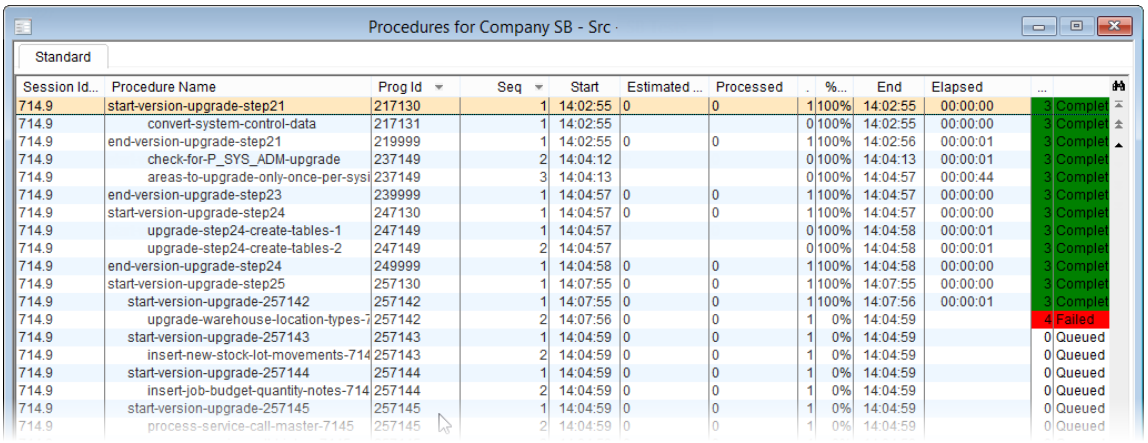
4.5.1 Troubleshoot procedure errors

If an error occurs in one of the procedures during the upgrade, the upgrade stops and an error status is displayed on the **Upgrade Dashboard** screen:



Steps

1. In the **Upgrade Details** area of the **Upgrade Dashboard** screen, click **Procedures**.
   The **Procedures for Company** screen is displayed.
2. Scroll down to the procedure in which the error occurred, as indicated by the red highlighting and *Failed* status.



3. Select the record with the error and use the following functions to examine the logs written to by the upgrade process:

- Error Log
  Open the error log file *$PRONTO\lib\error.log*, which is the primary log to which the upgrade processing engine writes all errors.

  > You can only click **Error Log** and **Procopy Log** if you are authorised to run an upgrade, that is, if you are a database administrator, and have been granted access to the **SYS S033** security function.

- Procopy Log
  When a procedure that runs a *procopy* is selected, this shows the log file that the *procopy* executable writes to.
- System Log
  Open the system event log with a filter on the entry type **UPGR**.
- Thread Log
  View the log entries for the highlighted procedure.
  The log includes the start and end time details, technical details recorded by the parallel processing engine, and any errors that arose.

4. Correct the data or programming errors that caused the upgrade to fail.
5. If there are any procedures that were previously completed but need to be rerun as a result of the correction, select the procedure in the **Procedures for Company** screen and click **Queue Procedure**.
6. On the **Upgrade Dashboard** screen, click **Start** to restart the upgrade.

> If you are running multiple upgrades at the same time and upgrade processing has stopped in one of the companies, click **Procedures** in the **Upgrade Dashboard** screen, locate the procedure that is pending and click **Dependencies**. This will show the procedures in other companies that need to be completed before the procedure in the current company can be run. Normally you should find that at least one other procedure is running. If no procedures are running, this suggests a fault in the upgrade processing engine and you should call Pronto Software Support to investigate.

4.5.2 Unable to perform open create on a table

If you receive an error message during an upgrade procedure similar to the image below, this might be because the database schema has run out of space and you should add a chunk to the DB space.

```
================================================
USER: psd, TTY: , TIME: Wed Jul 30 12:03:46 [redacted]
***  I/O ERROR  ***
I/O OPERATION: OPEN
ERROR STATUS: System error 2 - No such file or directory
OBJECT NAME: asset-master
FILE NAME: /live/data/ass/ASSETMASTER8
TABLE: ass:pronto.assetmaster8
INDEX NUMBER: 1
CURRENT WORKING DIRECTORY: /live/data/ass
PROGRAM TRACE BACK OF /pro/pronto/bms/upgrade/u25pregolive-v720.op7:
               upgrade-asset-register-7130
               check-bms-version-7130
               convert-data-after-procopy
               main
PARAMETERS:  1) -thread  2) 2  3) -mode  4) 2  5) -parallel  ...
VERSION: $Header: /apps/devel/src/bms/upgrade/RCS/u25pregolive-v720.spl,v 1.52 [redacted]/04/23 01:58:02 camerong Exp $
================================================
```

For more information, see Increase the size of a DB space by adding a chunk (p.67).

5 Migrating from a C-ISAM database to an Informix database

There are two scenarios for a migration from a C-ISAM database to an Informix database.

- Migrating to IBM Informix while migrating Pronto Xi to a new server (p.40)
- Migrating to IBM Informix on the same server (p.54)

Before you start the migration, you should familiarise yourself with the following and take any necessary action:

- Migration considerations (p.37)
- Avoiding Informix table locking during data migration (p.38)
- Avoiding overflow errors when migrating numeric data (p.39)

5.1 Migration considerations

When migrating Pronto Xi from C-ISAM to Informix, it is recommended that you migrate to a new server. This might not always be possible and you should consider the options available.

It is important to consider the extra load and performance degradation when you install a database and second version of Pronto Xi on the same server.

Consider the following before you proceed with this option:

- hard drive capacity
  You must at least triple the currently used storage capacity. This capacity allows for the Informix backup, log files, and expansion; these factors are greater than the expected storage requirement.
- hard drive access speed and performance
  You need a minimum of two mirrored pairs of hard drives. This allows splitting of the disk access load, where the logs are installed on one mirrored pair and the main database on the other. These requirements vary depending on the size of the installation and should be considered carefully as disk access can create performance bottlenecks.
- backups
  Review the current backup methodology and size capability. The backup data size will double and so backups will take longer to perform.

To maintain current performance when upgrading from C-ISAM to Informix, allow for a CPU capacity 3-4 times than what you are currently operating on.

Informix database size settings for new companies

When migrating C-ISAM data to an Informix database, it is necessary to specify the database size for each table in each company to be created in Informix. A utility *sys/m8scan-dat* has been provided to scan through the C-ISAM *.dat* files and, based on the actual table sizes, create a *storage_xxxx.ini* file specifying the required initial and next extents for each table. This utility needs to be run on each company as well as the *$PRONTO/sysinfo* directory (in this case specify **sysinfo** as the schema name).

You need to use a version of the *m8scan-dat* program that has been compiled with the same version of the dictionary (that is, environment settings) as the C-ISAM data being migrated.

The *storage_xxxx.ini* file can be placed in a directory specified by the user.

Once the *storage_xxxx.ini* file has been created, it will need to be placed in the *$PRONTO/lib* directory before any Informix database is created. If a database is created before the *storage_xxxx.ini* file is placed in the *$PRONTO/lib* directory, the individual tables will not be set up with the calculated initial and next extents.

5.2 Avoiding Informix table locking during data migration

Due to an Informix bug that occurs at the time of initial data load in the Informix database when a table containing only one record is loaded, the whole table can be locked by Informix in the destination company. When this bug occurs, the Informix database correctly applies row level locking when retrieving rows, but incorrectly applies a table level lock when updating rows.

This locking issue only occurs if you are uploading or copying data, and one or more of these tables has only a single row (record). Once live, subsequent copies of this table would have multiple rows so the locking issue does not reoccur. If the tables are created as empty tables and data added at a later point, then the table locking issue cannot occur.

You can resolve the table locking issue by running the Update Statistics utility after the data is loaded into the Informix database.

Steps

1. In a UNIX shell, log in as the DBA user *idsconx*.
2. In Pronto Xi, press `F3`.
3. Click **Admin** or press `A` to launch the **Pronto Xi UNIX System Administration** utility
4. Click **Pronto Xi RDBMS administration**.
   The **Pronto Xi IBM IDS Administration Login** screen is displayed.
5. Leave the **Connection Type** setting as **Default Pronto Xi IDS connection user**.
6. Click **OK**.
   The **Databases on IDS server** screen is displayed.
7. Highlight a database that you loaded existing data into and could therefore potentially be affected by the table locking issue.
8. Click **Tables-in-db**.
   The **Tables in database** screen is displayed.
9. Click **Update-Stats**.
10. When prompted for the Statistics Level to be performed, select the **Low** (default) setting.
11. Click **OK**.
    The statistics are rebuilt and tables can no longer be locked.

5.3 Avoiding overflow errors when migrating numeric data

In a C-ISAM implementation, numeric fields are stored as 32 bit binary values within the runtime and the C-ISAM file.

The maximum value for a field defined as PIC 9(6), for example, is therefore 429496729 rather than 999999.

Although users cannot directly enter a value larger than the defined number of digits for a numeric field, the application can store a value which is larger (usually this is the result of a calculation).

Numbers within an RDBMS, however, are stored as decimal numbers with a defined precision rather than as binary values. To cater for a minor overflow, the runtime automatically adds an extra integer digit to the precision of the number when it is defined in an RDBMS.

9(6) is defined in the database as 9(7). This allows for a single digit overflow.

If the value stored in a C-ISAM field is greater than the PIC definition plus the overflow allowance, an error message similar to the following is displayed during the data import.

The error number and description will vary between IBM Informix, Oracle, and Microsoft SQL Server databases but the cause is the same: a numeric field contains an invalid large numeric value.

```
Object : service-call-history
Start time: XXX 10:45:35 XXXX
Error encountered writing to file 'XXXXX:pronto.servhisj'
Error: INFORMIX error -1226 - Decimal or money value exceeds maximum precision
```

To improve the efficiency of the data upload process, the runtime buffers 20 rows per insert operation. Because of this, only one error is reported per insert operation, regardless of how many rows are affected.

To resolve these errors, you must set the *PROMAXROWARRAY* environment variable to **1** to ensure a separate insert operation is performed for each row, and then upload the affected files again. You can examine the *procopy.log* file to identify the affected rows, and then investigate the old C-ISAM data.

It is likely that if multiple errors occur for the same object, then it is the same field that is at fault. The best way to identify this is to browse the old data. A numeric field that overflows its defined precision will probably display as all question marks. Once you identify the fields and their values, determine if the values are valid. If they are valid, then consult the Application Development department of Pronto Software to determine the best way to break the value down, for example, using multiple records. If the value is invalid, then correct it. Once the data issues are resolved in the C-ISAM files, re-import the data into Informix.

For more information, see Using the C-ISAM Data Checker Program (https://kbase.pronto.com.au/intranet/documents/482/30731/Using_the_C-ISAM_Data_Checker_Program.pdf).

5.4 Migrating to IBM Informix while migrating Pronto Xi to a new server

The steps for migrating to IBM Informix database while also migrating an existing Pronto Xi implementation to a new server are:

1. Install and configure the IBM Informix database (p.40)
2. Install the Pronto Xi Foundation (p.59)
3. Install the Pronto Xi applications (p.60)
4. Configure the IBM Informix database (p.47)
5. Create non-initialised companies (p.61)
6. Create a temporary database and transfer the older dictionary version (p.48)
7. Transfer the C-ISAM data and import it into the Informix database (p.50)
8. Transfer and update the Pronto Xi scripts and configuration files (p.51)
9. Upgrade all companies and migrate Pronto Xi user accounts (p.52)
10. Complete the migration (p.53)

Before you start

- On the Migration worksheet (p.84), record the details of the companies being migrated. You can also use the worksheet to record the overall progress of the migration.
- To simplify the data migration process, copy the following directories on the old server to a temporary staging area on the new server (for example */oldserver*):

```
/etc, $PRONTO, all company data directories, $CUS
```

- Replicate the user accounts, group files, samba setup (if required), on so on. that exist on the old server.

> If possible, assign the same UNIX user IDs to the Pronto Xi users on the new server as on the old server. If the user IDs are different between the two machines, report ownership is not maintained, which can result in security issues. You should only copy reports if the user IDs are the same on both machines.

5.4.1 Install and configure the IBM Informix database

Follow the steps below to install and configure the IBM Informix database.

> Before modifying any of the recommended settings below, you must contact Pronto Software Support stating the nature and reason for the change. This change will be registered with the Pronto Software Development Centre for reference purposes. Pronto Software staff who change a setting must log the change with the Development Centre directly.

> The minimum requirements for new installations are 24GB RAM, four virtual CPUs. If the server does not meet these minimum requirements, the demo mode is automatically installed.

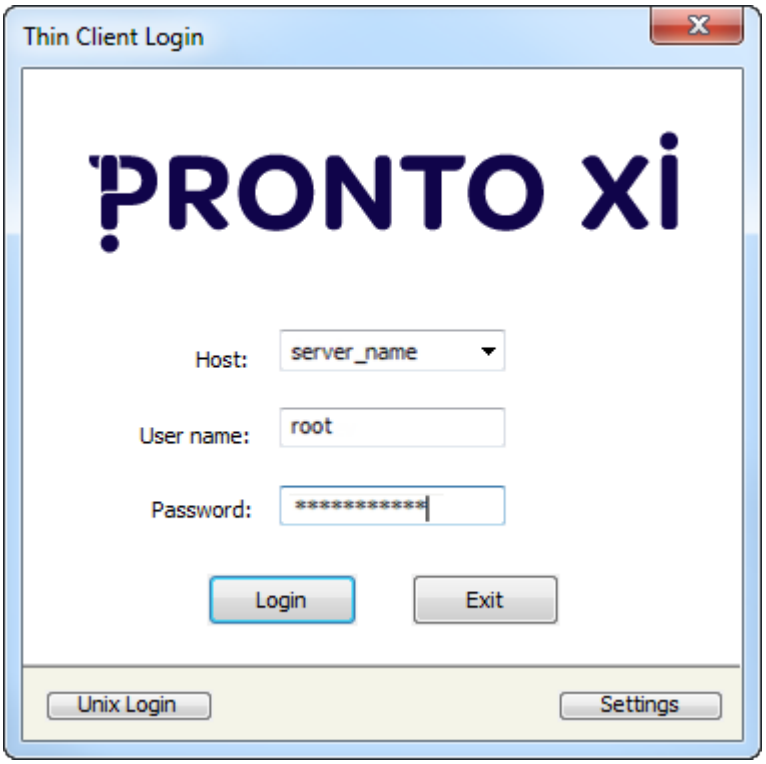
Before you start

On the Migration worksheet (p.84), record the details of the companies being migrated. You can also use the worksheet to record the overall progress of the migration.

Calculate the kernel.shmmax number. This should equal the total amount of memory to be allocated to Informix. For minimum recommendations, see the *System Requirements* section of the *ids_machine_notes_xx.xx.txt* file (where xx.xx is the Informix version, e.g. 12.10), which is located in the *dbs/lin_notes* or *dbs/aix_notes* directory of the Informix installation media.

Steps

1. In kernel.shmmax, enter the calculated value (see above).
2. Run **sysctl-p** to ensure the setting takes effect immediately.
3. Open the Pronto Xi Client and log in to the server as **root**.



4. A Pronto Xi shell is displayed after login.
5. Insert the Pronto Software-supplied Informix installation DVD into the drive of the Pronto Xi server.
6. In the Pronto Xi shell, mount the DVD and navigate to the root directory of the DVD.

```
mount /dev/cdrom /mnt
cd /mnt
```

7. Run the install script.

```
./install
```

```
Do you plan to install Cognos on Linux on this server (y/n) (default n) ?
```

If you are implementing IBM Cognos, the server must be running Linux Red Hat version 6 (if implementing IBM Cognos v10.2.1) or Red Hat version 7 (if implementing IBM Cognos v10.2.2).

8. Enter **y** to continue.
   Some tasks are performed then the required packages are listed.

```
Loaded plugins: product-id, refresh-packagekit, security, subscription-manager
Cleaning repos: dvd
Cleaning up Everything
------------------------------------------------
Active repository detected!.
Packages below are a prerequisite of Informix and must be installed before the installer can proceed.
------------------------------------------------------
       Required minimum package list
------------------------------------------------------
1)  libaio-0.3.107-10.el6.x86_64
2)  libgcc-4.4.4-3.el6.x86_64
3)  libgcc-4.4.4-3.el6.i686
4)  libstdc++-4.4.4-13.el6.x86_64
5)  compat-libstdc++-33-3.2.3-69.el6.x86_64
6)  ncurses-5.7-3.20090208.el6.x86_64
7)  pam-1.1.1-13.el6.x86_64
8)  libhugetlbfs-utils-2.12-2.el6.x86_64
------------------------------------------------------

All packages listed above will be automatically updated with the latest version present in the repository!
Press Enter to continue with installation/upgrade.
```

If the message "Could not match patches: Cannot retrieve repository metadata (repomd.xls) for repository: RHEL-CD" is displayed, make sure the Red Hat installation CD is mounted then restart the script.

9. Press `Enter` to continue.

   A group and a user named **informix** are created.

```
Attempting to install required packages please wait...
All the required packages successfully installed.


Group 'informix' added.
User 'informix' added - Please set password.
Changing password for user informix.
New password:
```

10. Enter a password for the **informix** user then re-enter the password when prompted.
    The installation script installs the Informix database in the */dbs* directory, and the Pronto Xi application in the */pro* directory. If these directories do not already exist, you are prompted to create them.

```
The directory /pro does not currently exist.
The Pronto-Xi and Informix systems and will be created within /pro.
The directory /dbs does not currently exist.
The Informix data will be stored within /dbs

If you wish to create separate file system/s for this you should do
so now and restart this installation once they have been created
and the file systems mounted.  If you do not create /pro or /dbs as
separate file systems then they will form part of the root file system.

Create missing directories within the root file system [y/n] (default n)? y
```

If you need control over the file system layout for the installation directories so that they are not part of the root file system, exit the script, create the links from */pro* and */dbs* to the relevant locations, and re-run this script.

11. Enter **y** to create the directories */pro* and */dbs*.
    You are asked whether to use the UTF-8 code page, which is a multi-byte implementation of Unicode, or the ANSI code page. In a new installation, we recommend that you enter **y** to select the UTF-8 code page, however if you are migrating from an existing non-UTF-8 system, you must enter **n**.

```
It is recommended that the UTF-8 code page is used by Informix if you need to
store international characters.  UTF-8 supports all international Unicode
characters.  However, if you are migrating existing data with ANSI (non
Unicode international characters) then you should continue to use an ANSI
code page.
Use the UTF-8 code page within Informix [y/n] (default n)?
```

12. Enter **y** to use the UTF-8 code page or enter **n** if you do not.

    If you entered **n** above, the following additional prompt is displayed.

```
If you do not wish to use the default ANSI code page then you should
set the SERVER_LOCALE, DB_LOCALE and CLIENT_LOCALE environments and
restart this installation.
Continue [y/n] (default y)?
```

13. Enter **y** to use the default ANSI code page.

    You are asked for a temporary area to extract the Informix installation software into.

```
Please provide the path to a temporary directory with sufficient space to
extract the Informix Dynamic Server installation software.  An area with at
least 750MB is recommended.

Temporary directory (default /pro/tmp):
```

14. Press `Enter` to accept the default directory, or enter an alternative directory.

    You are now prompted to begin installing the Informix Dynamic Server application.

```
Install Informix Dynamic Server [y/n]? y
```

15. Enter **y**.

    After the extraction is complete, you are prompted to select a suitable initial Informix configuration.

    The following minimum requirements apply:

```
*********************************  WARNING ************************************
To allow Informix to function correctly a minimum total of 24GB
physical memory is required, which includes at least:
   . 16GB database server memory.
   . 8GB operating system memory.
******************************************************************************
```

- If the server does not meet the minimum requirement of 4 virtual CPUs, the demo Informix configuration is automatically selected.

```
*********************************  WARNING ************************************
To allow Informix to function correctly the hardware needs to be capable of
supporting 4 Virtual CPUs.
******************************************************************************

------------------------------------------------------------------------------
** Please ignore the above warning message if you want to run in demo mode **
------------------------------------------------------------------------------
Do you really want to continue: [y/n]? y
```

- If the server meets the minimum requirement of 4 virtual CPUs but has less than 24GB of total physical memory, the demo Informix configuration is automatically selected.
- If the server has less than 4GB of total physical memory, the demo mode installation will fail.

If the server meets both the minimum virtual CPUs and minimum total physical memory requirements, the following is displayed.

```
Please select the required initial Informix configuration based on the
serial number of the following metrix (default is 1).

|--------|-----------|--------|--------------|----------|-----------|---------|
| Serial | Selection | No. of | Transactions | Database | Max Table | No .of  |
| Number | Category  | Users  |   per day    | Size(GB) | Size (GB) |Companies|
| ------ | --------  | -----  | -----------  | -------- | --------- | --------|
|   1    |  Small    | 0 - 49 |    0 - 4999  |  0 - 49  |  0 - 1.99 |   0 - 6 |
|--------|-----------|--------|--------------|----------|-----------|---------|
|   2    |  Medium   |50 - 199| 5000 - 9999  | 50 - 99  |  2 - 4.99 | 7 - 20  |
|--------|-----------|--------|--------------|----------|-----------|---------|
|   3    |  Large    |  199 + |   9999 +     |   99 +   |  5 +      |   20 +  |
|--------|-----------|--------|--------------|----------|-----------|---------|
Enter the selection to continue (default is 1)?
```

- For information on the parameter settings in the onconfig file, see Onconfig parameter settings (p.107).
  - Small setup - 4GB each 4 temp dbspaces
  - Medium setup - 8GB each 4 temp dbspaces
  - Large setup - 16GB each 4 temp dbspaces

16. Enter **1** to accept the default, or make an alternative selection from the menu.

> If the number of users expands into a higher category in the future, you will not necessarily need a configuration change. If the customer reports that the system performance is decreasing, the system must be reviewed, for example with regard to log files, server capacity, and so on. The Informix message log reports on the automatic, temporary adjustments made by the DB - these logs must be critically reviewed and assessed, and the database modified if necessary.

The installation script reports on the DB spaces that are created based on your selection and the required disk space.

```
The following database spaces will be created:
Name = rootdbs, Directory = /dbs/pronto/rootdbs, Size(MB) = 4000
Name = prontodbs, Directory = /dbs/pronto/prontodbs, Size(MB) = 4000
Name = livedbs, Directory = /dbs/pronto/livedbs, Size(MB) = 4000
Name = testdbs, Directory = /dbs/pronto/testdbs, Size(MB) = 4000
Name = llog, Directory = /dbs/pronto/llog, Size(MB) = 6001
Name = plog, Directory = /dbs/pronto/plog, Size(MB) = 4097
Name = tmpdbs1, Directory = /dbs/pronto/tmpdbs1, Size(MB) = 16000
Name = tmpdbs2, Directory = /dbs/pronto/tmpdbs2, Size(MB) = 16000
Name = tmpdbs3, Directory = /dbs/pronto/tmpdbs3, Size(MB) = 16000
Name = tmpdbs4, Directory = /dbs/pronto/tmpdbs4, Size(MB) = 16000

You need to ensure that there is sufficient space available for these.
Create the database spaces [y/n] (default y)?
```

17. Enter **y** to continue.

The required DB spaces and settings for a Pronto Xi implementation are initialised. This can take several minutes, depending on your setup choice and hardware.

```
** WARNING **  A level 0 archive of Root DBSpace will need to be done.
Archive to tape device '/dev/null' is complete.
```

The above warning messages are displayed during this process. These are default Informix messages and can be ignored.

The following is displayed once the installation is complete:

```
Restarting Informix Server with new configuration

pronto Database server creation complete


Informix Dynamic Server installation complete
*********************************************

You should now install Pronto-Xi.
Ensure that the required Informix Dynamic Server environments are set prior to
running the Pronto-Xi installation script.  You can do this by either logging
in again or by issuing the following command:
. /pro/informix/etc/profile.pronto

[root@win-gsdig8je342 mnt]#
```

18. To verify that Informix is running, enter the following:

```
. /pro/informix/etc/profile.pronto
```

then enter:

```
onstat -
```

A line similar to the following is displayed indicating that the database is online:

```
IBM Informix Dynamic Server Version [illegible] -- On-Line -- Up 00:02:20 -- 953
5456 Kbytes
```

19. Exit the current Pronto Xi terminal session.
20. Log out and back in again and check that the correct Informix environments are set.
21. Start a new Pronto Xi terminal session and log in as **root**.
22. Enter the following command to unmount the Informix installation DVD.

```
umount /dev/cdrom
```

5.4.2 Install the Pronto Xi Foundation

Now install the Pronto Xi Foundation.

Steps

1. Log on to the server as **root**.
2. Create a directory into which to install the Informix version of Pronto Xi.

```
mkdir /pro/pronto_ids
```

3. Install the Informix version of the Pronto Xi foundation as described in Install the Pronto Xi foundation and applications (p.9), with the following specific parameters:
   a. Specify */pro/pronto_ids* as the parent directory for the installation. The installation script creates a */pro/pronto_ids/pronto* directory.
   b. At the prompt to set the environments globally, enter **N**.
   c. At the prompt to add special pronto users, enter **Y** so that the additional users **idsconx** and

appserv are created.

d. At the prompt to start the batch automatically, enter **N**.

> When the foundation installation script exits, do not run the applications installation wizard yet.

4. Run the Pronto Xi Client and log on to the server as **psd**.
5. Correct *$PATH* to remove non-Informix directories from the path.

```
echo $PATH
   /usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:
    /usr/java14/jre/bin:/usr/java14/bin:/home/pronto/bin:
    /home/pronto/lbin:/pro/informix/bin
PATH= /usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:  _
      /usr/java14/jre/bin:/usr/java14/bin:/pro/informix/bin  _
      export PATH
```

6. Run the Informix-specific environment file and set the Informix environment.

```
cd /pro/pronto_ids/pronto/lib/
. sh_environs
. /pro/informix/etc/profile.pronto
```

5.4.3 Install the Pronto Xi applications

Steps

1. Change to the *bms* directory of the IBM Informix Pronto Xi installation.

```
cd /pro/pronto_ids/pronto/bms
```

2. Run the following command to launch the applications installation wizard:

```
prospl /mnt/proinst /mnt
```

3. Install the Pronto Xi applications, creating only one company:

```
DEM in /pro/pronto_ids/pronto/data/demodata
```

See Create a new database (p.79) for steps.

4. The remaining steps of the migration are identical to those for migrating to a new server and are reproduced below.
5. In the following instructions you must:
   - replace all references to the target directory **pronto** with **pronto_ids** or **pronto_ids/pronto**.
   - replace all references to the temporary staging area with the C-ISAM installation and data areas on the existing server.

5.4.4 Configure the IBM Informix database

Steps

1. On the Pronto Xi server, log in as **psd** and then the **informix** account.

```
login psd
Password: *******
su informix
Password: *******
```

2. Run the IDS Database Administration Utility.

```
prospl rdbms_adm
```

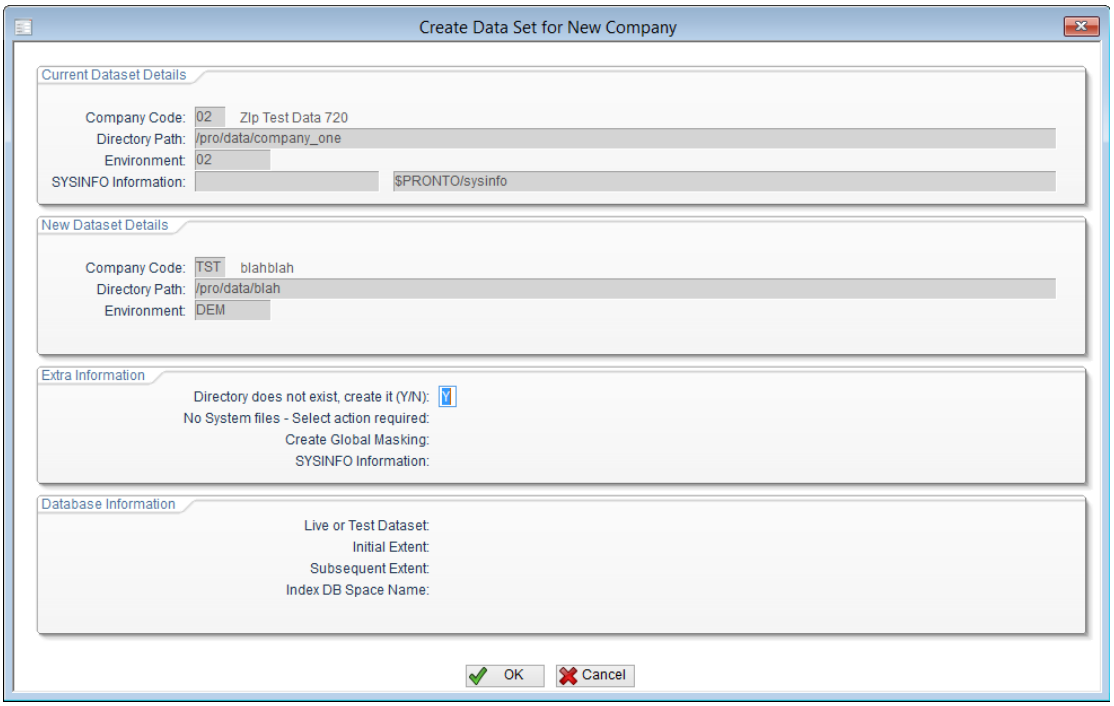
3. Click OK to log in.
4. Using the information collected on the Migration worksheet (p.84), calculate the total size of all companies to be migrated.
5. Click DB Spaces and create a **livedbs** DB Space if it does not already exist.
6. Create a single chunk that is one and half times the value determined in step 5.
7. Create a **testdbs** DB Space if it does not already exist.
8. Add a single chunk to the **testdbs** DB Space until it is at least the same size as the **livedbs** that you created. This will allow the live company data to be copied to a test company for testing purposes.
9. If auditing will be enabled in the companies on the new server, you should also increase the size of the **prontodbs** DB Space to create sufficient space for the audit log files.
10. Exit the IDS Database Administration Utility.

5.4.5 Create non-initialised companies

Steps

1. Run the Pronto Xi Client and log on to the new server as **psd**.
2. Select Administration > System Administration > User and Company Maintenance > Maintain Company Details (SYS M032).
3. Create a record for each of the companies being migrated:

- Ensure you enter the exact same company code and company description.
- At the final confirmation screen for each company, enter **N** as shown in the following image so the new company is not initialised.



5.4.6 Create a temporary database and transfer the older dictionary version

Steps

1. Log on to the new server as **psd**.
2. Check if appservices is running and, if so, stop it. This is required to allow the tables in sysinfo to be dropped in the next step.
3. Drop all tables in the **sysinfo** database:

```
ps –ef | grep appserv
prospl appservices –stop
ps –ef | grep appserv
```

4. Backup the *sysinfo* directory using the following command:

```
cd $PRONTO
cp -rp sysinfo sysinfo.sav
```

5. Create an *oldbms* directory and ensure that the owner is **psd**.

```
cd $PRONTO
mkdir oldbms
ls -l
```

6. Run the Informix Database Administration Utility.

```
prospl rdbms_adm
```

7. Click OK to log in.
8. Create a temporary database for the migration of the earlier Pronto Xi release data:

a. Click Create Database.
b. Create a database called oldbms using the prontodbs DB Space.

9. Drop all tables in the **sysinfo** database:
   a. Highlight the sysinfo database and select Tables-in-db.
   b. Select Drop-tables, enter * as the table name.
   c. Press `Enter` to perform the action.
10. Exit the Informix Database Administration Utility.
11. Copy the old server *bms*.dat* files in the *bms* directory of the temporary staging area created earlier (e.g. */oldserver*) to the *oldbms* directory.
12. If the existing Pronto Xi implementation is using a custom dictionary (i.e. tables from *$PROUSRDICT*), perform the following steps:
    a. Copy the .dat files for the *$PROUSRDICT* dictionary on the old server to the corresponding directory on the new server, for example $CUS.
    b. On the new server, run the following command to register users within the RDBMS and to merge the custom dictionary:

    ```
    prospl dictload -d $PROUSRDICT
    ```

    c. Select Load dictionary from *C-ISAM.dat* files.
    d. Copy the .dat files on the old server for the tables defined in the *$PROUSRDICT* dictionary into the corresponding company directories on the new server.
    e. For each company on the new server that contains these tables, change to the associated data directory of the company and run the following command to upload the data:

    ```
    procopy -it -d $PROUSRDICT
    ```

13. If the existing Pronto Xi implementation is using a distributor dictionary, then follow the same procedure as in step 12 for the *$PRODISTDICT* dictionary.
14. Any shared data areas (such as *SYSGLDATA*) that are not defined as a company must have separate RDBMS level permissions defined for users. To specify which users have access to a shared data area:
    a. Run the following command:

    ```
    prospl rdbms_adm
    ```

    b. Position on the database for the shared data area.
    c. Select Tables-in-db > Pronto Xi Users > Add-user.
    d. Enter the individual users who are permitted access to this database, or * for all users.
15. Set the *PRODICT* environment variable to point to the old bms data:

    ```
    PRODICT=/pro/pronto/oldbms/bms;export PRODICT
    ```

16. Unset all other dictionary-related environment variables:

    ```
    env | grep DICT
    unset PROUSRDICT
    ...
    ```

17. Unset all *SYS** environment variables, and any environment variables, such as *SOARCH*, *STKHIST*:

    ```
    env | grep SYS
    unset SYSTMP
    unset SYSPOST
    ...
    ```

18. Load the old BMS dictionary:

a. Change to the oldbms directory and run the dictionary load utility.

```
cd $PRONTO/oldbms
prospl dictload
```

b. Select Load dictionary from *C-ISAM.dat* files.

19. If the Data Trigger Definitions step gives an error, ignore it.

5.4.7 Transfer the C-ISAM data and import it into the Informix database

Steps

1. Copy the old **.dat** files in the *sysinfo* directory of the temporary staging area to the new *sysinfo* directory.
2. Copy the contents of the *$CUS* directory on the old server (using the temporary copy in */oldserver)* to the corresponding directory on the new server.
3. For each company being migrated, copy the old **.dat** files in the company data directory in the temporary staging area to the corresponding new data directory.
4. If all companies are contained within the one subfolder, you can use a loop similar to the following to copy them all from the old area to the new area.

```
cd /oldserver/data
for i in $(ls -d */)
do
cp ./$i*.dat* /pro/pronto/data/$i
done
```

5. For each company being migrated, copy the contents of the *$DATADIR/reports* directory on the older server (using the temporary copy in */oldserver*) to the corresponding company-specific data directory on the new server.

You should only copy reports if the user IDs are the same on both machines.

6. If the *$PRONTO* directory or any of the company directories on the new server are defined using a soft (symbolic) link, then this could interfere with the data upload procedure detailed below. You must be positioned in the real directory path when you run the *procopy -i* command. If the *$PRONTO* directory is affected, then the *$PRONTO* environment must be set to point to its real directory path in order to upload the sysinfo directory.
7. Load the sysinfo data files into the Informix database:

```
cd /pro/pronto/sysinfo
procopy -i
```

8. Check and, if necessary, correct the directory paths stored in the system-companies object:
   a. Launch the **Browse** utility:

```
progen -b
```

   b. Find and highlight the system-companies object, then click **Browse**.
   c. Check, and if necessary, correct the paths specified in the **Data Directory Path** and **General Ledger Path** columns.
   d. Exit the **Browse** utility.
9. Load the C-ISAM dat files for each company by running the following commands for each new company data directory:

```
cd <company_data_directory>
procopy –i
```

10. After each *procopy –i* import, check the *procopy.log* file for warnings or errors such as the following and, if necessary, correct the original data in C-ISAM and reimport into Informix.

```
At the end of the log: Note: The following objects had errors or warnings.
```

11. Check the preceding log text to locate the specific issues that were found.

```
"n record(s) with illegal values not copied"
```

12. Check the preceding log text to identify the type of error (for example duplicate record, incorrect precision) and the primary key of the records that were not inserted;

```
"INFORMIX error -202 - An illegal character has been found …"
```

13. In this case the entire table is omitted. Check the subsequent lines of the log to identify the primary key of the record that had the illegal character.
14. For each company for which you have loaded data into Informix, perform the procedure specified in Migrating from a C-ISAM database to an Informix database (p.37) to the corresponding Informix database to eliminate the possibility that the Informix bug described in that section will appear.
15. Prepare and execute scripts to copy the company data to the new server. A sample script is provided in Create a new database (p.79).

5.4.8 Transfer and update the Pronto Xi scripts and configuration files

Steps

1. Copy the files in the table below from the temporary staging area to the corresponding installation directory on the new server. Review the contents of all scripts and ensure that the path information is correct.
   - $PRONTO/lbin
     All relevant scripts, forms and *.awk* files.
     Create symbolic links to */etc/rc.d/rc3.d* and */etc/rcd/rc5.d*.
   - $PRONTO/lib
     procmnd, printers, printcap

   Take care to not overwrite the following files on the new server, if present, as these contain machine and/or Informix-specific settings which will be lost if overwritten:
   - proctrl
   - prouser
   - sh_environs
   - pronight
   - forms.lok
   - S99pront

   You can make any necessary changes by editing these files.
2. Check the *pronight* script to ensure backups are performed as required (see also Back up the Informix databases (p.70)).
3. Check that the *S99pronto* script is located in *$PRONTO/lib*.
4. Review, and update as necessary, any other scripts present in the *lib* or *lbin* directories.

5.4.9 Upgrade all companies and migrate Pronto Xi user accounts

Steps

1. Log out and back in again to set all environment variables to their correct (IBM Informix) values.
2. If you are migrating from an earlier version of Pronto Xi, run the following command to initiate a BMS version upgrade for each company:

   ```
   prospl bmsmenu
   ```

3. To ensure all Pronto Xi users have the required RDBMS level permissions and access to the required companies:
   a. Login in as the **psd** user.
   b. Run the following command to merge the contents of the *prouser* file in the temporary staging area (assumed here to be */oldserver*) into the new *prouser* file:

      ```
      prospl sys/m8rdbmsusers -prouser /oldserver/pronto/lib/prouser
      ```

   The upgrade on the new server is complete.

5.4.10 Complete the migration

Steps

1. Select **Administration > System Administration > User and Company Maintenance > Maintain Company Details** (SYS M032).
2. Check the company details.
3. Click **Users** and ensure that all users are loaded for that company.
4. Log in as the **psd** user, and perform the following for each company:
   a. cd to the company data directory and copy the file *SYSCTRL.dat* to SYSCTRL.SAV.
   b. Delete all .dat files in the data directory.
   c. Copy *SYSCRTL.SAV* back to *SYSCTRL.dat*.
   d. Select the company in Pronto Xi and check that access to the Informix database is functioning correctly.

   The installation program installs *Copy live to test* scripts in the *$PRONTO/lbin* directory. There is an Informix-specific script available if required.

   For more information, see the Informix Live to Test Copy Script User Guide (https://kbase.pronto.com.au/intranet/documents/1462/31602/informix_copy_live_to_test_guide_720.pdf).

5.5 Migrating to IBM Informix on the same server

The steps for migrating to an IBM Informix database on the same server as an existing C-ISAM Pronto Xi implementation are described below.

Migration from a C-ISAM database to an IBM Informix database on the same server is not recommended due to the higher performance and disk space requirements on the server. For more information, see Migration considerations (p.37).

To perform this migration you will:

- Install and configure the IBM Informix database (p.54)
- Install the Pronto Xi Foundation (p.59)
- Install the Pronto Xi applications (p.60)
- Configure the IBM Informix database (p.60)
- Create non-initialised companies (p.61)

5.5.1 Install and configure the IBM Informix database

Follow the steps below to install and configure the IBM Informix database.

Before modifying any of the recommended settings below, you must contact Pronto Software Support stating the nature and reason for the change. This change will be registered with the Pronto Software Development Centre for reference purposes. Pronto Software staff who change a setting must log the change with the Development Centre directly.

The minimum requirements for new installations are 24GB RAM, four virtual CPUs. If the server does not meet these minimum requirements, the demo mode is automatically installed.

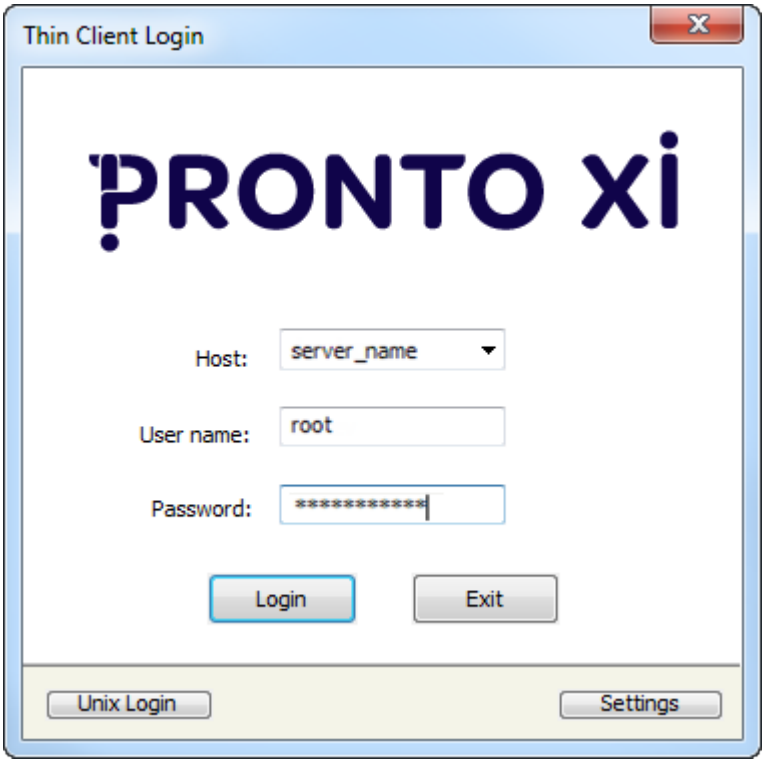
Before you start

On the Migration worksheet (p.84), record the details of the companies being migrated. You can also use the worksheet to record the overall progress of the migration.

Calculate the kernel.shmmax number. This should equal the total amount of memory to be allocated to Informix. For minimum recommendations, see the *System Requirements* section of the *ids_machine_notes_xx.xx.txt* file (where xx.xx is the Informix version, e.g. 12.10), which is located in the *dbs/lin_notes* or *dbs/aix_notes* directory of the Informix installation media.

Steps

1. In kernel.shmmax, enter the calculated value (see above).
2. Run **sysctl-p** to ensure the setting takes effect immediately.
3. Open the Pronto Xi Client and log in to the server as **root**.



4. A Pronto Xi shell is displayed after login.
5. Insert the Pronto Software-supplied Informix installation DVD into the drive of the Pronto Xi server.
6. In the Pronto Xi shell, mount the DVD and navigate to the root directory of the DVD.

```
mount /dev/cdrom /mnt
cd /mnt
```

7. Run the install script.

```
./install
```

```
Do you plan to install Cognos on Linux on this server (y/n) (default n) ?
```

If you are implementing IBM Cognos, the server must be running Linux Red Hat version 6 (if implementing IBM Cognos v10.2.1) or Red Hat version 7 (if implementing IBM Cognos v10.2.2).

8. Enter **y** to continue.
   Some tasks are performed then the required packages are listed.

```
Loaded plugins: product-id, refresh-packagekit, security, subscription-manager
Cleaning repos: dvd
Cleaning up Everything
------------------------------------------------
Active repository detected!.
Packages below are a prerequisite of Informix and must be installed before the installer can proceed.
------------------------------------------------------
       Required minimum package list
------------------------------------------------------
1)  libaio-0.3.107-10.el6.x86_64
2)  libgcc-4.4.4-3.el6.x86_64
3)  libgcc-4.4.4-3.el6.i686
4)  libstdc++-4.4.4-13.el6.x86_64
5)  compat-libstdc++-33-3.2.3-69.el6.x86_64
6)  ncurses-5.7-3.20090208.el6.x86_64
7)  pam-1.1.1-13.el6.x86_64
8)  libhugetlbfs-utils-2.12-2.el6.x86_64
------------------------------------------------------

All packages listed above will be automatically updated with the latest version present in the repository!
Press Enter to continue with installation/upgrade.
```

If the message "Could not match patches: Cannot retrieve repository metadata (repomd.xls) for repository: RHEL-CD" is displayed, make sure the Red Hat installation CD is mounted then restart the script.

9. Press `Enter` to continue.

   A group and a user named **informix** are created.

```
Attempting to install required packages please wait...
All the required packages successfully installed.


Group 'informix' added.
User 'informix' added - Please set password.
Changing password for user informix.
New password:
```

10. Enter a password for the **informix** user then re-enter the password when prompted.
    The installation script installs the Informix database in the */dbs* directory, and the Pronto Xi application in the */pro* directory. If these directories do not already exist, you are prompted to create them.

```
The directory /pro does not currently exist.
The Pronto-Xi and Informix systems and will be created within /pro.
The directory /dbs does not currently exist.
The Informix data will be stored within /dbs

If you wish to create separate file system/s for this you should do
so now and restart this installation once they have been created
and the file systems mounted.  If you do not create /pro or /dbs as
separate file systems then they will form part of the root file system.

Create missing directories within the root file system [y/n] (default n)? y
```

If you need control over the file system layout for the installation directories so that they are not part of the root file system, exit the script, create the links from */pro* and */dbs* to the relevant locations, and re-run this script.

11. Enter **y** to create the directories */pro* and */dbs*.
    You are asked whether to use the UTF-8 code page, which is a multi-byte implementation of Unicode, or the ANSI code page. In a new installation, we recommend that you enter **y** to select the UTF-8 code page, however if you are migrating from an existing non-UTF-8 system, you must enter **n**.

```
It is recommended that the UTF-8 code page is used by Informix if you need to
store international characters.  UTF-8 supports all international Unicode
characters.  However, if you are migrating existing data with ANSI (non
Unicode international characters) then you should continue to use an ANSI
code page.
Use the UTF-8 code page within Informix [y/n] (default n)?
```

12. Enter **y** to use the UTF-8 code page or enter **n** if you do not.

    If you entered **n** above, the following additional prompt is displayed.

```
If you do not wish to use the default ANSI code page then you should
set the SERVER_LOCALE, DB_LOCALE and CLIENT_LOCALE environments and
restart this installation.
Continue [y/n] (default y)?
```

13. Enter **y** to use the default ANSI code page.

    You are asked for a temporary area to extract the Informix installation software into.

```
Please provide the path to a temporary directory with sufficient space to
extract the Informix Dynamic Server installation software.  An area with at
least 750MB is recommended.

Temporary directory (default /pro/tmp):
```

14. Press `Enter` to accept the default directory, or enter an alternative directory.

    You are now prompted to begin installing the Informix Dynamic Server application.

```
Install Informix Dynamic Server [y/n]? y
```

15. Enter **y**.

    After the extraction is complete, you are prompted to select a suitable initial Informix configuration.

    The following minimum requirements apply:

```
********************************  WARNING ************************************
To allow Informix to function correctly a minimum total of 24GB
physical memory is required, which includes at least:
   . 16GB database server memory.
   . 8GB operating system memory.
******************************************************************************
```

- If the server does not meet the minimum requirement of 4 virtual CPUs, the demo Informix configuration is automatically selected.

```
********************************  WARNING ************************************
To allow Informix to function correctly the hardware needs to be capable of
supporting 4 Virtual CPUs.
******************************************************************************

------------------------------------------------------------------------------
** Please ignore the above warning message if you want to run in demo mode **
------------------------------------------------------------------------------
Do you really want to continue: [y/n]? y
```

- If the server meets the minimum requirement of 4 virtual CPUs but has less than 24GB of total physical memory, the demo Informix configuration is automatically selected.
- If the server has less than 4GB of total physical memory, the demo mode installation will fail.

If the server meets both the minimum virtual CPUs and minimum total physical memory requirements, the following is displayed.

```
Please select the required initial Informix configuration based on the
serial number of the following metrix (default is 1).

|--------|-----------|--------|--------------|----------|-----------|---------|
| Serial | Selection | No. of | Transactions | Database | Max Table | No .of  |
| Number | Category  | Users  |   per day    | Size(GB) | Size (GB) |Companies|
| ------ | --------  | -----  | -----------  | -------- | --------- | --------|
|   1    |  Small    | 0 - 49 |    0 - 4999  |  0 - 49  |  0 - 1.99 |   0 - 6 |
|--------|-----------|--------|--------------|----------|-----------|---------|
|   2    |  Medium   |50 - 199| 5000 - 9999  | 50 - 99  |  2 - 4.99 | 7 - 20  |
|--------|-----------|--------|--------------|----------|-----------|---------|
|   3    |  Large    |  199 + |   9999 +     |   99 +   |  5 +      |   20 +  |
|--------|-----------|--------|--------------|----------|-----------|---------|
Enter the selection to continue (default is 1)?
```

- For information on the parameter settings in the onconfig file, see Onconfig parameter settings (p.107).
  - Small setup - 4GB each 4 temp dbspaces
  - Medium setup - 8GB each 4 temp dbspaces
  - Large setup - 16GB each 4 temp dbspaces

16. Enter **1** to accept the default, or make an alternative selection from the menu.

> If the number of users expands into a higher category in the future, you will not necessarily need a configuration change. If the customer reports that the system performance is decreasing, the system must be reviewed, for example with regard to log files, server capacity, and so on. The Informix message log reports on the automatic, temporary adjustments made by the DB - these logs must be critically reviewed and assessed, and the database modified if necessary.

The installation script reports on the DB spaces that are created based on your selection and the required disk space.

```
The following database spaces will be created:
Name = rootdbs, Directory = /dbs/pronto/rootdbs, Size(MB) = 4000
Name = prontodbs, Directory = /dbs/pronto/prontodbs, Size(MB) = 4000
Name = livedbs, Directory = /dbs/pronto/livedbs, Size(MB) = 4000
Name = testdbs, Directory = /dbs/pronto/testdbs, Size(MB) = 4000
Name = llog, Directory = /dbs/pronto/llog, Size(MB) = 6001
Name = plog, Directory = /dbs/pronto/plog, Size(MB) = 4097
Name = tmpdbs1, Directory = /dbs/pronto/tmpdbs1, Size(MB) = 16000
Name = tmpdbs2, Directory = /dbs/pronto/tmpdbs2, Size(MB) = 16000
Name = tmpdbs3, Directory = /dbs/pronto/tmpdbs3, Size(MB) = 16000
Name = tmpdbs4, Directory = /dbs/pronto/tmpdbs4, Size(MB) = 16000

You need to ensure that there is sufficient space available for these.
Create the database spaces [y/n] (default y)?
```

17. Enter **y** to continue.

The required DB spaces and settings for a Pronto Xi implementation are initialised. This can take several minutes, depending on your setup choice and hardware.

```
** WARNING **  A level 0 archive of Root DBSpace will need to be done.
Archive to tape device '/dev/null' is complete.
```

The above warning messages are displayed during this process. These are default Informix messages and can be ignored.

The following is displayed once the installation is complete:

```
Restarting Informix Server with new configuration

pronto Database server creation complete


Informix Dynamic Server installation complete
*********************************************

You should now install Pronto-Xi.
Ensure that the required Informix Dynamic Server environments are set prior to
running the Pronto-Xi installation script.  You can do this by either logging
in again or by issuing the following command:
. /pro/informix/etc/profile.pronto

[root@win-gsdig8je342 mnt]#
```

18. To verify that Informix is running, enter the following:

```
. /pro/informix/etc/profile.pronto
```

then enter:

```
onstat -
```

A line similar to the following is displayed indicating that the database is online:

```
IBM Informix Dynamic Server Version [illegible] -- On-Line -- Up 00:02:20 -- 953
5456 Kbytes
```

19. Exit the current Pronto Xi terminal session.
20. Log out and back in again and check that the correct Informix environments are set.
21. Start a new Pronto Xi terminal session and log in as **root**.
22. Enter the following command to unmount the Informix installation DVD.

```
umount /dev/cdrom
```

5.5.2 Install the Pronto Xi Foundation

Now install the Pronto Xi Foundation.

Steps

1. Log on to the server as **root**.
2. Create a directory into which to install the Informix version of Pronto Xi.

```
mkdir /pro/pronto_ids
```

3. Install the Informix version of the Pronto Xi foundation as described in Install the Pronto Xi foundation and applications (p.9), with the following specific parameters:
   a. Specify */pro/pronto_ids* as the parent directory for the installation. The installation script creates a */pro/pronto_ids/pronto* directory.
   b. At the prompt to set the environments globally, enter **N**.
   c. At the prompt to add special pronto users, enter **Y** so that the additional users **idsconx** and

appserv are created.

d. At the prompt to start the batch automatically, enter **N**.

> When the foundation installation script exits, do not run the applications installation wizard yet.

4. Run the Pronto Xi Client and log on to the server as **psd**.
5. Correct *$PATH* to remove non-Informix directories from the path.

```
echo $PATH
   /usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:
    /usr/java14/jre/bin:/usr/java14/bin:/home/pronto/bin:
    /home/pronto/lbin:/pro/informix/bin
PATH= /usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:  _
      /usr/java14/jre/bin:/usr/java14/bin:/pro/informix/bin  _
      export PATH
```

6. Run the Informix-specific environment file and set the Informix environment.

```
cd /pro/pronto_ids/pronto/lib/
. sh_environs
. /pro/informix/etc/profile.pronto
```

5.5.3 Install the Pronto Xi applications

Steps

1. Change to the *bms* directory of the IBM Informix Pronto Xi installation.

```
cd /pro/pronto_ids/pronto/bms
```

2. Run the following command to launch the applications installation wizard:

```
prospl /mnt/proinst /mnt
```

3. Install the Pronto Xi applications, creating only one company:

```
DEM in /pro/pronto_ids/pronto/data/demodata
```

See Create a new database (p.79) for steps.

4. The remaining steps of the migration are identical to those for migrating to a new server and are reproduced below.
5. In the following instructions you must:
   - replace all references to the target directory **pronto** with **pronto_ids** or **pronto_ids/pronto**.
   - replace all references to the temporary staging area with the C-ISAM installation and data areas on the existing server.

5.5.4 Configure the IBM Informix database

Now you can configure the IBM Informix database.

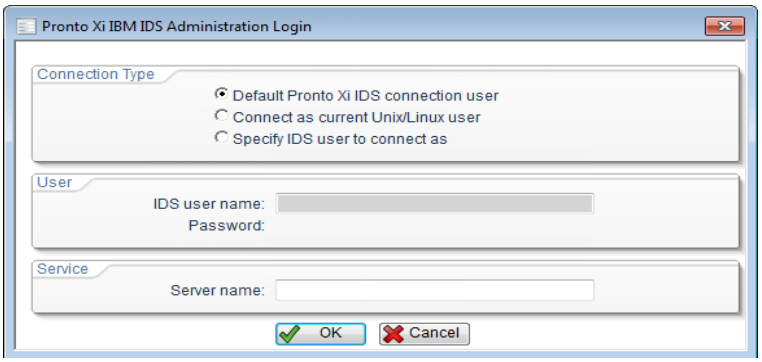
Steps

1. Still logged in as **psd** with the path corrected:

```
su pronto
Password: *******
```

2. Run the Informix Database Administration Utility.

```
prospl rdbms_adm
```



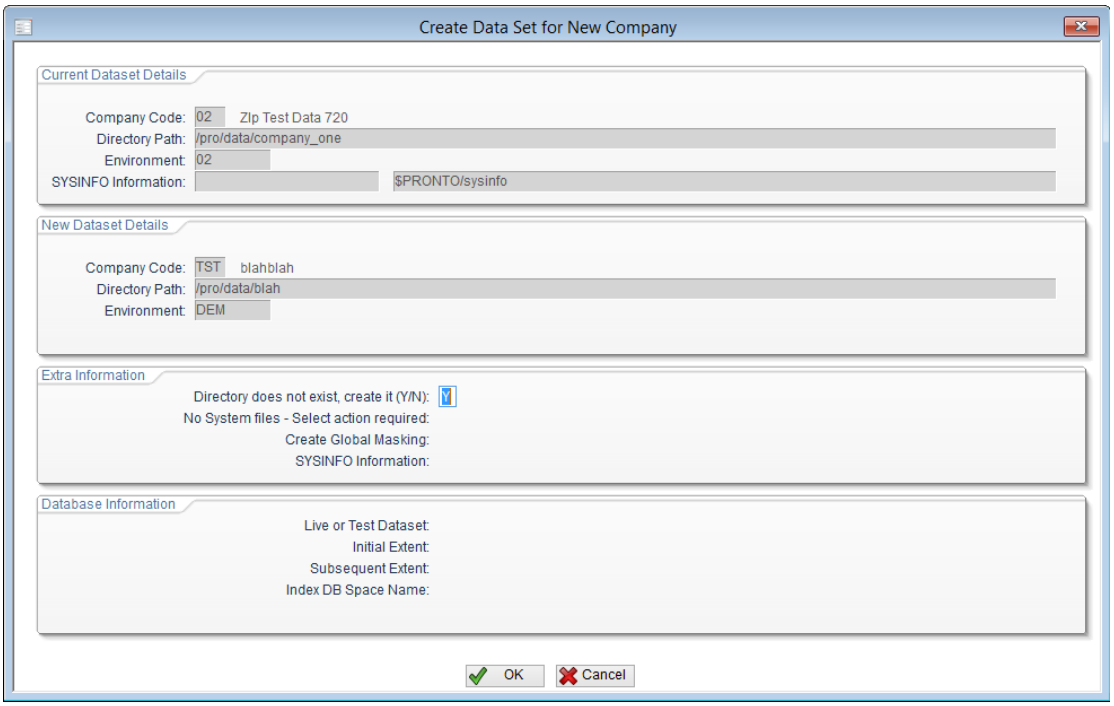
3. Click OK to log in.
4. Using the information collected on the Migration worksheet (p.84), calculate the total size of all companies being migrated.
5. Create a **livedbs** DB space with a 4096 chunk.
6. Add 4096 sized chunks to the **livedbs** DB space until it is twice the size of the value determined in Migrating to IBM Informix while migrating Pronto Xi to a new server (p.40).
7. Return to the main screen (the database list), select the **testdbs** database and then click DB Spaces.
8. Add 4096 sized chunks to the **testdbs** DB space until it is at least the same size as the **livedbs** that you created. This allows the live company data to be copied to a test company for testing purposes.
9. If auditing is enabled in the companies on the new server, increase the size of the prontodbs DB space to create sufficient space for the audit log files.
10. Exit the Informix Database Administration Utility.

5.5.5 Create non-initialised companies

Steps

1. Run the Pronto Xi Client and log on to the new server as **psd**.
2. Select Administration > System Administration > User and Company Maintenance > Maintain Company Details (SYS M032).
3. Create a record for each of the companies being migrated:

- Ensure you enter the exact same company code and company description.
- At the final confirmation screen for each company, enter **N** as shown in the following image so the new company is not initialised.



6 Administering the IBM Informix database

You can perform the following common administration tasks.

- Monitor IBM Informixdatabase sizes (p.63)
- Increase the size of a DB space by adding a chunk (p.67)
- Back up the Informix databases (p.70)
- Restore the IBM Informix databases (p.74)
- Create a new database (p.79)

6.1 Monitor IBM Informixdatabase sizes

Pronto Xi includes the following pre-packaged functionality that you can use to monitor space usage in an IBM Informix database and to generate an alert as it approaches its maximum available space:

Application services:

- #18: Database Size Monitor (populates a database table with database size data)
- #19: Database Size Monitor - Usage Purge (clears the size data table).

Alert Intelligence event templates:

- Database Size Monitor - All DB Threshold Warning
- Database Size Monitor - Specific DB Threshold Warning

This topic covers the following tasks:

- Configure the application services used to collect and purge database size data (p.63)
- Set up a notification when an Informix database size reaches a threshold (p.64)
- View historical size data (p.66)

6.1.1 Configure the application services used to collect and purge database size data

Steps

1. Select Administration > Application Services > Services Maintenance (APPS M001).
2. Select application service #18 - Database Size Monitor.
3. Click Correct Wizard.
   The Application Service Wizard is displayed.
4. On the first two pages of the wizard, set the frequency at which database size data is to be collected and a start date for this application service.
5. Click Next several times to navigate to the Setup Execution Control and Company Execution Method screen of the wizard.
6. Click Start Automatically.
7. Click Finish to exit the wizard and save your configuration changes.
8. Select application service #19 - Database Size Monitor - Usage Purge.
9. Click Correct Wizard.
   The Application Service Wizard is displayed.
10. On the first two pages of the wizard, set the frequency at which historical database size data is to be purged, and a start date for this application service.
11. Click Next.

The Select Executable screen is displayed.

> Parameter 2 passed to the *sys/m8db_space* program is the cutoff age, in days, after which historical data will be deleted. The default value is 90 days. If you want to change this value, select Duplicate on the Services Maintenance screen to create a copy of application #19, and then launch the correct wizard on the new copy.

12. Click Next.
    The Setup Execution Control and Company Execution Method page is displayed.
13. Click Start Automatically.
14. Click Finish.
    The wizard is closed and configuration changes are saved.

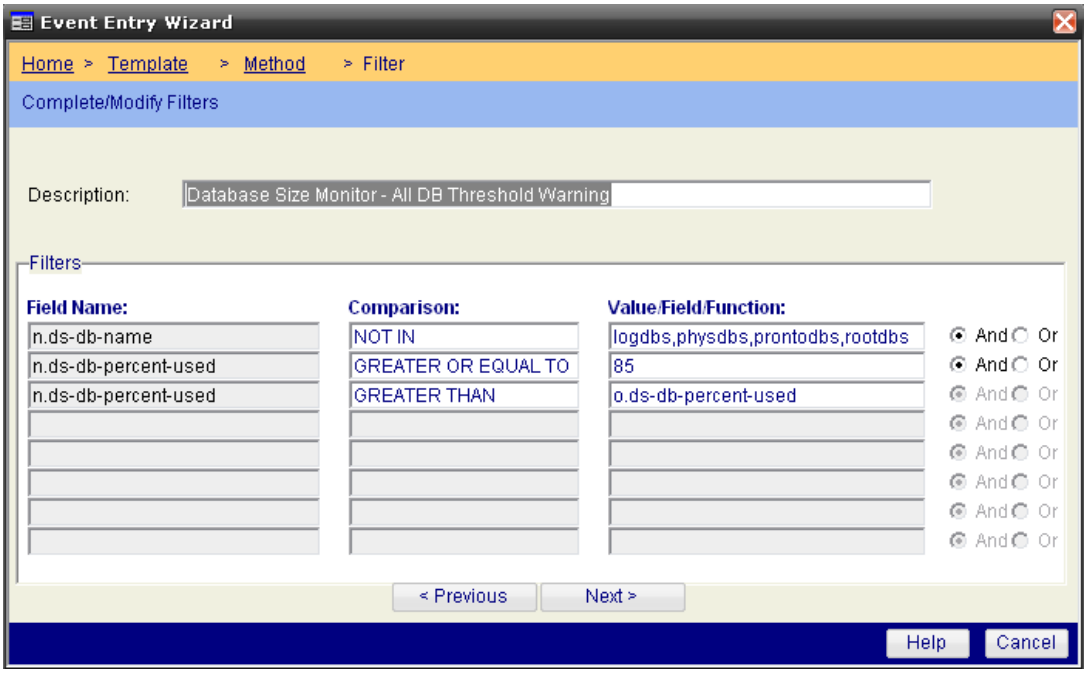
> You must ensure that the application services run again automatically whenever the server is rebooted. For more information see the Application Services help topic *Automatically Starting the Application Services Daemon*.

6.1.2 Set up a notification when an Informix database size reaches a threshold

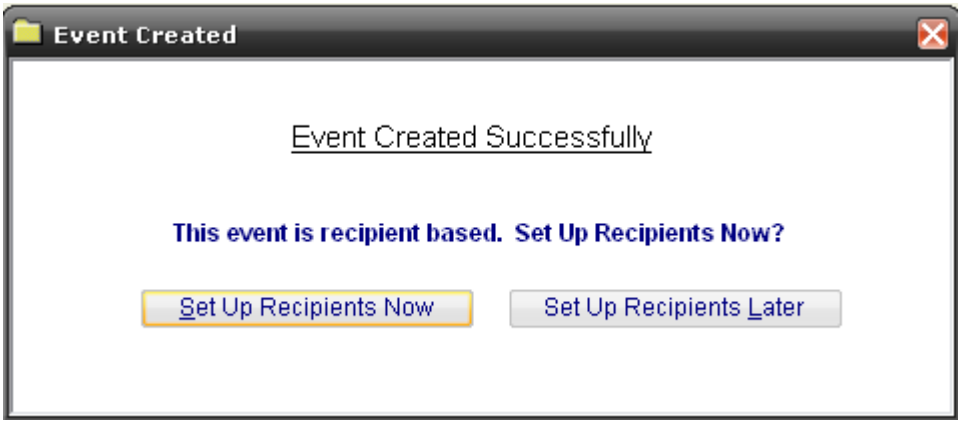
Steps

1. Select Alert Intelligence > Event Maintenance (AI M001).
2. Click Entry Wizard.
   The Event Entry Wizard - Choose Method screen is displayed.
3. Click Pre-Packaged Event Template.
4. Click Next.
5. On the Select Event Template page, select one of the following two templates:
   - Database Size Monitor – All DB Threshold Warning
     Select this template to send a notification if the size of any database reaches a specified % threshold.
   - Database Size Monitor – Specify DB Threshold Warning
     Select this template to send a notification if the size of a specific database reaches a specified % threshold.
6. Click Next.
   The Complete/Modify Filters screen is displayed.

   If you selected the All DB notification, the value field for the **db-name** filter will show the list of DB spaces shown below, otherwise it will be empty.



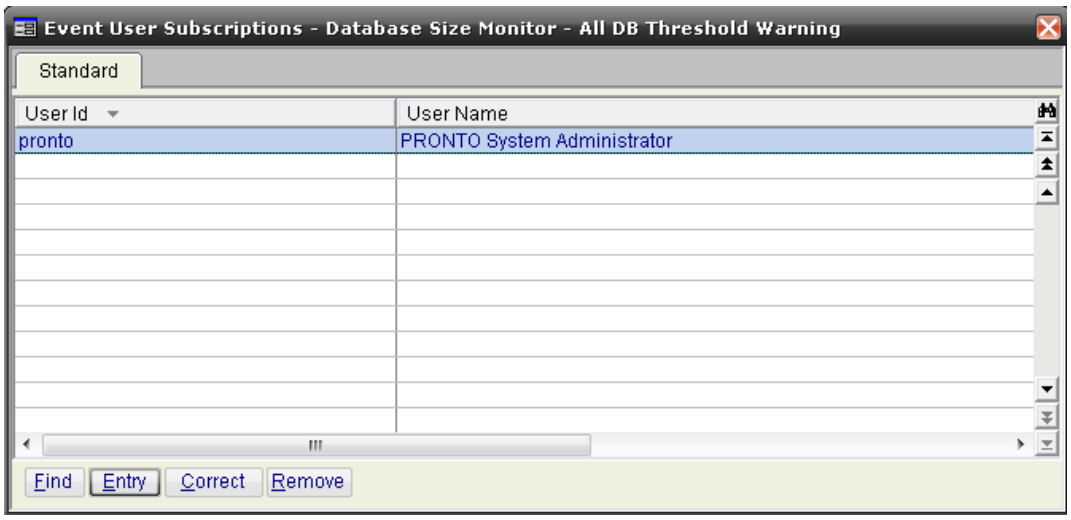
7. If necessary, edit or add to the comma-separated list of DB spaces not to be checked, and optionally change the default warning threshold of 85%.
8. Click **Next**.
   The relevant notification text configuration page is displayed for the notification type you selected.
9. Modify the default notification text if required.
10. Click **Create**.
11. After the event is created, you are asked whether to set up the recipients for the notification.



12. Click **Set Up Recipients Now**.
    The **Event Details** screen is displayed with the details of the new event.
13. In the **Define this event's email/SMS/fax recipients** pane, select the method by which the recipients are to be selected.
14. Click **User** to enter the user IDs of one or more Pronto Xi users, or **External** to enter the contact details of non-Pronto Xi users.

> For full details on using the available recipient selection options, see the **Alert Intelligence** help.

In the following example, the User option was selected and the **pronto** administrator account is set to receive the notifications.



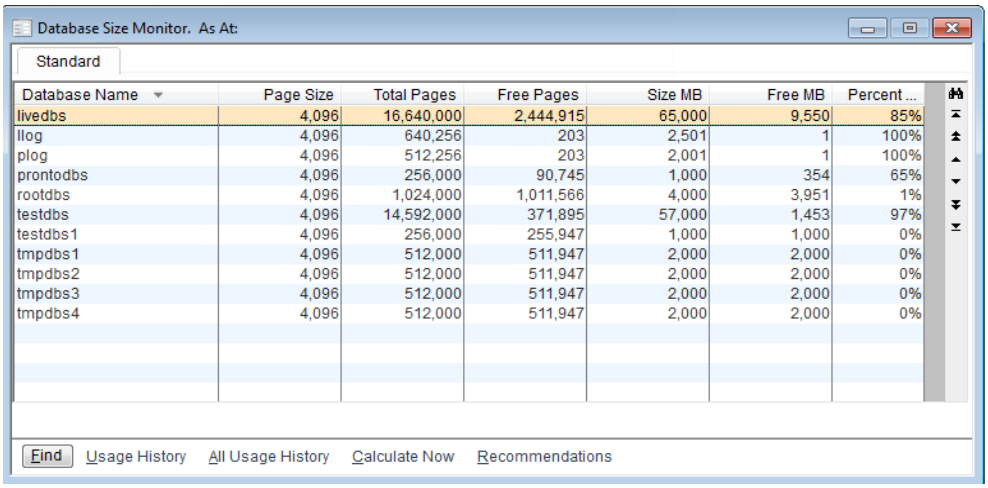
15. When you have finished, change the Event Status setting from **Testing** to **Active**.
16. Click OK.
    The configuration changes are saved.
17. Click Generate to create the application code and database triggers for the new event.

6.1.3 View historical size data

You can view the collected historical size data.

Steps

1. Select Administration > System Administration > RDBMS Tools > Database Size Monitor (SYS M081).
   Sample historical data is shown below.



2. To see the individual records for a database, highlight the row you want to view and click Usage History.

The table that the above enquiry screens are based on is not a live table of DB space data and is only updated when application service #18 - Database Size Monitor is run.

6.2 Increase the size of a DB space by adding a chunk

If the percentage usage of a DB space reaches the configured threshold, you can increase its size by adding an additional chunk of space using the *IDS Database Administration* menu.

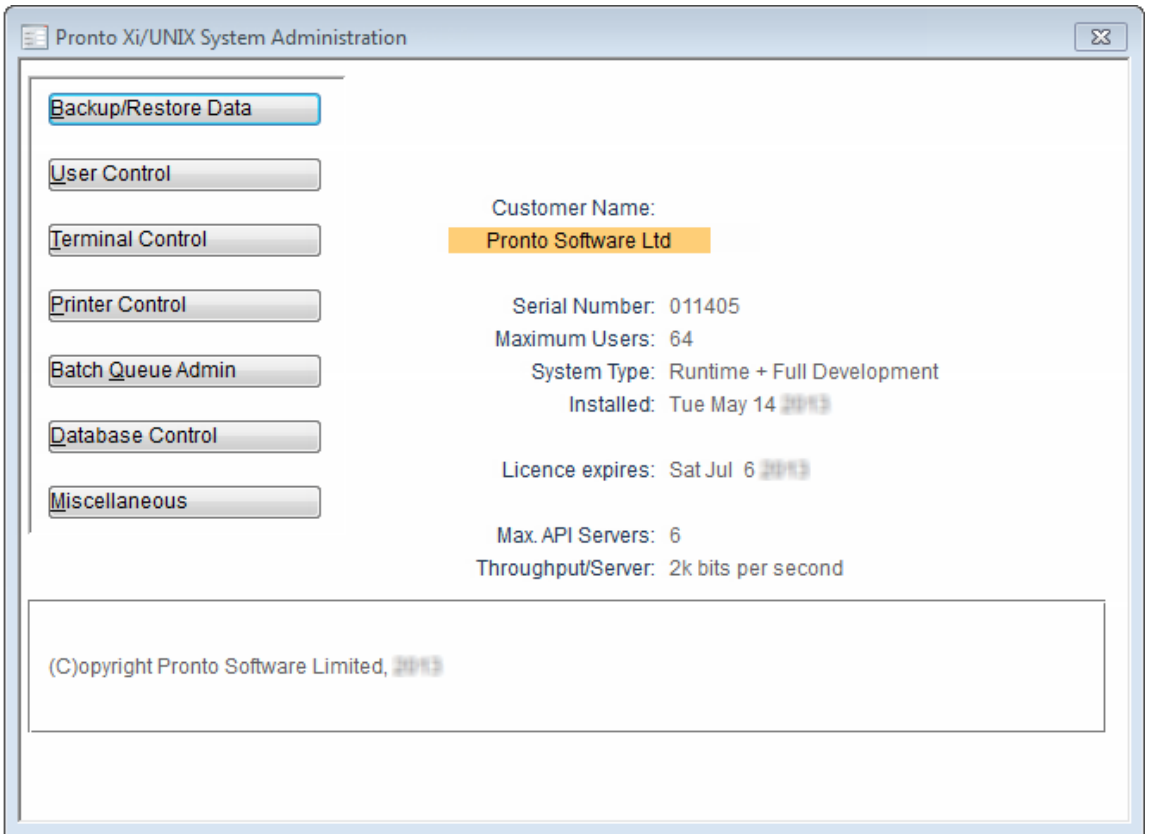
Steps

1. On the Pronto Xi server, log in as **psd** and then the **pronto** account.

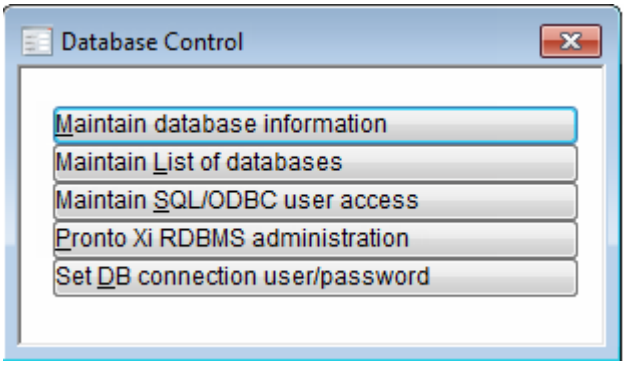
```
login psd
Password: *******
su pronto
Password: *******
```

2. Open the Pronto Xi System Administration utility.

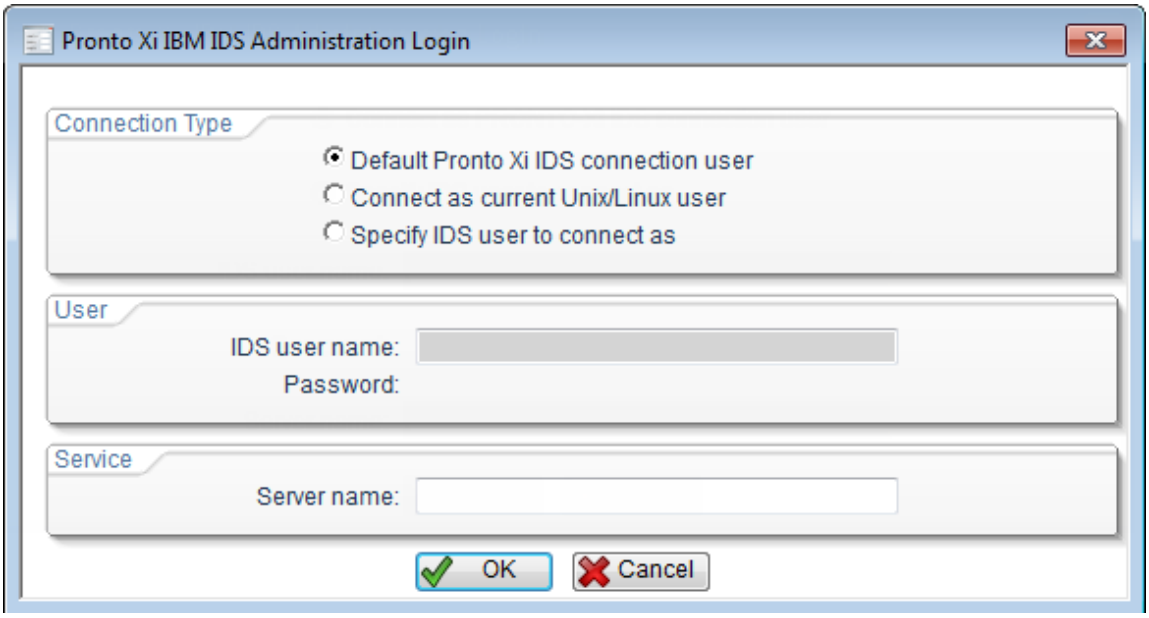
```
proadmin
```



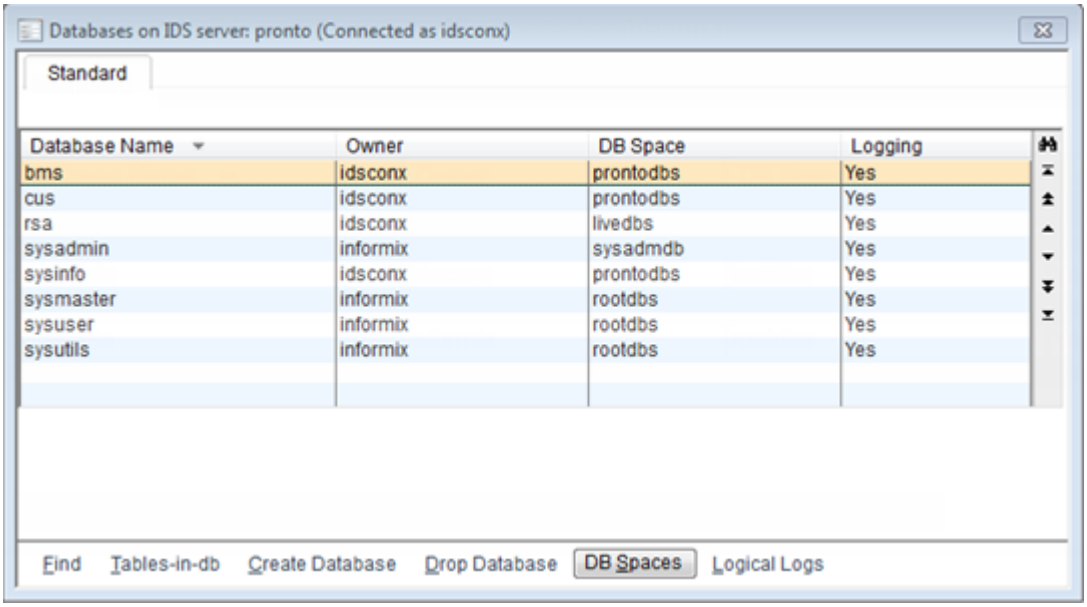
3. Click Database Control.
   The Database Control menu is displayed.



4. Click Pronto Xi RDBMS administration.

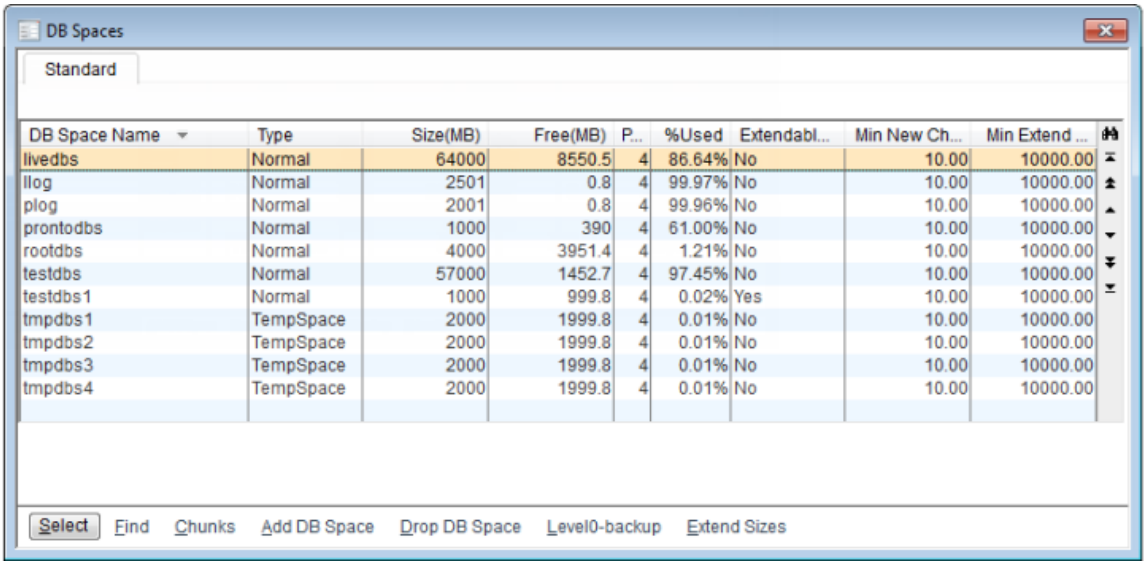


5. Click OK to connect to the IBM Informix database.
The existing IBM Informix databases are listed in a data grid.

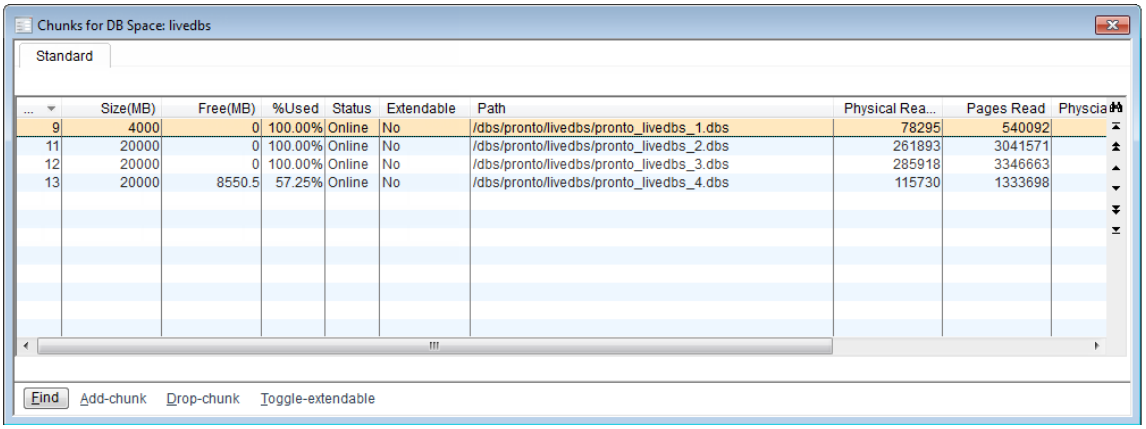


6. Click DB Spaces.
The existing DB spaces and their size information are displayed.

In this example, the usage of the 64GB livedbs DB space has reached 86.6%, so you can increase its size by adding a 1GB chunk.

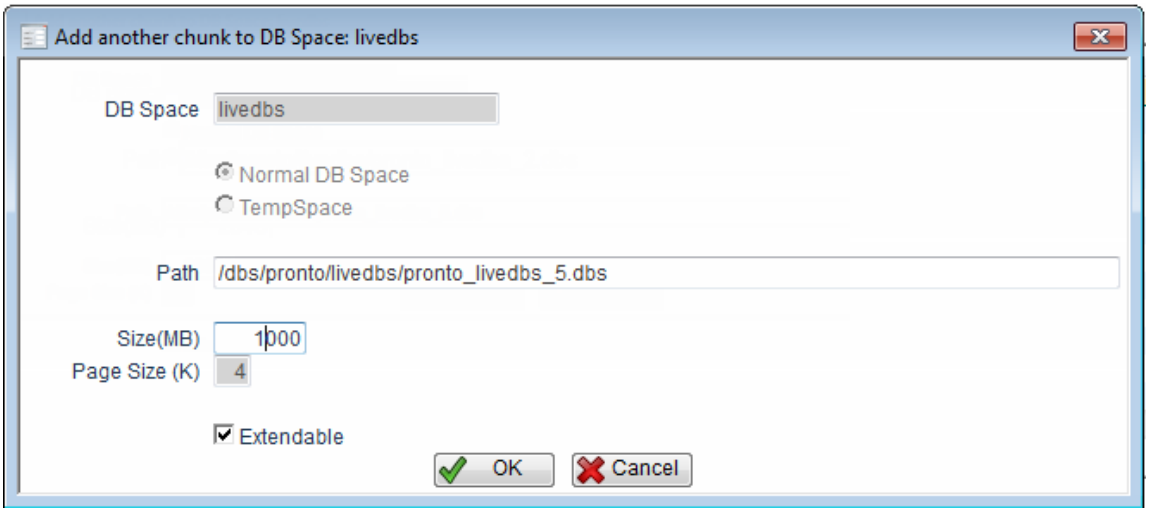


7. Click **Chunks**.
   The chunks for the DB space are listed in a data grid.



The 64GB DB space includes the four chunks with 86.6% usage.

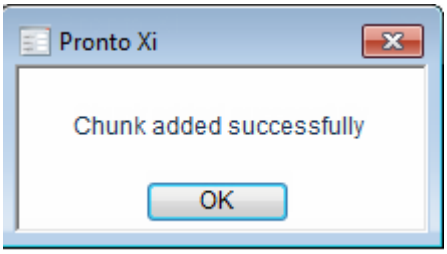
8. Click **Add-chunk**.



9. Accept the default path and name for the chunk to be added and enter its size.

Click **OK**.

10. Press `Enter`.
    The successful creation of the chunk is confirmed.



Click **OK**.

6.3 Back up the Informix databases

A hot backup of all Pronto Xi databases can be performed either by:

- using a cron job to run the *pronight* script as described below
- using the Informix ON-Bar backup solution as described in the Backing up and restoring Informix using ON-Bar Implementation Guide (https://kbase.pronto.com.au/intranet/documents/1462/33915/onbar_backups_implementation_guide_720.1.pdf)

The backup size is dependent on the percentage utilisation of the database.

If the total database size is configured as 16GB, for example, and the current usage is 62.5%, the data will take up 10GB. The size of the backup file will be approximately 10GB.

The *prokillall* command in the *pronight* script is not there for the backup, it is there for the other applications that *pronight* runs. The integrities, updates, and other applications can be affected by user processing.

Steps

1. On the Pronto Xi server, log in as **root**.

```
login root
Password: *******
```

2. Change the *skeleton* directory of the Pronto Xi installation which contains template versions of the pronight script.

```
cd $PRONTO/skeleton
ls
```

```
backup2disk         cmpverify           one_login           pronight.ids
backups             cshrc               opdraw              pronight.ora
bcl_comm.awk        data_reload         ora_cold_backup     protelnetd.auth
bcl_dhbb.awk        dbshut              ora_datafiles       prottys
bcl_epl2.awk        dbstart             ora_exp_backup      prouser
bcl_fp40.awk        dumb                ora_hot_backup      rdbms_create_users.spl
bcl_inter.awk       initSKEL.ora        ora_locks.sql       READ.ME
bcl_kyocfs.awk      install.cdrom       ora_tune.sql        S99pronto
bcl_lp24oki.awk     kermbms             printcap            send2tradelink
bcl_lp.awk          kermrc              printers            spl.vim
bcl_monarch.awk     kill_idle_bmsmenu   proapi.conf         standby.act_standby
bcl_mp5044.awk      live2test           proapimgr.sh        standby.cold_backup
bcl_pinacl.awk      logging_off         procmnd             standby.cp_database
bcl_prodig.awk      logging_on          products            standby.hot_backup
bcl.sh              login               proedi.sh           standby.make_standby
bcl_skeleton.awk    lp_mult             proexattach.sh      standby.README
bcl_zebra.awk       lp_post             profile             standby.rollforward
chaixvirprt         mkaixlps            promq.env           standby.sendlogs
checkspace          mkaixttys           promq.sh            storage.ini
cmpbackup           netbatch.csh        pronight.cisam      sysbackup
cmprestore          netbatch.sh         pronight.cron
```

3. Copy the template *pronight.ids* script to the *lib* directory and then change to that directory.

```
cp pronight.ids ../lib/pronight
cd ../lib
Open the 'pronight' file in vi.
vi pronight
```

4. Locate the section of the script where the backups are performed.

```
# NOTE: This scripts performs a hot IDS backup which does allow users to stay
# connected to IDS while it is running.  However, we also do a full system
# backup to tape which requires us to shut down IDS in order to back up the
# raw database files in /dbs.  In addition, some NIGHT sequence applications
# such as integrities require all users to be logged off.  As a result we
# stop the batch queues and kill of any remaining PRONTO tasks.

# Do any backups and then process the data

echo "Performing a hot level 0 IDS backup to disk"
# This will call ontape to generate a full level 0 IDS backup.  The backup file
# will be written to the /pro/arch/dbs directory by default.  These backup files
# can be used to do full restores or selective restores using archecker.
# The -retain parameter indicates how many old backups to retain in /pro/arch/dbs
# (0 means none).  Retained backups are appended with their backup number
# relative to the current backup.  For example, .1 indicates the previous backup,
# .2 the next oldest etc.
# The -logs-retain parameter indicates whether or not to retain archived log
# files in /pro/arch/log.  If set to a value greater than zero the log files will
# be retained back to the corresponding retained level 0 backup.  For example,
# a -logs-retain value of 1 indicates to retain log files back to the time of the
# previous level 0 backup.  A -logs-retain value of 0 will clear all log files
# created prior to the start of this level 0 backup.
# If you do not wish this process to clear the backup files or log files then
# "all" can be specified as the -retain or -logs-retain value.
su informix -c "prospl -b informix_adm -backup -retain 0 -logs-retain 0"
if [ $? -ne 0 ]
then
        echo 'Errors were encountered during IDS hot backup - ABORTING'
        exit 1
```

The *su informix -c ... informix_adm -backup* line is where the Informix databases are backed up to disk to the */pro/arch/dbs* directory. The next section of the script performs a full database backup after ensuring that there are no Pronto Xi users currently logged on and blocking write access to the database.

5. Edit the script as required.
6. Save the changes and exit vi.

7. To test the backup process, run the script manually:

```
./pronight
```

The output of the script should be similar to the following.

```
Nightly Backup & Update Procedure
Thu Apr 30 15:19:52 EST 2009


Broadcast message from root (Thu Apr 30 15:19:52 2009):

^G^GPLEASE LOG OFF NOW ! ! !^G^G
System backups and update about to begin.

Broadcast message from root (Thu Apr 30 15:20:52 2009):

^G^GSYSTEM BEING backed up NOW ! ! !^G^G
No PRONTO tasks are currently active
Backing up IDS

Generating database table definitions files
```

```
File created: /pro/arch/dbs/pronto_0_L0

Please label this tape as number 1 in the arc tape sequence.
This tape contains the following logical logs:

 16

Program over.
Starting Level 0 backup
Now processing NIGHT sequence
```

```
All done
[root@pronto lib]#
```

8. Change to the backup directory indicated above to view the new backup files:

```
cd /pro/arch/dbs
ls
```

```
bms.def        mycomp.def                    pronto_0_L0    sysuser.def
cus.def        newbms.def                    sysadmin.def   sysutils.def
demodata.def   pronto_0_20090430_115502_L0   sysinfo.def    test.def
[root@pronto dbs]#
```

The directory contains .def (definition) files for each of the databases, and the backup files *pronto*L0*.

For a live system, these backup files can be very large.

By default, only a single day's backup is kept. The backup is written to the same location and with the same filenames each day. A comment in the script explains this. It is related to the *-retain 0* command.

To keep five days of backups, change the script to `-retain 5`

6.4 Restore the IBM Informix databases

If necessary, you can perform a full restore of the IBM Informix databases using the backup created in the */pro/arch/dbs* directory as described in Back up the Informix databases (p.70).

Partial restores are not currently supported, but are planned for future implementation.

Steps

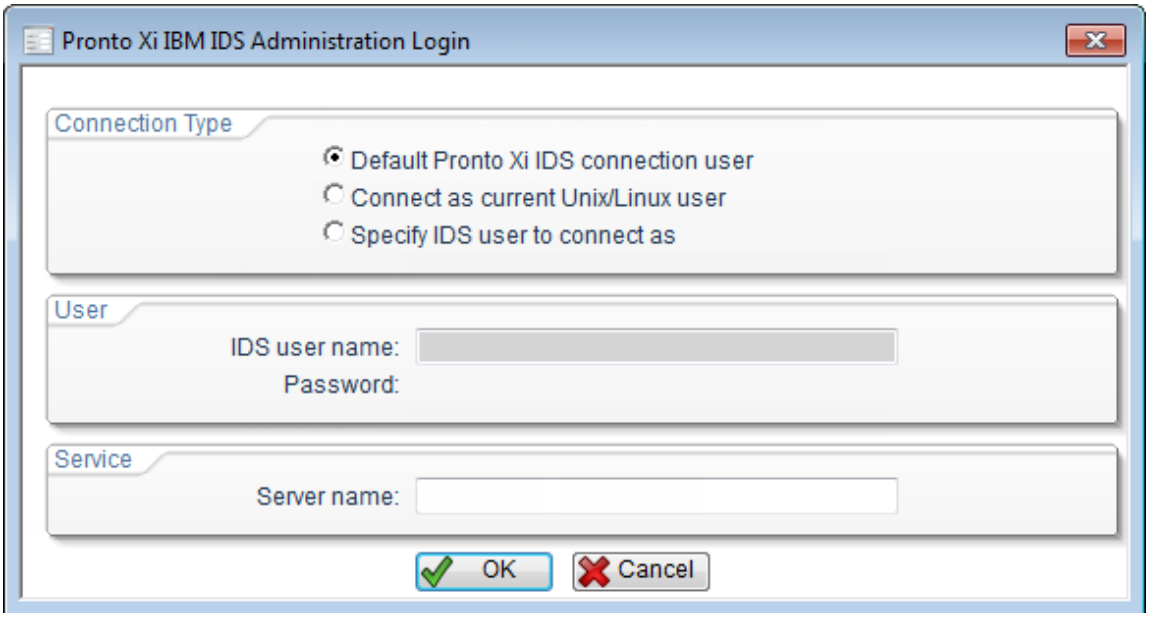
1. If the backup file is located on a tape, first copy the backup file from the tape to a suitable directory on the file system.
2. On the Pronto Xi server, log in as **psd** and then the Informix account.

```
login psd
Password: *******
su informix
Password: *******
```

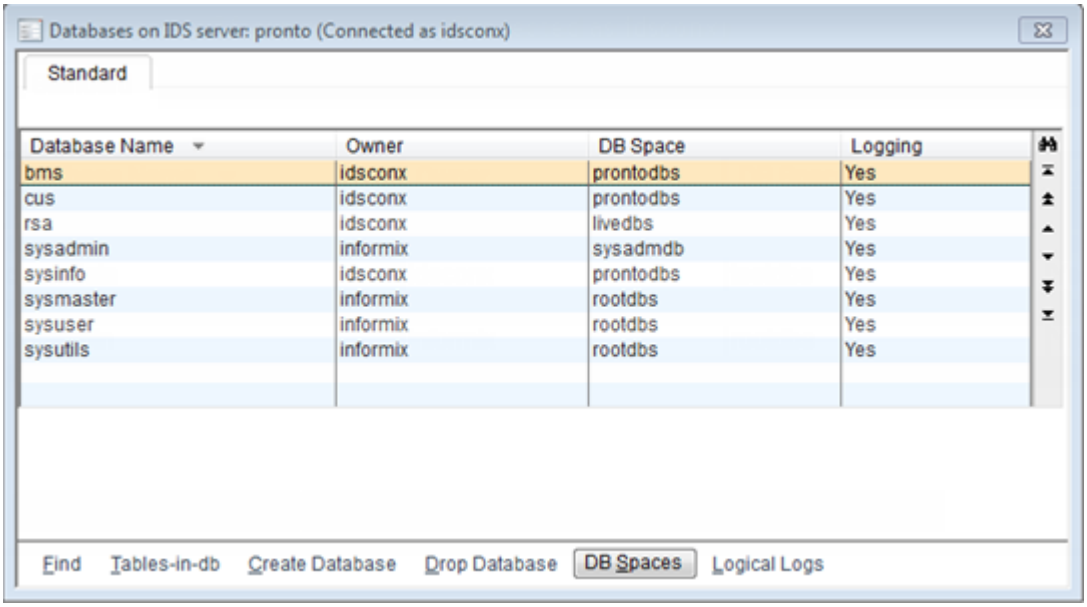
3. Open the IDS Administration menu.

```
prospl rdbms_adm
```

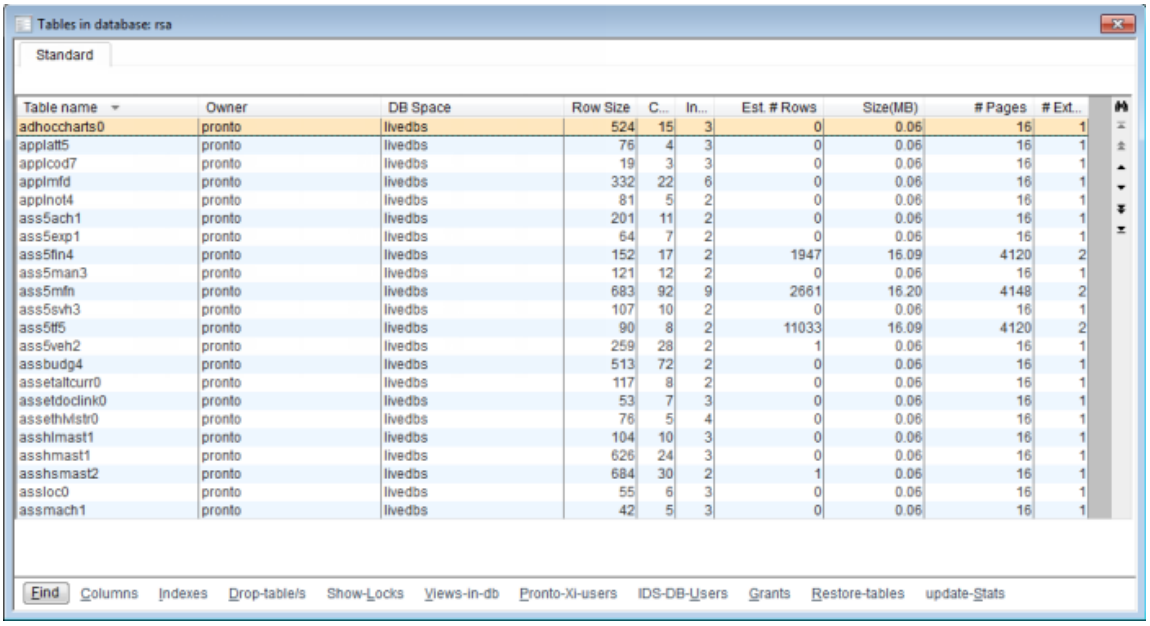
You are prompted to log in to the Informix Database Administration utility.



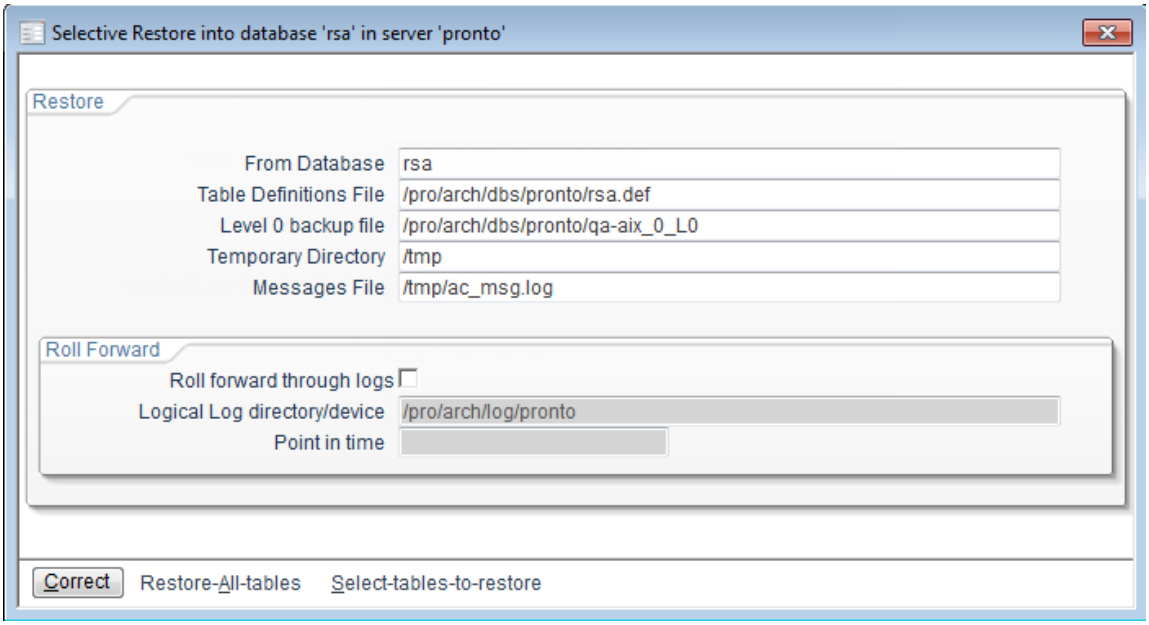
4. Click OK to connect to the Informix database.
The existing Informix databases are listed in a data grid.



5. Highlight the database to be restored and click **Tables-in-db**.
   The tables in the database are listed in a data grid.



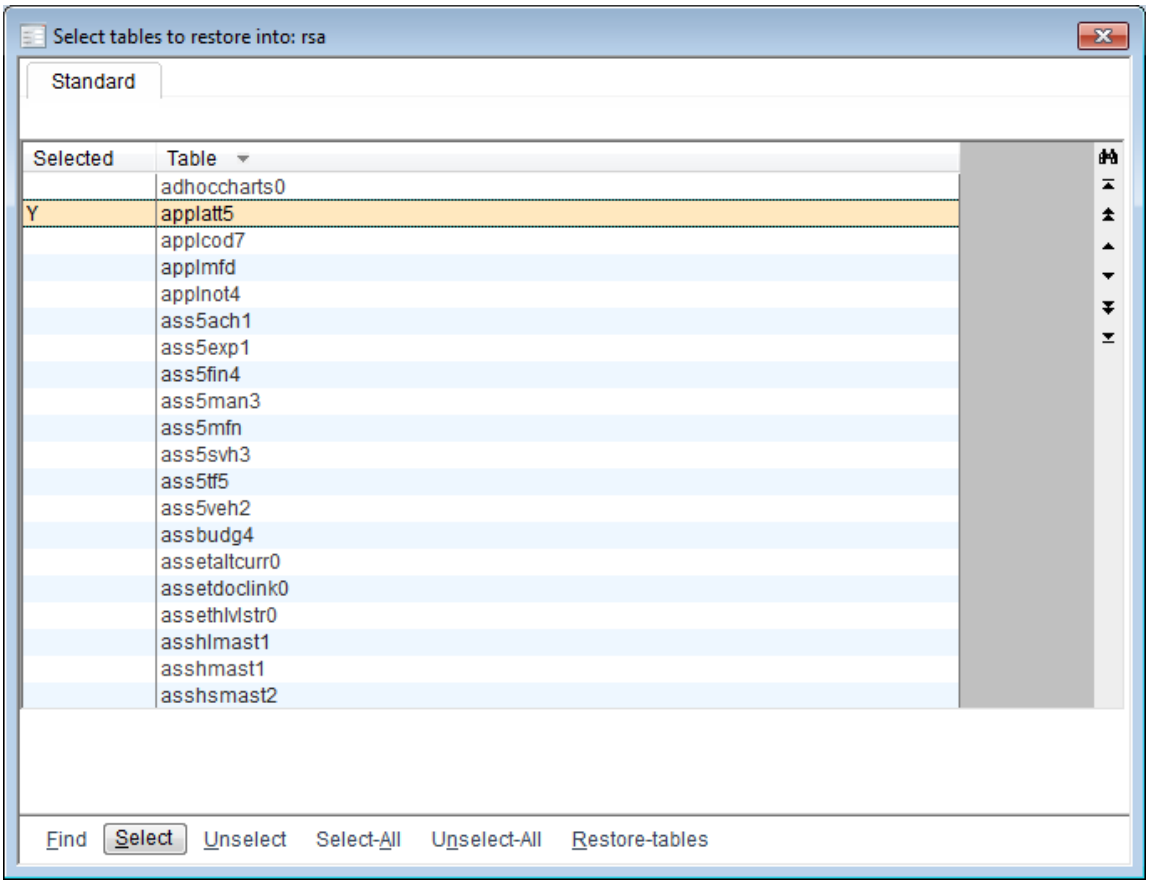
6. Click **Restore-tables**.
   You are prompted for the restore parameters. If you also want to restore the logical logs, select the **Roll forward through logs** check box. You can specify the point in time to roll forward to. No data after this point in time will be restored from the archived log files. You must specify the time value as a single parameter in `yyyy-mm-dd hh:mm:ss` format.



The **Level 0 backup file** field is the path to where the backup can be found.

- For a tape backup, you must restore the file to a directory on the machine, and then point this field to that machine directory.
- With the default setup of a single backup only, the backup file is always named **_L0*. If you have more than one file, you must point this to the correct file.
- If you accepted the default directories when creating the backup, you do not need to change the parameters on this screen.

7. If you want to select the tables to restore, click **Select-tables-to-restore**.

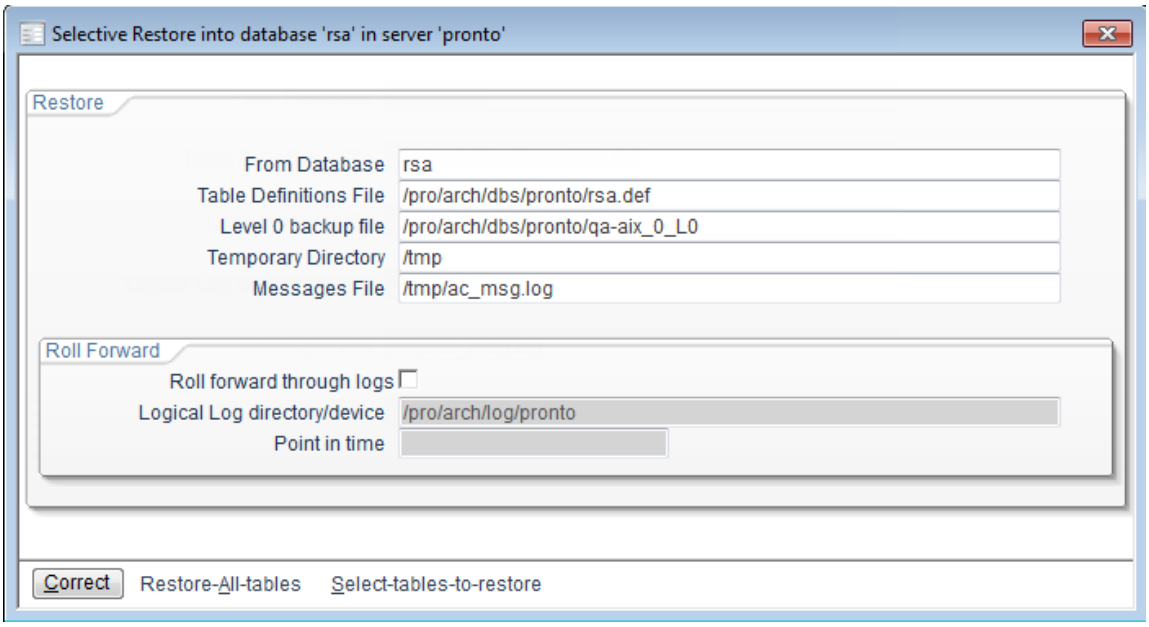


8. Select the required tables, and click **Select**.

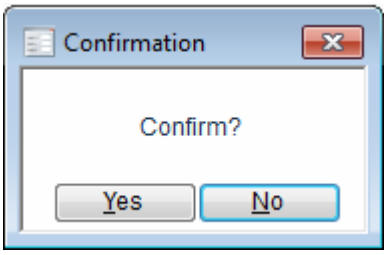
   If the table is selected, a **Y** is displayed in the **Selected** column as shown in the preceding image.

9. Click **Restore-tables**.
   The selected tables are restored.

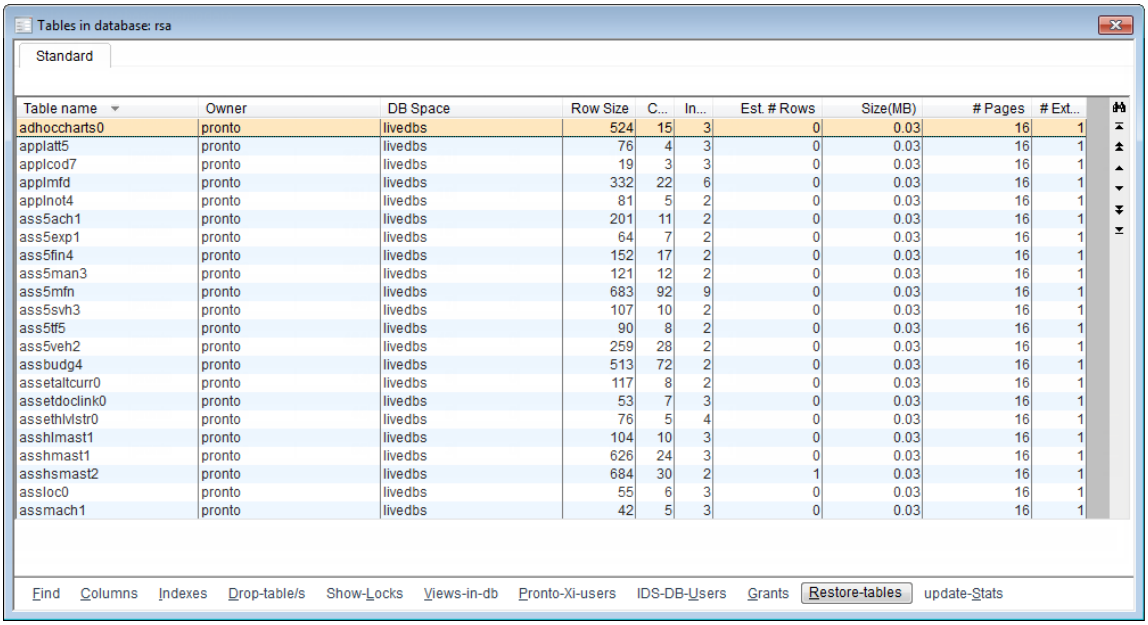
   If, for example, tables are corrupt, you can restore all tables.



10. Click **Yes** to confirm.



11. Press `Enter` to exit the restore script.
    The restored tables are listed.


Tables in database: rsa
Standard
Table name
Owner
DB Space
Row Size
C...
In...
Est. # Rows
Size(MB)
# Pages
# Ext...
adhoccharts0 pronto livedbs 524 15 3 0 0.03 16 1
applatt5 pronto livedbs 76 4 3 0 0.03 16 1
applcod7 pronto livedbs 19 3 3 0 0.03 16 1
applmfd pronto livedbs 332 22 6 0 0.03 16 1
applnot4 pronto livedbs 81 5 2 0 0.03 16 1
ass5ach1 pronto livedbs 201 11 2 0 0.03 16 1
ass5exp1 pronto livedbs 64 7 2 0 0.03 16 1
ass5fin4 pronto livedbs 152 17 2 0 0.03 16 1
ass5man3 pronto livedbs 121 12 2 0 0.03 16 1
ass5mfn pronto livedbs 683 92 9 0 0.03 16 1
ass5svh3 pronto livedbs 107 10 2 0 0.03 16 1
ass5tf5 pronto livedbs 90 8 2 0 0.03 16 1
ass5veh2 pronto livedbs 259 28 2 0 0.03 16 1
assbudg4 pronto livedbs 513 72 2 0 0.03 16 1
assetaltcurr0 pronto livedbs 117 8 2 0 0.03 16 1
assetdoclink0 pronto livedbs 53 7 3 0 0.03 16 1
assethlvlstr0 pronto livedbs 76 5 4 0 0.03 16 1
asshlmast1 pronto livedbs 104 10 3 0 0.03 16 1
asshmast1 pronto livedbs 626 24 3 0 0.03 16 1
asshsmast2 pronto livedbs 684 30 2 1 0.03 16 1
assloc0 pronto livedbs 55 6 3 0 0.03 16 1
assmach1 pronto livedbs 42 5 3 0 0.03 16 1
Find
Columns
Indexes
Drop-table/s
Show-Locks
Views-in-db
Pronto-Xi-users
IDS-DB-Users
Grants
Restore-tables
update-Stats

6.5 Create a new database

You can create a new database, for example for the live company.

You are automatically prompted to create an IBM Informix database when you create a new company in the **Maintain Company Details** function in Pronto Xi. This process is only necessary if you want to create a separate DB space for the new database, which provides more flexibility in space management, for example, to locate the company data on a different disk or file system. It also maintains total separation for the ease of adding or removing a company and its associated data files.

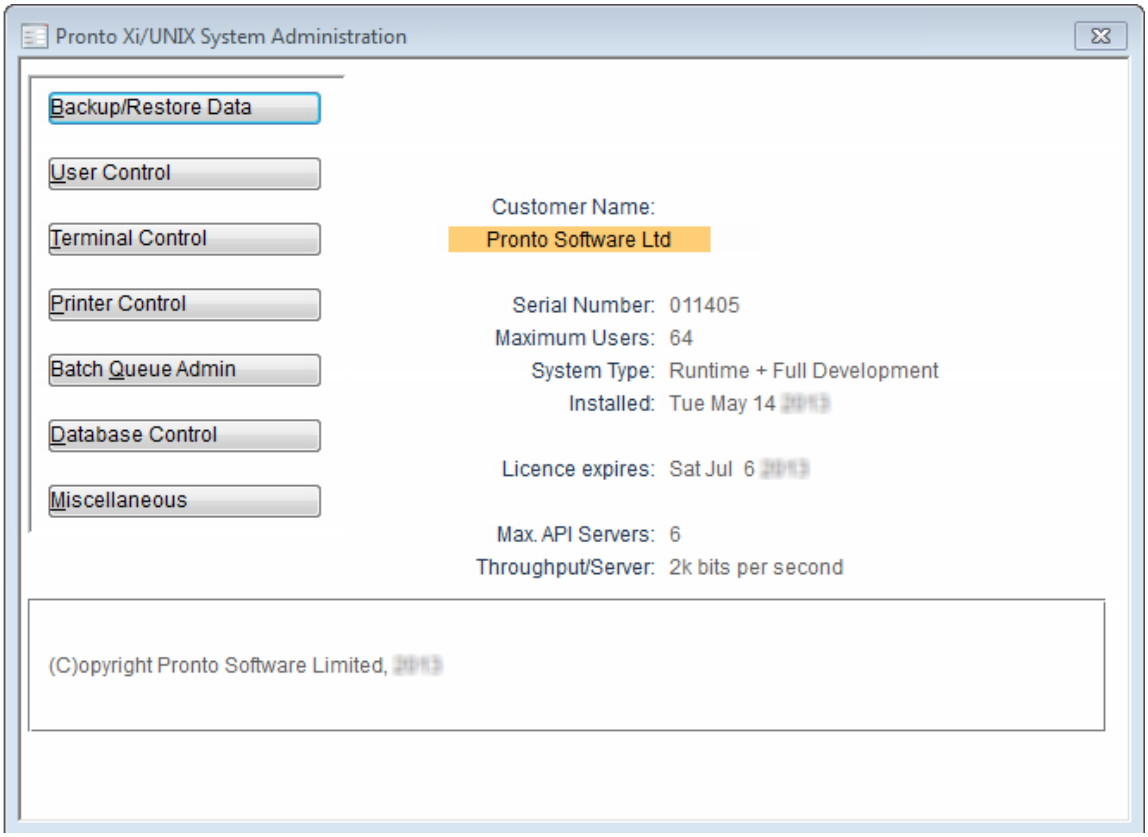
Steps

1. On the Pronto Xi server, log in as **psd** and then the **pronto** account.

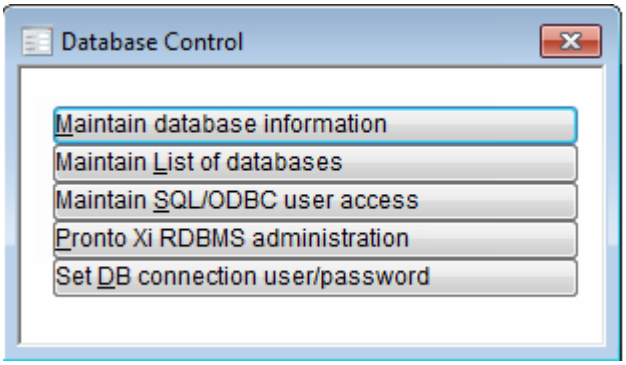
```
login psd
Password: *******
su pronto
Password: *******
```

2. Open the Pronto Xi System Administration utility.

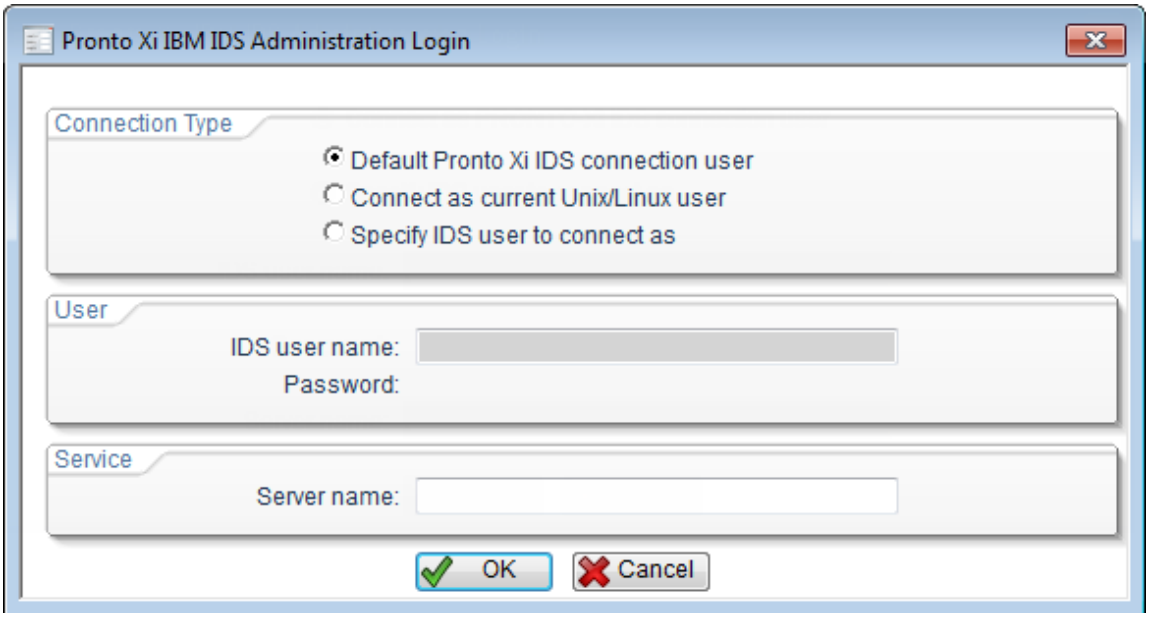
```
proadmin
```



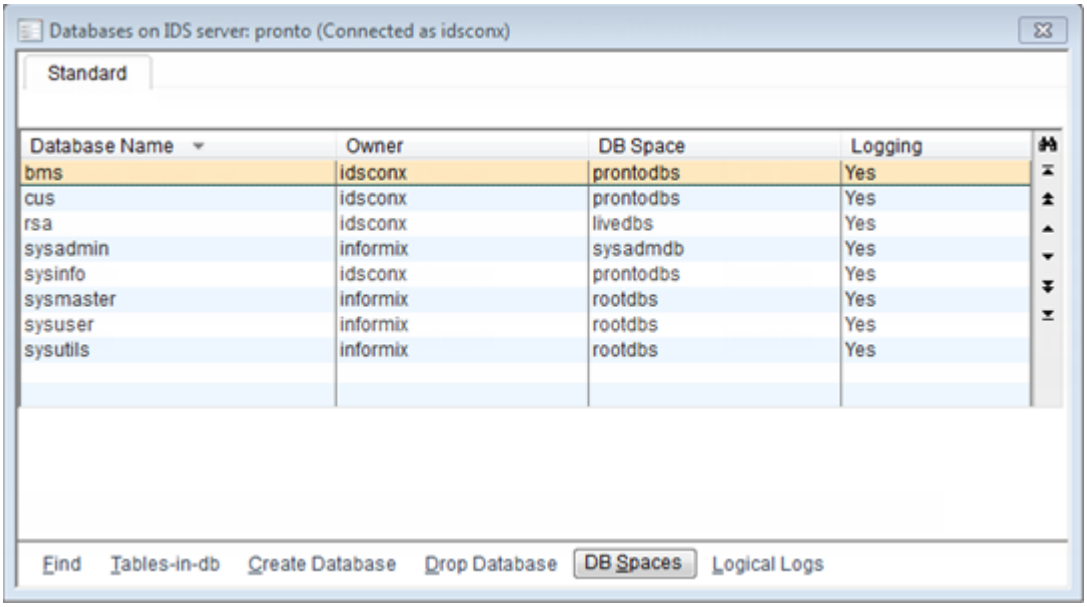
3. Click **Database Control**.
   The **Database Control** menu is displayed.



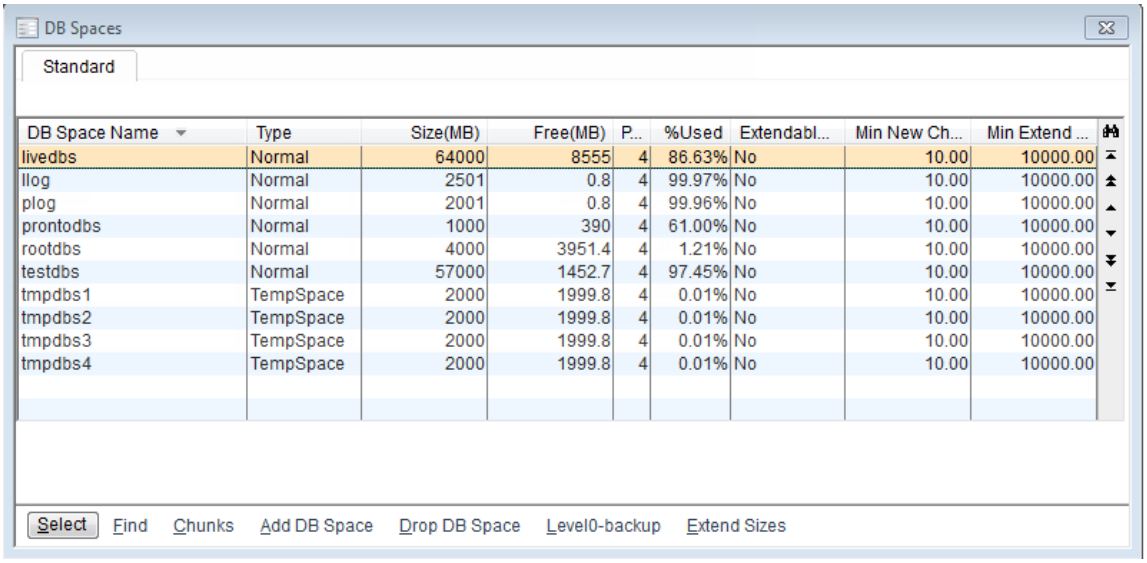
4. Click Pronto Xi RDBMS administration.



5. Click OK to connect to the IBM Informix database.
The existing Informix databases are listed in a data grid.



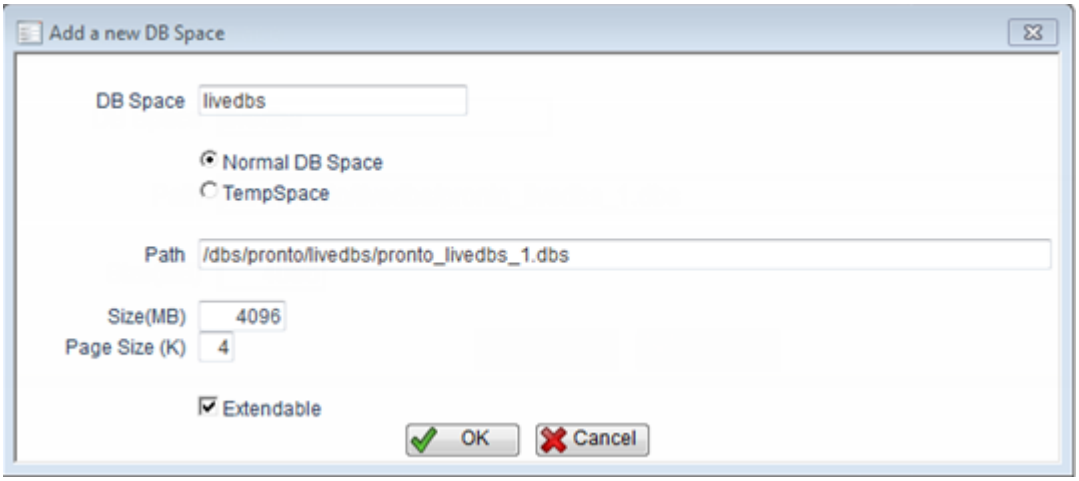
6. Click DB Spaces.
The existing DB spaces and their size information are displayed.



7. Click **Add DB Space**.

   This example will add a new 4GB DB space called **livedbs**.

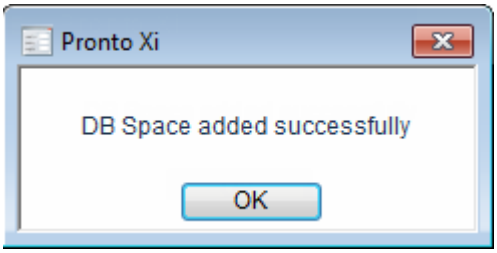
   The **Page Size** field is relevant for Linux only. If you have 2K page size in your DB space, enter **2**. If you have 4K page size in your DB space, enter **4**. In AIX this field will default to 4.



8. Enter the **DB Space** name, accept the default path, enter the size in MB and click **OK**.
   The available disk space is verified and the DB space is created. This can take several minutes.

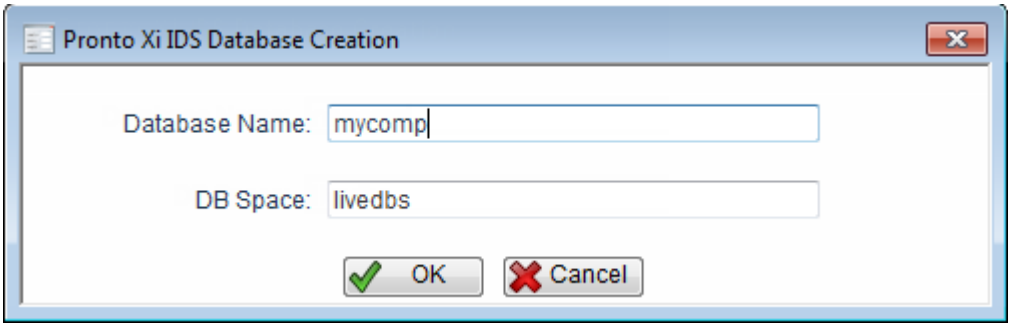
```
Verifying physical disk space, please wait ...
Space successfully added.

** WARNING **  A level 0 archive of Root DBSpace will need to be done.


PRESS <ENTER>
```

9. Press `Enter`.
   The DB space is created.



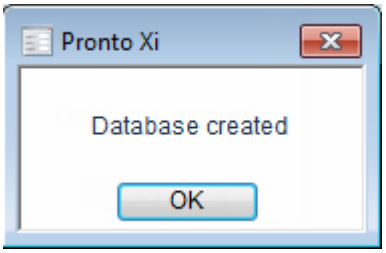
10. Click **OK**.
11. Click **Create Database**.

    This example creates a **mycomp** database based on the 4GB DB space that was previously created.



12. Enter the database name (based on the company being implemented), enter the DB space to be associated with the database.
13. Click **OK**.

    The database is created.



14. Click **OK**.
15. Create a new company in Pronto Xi and point it to the DB space that you created above.

7 Appendix

The following appendices are included:

7.1 Migration worksheet

Determine which companies must be migrated* and gather the following information for each company:

Code	Company description	Directories
		Installation: Company: (Size: MB) Reports:
		Installation: Company: (Size: MB) Reports:
		Installation: Company: (Size: MB) Reports:
		Installation: Company: (Size: MB) Reports:
		Installation: Company: (Size: MB) Reports:
		Total size of data to be migrated:

* Establish whether the test companies must be transferred, or whether a live to test on the new server is sufficient, as this can save considerable time in the migration process.

7.2 Sample data copy script

```
# Data Copy Script

 # Comment out the procopy -zt line if C-ISAM
 # Pass -b parameter if run from cron

 # Set SOURCE_DATA to Copy FROM
 # Set DESTINATION_DATA to Copy TO
 # Set DESTINATION_ENV = Destination Company Environment Script
 # Set TST_CMPY = Destination Company Code in User and Global Companies
 # Set TST_NAME = Destination Company Name in User and Global Companies

 # Ensure at least a basic path
 PATH=/bin:/usr/bin:$PATH; export PATH

 # Set up pronto environments
 PRONTO=/pro/pronto
 if  ! -r $PRONTO/lib/sh_environs  ; then
 # We don't get a message if we don't test for it since we
 # redirect stderr
 echo "$PRONTO/lib/sh_environs not found - aborting"
 exit 1
 fi
 . $PRONTO/lib/sh_environs </dev/null >/dev/null 2>&1

 SOURCE_DATA=/pro/data/mycompany
 DESTINATION_DATA=/pro/data/test
 DESTINATION_ENV=$PRONTO/lbin/tst.env
 TST_CMPY=TST
 TST_NAME="Mycompany TEST DATA"
 export SOURCE_DATA DESTINATION_DATA DESTINATION_ENV TST_CMPY TST_NAME

 clear

 if  ! -d $SOURCE_DATA -o "$SOURCE_DATA" = ""  ; then
 echo Problem with SOURCE_DATA. Not set or directory not found.
 echo SOURCE_DATA=$SOURCE_DATA
 echo Exiting Copy Script - Hit any key
 exit 1
 fi
 if  ! -d $DESTINATION_DATA -o "$DESTINATION_DATA" = ""  ; then
 echo Problem with DESTINATION_DATA. Not set or directory not found.
 echo DESTINATION_DATA=$DESTINATION_DATA
 echo Exiting Copy Script - Hit any key
 exit 1
 fi
 echo
```

```
echo '*********************************'
 echo '************ WARNING ************'
 echo '*********************************'
 echo '*** OVERWRITING EXISTING DATA ***'
 echo '*********************************'
 echo
 echo Copying $SOURCE_DATA to $DESTINATION_DATA \($TST_CMPY\) #$TST_NAME
 echo

 if  "$1" = "-b"  ; then
 ans=C
 else
 echo 'Press C to (C)ontinue. Any other key to QUIT :\c'
 read ans
 fi

 case `echo $ans` in
 c|C)
 rm -r $DESTINATION_DATA
 mkdir $DESTINATION_DATA
 chown psd:pronto $DESTINATION_DATA
 chmod 775 $DESTINATION_DATA
 cd $SOURCE_DATA
 find . ! \( -name "#P*" -o -name "*.x?l" \) -print | cpio -pvdum $DESTINATION_DATA
 ### Comment Out the procopy -zt line below if C-ISAM ###
 $PRONTO/bin/procopy -zt $SOURCE_DATA $DESTINATION_DATA
 cd $DESTINATION_DATA
 . $DESTINATION_ENV
 su psd -c "$PRONTO/bin/prospl -b 999 $BMS/sys/m8chgname -noask"
 ;;
 *)
 echo 'Quitting Copy - Hit ENTER'
 read Q
 #exit 1
 ;;
 esac
```

7.3 Run multiple BMS versions in the same Informix database

You can set up and install a second or subsequent BMS version for a company located in the same Informix database on the Pronto Xi server.

The following example is specifically for setting up a User Acceptance Testing (UAT) company for testing a newer application release than the current live system on the same Pronto Xi server.

You can also adapt this procedure for the more general scenario of installing multiple BMS versions in parallel by:

- creating databases for each BMS version, for example bms670.1, bms670.2, and so on.
- defining parallel home directories for each BMS version, for example:

```
PRONTO=/pro/pronto670.1/pronto
PRONTO=/pro/pronto670.2/pronto
...
```

- setting up the required BMS directories within these (as per the full procedure below):

```
mkdir bms670.1_dir
mkdir bms670.1_dir/bms
mkdir bms670.1_dir/cus
...
```

- creating a company environment script for each BMS version, for example BMS670.1.env, BMS670.2.env, and so on.

Multiple sysinfo considerations.

When upgrading to Pronto Xi 720 or later, it is not recommended that you share a sysinfo between different versions of Pronto Xi.

Recommended ways to install new test systems:

• If you run a VM environment, then clone a new system.

• If licensed, create a second instance of the database.

• If no other option, then consider using Multiple Sysinfo.

In the event of setting up a non-production environment, it is possible to share sysinfo between different Pronto Xi versions but note that there might be limitations. For example, the IBM Cognos report server link that exists in sysinfo can only point to one version of Pronto Xi.

7.3.1 Setting up a UAT company for a newer BMS version in the current database

The *$PRONTO/lib/sh_login* script is run at the initial runtime installation. This is only run once. It will then call *$PRONTO/lib/sh_environs*.

The *$PRONTO/lib/sh_environs* script defines the following environments:

- BMS
- CUS
- PRODICT
- PROUSRDICT
- PRODISTDICT
- PROPATH
- PATH

The *$PRONTO/lib/sh_environs* script has the PROCMPINC, SYSPOST, (if UAT company is used) BMSUAT and CUSUAT environments.

The company scripts, created at installation time will now call *$PRONTO/lib/sh_environs*. That is, each time a company is selected this *sh_environs* is executed.

When running in a UAT company the following environments will be set:

- BMS - points to the live BMS area
- CUS - points to the live CUS area
- BMSUAT - points to the UAT BMS area
- CUSUAT - points to the UAT CUS area

When installing programs to be tested in the UAT area, you should use the BMSUAT or CUSUAT environments to install the programs into. Once tested and validated by the customer, the programs should be moved from BMSUAT/CUSUAT to the BMS or CUS area.

- Create a database for the UAT company (p.88)
- Install the applications for the UAT company (p.89)
- Create a directory structure to store the BMS version of the UAT company (p.95)

Create a database for the UAT company

Steps

1. On the Pronto Xi server, log in as **psd**.
2. Open the Database Administration utility.

```
prospl rdbms_adm
```

3. Select Create Database and enter the following details:

```
Database Name = uatbms
DBspace = prontodbs
```

4. Select DB Spaces and check the size and usage of the **prontodbs** DB space.
5. If necessary, highlight the **prontodbs** record and select Create Chunk to increase the size of the DB space.
6. Close the Database Administration utility.

Install the applications for the UAT company

Steps

1. On the Pronto Xi server, log in as **psd**.
2. Change to root user.

```
su root
```

3. Insert the Pronto Xi installation DVD and navigate to the *unix* directory.

```
mount /dev/cdrom /mnt
cd /mnt/unix
```

4. Run the install script.

```
./install
```

```
PRONTO CD-ROM based installation/update for Unix/Linux Systems
==============================================================

Enter the directory where the PRONTO-Xi CD-ROM is mounted.

Directory (default /mnt):
```

5. Press `Enter` if the default mount directory is correct, or enter the actual mount directory.
   You are asked for the directory to install Pronto Xi into.

```
Enter the parent directory where PRONTO-Xi is to be loaded.
e.g. if the PRONTO-Xi directory is /pro/pronto then the parent is /pro.

Parent directory (default /pro/prontouat):
```

6. Press `Enter` to accept the default directory, which is taken from the current setting of the PRONTO environment variable.
   You are asked to identify the operating system and machine type.

```
Select Your Operating System and Machine type.

1) IBM pSeries (AIX)
2) Linux (Intel x86)
3) Sun Sparc (Solaris)
4) SCO OpenServer6 / Unixware
99) Other
q) Quit

System (default 2):
```

7. Press `Enter` if the operating system has been correctly detected, otherwise enter **2**.
   You are asked to select the database type for the implementation.

```
Select the database that will be used by PRONTO-Xi in this implementation.

1) Oracle
2) IBM Informix Dynamic Server (IDS)
q) Quit

Database (default 2)?
```

8. Press `Enter` to accept the default database, Informix.
   You are asked to select the runtime version to install.

```
The following PRONTO-Xi runtime Linux (Intel x86) IDS versions are defined:

1) PRONTO-4GL [illegible] Linux [illegible] (Red Hat Intel x86), IDS [illegible] 64bit
q) Quit

Enter the required PRONTO-Xi runtime version (default 1):
```

9. Press `Enter` to accept the default runtime version.
   The installation settings are summarised.

```
PRONTO-Xi Installation/Update Details
=====================================

PRONTO-Xi directory: /pro/prontouat/pronto
PRONTO-Xi runtime  : PRONTO-4GL [illegible], Linux [illegible] (Red Hat Intel x86), IDS [illegible],
64bit


Confirm [y/n]?
```

10. Check that the installation details are correct, then enter **y** to continue.
    The Pronto Xi foundation files and tools are extracted and then the runtime installation and setup program is launched automatically. This program detects that an earlier runtime version is already installed and offers to run an upgrade procedure.

```
Running the standard PRONTO-Xi runtime installation/setup program...


PRONTO-Xi directory : /pro/prontouat/pronto

PRONTO-Xi Upgrade Procedure.
----------------------------

This upgrade procedure performs the following:

        - Sets up any new PRONTO-Xi control files
        - Sets ownership/modes of PRONTO-Xi files
        - Compiles old style terminal definitions

You should run this with super-user permissions if these are available.


Do you wish to continue the upgrade procedure [y/n] ?
```

11. Enter **y** to perform the runtime upgrade.
    After the upgrade is complete, you are prompted whether you want to launch the software (BMS) installation now.

```
Compiling old style terminal definitions...
Changing ownerships...

Upgrade complete.

Invoke PRONTO-Xi application software installation [y/n]?
```

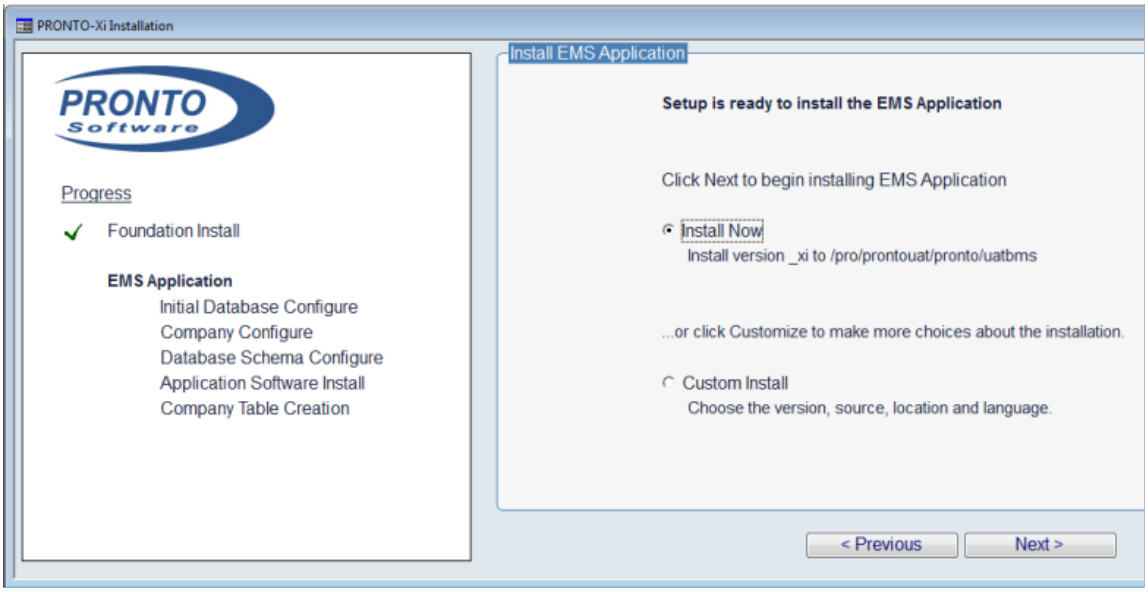
12. Enter **n** to not run the installation program now as you must be logged in as **psd** for the BMS install.

```
To install the PRONTO-Xi application software, you must:
1) Install and launch the PRONTO-Xi Thin Client on a Windows PC
2) Log in as the user 'psd' and run the following command:
   prospl /mnt/proinst /mnt
```

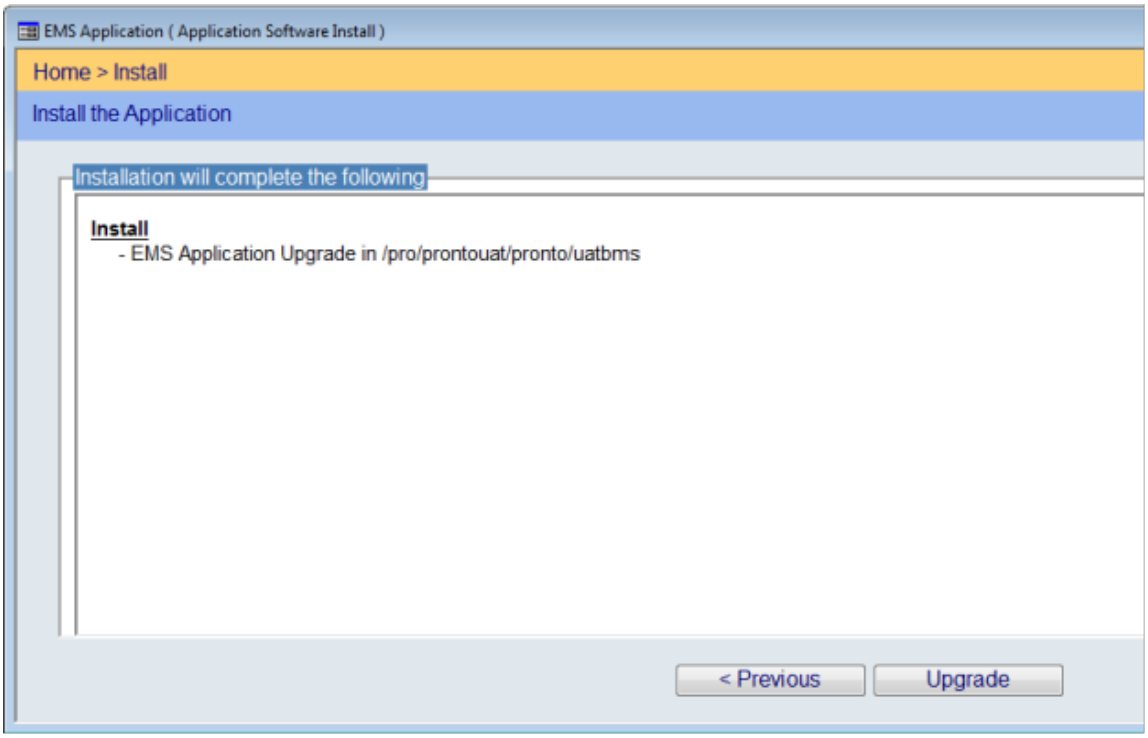
13. Enter the following commands to launch the application software installation.

```
exit            #returns to psd user
echo $BMS       #check this is pointing to UAT bms:
                #  /pro/prontouat/pronto/uatbms
prospl /mnt/proinst /mnt
```

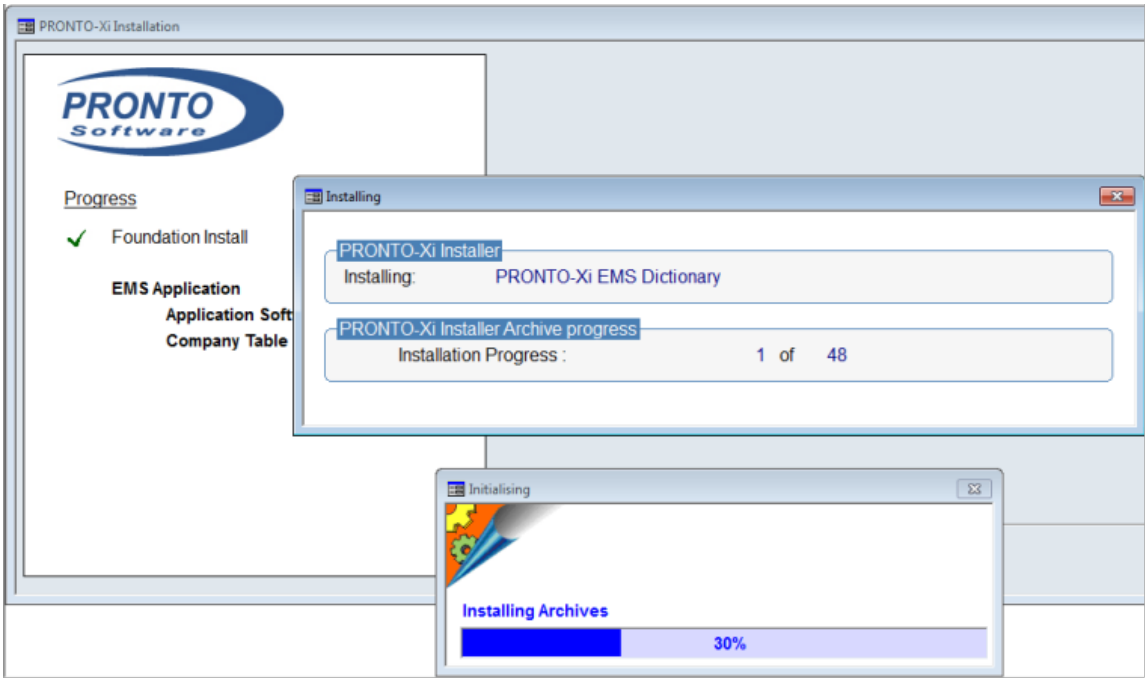
The installer detects that the foundation is already installed and prompts to continue with the application install.



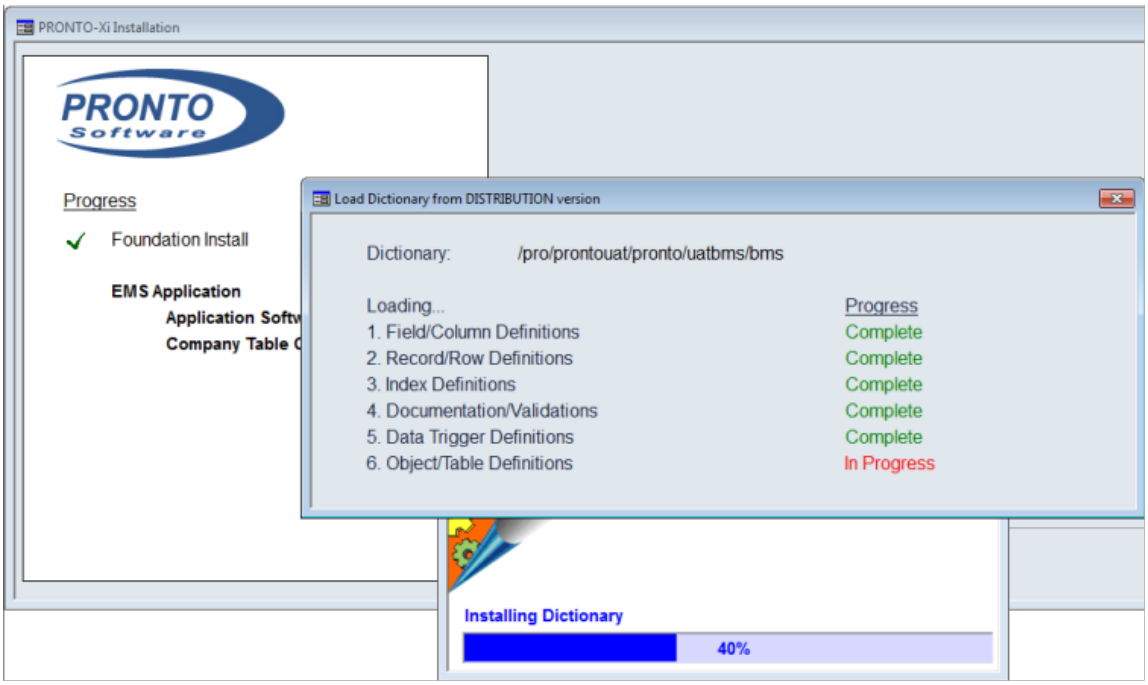
14. Click **Next**.
You are asked to confirm the directory in which to install the application software.



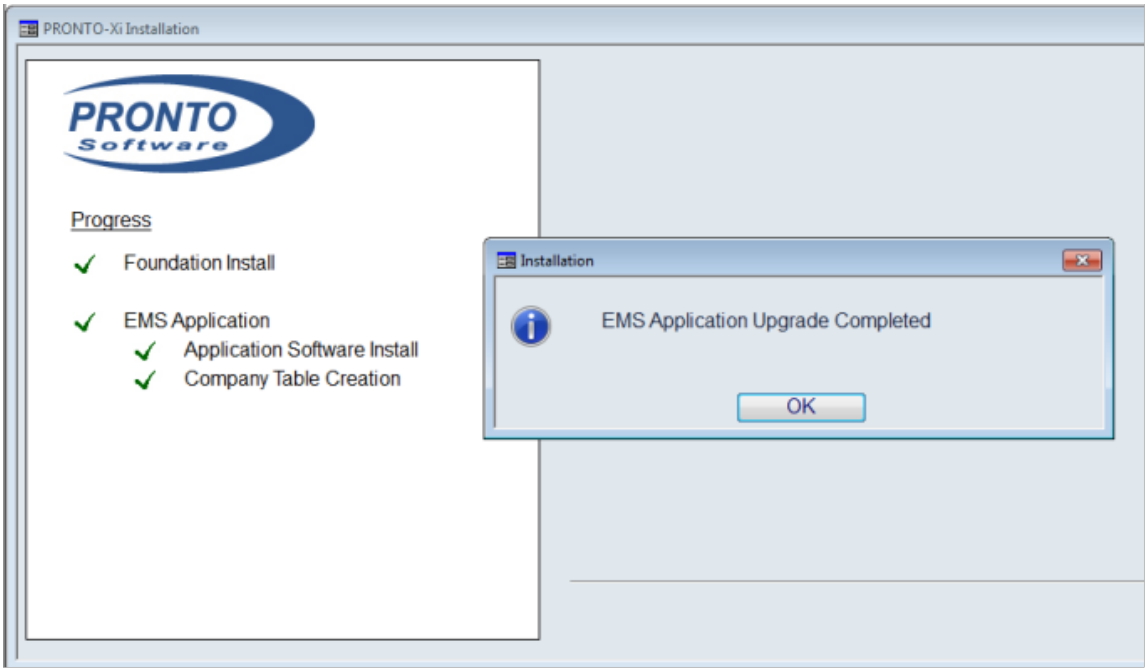
15. Select **Upgrade** to continue.
The files are installed.



The dictionary is installed.



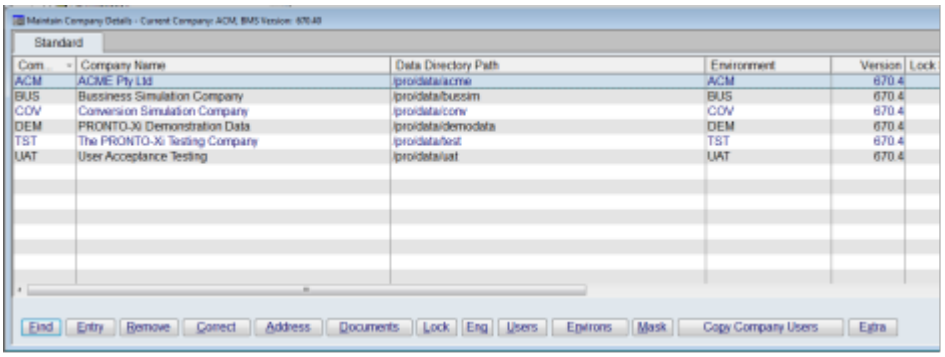
A completion message is displayed.



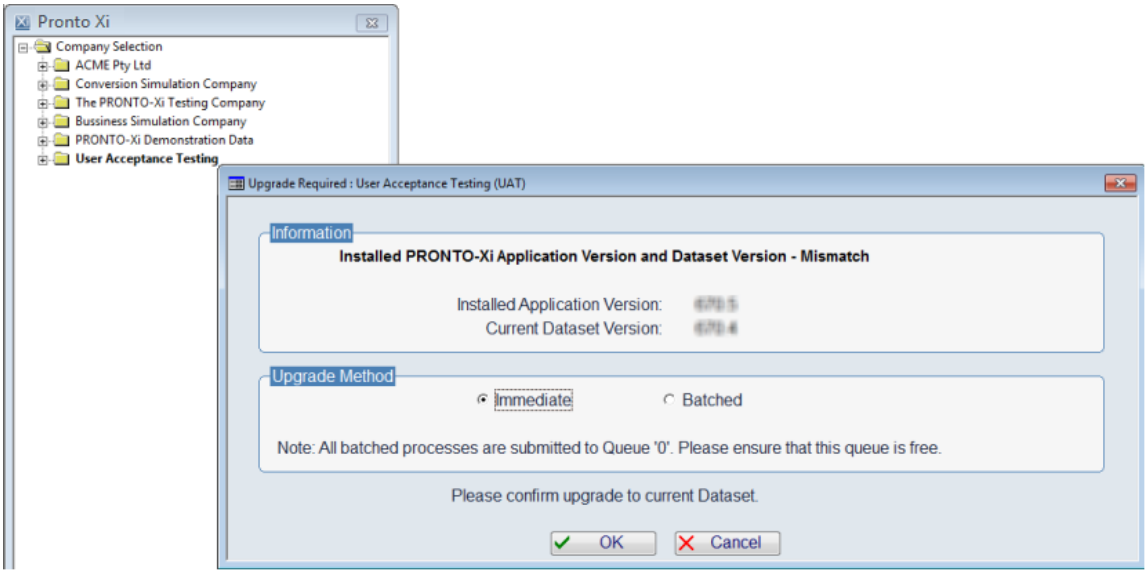
16. Click **OK**.
17. Run the Pronto Xi Client:

```
prospl bmsmenu
```

18. In any of the existing companies, select **Administration > System Administration > User and Company Maintenance > Maintain Company Details**.



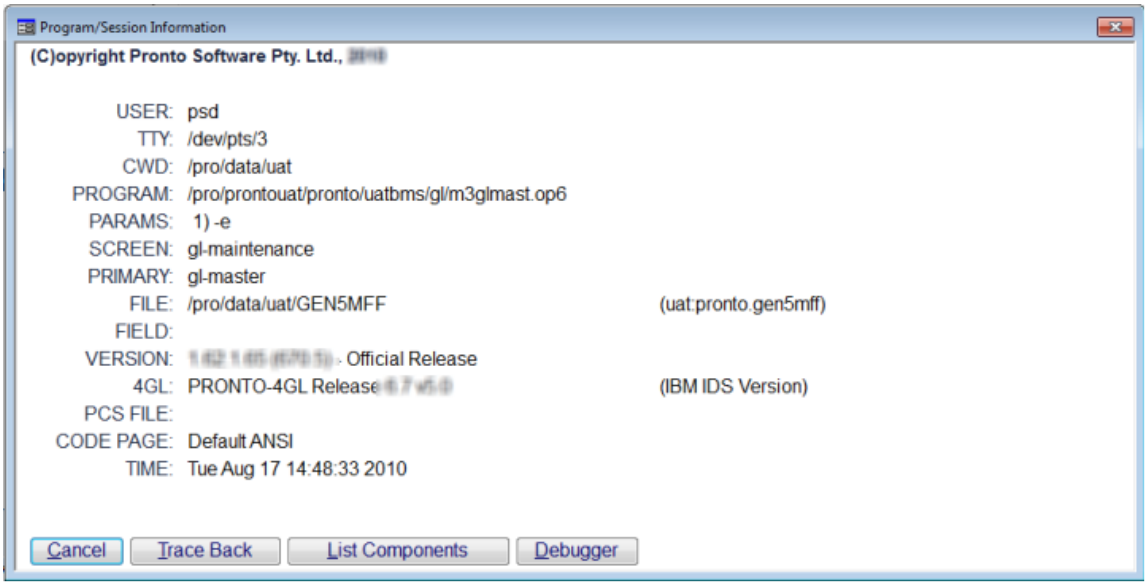
19. Select the UAT record.
20. Click **Correct**.
21. In the **Environment** field, enter **UAT2** to reference the *UAT2.env* script you created earlier.
22. Exit the screen and select the UAT company.
    The runtime detects that a newer BMS version has been installed for that company:



23. Click **OK**.
24. When the upgrade is complete, select a menu function in the UAT company.

> General Ledger > Enquire on G/Ledger Account.

25. Press `F9` to view the **Program/Session Information** screen and check the **PROGRAM** and **4GL** fields to ensure that the correct BMS version of the program is being run from the */pro/prontouat/pronto/uatbms* area.



Create a directory structure to store the BMS version of the UAT company

Steps

1. On the Pronto Xi server, log in as **psd**.
2. Enter the series of commands below to create the required directory structure:

```
su root
#Create path for UAT $PRONTO: /pro/prontouat/pronto
cd /pro
mkdir prontouat
chown -R psd:pronto prontouat
exit              #return to psd user
cd prontouat
mkdir pronto
cd pronto
pwd               #make sure currently in /pro/prontouat/pronto
#
#Link to shared directories in LIVE
#
ln -s /pro/pronto/batch batch
ln -s /pro/pronto/diary diary
ln -s /pro/pronto/edi edi
ln -s /pro/pronto/lbin lbin
ln -s /pro/pronto/lib lib
ln -s /pro/pronto/sysinfo sysinfo
#
#Create non-shared directories
#
mkdir bin
mkdir relnotes
mkdir skeleton
mkdir terminfo
mkdir xmllib
#
#Create directories for UAT bms
#
mkdir uatbms_dir
mkdir uatbms_dir/bms
mkdir uatbms_dir/cus
mkdir uatbms_dir/cus/xxxxx      #xxxxx = company name
ln -s uatbms_dir/bms uatbms
```

3. Create a script file *UAT2.env* to set the environment variables for the UAT company

```
cd /pro/prontouat/pronto/lbin
vi UAT2.env
```

4. Paste the following content into the file

```
# Pronto Company Environments
# Script Name: UAT2.env
# If you add an environment it must be set in ALL company scripts!
# run the sub script holding the main defaults!
. $PRONTO/lib/prontodefaults.env
PRONTO=/pro/prontouat/pronto;export PRONTO
DATADIR=`pwd`;export DATADIR

PROEDI=$DATADIR/edi;export PROEDI
BMS=$PRONTO/uatbms;export BMS
CUS=$PRONTO/uatbms_dir/cus;export CUS
PRODICT=$BMS/bms;export PRODICT
PROUSRDICT=$CUS/uatcus;export PROUSRDICT
PRODISTDICT=$CUS/uatdist;export PRODISTDICT
PROPATH=$CUS:$BMS:$PRONTO/bin:$PRONTO/lbin:.;export PROPATH
PATH=/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin:/pro/informix/bin:$PRONTO/b
in:$PRONTO/lbin;export PATH

#PATH must not be set as: PATH=$PATH:$PRONTO/bin:$PRONTO/lbin;export PATH
```

5. Set execute permission and execute the script now.

```
chmod +x UAT2.env
. ./UAT2.env
```

6. Check that no environment variables point to live (/pro/pronto).

```
env | grep PRO    # should be no references to live
                  # environment: /pro/pronto
```

7.4 Run multiple Informix instances

You can install multiple instances of Informix on a server.

Before you can do this, you must check that you have sufficient disk space and make sure that the instance name, SERVERNUM value and port number are all unique. If they are not, both the existing instance and the new instance will fail.

Steps

1. Run *mkdbs.sh* from the Pronto Xi IBM Informix installation DVD in the dbs folder.

```
Usage: ./mkdbs.sh <instance-name>
First standard instance name = pronto.
```

2. When prompted for port number, check */etc/services*.

7.5 Copying instance-wide databases using ifxclone

You can copy instance-wide databases using ifxclone for IBM Informix 11.7 and above.

The results of testing on ifxclone in IBM Informix 12.10 and 11.7 FC4 show that cloning an Informix instance can produce faster results than creating a level 0 backup and restoring the target server.

The following steps were tested with almost 25GB * 2 = 50GB of total database size (Test + Live). The full process took an average of 60 minutes to complete. This is a better result than backing up L0 and performing the restoration, which can take more than three hours and might require additional storage on both servers that deal specifically with disk level L0 backups (there is also no need for magnetic tape backups).

This is a straightforward process that uses IBM Informix-provided facilities to accomplish the whole task.

7.5.1 Prerequisites

You can easily clone Informix databases in two IBM Informix instances, however this is only feasible under the following conditions:

1. You cannot use this command to populate the existing database structure of the same instance (that is, either in a different dbspaces or the same dbspace).
2. You cannot clone a single selected database, as this method only supports instance-wide database replication.
3. You must use the same IBM Informix version, platform and file structure in both source and the target server.
4. You must pre-create the required chunks in precisely the same source server chunks structure and have enough file system space to populate data during the cloning process of the target server.
5. You must set up both source and target IBM Informix servers so they are trusted (p.99) by each other.
6. The following configuration parameter values must be identical on both the source and target servers (and you will be unable to change them during the cloning process):

    - DRAUTO
    - DRINTERVAL
    - DRTIMEOUT
    - LOGBUFF
    - LOGFILES
    - LOGSIZE
    - LTAPEBLK
    - LTAPESIZE
    - ROOTNAME
    - ROOTSIZE
    - PHYSBUFF

- PHYSFILE
- STACKSIZE
- TAPEBLK
- TAPESIZE

7.5.2 ifxclone parameters

$ ifxclone

-S	source=<name> # Name of the source node
-I	sourceIP=<IP> # IP address of source node
-P	sourcePort=<port> # Port number of source server
-t	target=<name> # Name of target server
-i	targetIP=<IP> # IP address of target server
-p	targetPort=<port> # Port number of target server
-d	disposition=[RSS|ER] # Clone disposition (default:standard)
-s	size=[tiny|small|medium|large] # Configuration size
-c	configParm="PARAMETER=VALUE" # Configuration override
-L	useLocal # Use the local config and sqlhost
-T	trusted # No userid/password required.

You can omit the –L parameter in the above command if you want to use remote server *onconfig* and *sqlhost* files to apply as it is in the target server. If you do not specify this option, you can run the ifxclone utility without first creating the instance on the target server. If the target server instance does not exist, you are prompted to enter the IBM Informix password to create the instance. But during the Pronto Xi IBM Informix installation process it would still create a server instance and correctly set up other Pronto Xi IBM Informix.

We recommend that you use the –L option and change any other onconfig related changes after the cloning process is complete.

The preferred method for looking into the online log is by running onstat –m –r 20 by a separate target server database sessions.

7.5.3 Set up trust between the servers

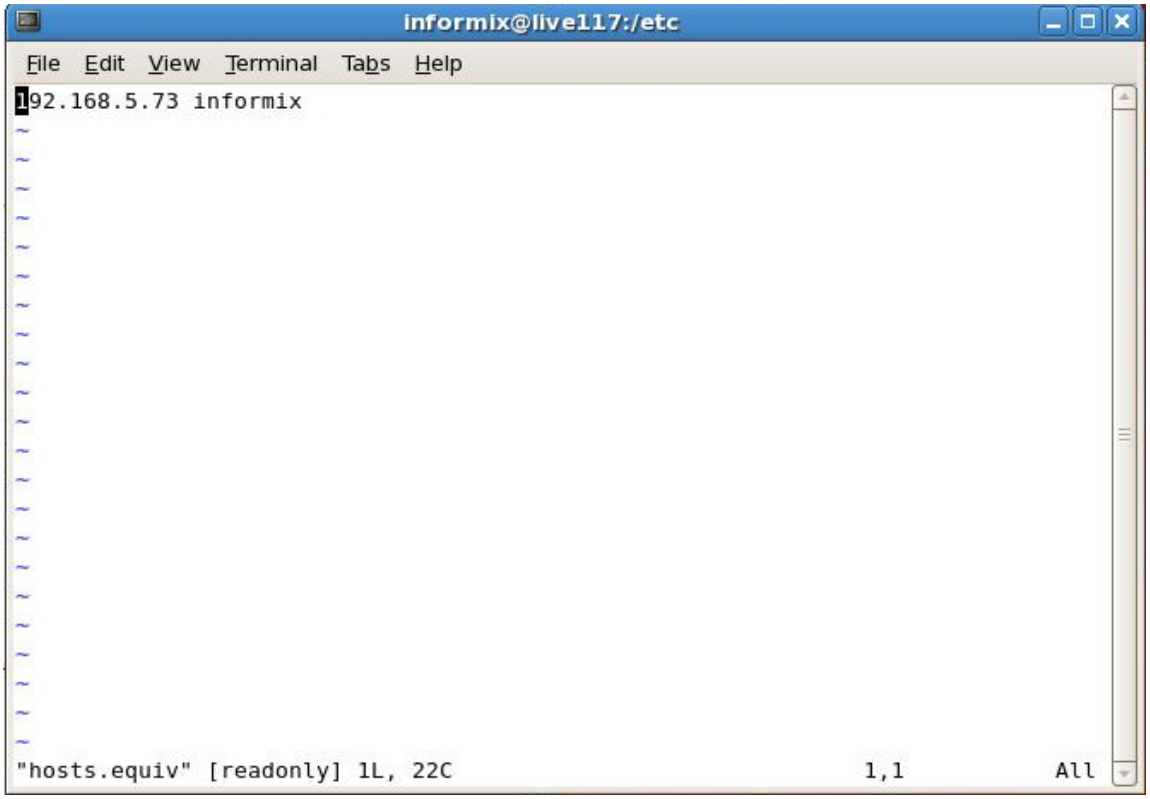
Now you can set both servers so they trust each other.

You must repeat the following steps for both the source and target servers.

Steps

1. Edit the */etc/hosts.equiv* file with the IP address of the other server and IBM Informix as the user:

```
192.168.5.73 informix
```



2. You can change the temporary name of the target INFORMIXSERVER server (in this case **pronto1**) back to the preferred INFORMIXSERVER name (e.g. **pronto**) of the target server in the following three files in the *$INFORMIXDIR/etc/* directory.

   - onconfig.pronto

```
SERVERNUM          0
DBSERVERNAME       pronto
DBSERVERALIASES    pronto_net
```

   - sqlhosts

```
pronto  onsoctcp        localhost       9088
pronto_net      onsoctcp        192.168.5.64    9088
```

   - profile.pronto

```
export INFORMIXSERVER=pronto
```

3. Shut down the database server of the target server using **onmode -ky** command to initialise everything.
4. Start the database server of the target server using **oninit** command or restart the database server.
5. Before you start the cloning process, install the Pronto Xi runtime using the same version as in the source server, and configure the required companies, similar to the source server. Otherwise, after the database cloning processes, you might not be able to access or repair them.

7.5.4 Clone the database

Now you will prepare and clone the database.

For sample images of the cloning process, see Cloning process images (p.102).

Before starting the process, you can safely remove any testing companies if you do not want to populate them in the target server. This will reduce the overall time for the process.

Steps

1. Install the same Informix version as the source server on the target server using the media provided.
2. Temporarily change the INFORMIXSERVER name to any short name of the target server (for example **pronto1**) in the following files:
   - *onconfig.pronto* - DBSERVERNAME**pronto1**
   - *sqlhosts*
   - *profile.pronto* - edit INFORMIXSERVER=**pronto1** (If pronto1)
3. Restart the database server using the **oninit –ivy** command to initialise everything.
4. Shut down the databases in this target server using the **onmode –ky** command.

```
#####################################

SERVERNUM           0
DBSERVERNAME        pronto1
DBSERVERALIASES     pronto1_net

#####################################
```

5. Enable FULL_DISK_INIT of the target server by setting it to **1** (from **0**) in *onconfig.pronto*.

```
FULL_DISK_INIT  1
```

6. Set the ENABLE_SNAPSHOT_COPY configuration parameter in the source server to **1** in the *onconfig file*.

```
ENABLE_SNAPSHOT_COPY 1
```

7. Configure the network-based (onsoctcp) connectivity between the two servers.

```
pronto1 onsoctcp        192.168.5.64    9089
pronto1_net     onsoctcp        192.168.5.64    9089
pronto  onsoctcp        192.168.5.73    9088
```

8. Create chunk files with similar names with correct ownership (Informix) and permission (660) to the source server at the correct locations (don't worry about the chunk sizes).

   Use **onstat –d** to display all of the chunks and create them as it is to the source server. You can use touch {file name}, chown Informix user on it and chmod 660 to these chunks if using command line arguments.

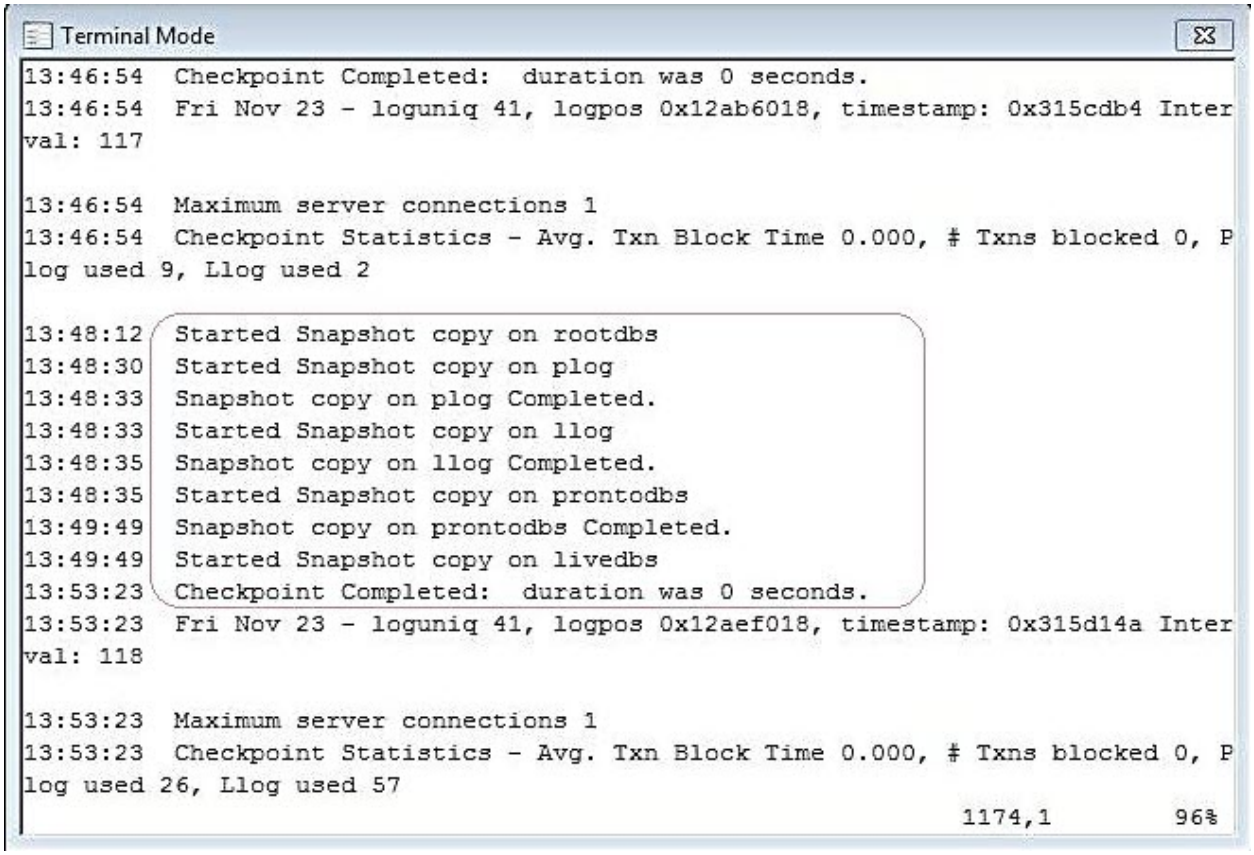
9. Log in to the target server as user **Informix**.
10. Shut down the database server if it is already running, using **onmode –ky**.
11. If you are using separate ports, add an entry in */etc/services* on the target server.
12. Enter the following command to start the cloning process and check for any other errors either on screen or in online.log.

```
ifxclone -T -L -S pronto -I 192.168.5.73 -P 9088 -t pronto1 -i 192.168.5.64 -p
9089
```

7.5.5 Cloning process images

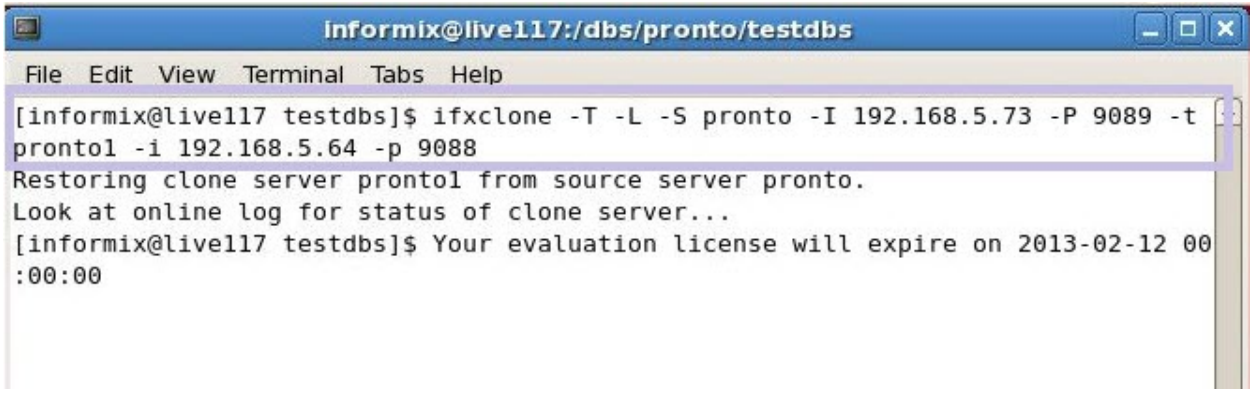
The following images were captured during a cloning process.

The following image shows some of the online log records in the source server online log.

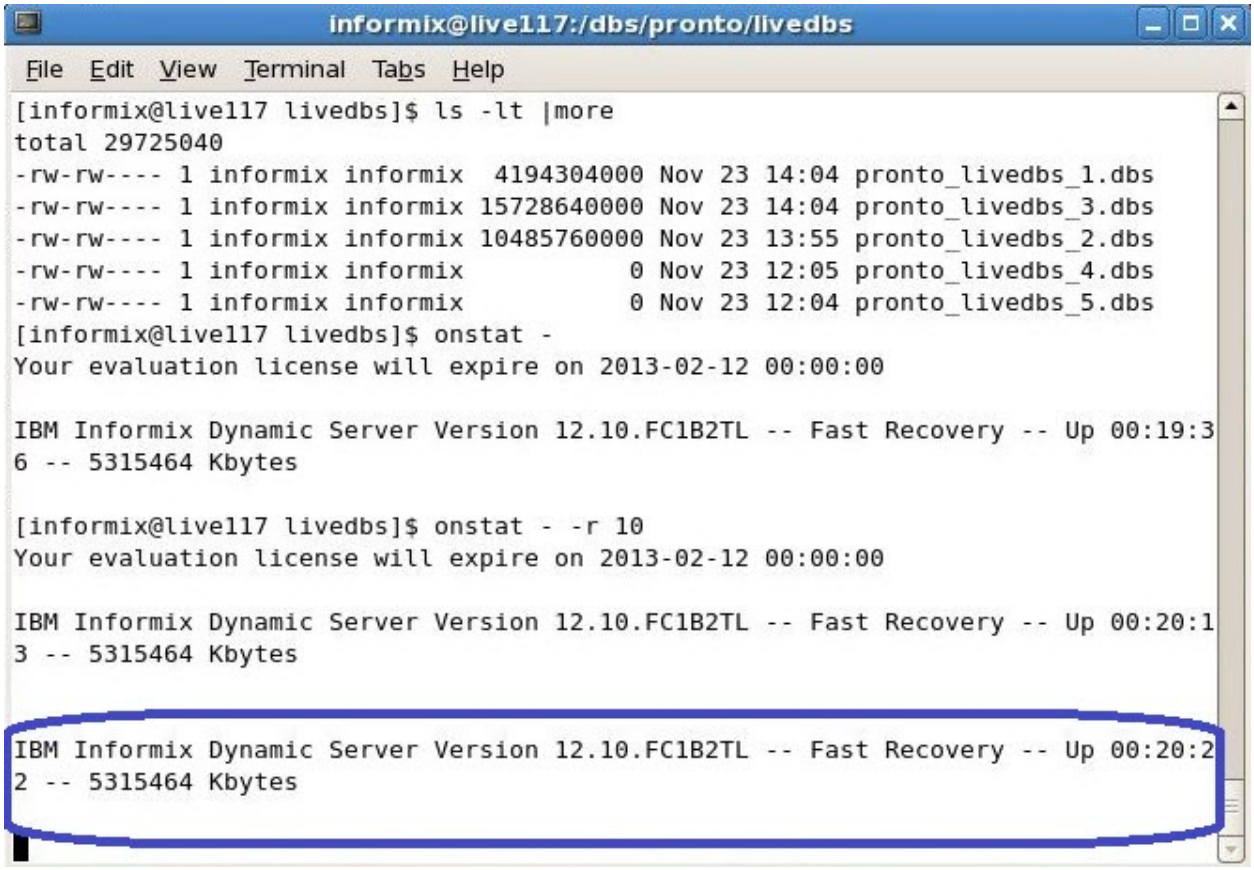


The following shows the command line parameters to the ifxclone utility.

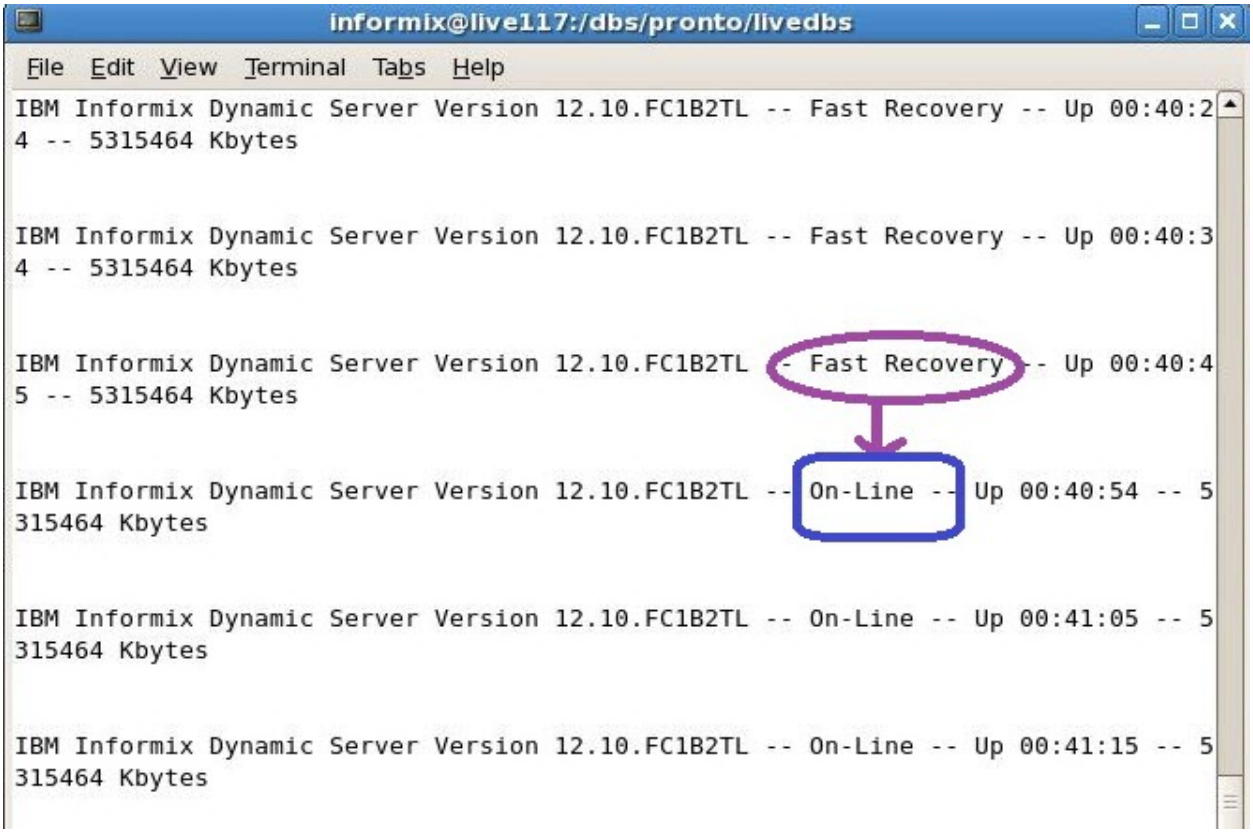
- S - source IBM Informix server name
- I - source server IP address
- P - source server assigned Port Number
- t - target IBM Informix server name
- i - target server IP address
- p - target server assigned port number
- L- If you want to use the existing config and sqlhost files of the target server. If you do not specify this, the process uses the source server configuration.
- T - using password-less trusted hosts for communicating



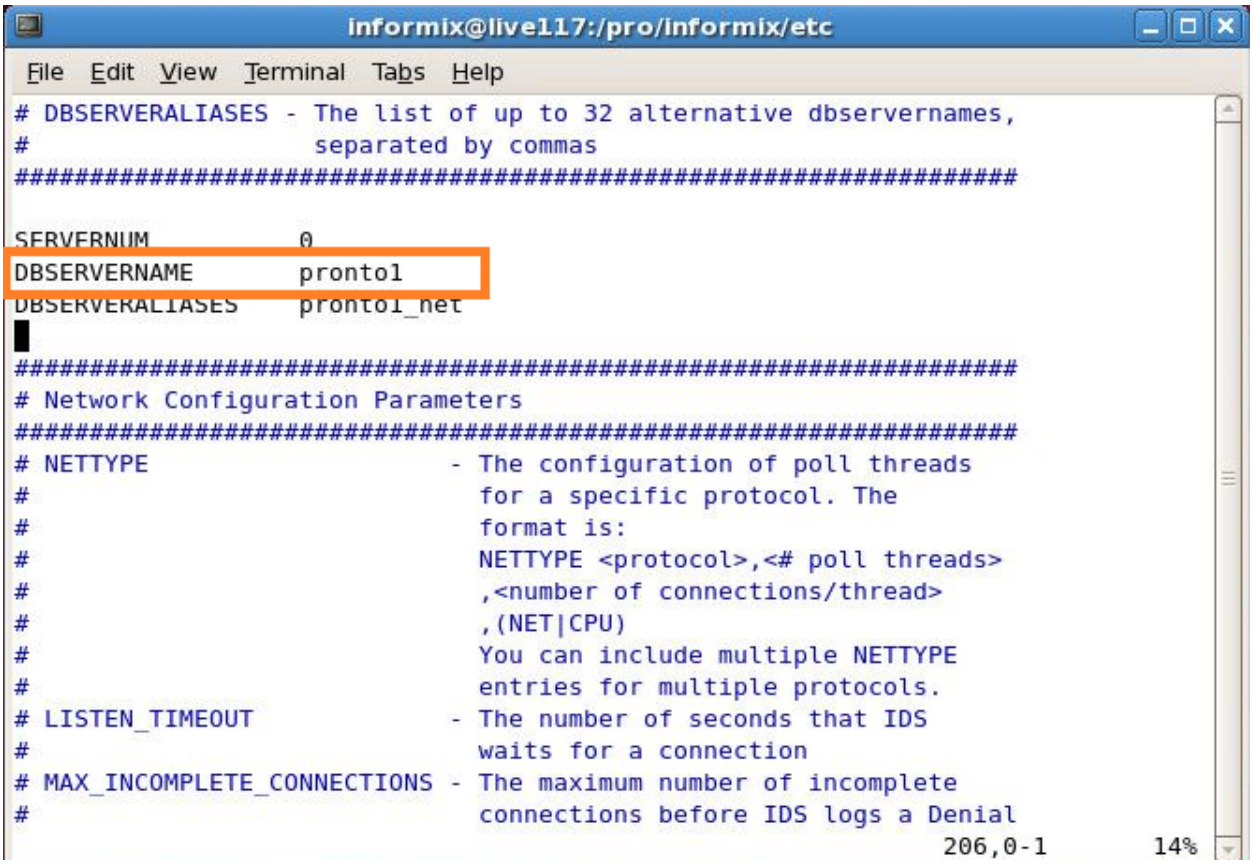
The following image shows that the target server first goes to *Fast Recovery* mode before going into *On Line* mode.



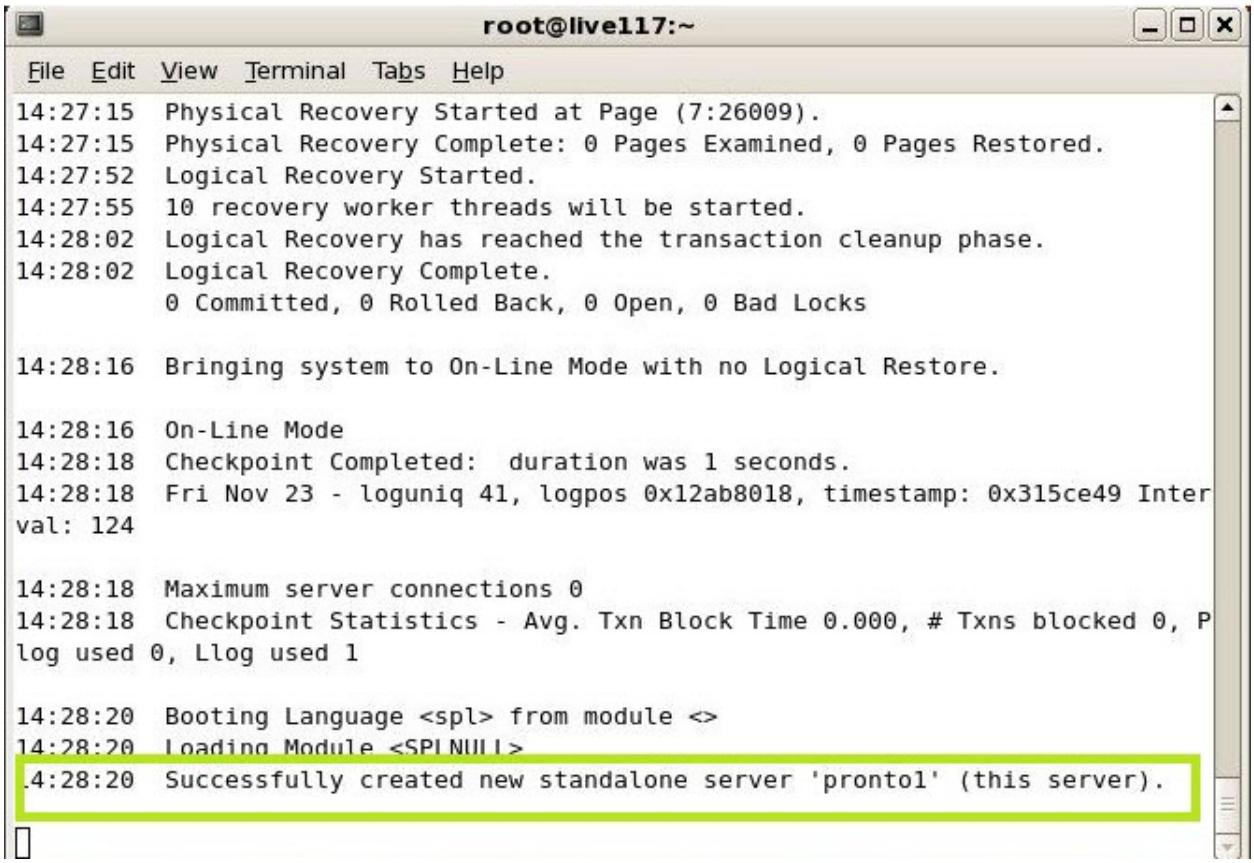
The following image shows the change of the target database server mode from *Fast Recovery* to *On Line* after fully recovering both physically and logically and if the process is successful.



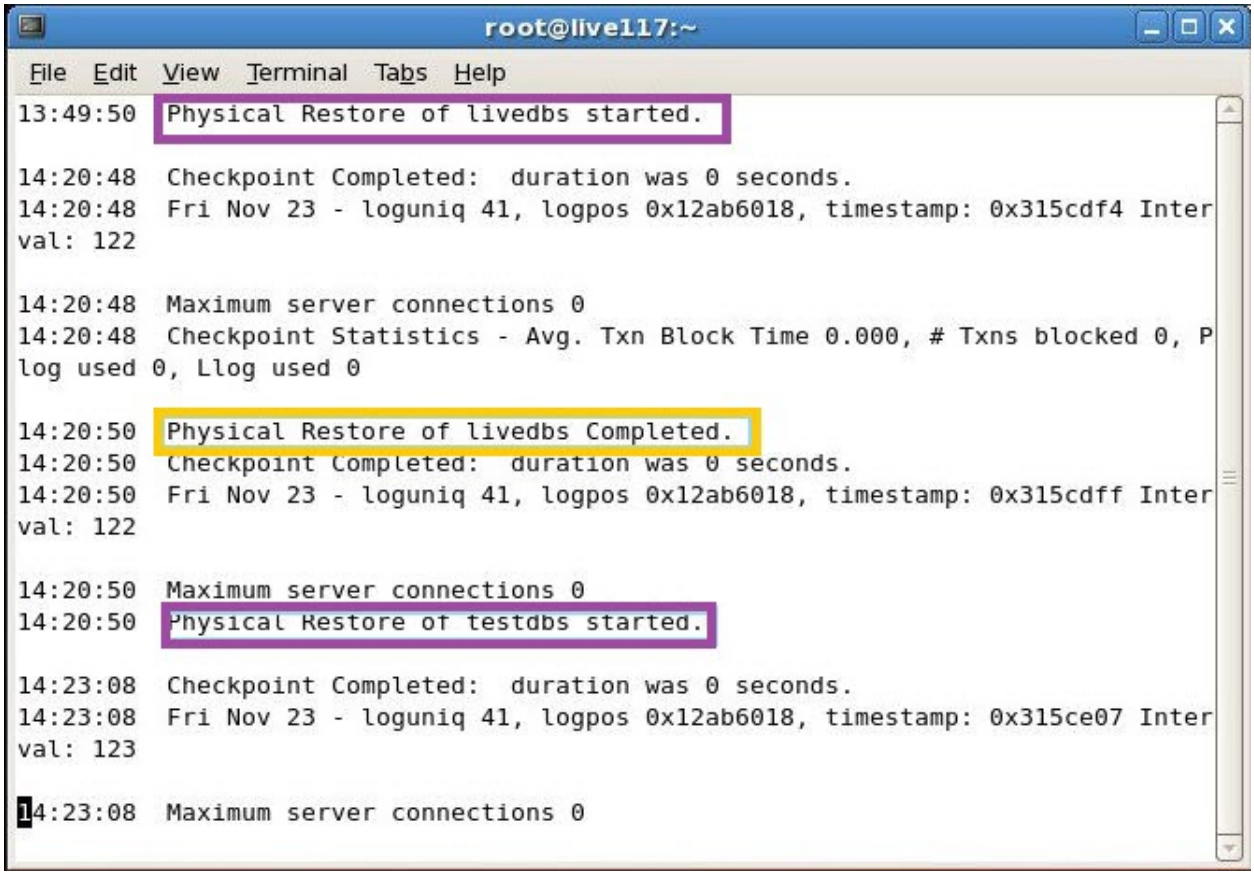
The following image shows the INFORMIXSERVER temporarily changed to **pronto1** before starting the ifxclone process in the target server.



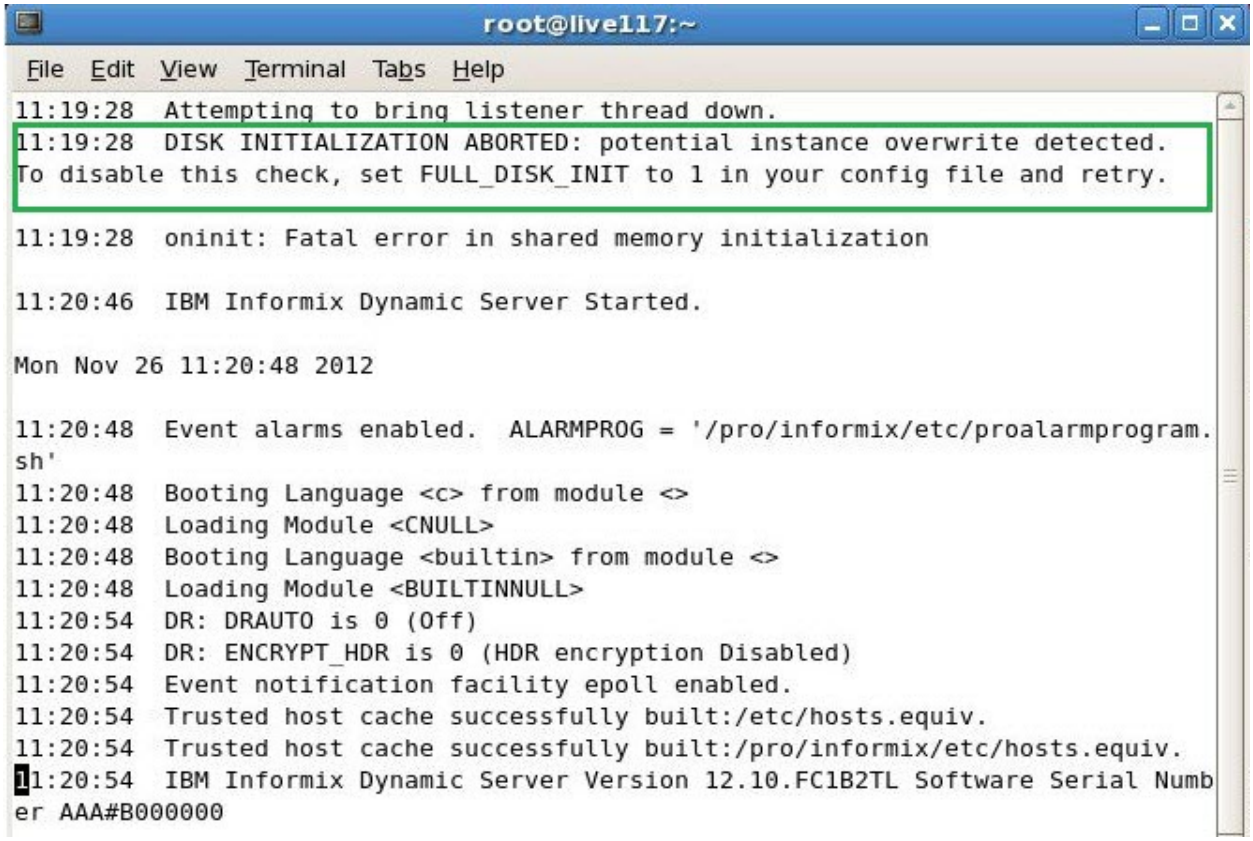
The following image shows the finish point of this cloning process in the target server online.log. Any errors in the log indicate there has been an issue with the cloning process.



The following image shows the physical recovery of each and every db space chunk in the target server online.log



The following image indicates that you should enable FULL_DISK_INIT (Setting to 1) before starting the cloning process in the target server.



7.5.6 Other uses for this utility

You can also use this utility to set up new nodes for the existing HA environment.

To add an RS secondary server to the existing high-availability cluster.

According to IBM, it is possible to clone and add a new server to a HA cluster to allow you to :

- clone a server with minimum setup or configuration
- quickly add a new node to an existing ER replication domain
- add a RSS server to the existing HA cluster by cloning against an existing primary server

7.5.7 More resources

You can find more information about the ifxclone clone utility and about the cloning process here:

http://www-01.ibm.com/support/knowledgecenter/SSGU8G_12.1.0/com.ibm.admin.doc/ids_admin_1471.htm?lang=en

http://www-01.ibm.com/support/knowledgecenter/SSGU8G_12.1.0/com.ibm.adref.doc/ids_adr_1093.htm?lang=en

7.6 Onconfig parameter settings

The table below shows the changes made to the parameter settings in the *onconfig* file.

Setting	Small (16GB)	Medium (32GB)	Large (64GB)	Description
SHMTOTAL	16777216	33554432	66060288	Configuration parameter to specify the total amount of shared memory (resident, virtual, communications and virtual extension portions) to be used by the database server for all memory allocations. Formula (example): 1024 * 1024 * 16 = 16777216. You must specify the total. Setting it to 0 (maximum) could result in a breach of licensing conditions as only a maximum of 64GB is permitted.
SHMVIRTSIZE	9437184	12582912	27262976	Configuration parameter to specify the initial size of a virtual shared memory segment. Specifies the size of the virtual portion of shared memory to allocate when you start the database server. The virtual portion of shared memory holds session- and request-specific data as well as other information.
Buffers	800000	1000000	1120000	Allocating more buffers allow more data to be stored in the memory and then retrieved for sequent SQL statements, therefore data is retrieved from memory rather than disk. Each buffer is the size of the operating system page. The number of buffers that the database server requires depends on the amount of physical memory and how much memory is used by the applications. For example, if the database server accesses 15 per cent of the application data at 90 per cent of the time, allocate enough buffers to hold 15 per cent of the data. Increasing the number of buffers can improve system performance. The number of buffers can have a significant effect on performance and use a large percentage of physical memory. *SHMTOTAL – SHMVIRTSIZE is the maximum buffer value for the total of all buffer statements.*
DS_TOTAL_ MEMORY	5242880	6291456	15728640	Specify the amount of memory available for Parallel Database Query (PDQ). The amount should be smaller than the computer physical memory, minus fixed overhead, such as operating-system size and buffer-pool size.
DS_NON_PDQ_ QUERY_MEM	1309696	1571840	5238784	Configuration parameter to increase the amount of memory that is available for a query that is not a Parallel Database Query (PDQ). This can only be a maximum of 25 percent of the value of DS_TOTAL_MEMORY.

Setting	Small (16GB)	Medium (32GB)	Large (64GB)	Description
Cleaners	32	32	32	Specify the number of page-cleaner threads available during the database server operation. A general guideline is one page cleaner per disk drive.
LRUs	128	128	128	Specifies the number of LRU (least recently used) queues in the buffer pool. Values for a 64-bit platforms range from 1 to 512. The more LRU queues you specify, the more page cleaners work in parallel. However, setting the value of the LRUs field too high might result in excessive page-cleaner activity.
LOGFILES	10	15	20	Configuration parameter, which specifies the number of logical-log files, affects logging.
LOGSIZE	204800	256000	307200	The size of one logical log.
DS_MAX_QUERIES	1	1	1	Currently not supported by Pronto Software. This might change in future releases. Configuration parameter to specify the maximum number of Parallel Database Query (PDQ) that can run at the same time.
MAX_PDQPRIORITY	0	0	0	Currently not supported by Pronto Software. This might change in future releases. Configuration parameter limits the PDQ priority that the database server grants when users either set the PDQPRIORITY environment variable or issue the SET PDQPRIORITY statement before they issue a query. When an application or an end user attempts to set a PDQ priority, the priority that is granted is multiplied by the value that the MAX_PDQPRIORITY specifies. Specify MAX_PDQPRIORITY lower when you want to allocate more resources to OLTP processing, such as Pronto ERP transactions. Specify MAX_PDQPRIORITY higher when you want to allocate more resources to decision-support processing.
DS_MAX_SCANS	1048576	1048576	1048576	Limits the number of PDQ scan threads that the database server can execute at the same time. When a user issues a query, the database server issues scan threads, depending on the following values: * Related to PDQ * Set to default

Setting	Small (16GB)	Medium (32GB)	Large (64GB)	Description
vpclass aio	"2"	"4"	"7"	The number of asynchronous I/O (AIO) virtual processors that the database server should start initially, for example 2. We do not specify an upper range, allowing the auto tune onconfig parameter to expand the value as required.
USELASTCOMMITTED	COMMITTED READ	COMMITTED READ	COMMITTED READ	All transactions from a Committed Read isolation level are treated as last committed transactions. The database server reads the most recently committed version of the data when it encounters an exclusive lock while attempting to read a row in the Committed Read or Read Committed isolation level. Cognos connection strings must be set to **Read Uncommitted**.
SQL_DEF_CTRL	0x00000eb0	0x00000eb0	0x00000eb0	Further minimises the temp space required to produce a Business Intelligence report. Optimises the schemas of system-created TEMP tables that store materialised views and derived tables.
BUFFERPOOL default				Specifies the default values that are used if you create a DB space with a page size that does not already have a corresponding bufferpool created at start up.
BUFFERPOOL size=2K				A minimum 2k is still required as the system DB spaces such as log spaces and root dbs are still in 2k for Linux. Not available in AIX.
BUFFERPOOL size=4K				Specifies the database server's default values for a buffer pool, which are based on the database server's default page size. This is now 4k for both AIX and Linux.
IFX_FOLDVIEW	Set to On by default	Set to On by default	Set to On by default	Previously set to **1**, this functionality has been incorporated into the core of the product and it should be # out (On).
ANSI_TO_IFM_JOIN	Set to On by default	Set to On by default	Set to On by default	It was required in earlier versions. Now the functionality has been incorporated into the core of the product.

The following parameter settings are deprecated:

- RA_THRESHOLD
- OPCACHEMAX
- PHYSDBS
- IFX_ONTAPE_FILE_PREFIX
- RA_PAGES