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EEE INSTALL

The main purpose of this section is to walk you through a typical install of DB2 EEE v7.2 on Linux, based on a partitioned database system with more then one physical workstation.

1.   Before installing EEE on your machine make sure:

       1.1   Extra packages required are installed. Please refer to the individual distribution's setup instructions for exact packages needed.

       1.2   Make sure kernel parameters are configured. Please refer to the individual distribution's setup instructions for how to do this.

       1.3   Ensure that the rsh network service is enabled. Please refer to the individual distribution's setup instructions for how to do this.

       1.4   On a single machine (Control Workstation) in the cluster, you have a file system to be used as instance and home directory.   Please refer to the individual distribution's setup instructions for how to do this.

       1.5   If you have configuration that uses more then one machine for the single database instance, you have exported this file system using NFS. Please refer to the individual distribution's setup instructions for how to do this.

       1.6   You have mounted the exported file system on each of the remaining machine in the cluster. Please refer to the individual distribution's setup instructions for how to do this.

       1.7   Ensure that the clock is correct on all workstations in the cluster.

              To set system time you can use the following command:

              date mmddhhmm YY.ss

              To set hardware clock to the current system time use the following command:

              Suse:

              hwclock –systohc

              RedHat & Turbolinux

              clock   --systohc

2.   CREATE SEPARATE GROUPS AND USERS ACCOUNTS

If you are using NIS or NIS+, groups and users must be created before you run db2setup. If you are not using NIS and NIS+ groups and want to use the installer program to create user and group IDs you can proceed with Step 3. Otherwise:

Create these group and user accounts on all workstations in the cluster:

- The DB2 instance owner

- The user that will execute fenced UDF's (userdefined functions) and stored procedures

- The Administration Server

To create the user accounts perform the following steps:

a. Log on to the system as user with root authority.

b. Create a primary group for the instance owner (for example db2iadm1), the user who will execute UDFs and stored procedures (for example db2fadm1), and the Administration Server (db2asgrp).

groupadd -g 101 db2iadm1

groupadd -g 102 db2fadm1

groupadd -g 103 db2asgrp

c. Create user that belongs to each group created above

useradd -u 502 -g db2iadm1 -d /nfshome/db2inst1 -s /bin/bash -m db2inst1

useradd -u 501 -g db2fadm1 -d /nfshome/db2fenc1 -s /bin/bash -m db2fenc1

useradd -u 503 -g db2asgrp -d /nfshome/db2as -s /bin/bash -m db2as

d. Set password for each user you created.

e. Secondary groups must be created for the DB2 instance owner and the Administration Server on the NIS server. You must then add the primary group of the instance owner to the secondary Administration Server group. Likewise, you must add the primary Administration Server group to the secondary group for the instance owner.

Bellow is example of the entry in the /etc/group file

db2iadm1:x:101:db2as
db2fadm1:x:102:
db2asgrp:x:103:db2inst1

e. Log out.

3.   **PERFORMING THE INSTALLATION**

To perform the installation on a Linux system or cluster, perform the following steps.

Note: If you are deploying DB2 EEE on a Linux cluster you must install DB2 EEE on each machine.

Control Workstation: It is recommended that you use db2setup command to install EEE and create a db2 instance. To install DB2 EEE on the Control Workstation do the following.

a.   Log on as user with root authority to the Control Workstation and mount the cdrom :

bash#   mount /media/cdrom

Tip: Some distributions disable execute privileges on CD-ROM devices by default. To mount a CD-ROM with execute permission at mount point /media/cdrom, issue the following command as root:

bash#   mount -o exec /media/cdrom

b.   In the CD-ROM directory, use the db2setup setup command for DB2 Version 7.2 installation:
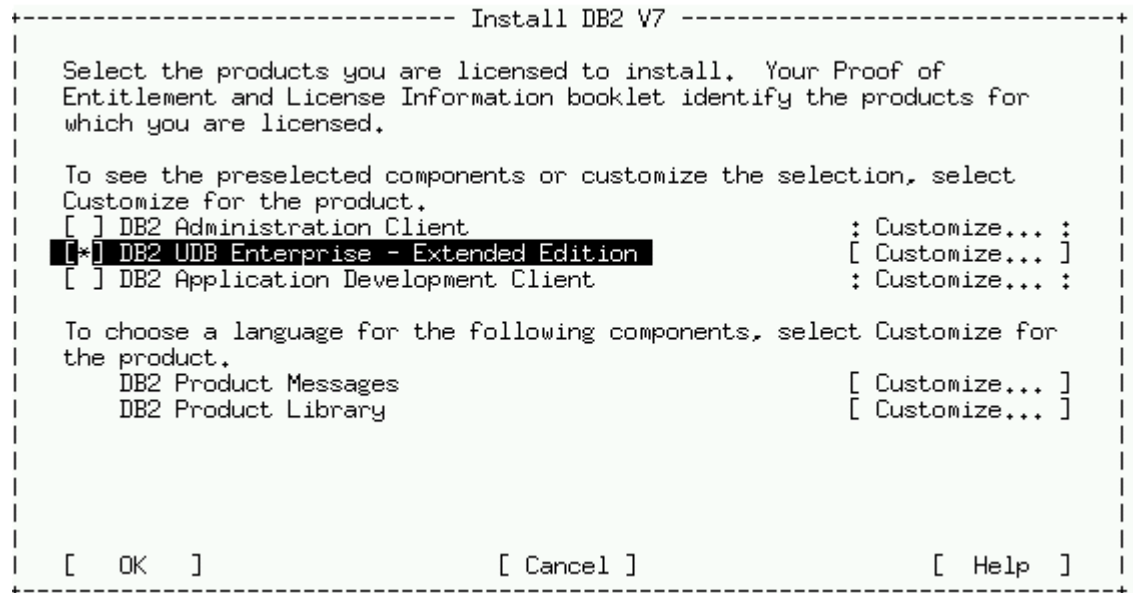   *./db2setup*

Note: db2setup works only with bash, Bourne and Korne shells

c.   The dialog box shown in the Figure 1 will appear asking which product you wish to install.

For the database install you will choose DB2 UDB Extended Enterprise Edition.

To select or deselect a component, highlight the component using the cursor keys and press Enter.

Figure 1.

```
+------------------------------ Install DB2 V7 ------------------------------+
|                                                                            |
|    Select the products you are licensed to install.  Your Proof of         |
|    Entitlement and License Information booklet identify the products for    |
|    which you are licensed.                                                  |
|                                                                            |
|    To see the preselected components or customize the selection, select     |
|    Customize for the product.                                              |
|    [ ] DB2 Administration Client                         : Customize... :   |
|    [*] DB2 UDB Enterprise - Extended Edition             [ Customize... ]   |
|    [ ] DB2 Application Development Client                : Customize... :   |
|                                                                            |
|    To choose a language for the following components, select Customize for  |
|    the product.                                                            |
|        DB2 Product Messages                              [ Customize... ]   |
|        DB2 Product Library                               [ Customize... ]   |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|    [   OK   ]                    [ Cancel ]                    [  Help  ]    |
+----------------------------------------------------------------------------+
```

d.   To select or deselect optional components for DB2 products you would like to install select **[Customize]** option. For example, if you would like to install Control Center, choose **[Customize]** then select Control Center as Optional component.

Figure 2.

```
+------------------------------- Install DB2 V7 --------------------------------+
+--- DB2 Universal Database Enterpise Extended Edition ------------------------+
|                                                                              |
|    Required:        DB2 Parallel Extension                                   |
|                     Product Signature                                        |
|    Optional:        [*] Java Support                                         |
|                     [*] Replication                                          |
|                     : : DFS Client Enabler                                   |
|                     [*] Local Warehouse Control Database                     |
|                     [*] Distributed Join for DB2 Data Sources               |
|                     : : Information Catalog for the Web                      |
|                     [*] Getting Started                                      |
|                     : : Light-weight Directory Access Protocol              |
|                     [*] Control Center                                       |
|                     Code Page Conversion Support:                            |
|                         [*] Japanese      [*] Simplified Chinese            |
|                         [*] Korean        [*] Traditional Chinese           |
|                                                                              |
|                                                                              |
|    [ Select All ]                    [ Deselect All ]            [ Default ] |
|    [    OK    ]                       [ Cancel ]                 [  Help  ]  |
+------------------------------------------------------------------------------+
+------------------------------------------------------------------------------+
```

e.	On the Create DB2 services windows appeared select **Create a DB2 Instance.**

f.	Create DB2 Services window will ask you to create group and user IDs for instance owner - Figure 3. You can use default or fill in the corresponding fields with the user, user ID, group, group ID and the home directory (fill in group and user's ID of the intance owner if you created one before running db2setup,)
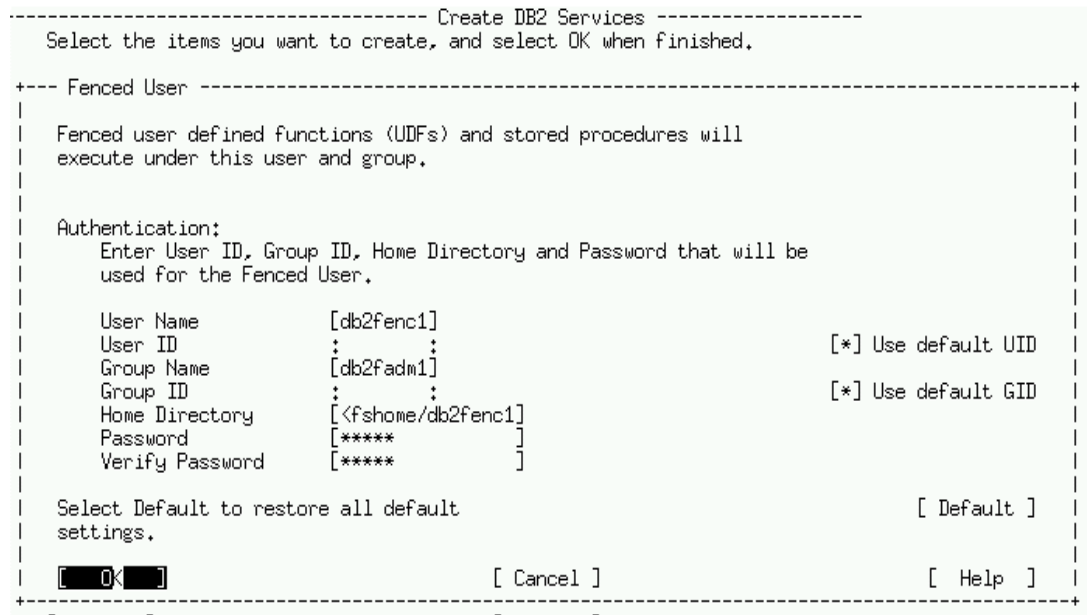
Figure 3.

```
+------------------------------------ Create DB2 Services -------------------+
|    Select the items you want to create, and select OK when finished.       |
|                                                                            |
|+--- DB2 Instance ---------------------------------------------------------+ |
||                                                                          | |
||    Authentication:                                                       | |
||       Enter User ID, Group ID, Home Directory and Password that will be  | |
||       used for the DB2 Instance.                                         | |
||                                                                          | |
||       User Name            [db2inst1]                                    | |
||       User ID              :        :                    [*] Use default UID | |
||       Group Name           [db2iadm1]                                    | |
||       Group ID             :        :                    [*] Use default GID | |
||       Home Directory       [<fshome/db2inst1]                            | |
||       Password             [*****        ]                               | |
||       Verify Password      [*****        ]                               | |
||                                                                          | |
||    Select Properties to view or change more              [ Properties... ] | |
||    options.                                                              | |
||                                                                          | |
||    Select Default to restore all default                 [ Default ]     | |
||    settings.                                                             | |
||                                                                          | |
||    [    OK    ]                       [ Cancel ]            [  Help  ]    | |
|+-------------------------------------------------------------------------+ |
```

g. Create group and user IDs for fenced user defined functions (UDF) and stored procedures. You can use default or fill in the corresponding fields with the user, group id's and home directory.

Figure 4.

```
-------------------------------------- Create DB2 Services -------------------
    Select the items you want to create, and select OK when finished.

+--- Fenced User -------------------------------------------------------------------------+
|                                                                                         |
|   Fenced user defined functions (UDFs) and stored procedures will                       |
|   execute under this user and group.                                                    |
|                                                                                         |
|                                                                                         |
|   Authentication:                                                                       |
|       Enter User ID, Group ID, Home Directory and Password that will be                 |
|       used for the Fenced User.                                                         |
|                                                                                         |
|       User Name           [db2fenc1]                                                    |
|       User ID             :        :                           [*] Use default UID      |
|       Group Name          [db2fadm1]                                                    |
|       Group ID            :        :                           [*] Use default GID      |
|       Home Directory      [<fshome/db2fenc1]                                            |
|       Password            [*****          ]                                             |
|       Verify Password     [*****          ]                                             |
|                                                                                         |
|   Select Default to restore all default                               [ Default ]       |
|   settings.                                                                             |
|                                                                                         |
|   [   OK   ]                               [ Cancel ]                      [  Help  ]    |
+-----------------------------------------------------------------------------------------+
```

h.   In the Create DB2 Services windows select **Create the Administration Server** and press Enter. You can use default user and group names or fill the corresponding fields with the user and group you created in the CREATE SEPARATE GROUPS AND USERS ACCOUNTS.

The Administration Server component is necessary if you want to use Control Center to administer your partition database.

If your partitioned database system has **one** Administration Server, create this server on the instance owning node (Control Workstation).

Figure 5.

```
+-------------------------------- Create DB2 Services -------------------
|   Select the items you want to create, and select OK when finished.
|+--- Administration Server ---------------------------------------------------------------+
||                                                                                          |
||   Authentication:                                                                        |
||       Enter User ID, Group ID, Home Directory and Password that will be                  |
||       used for the Administration Server.                                                |
||       User Name        [db2as   ]                                                        |
||       User ID          :        :                            [*] Use default UID         |
||       Group Name       [db2asgrp]                                                        |
||       Group ID         :        :                            [*] Use default GID         |
||       Home Directory   [/nfshome/db2as  ]                                                |
||       Password         [                ]                                                |
||       Verify Password  [                ]                                                |
||                                                                                          |
||   Select Properties to view or change more                       [ Properties... ]       |
||   options.                                                                               |
||                                                                                          |
||   Select Default to restore all default                          [ Default ]             |
||   settings.                                                                              |
||                                                                                          |
||   Note: It is not recommended to use the DB2 Instance user ID for                        |
||         security reasons.                                                                |
||   [   OK   ]                              [ Cancel ]                      [  Help  ]      |
|+------------------------------------------------------------------------------------------+
|   [   OK   ]                         [  C     ]
```

<u>Workstations in the cluster</u>

a.   Make sure group and user accounts are created on all workstations in the cluster [see Section 2: CREATE SEPARATE GROUP AND USER ACCOUNTS]. If you have used default user and group ids to create a DB2 Instance and Administration Server on the Control Workstation, then log in to the Control Workstation and read those IDs from the /etc/passwd file and /etc/group file.

b.   You can use db2setup or db2_install executables on the root directory of the DB2 V 7.2 Installation CD-ROM

- **db2setup:**

It is assumed that you already created a DB2 instance on the Control Workstation.

Usually, your partitioned database system has **one** Administration Server, it often exists on your instance owning node (Control Workstation).

However, multiple Administration servers can be created, but there can be only one server for each machine. If several users will be administering your system using control center, you may consider multiple Administration Servers to redistribute the network traffic

Once you install DB2, db2setup is copied to the /usr/IBMdb2/V7.1/install directory to enable you to create or modify instances without the CD-ROM.

- **db2_install:**

db2_install command provides an alternate means of installing DB2 RPMs. Unlike db2setup, it does not enable you to create a DB2 instance or Administration Server, or install a license key
.

4.   POSTINSTALLATION

4.1   ENABLE FAST COMMUNICATIONS MANAGER

The Fast Communication Manager (FCM) handles the communication between partitioned database servers. To enable FCM, you must ensure that the services that you reserve in */etc/services* file are available on every workstation in your partitioned database system.

When you create the instance using *db2setup* utility the entry, something similar to the following was placed to the */etc/services* file:

DB2_instance_name   60000/tcp

Where, *instance_name* is name of instance you created

This entry must be of the same form as:

DB2_instace_name   port_number

Where, *port_number* is the port number you reserve for database partition server communication.

The port 60000 is FCM default port used for any instance created using db2setup utility.

For example, if you created an instance called db2inst1, an entry paced in the /etc/services file is:

DB2_db2inst1   60000/tcp

If you are planning to run multiple logical nodes (MLNs), you must reserve a range of consecutive ports (one for each logical node). The consecutive port range that you reserve must be equal to the number of MLNs on the database partition server that is running the most MLN's in your partitioned database system. To reserve a port range for FCM to use, you need to add another entry to the *example* file that specifies the end of the port range. This entry must be of the format.

DB2_instance_name_END   port_number

where:

- *instance_name* is the name of the multipartition instance

- port_number is the port number of the last port in the port range that you reserved for database partition server communications.

For example, if you have a database partition server that is running four database partitions, you will need to specify four consecutive ports as your port range. In our example, the entry in the /etc/services file is

DB2_db2inst1   60000/tcp

DB2_db2inst1_END   60003/tcp   # running 4 MLN's

To enable your partition database system for FCM communication, perform the following steps on each machine that will participate in your partitioned database system:

a.   Log on as root to the Control Workstation.

b.   Open the *etc/services* file and verify that the port range entries that you have reserved for FMC communication are there .

c.   Log out.

d.   Log on to each additional workstation in your partitioned database system and add the same entries to the *etc/services* file that you added to the *etc/services* file on the Control Workstation (workstation where DB2 instance was created).

e.   Log out.

NOTE: If you are using NIS, the entry in the service file has to be entered prior to db2 installation and creation of instance with the installer. Alternatively, you can temporarily turn off NIS in the nsswitch.conf file and the DB2 installer will create the user/service locally.

4.2   ENABLING THE EXECUTION OF REMOTE COMMANDS

In a multipartition instance, each database partition server must have the authority to perform remote commands on all the other database partitions in the partition database system. To do this, you can either create an **INSTHOME/.rhosts** file (where INSTHOME is the home directory of the instance owner) or an /etc/hosts.equiv file.

If you decide to create an */etc/hosts.equiv* file, you have to create this file on every workstation that participates in your partitioned database system.

If you want to use the INSTHOME/.rhosts file, it should contain entries similar to the following

>   *workstation1.torolab.ibm.com db2inst1*

>   *workstation2.torolab.ibm.com db2inst2*

You can confirm if you are able to perform remote command by issuing*: rsh workstation1 ls.* If you receive an error make shure rsh network service was enabled.

4.3   ENVIRONMENT VARIABLES

DB2 provides two environment profiles in the sqllib directory:

- *db2profile for sh, bash, ksh*
- *db2cshrc for sch*

To modify the DB2 environment, modify the following profiles sqllib/userprofile and sqllib/usercshrc. Theses environmental profiles are called after the db2 environment is initialized.

4.4   UPDATE NODE CONFIGURATION FILE

This information is taken from *DB2 Enterprise - Extended Edition for Unix Quick Beginnings* http://www-4.ibm.com/cgi-bin/db2www/data/db2/udb/winos2unix/support/v7pubs.d2w/en_main

When the database is created a database partition is created at each server (node) that is defined in the nodes configuration file *db2nodes.cfg* . This file is located in the *INSTHOME/sqllib/* directory (where INSTHOME) is the home directory of the instance owner) contains information for all database partitions servers that are participating in the instance. The file contains one entry for each database partition server for a particular DB2 instance. By default, when you create an instance, the *db2nodes.cfg* file is automatically created and an entry for the workstation where the instance was created is added to the file.

The format of the db2nodes.cfg file is as follows:

>   *nodenum hostname logical port netname*

where,

nodenum   A unique number, between 0 and 999, that identifies a database partition server in a partition database system. To scale your partitioned database system, you add an entry for each database partition server to the db2nodes.cfg file. The nodenum value that you select for additional database partition servers must be in ascending order. However, gaps can exist in this sequence. You may choose to put a gap between the nodenum values if you plan to add Multiple Logical Node (MLN) and wish to keep the nodes logically grouped in this file.

hostname   The TCP/IP hostname of the database partition server for use by the FCM

logical port   Specifies the logical port for the database partition server. This field is used to specify a particular database partition server on a workstation that is running MLNs. If there is no entry for this field, the default is 0. However, if you add an entry for the netname field, you must enter a number for the logical port field. In this case, if you specify an entry for the netname field, the entry must be set to 0. If you are using MLNs, the logical port value you specify must start at 0 and continue in ascending order with no gaps (for example 0, 1, 2).

Furthermore, if you specify a logical port entry for the database partition server, you must specify a logical port for each database partition server listed in your db2nodes.cfg file.

netname   Specifies the hostname or the IP address of the high speed interconnect for FCM communication.

If an entry is specified for this field, all communication between database partitioned servers (except for communications as a result of the db2start, db2stop and db2_all commands) is handled through the high speed interconnect. This parameter is only required if you are using a high speed interconnect for database partition communications.

For example, when you created the DB2 instance db2inst1, on the workstation called workstation1, the db2nodes.cfg file was updated as follows:

> *0   workstation1   0*

If you are not using a clustered environment anas followsd want to have four database partition servers on one physical workstation called workstation1, update db2nodes.cfg file as follows:

> *0   workstation1   0*
>
> *1   workstation1   1*
>
> *2   workstation1   2*
>
> *3   workstation1   3*

If you want your partition database system contain two physical workstations, called workstation1 and workstation2, each of them running two partitioned database servers update db2nodes.cfg file as follows:

> *0   workstation1   0*
>
> *1   workstation1   1*

| 2 | workstation2 | 0 |
| 3 | workstation2 | 1 |

To update the db2nodes.cfg file, perform the following steps:

a. Logon to the instance as a user with system administrative (SYSADM) authority (by default, the username that you created for the instance owner)

b. Ensure that the DB2 instance is stopped by entering db2stop command

Note. db2nodes.cfg is locked when instance is running and can only be edited when the instance is stopped.

c. Edit the db2nodes.cfg file and add an entry for each database partition server that will participate in your partitioned database system.

d. Enter db2start command.

e. Log out.

4.5 STARTING THE DB2 INSTANCE

You must start the DB2 instance before you can create database. To start the DB2 instance, login as the instance owner and run the db2start command.

If the DB2 instance is started successfully, you will receive message similar to the following:

control_ma:/ > db2start

11-14-2001 15:30:37   0   0   SQL1063N DB2START processing was successful.
11-14-2001 15:30:37   1   0   SQL1063N DB2START processing was successful.

Note that the number after the timestamp is the nodenum of the database partition as defined in the db2nodes.cfg.

4.6 CREATING DATABASE

To verify that the DB2 Enterprise - Extended Edition (DB2 EEE) is installed correctly create a sample database and try to access data from database.

For the purpose of testing installation and configuration of DB2 EEE, it is recommended that you create the SAMPLE database for your instance after you have defined all of the database partition servers that will participate on your partitioned database system. It is also recommended to create database on the separate file system (/database)

a. Log on to the system as user with the system administrative authority (SYSADM) (by default the username you created for instance owner - **db2inst1)**

b. If you creating database on the separate filesystem (/database) , make sure that it has correct permission's and is owned by instance owner.

c. Enter the following command to create sample database

INSTHOME/sqllib/bin/db2sampl   path

where:

   INSTHOME is home directory of instance owner

path is the local filesystem that exists on each workstation that participates in your partitioned database.

d.   Start database manager by entering the db2start command

e.   Enter the following commands to connect to SAMPLE database, list tables select list of all employees that work in department 20, and reset database connection.

      db2 connect to sample

      db2 list tables

      db2 'select * from staff where dept = 20'

      db2 connect reset

f.   After you verified installation you can remove sample database to free up disk space. Enter the following command to drop SAMPLE database:

      db2 drop db sample

4.7   START THE ADMINISTRATION SERVER

Before you can use the Client Configuration Assisance (CCA) or the Control Center to administer your partitioned database system, you must ensure the Administration Server is started and the db2cclst daemon is running on every system in your partitioned database.

To enable your partitioned database system so that it can be administered by the CCA or the Control Center, perform the following steps on each node where an Administration Server was created.

a.   Log on to the workstation with the user name that you created for the Administration Server (db2as).

b.   Enter the following command to start the Administration Server

      DASINSTHOME/sqllib/bin/db2admin start

where *DASINSTHOME* is the home directory of the Administration Server.

c.   Enter the following command to start the db2cclst daemon:

      DASINSTHOME/sqllib/bin/db2cclst

d.   Ensure that the db2cclst daemon is running by entering the following command:

      ps -ef |grep db2cclst

Error information for the *db2cclst* daemon is returned to the syslog file. Error are written to this file instead of the *db2diag.log* file, because tha daemon runs independent from the instance.

You can set up the *db2cclst* daemon to start when a workstation is restarted by adding the following command to the */etc/innitab* file

Note If you have an error **SQL1072C** when trying to start Administration Server: The problem is basically in the creation of the new instance which will have unique IPC keys. sqllib inode ftok causes it to generate the same IPC keys for dbm shared memory. To solve the problem logon to the workstation with the user name that you created for the Administration Server (db2as). Rename .ftok file and then touch a new .ftok file (just deleting the .ftok and touching a new one may not work because the same inode will be used).

4.8 INSTALL THE LICENSE KEY

- Please see document on "INSTALLING LICENSE KEY" for how to do this.

4.9 CREATE THE ADMINISTRATION SERVER DB2INSTALLER PROGRAM

If you have not created the Administration Server during DB2 Installation, we recommend that you use the DB2 Installer program to create the Administration Server, because it configures administration Server automatically for communications. To create Administration Server using DB2 Installer Program, perform the following steps.

a. Log as a user with root authority to a machine where you installed DB2 Enterprise-Extended Edition (DB2 EEE)

b. Enter the /usr/IBmdb2/V7.1/install/db2setup command to start the DB2 Installer program. The Db2 installer window opens.

c. Select the Create option and press the Enter key.

d. Select the Create the Administration Server option and press the Enter key.

e. Fill in the fields for the username that you created for the Administration Server.

f. Select the OK option and press the Enter key. You are returned to the Crete DB2 Services window.

g. Select the Continue option and press the Enter key. The DB2 Installer program will prompt you to complete this task.

When you have completed the task, you are returned to the installer program.

h. Select the Close option and press the Enter key.