
insure/RESOURCES

User Guide and Reference

Version 8.0

Document date: 09/15/2011



Centerfield Technology, Inc.

<http://www.centerfieldtechnology.com>

© 1999-2011 Centerfield Technology, Inc.

All rights reserved. No part of the contents of this book may be reproduced or transmitted in any form or by any means without the written permission of Centerfield Technology, Inc.

Notice: The information contained in this document is subject to change without notice. Centerfield Technology, Inc. shall not be liable for errors contained herein or consequential damages in connection with the furnishing, performance, or use of this material.

The sample source and resulting programs are provided for your use only. You may repackage any source or resulting program or portion of source or resulting program provided within this document for the purpose of product distribution, installation, or system archiving. Any other use requires the written permission of Centerfield Technology, Inc.

Centerfield Technology, Inc. and HomeRun are trademarks of Centerfield Technology, Inc.

All other product and brand names are trademarks and registered trademarks of their respective companies.

Use of this book and the information within implies an understanding and agreement with the above statements.

Centerfield Technology, Inc.
3131 Superior Drive NW - Suite C
Rochester, MN 55901



1	OVERVIEW OF HOMERUN	5
1.1	PRODUCT CONTENTS	6
1.1.1	<i>HomeRun installation</i>	6
1.1.2	<i>User Guide and Reference</i>	6
1.2	PRODUCT LIBRARIES	6
2	INTRODUCTION TO INSURE/RESOURCES	7
3	GETTING STARTED WITH INSURE/RESOURCES	8
3.1	HOMERUN REQUIREMENTS AND INSTALLATION	9
3.1.1	<i>Product Requirements</i>	9
3.1.2	<i>Product Installation</i>	9
3.1.3	<i>Connecting to the server for the first time</i>	18
3.2	INSTALL POLICY MANAGERS	21
3.3	INSURE/RESOURCES WORKSPACE	21
3.4	DEFINE YOUR WORKDAY	22
3.5	DEFINE POLICIES	22
3.5.1	<i>Predefined policies</i>	22
3.5.2	<i>Defining new policies</i>	23
3.6	PLAN FOR POLICY IMPLEMENTATION	23
3.6.1	<i>Fast-Path Planning approach</i>	24
3.6.2	<i>Environment-Monitoring Planning process</i>	24
3.6.3	<i>Feedback Planning process</i>	25
3.7	POLICY ASSIGNMENT	26
3.8	MONITOR POLICY IMPACTS AND MAKE ADJUSTMENT	28
4	ADVANCED TOPICS	29
4.1	CONFIGURATION FEATURES	29
4.1.1	<i>Install Policy Managers</i>	29
4.1.2	<i>Uninstall Policy Managers</i>	29
4.1.3	<i>Workday definition</i>	29
4.2	POLICIES	30
4.2.1	<i>Inspecting existing policies</i>	30
4.2.2	<i>Creating new policies</i>	31
4.2.3	<i>Policy values</i>	31
4.3	POLICY ASSIGNMENT	34
5	SCENARIOS FOR PRODUCT USE	36
5.1	ISSUES	36
5.2	CHALLENGES	36
5.3	PURPOSE	37
5.4	POLICIES FOR RESOURCE MANAGEMENT	38
6	SUPPORT	39
6.1	CONTACT INFORMATION	39
6.2	ADDITIONAL INFORMATION	39
7	APPENDIXES	40
7.1	SYSTEM-WIDE INSTALLATION IMPACTS	40
7.1.1	<i>System Values</i>	40



7.1.2	<i>Servers, Jobs, and Monitors</i>	41
7.1.3	<i>Database Monitor and HomeRun</i>	41
7.1.4	<i>Subsystems and Work Management</i>	42
7.1.5	<i>Exit points</i>	44
7.1.6	<i>TCP/IP Usage</i>	44
7.1.7	<i>Job Scheduler Usage</i>	45
7.1.8	<i>Default public authority of libraries</i>	45
7.1.9	<i>Command Language (CL) Commands Used by HomeRun</i>	45
7.1.10	<i>OS/400 System APIs Used by HomeRun</i>	46
7.1.11	<i>Programs Adopting *OWNER Authority</i>	47



1 Overview of HomeRun

The HomeRun toolset allows you to efficiently design, deploy, manage, and support all aspects of an SQL-based environment. The set of tools in HomeRun includes:

- insure/INDEX
- insure/ANALYSIS
- insure/MONITOR
- insure/RESOURCES
- insure/SECURITY

All tools make use of the HomeRun server on the iSeries. The password you enter on the server controls which tools are available for your use. However, the manual for each of these tools is included in your product download.

In addition, the following tools are included with every HomeRun installation:

- Autonomic DBA
- Visual SQL Explain (a.k.a. sql/OPTIMIZER)
- Database Explorer
- Lock Detector
- Semaphore Wait Detector
- Mutex Wait Detector

See the Appendixes for more information on using these built-in tools.

1.1 Product Contents

The product you received from Centerfield Technology, Inc. contains the following items:

1.1.1 HomeRun installation

The download contains the software for both your iSeries and your Windows 2000/XP/Vista/7 client workstation. Refer to the Product Installation section for instructions on installing the software.

Also, for JDE OneWorld® (aka Oracle E1®) environments there is an additional piece of software that needs to be installed on the Windows® Terminal Server (i.e. Citrix® server).

1.1.2 User Guide and Reference

Manuals for all tools in the HomeRun toolset can be found in your product download. Each manual is intended to help you get started with the tool, explain the tool's features, and provide guidance on the effective use of the product.

1.2 Product libraries

Centerfield uses a naming convention where all IBM System i™ object names are prefixed with the letters “XC”.

As part of that naming convention throughout this manual the Centerfield *{program library}* will be “XCENTER80” and the Centerfield *{data library}* will be “XCENTERD80”.

This version of the product uses TCP/IP port number 9920 by default. The rest of this document refers to this port as the default port “**{default port}**”. If that port is in use, the installation will incrementally search for unused port numbers starting at **{default port}** and continue looking until one is found. To determine the port that was chosen use the following command:

```
WRKSRVTBLE SERVICE(CENTERFIELD_SERVER_80)
```

2 Introduction to insure/RESOURCES

insure/RESOURCES protects the availability and performance of your core business applications by automating the management and control of these query and reporting interfaces:

- Query/400
- Open Query File Manager
- ODBC/JDBC
- Interactive SQL (STRSQL)
- Run SQL Statement (RUNSQLSTM)

In addition, insure/RESOURCES provides feedback on the management policies you put in place with it, and on how query and reporting tools are affecting your environment. This feedback lets you design the optimal resource management strategy, and assures you that these interactive tools are not consuming excessive system resources or interfering with other critical processes on the System i.



3 Getting started with insure/RESOURCES

This section describes how to get started quickly with insure/RESOURCES. It contains basic usage information for users who want to get started right away. For in-depth information about advanced features of insure/RESOURCES, see the next section.

The steps outlined in this Getting Started section are:

1. Install the product
2. Install policy managers for interfaces you want to manage
3. Review the insure/RESOURCES workspace to understand the major concepts in insure/RESOURCES
4. Define your workday
5. Plan for the policies to assign to your users
6. Assign those policies to users
7. Monitor policy impacts and make adjustments

Note: insure/RESOURCES policies will not take effect unless you complete Step 2, Installing the policy managers.

3.1 HomeRun requirements and installation

3.1.1 Product Requirements

The HomeRun toolset requires specific System i and Windows hardware and software before it will install and perform correctly.

Here is the list of required IBM PTFs:

- ✓ V5R4:
 - MF39418, MF39419, MF39466, SI24100, SI23714, SI23713, SI24580, SI23891, SI23890, SI24569, SI24504, SI23485, SI25668, SI25041, SI23365, SI23514, SI28951, SI28952, SI28953, SI30076, SI30013, SI30014, SI31631, SI31633
- ✓ V5R4M5:
 - SI24100, SI23714, SI23713, SI24580, SI23891, SI23890, SI24569, SI24504, SI23485, SI25668, SI25041, SI23365, SI23514, SI28951, SI28952, SI28953, SI30076, SI30013, SI30014, SI31631, SI31633
- ✓ V6R1:
 - SI31727, SI31641, SI31407

NOTE: PTFs listed above are current with the release date of this document. Centerfield may learn of new PTFs after the document release so we strongly encourage you to check our website for latest PTF requirements – www.centerfieldtechnology.com

3.1.1.1 System i

- ✓ i5/OS V5R4, or V6R1, V7R1
- ✓ TCP/IP configured

3.1.1.2 Windows

- ✓ Windows 2000, Windows XP, Windows Vista, Windows 7
- ✓ Minimum 80486 @ 66Mhz, 32 MB RAM
- ✓ 50 MB of disk space for product
- ✓ TCP/IP installed and configured
- ✓ ODBC driver installed

3.1.1.3 Citrix Windows Terminal Server for E1

- ✓ Windows NT Server, Windows 2000 Server, Windows 2003 Server

3.1.2 Product Installation

The HomeRun toolset has software that needs to be installed on the System i and on the workstations. The installation processes for both the System i and the workstations are

designed to be simple interfaces that provide good default values. The following sections in combination with the on-screen documentation help you understand the installation processes.

If you're re-installing HomeRun you **MUST** refer to the “**HomeRun Installation Guide**” document rather than these 1st time installation instructions.

3.1.2.1 System i Installation

- 1) Before beginning the installation on the System i, please review this list of the impacts the installation will have on your system. For more detailed information about the HomeRun System i installation, see the Appendix titled *System-Wide Installation Impacts*.
 - ✓ This product uses TCP/IP to communicate between the System i and the personal computer. TCP/IP needs to be configured before the HomeRun server will function. Before continuing, make sure your Windows PC client can *ping* the System i system. See one of the following IBM System i references for information on configuring TCP/IP.
 - *TCP/IP Fastpath Setup (SC41-3430)*
 - *TCP/IP Configuration and Reference (SC41-3420)*
 - ✓ The installation uses TCP/IP port number **{default port}**. If that port is in use, the installation will search for unused port numbers starting at **{default port}** and continue looking until one is found. To determine the port that was chosen use the following command:

```
WRKSRVTBLE SERVICE(CENTERFIELD_SERVER_80)
```
 - ✓ The HomeRun server installs into a library named *{PROGRAM LIBRARY}*. *The installation process will copy over existing programs if the library exists.*
 - ✓ The HomeRun data files install into a library named *{DATA LIBRARY}*. *The installation process will selectively replace the data files and preserve information specific to your configuration and settings if they exist.*
 - ✓ The HomeRun server requires an active subsystem for proper installation and operation. Determine the subsystem you wish to use. It will be needed later in the installation process. If you have no special work management requirements, you may use the default of *{PROGRAM LIBRARY}/XCSBS80*.

-
- ✓ If you are installing over the top of an existing HomeRun or Database Essentials product library, the jobs currently using that library will be ended before the installation begins. The server will be re-started at the end of the installation if a valid password is entered during the install, or if you have installed over an existing library that already has a valid password.
 - 2) Sign-on to a 5250 session with QSECOFR or a user profile that has security officer special authorities. This user profile must have a minimum of *ALLOBJ, *IOSYSCFG, *JOBCTL, *SECADM, and *SAVSYS special authorities.
 - 3) The system value QUSEADPAUT must be set to *NONE.

You can verify and change this system value using the following command.

```
WRKSYSVAL QUSEADPAUT
```

In addition, if the system value QUSEADPAUT is secured with an authorization list, the user profile used for the installation must be on that authorization list.

- 4) Place the CD-ROM containing the HomeRun product into your System i primary CD-ROM drive and issue the following command (does not apply when performing a fully electronic installation).

```
LODRUN *OPT
```

- 5) When you are prompted to configure the HomeRun server subsystem, either take the default (i.e. XCSBS80) or enter the subsystem where you want the HomeRun server and client jobs to run, and press Enter. It is recommended that the default be taken. You can reconfigure the server's subsystem after the installation by running the CFGSVR command.
- 6) When you are prompted to enter the HomeRun license password, enter the license password that was provided with your product and press Enter. The license password is based on the serial number of the System i and the LPAR number. Hence, a different license password is needed for each System i that you install.

If you do not know the license password for your System i, you can skip this step of the installation by pressing F12. You can enter the license password after the installation by running the PASSWORD command from the *{PROGRAM LIBRARY}* library.

If you defer adding the license password, the HomeRun server will not start

automatically. No client machines will be able to connect to the System i using any of the HomeRun tools until the password is entered.

- 7) You will be returned to an System i command line when the installation is complete. If you did not skip any of the installation steps, the HomeRun server will be automatically started for you. If you skipped any steps in the installation process, you should perform the configuration steps that you skipped before you continue.
- 8) If you skipped configuring the server or the license password as part of the installation, or if the server did not automatically start as part of the product installation, you need to start the HomeRun server before clients can connect to the System i using any of the HomeRun tools. Prior to trying to start the server, you should ensure that TCP/IP is active on your system. If it is not active, issue the following command using the correct options for starting the TCP/IP servers on your system.

STRTCP STRSVR(*YES/*NO)

- 9) Issue the following command to start the HomeRun server:

{PROGRAM LIBRARY}/STRSVR

- 10) Verify the server is active in the subsystem that you specified. The job name will be XCSERVER. The following command can be used to check for the active job and to verify that the subsystem is correct.

WRKACTJOB JOB(XCSERVER*)

- 11) The server will need to be restarted every time the associated subsystem is ended or the system is restarted. You may add the *{PROGRAM LIBRARY}/STRSVR* command to your system startup routine (**recommended**) or add an autostart job entry in the subsystem if you would like to automatically start the server. If you start the server in your system startup procedure, the i5/OS command STRTCP must be issued and TCP must be completely started before the server will start.
- 12) If you plan to use insure/SECURITY or insure/MONITOR, you will need to register Centerfield's exit point programs with the System i registration facility:

{PROGRAM LIBRARY}/ADDMON

This enables the policies you define to take effect. More information can be found in the manuals for each of these tools.

NOTE: you will have to recycle the host servers for the exit point registration to take effect (refer to the table on next page as well as the Appendix for more detailed information).

- 13) If you plan to use insure/RESOURCES, you must install policy managers before your resource policies will take effect. This can be done either with the:

{PROGRAM LIBRARY}/ADDQCEXIT

or with the menus in insure/RESOURCES PC client GUI.

ODBC exit may need recycling database host server and corresponding prestart jobs (i.e. ENHOSTSVR *DATABASE, ENDPJ QUSRWRK QZDASOINIT, STRHOSTSVR *DATABASE)

More information can be found in the insure/RESOURCES manual.

- 14) You are now ready to begin the workstation installation.

3.1.2.2 Windows 2000/XP/Vista/7 Installation

We recommend Administrator authority on the PC to run the install:

- 1) Go to website: <http://www.centerfieldtechnology.com/downloads.asp>
- 2) Click on the download link for HomeRun
- 3) Follow the online instructions in the START HERE pdf.
- 4) If the installation needed to replace DLLs, you will be prompted to restart your system.
- 5) You may now use the HomeRun tools for which you have a license.

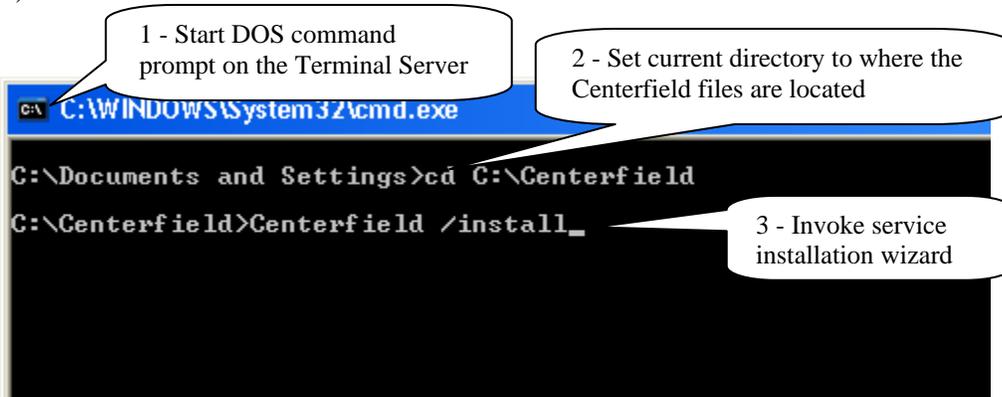
3.1.2.3 Installation instructions for OneWorld® customers using Windows® Terminal Server (i.e. Citrix® server)

These instructions apply **only** to customers that are running JDE OneWorld® (a.k.a. PeopleSoft EnterpriseOne® aka Oracle E1®) on their System i and have purchased insure/Monitor for OneWorld® license. Furthermore, customers using Terminal Servers (TS) in their environment and require Centerfield windows service running on those TS to achieve correlation of System i ODBC jobs to the OneWorld users will follow these instructions.

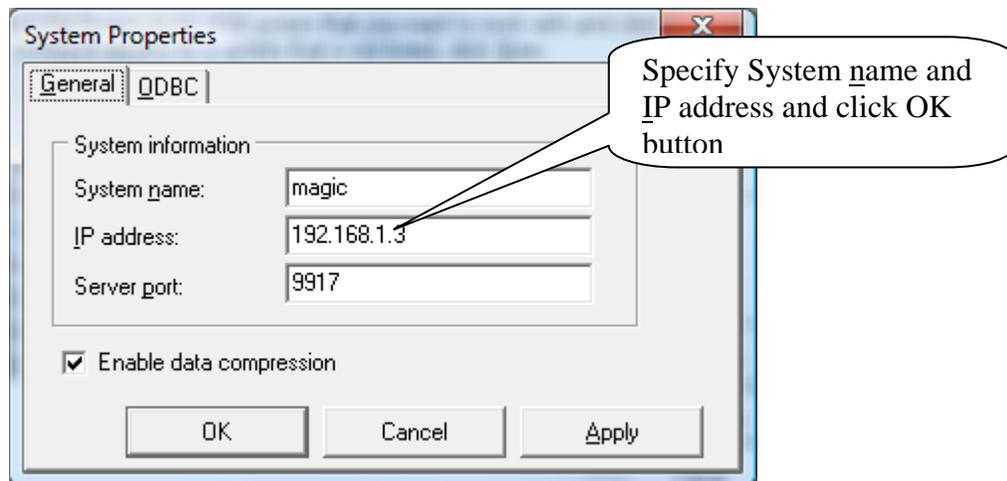
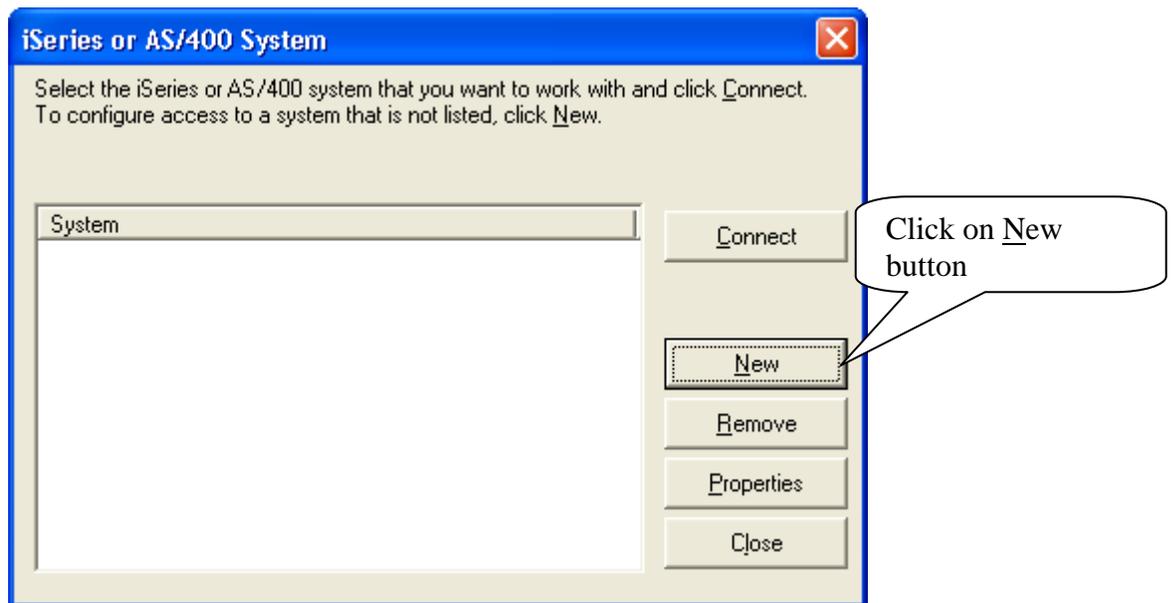
If these conditions do **NOT** apply to your scenario, do **NOT** follow these installation steps.

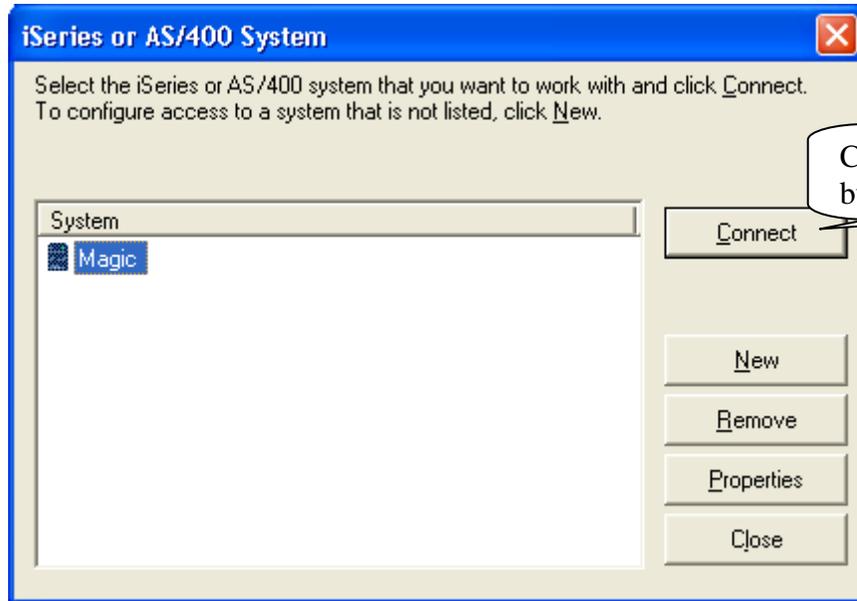
These instructions are to be performed by the Terminal Server administrator (i.e. OneWorld® CNC specialist) with Administrator authority to the server.

- 1) Locate **Centerfield.exe**, **Centerfield.dll** and **CenterfieldServiceConfiguration.exe** on the installation CD using Windows Explorer
- 2) Create a new folder on the Terminal Server (i.e. C:\Centerfield)
- 3) Copy and paste **Centerfield.exe**, **Centerfield.dll** and **CenterfieldServiceConfiguration.exe** to the newly created folder
- 4)

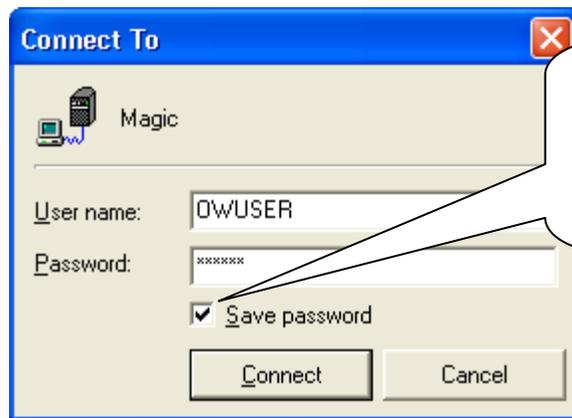


5) Several one time configuration windows will appear.





Click on Connect button



Specify iSeries profile and password, make sure you **check** the Save password checkbox then hit the Connect button.



Default 'push data to System i' interval is 15 seconds, but you can change it at this time. Good rule of thumb is to use 5 seconds per Terminal Server on which our service is running (i.e. 8 * 5 = 40 seconds). When done click OK button



Upon successful installation of the Centerfield Terminal Server windows service you will see this window. Click OK to return to DOS prompt screen.



```
C:\WINDOWS\System32\cmd.exe

C:\Documents and Settings>cd C:\Centerfield
C:\Centerfield>Centerfield /install
C:\Centerfield>net start "Centerfield Service"
The Centerfield Service service is starting.
The Centerfield Service service was started successfully.

C:\Centerfield>_
```

start Centerfield window service

6)

You can check Centerfield service status in a couple of ways. One is to invoke the services applet via Start->Run->services.msc. Another is to check for the existence of Centerfield.exe process in the Task Manager on the Terminal Server.

If there are active OneWorld connections on the Terminal Server, there should be an XCCLIENT job on the System i with the joblog message:

“Serving Terminal Server at IP address 0.0.0.0.” where 0.0.0.0 will list the true IP address of the Terminal Server. If there are no active OneWorld connections on the Terminal Server, Centerfield service will not push any data to the System i.

This completes the Centerfield service installation on the Terminal Server. Service should auto-start every time Terminal Server reboots. For the Centerfield service to push data, XCSERVER job needs to be active on the System i. You can start it by executing *{PROGRAM LIBRARY}/STRSVR* command, or automate this by adding STRSVR command to your IPL startup routine (DSPSYSVAL QSTRUPPGM).

There is one final configuration step that has to be performed from the insure/MONITOR for OneWorld® PC client.

Refer to the documentation located under section **“Configuration for OneWorld® customers”** in the **“insure Monitor User Guide and Reference”** document for details.

3.1.3 Connecting to the server for the first time

Once you have the product installed, you are ready to connect to the server from the Windows based workstations. The workstation installation adds a program group to your start menu called *Centerfield HomeRun*. Within the program group there are one more features that can be selected depending on the options that were selected at installation time. To start the HomeRun tool you want to use, choose its name from this group.

The HomeRun tools use a consistent interface for connecting to the System i. When you start one of the HomeRun tools for the first time on your workstation, you will need to configure your connection to a server.

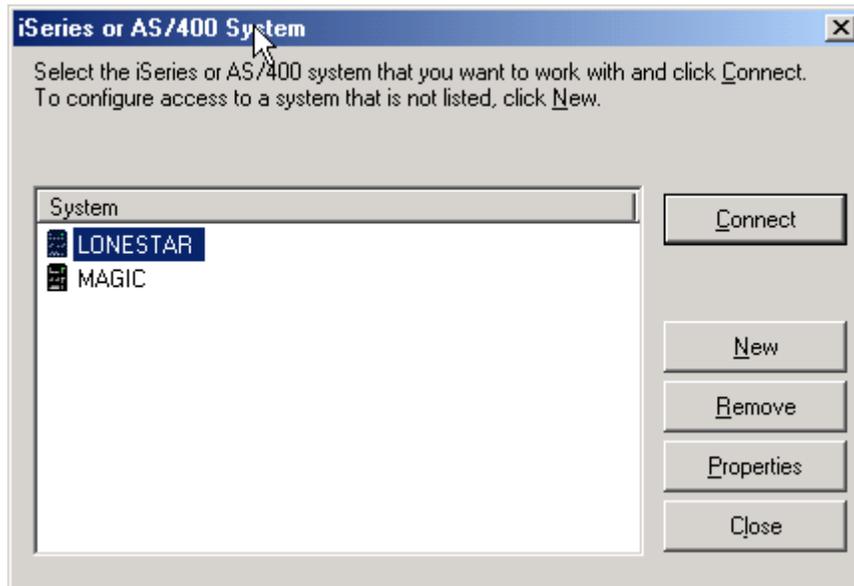
Auto-configuration

When you start the tool, it will try to auto-detect the System i systems in your environment and configure itself to connect to them.

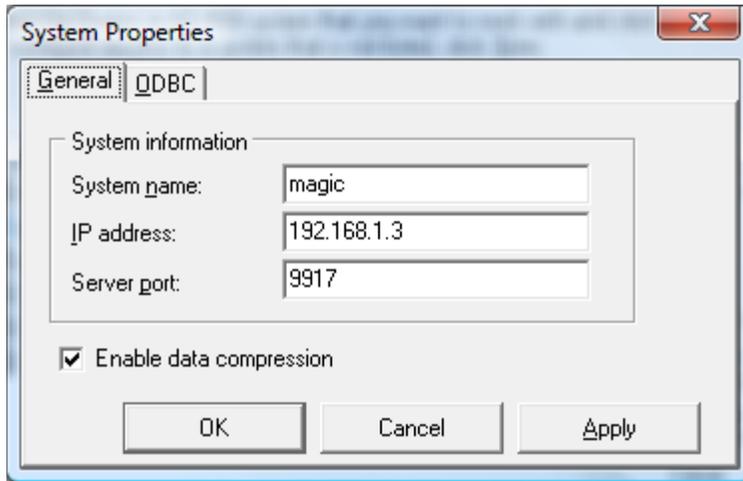
The auto-configuration interface will show you all of the systems that it can detect. If no systems are detected, the auto-configuration will be skipped and you will need to define your system connection information manually.

Manual configuration

If the auto-configuration interface did not detect your system, or you want to manually configure a connection, use the following instructions.



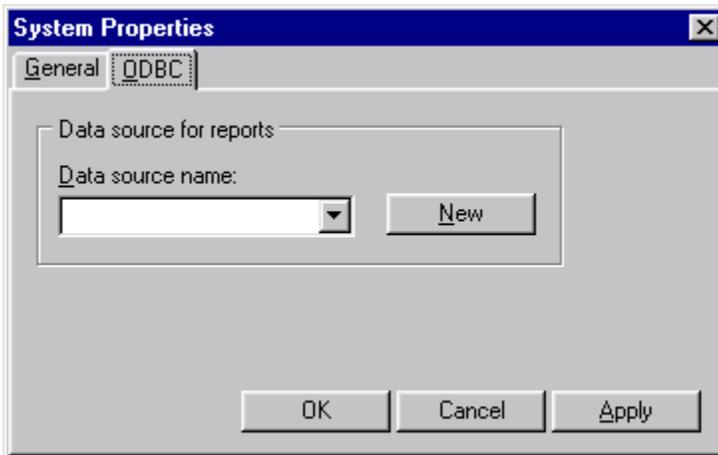
When the *System i* system window is displayed, press [New] to add a new system.



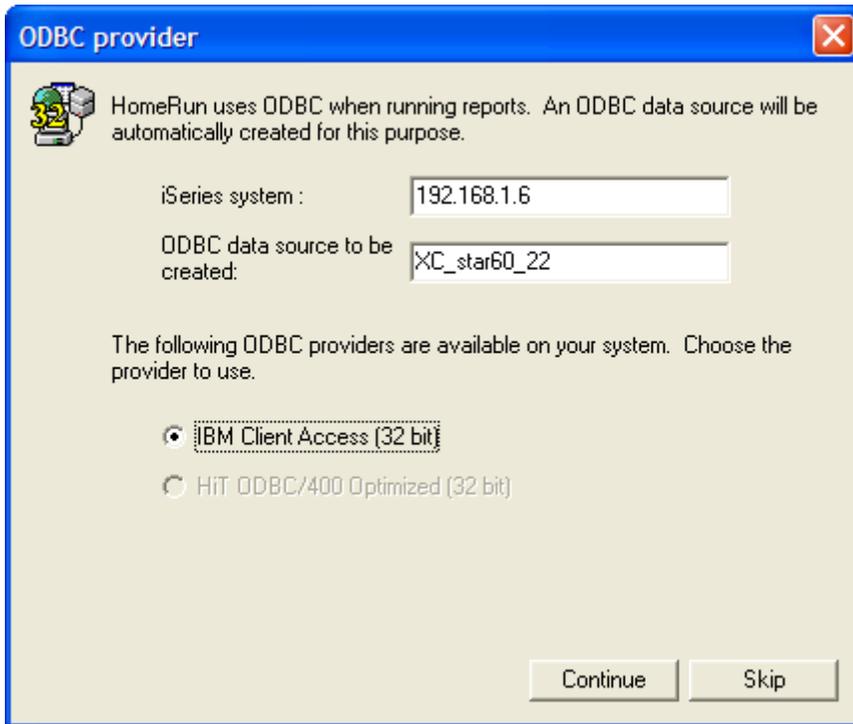
For *System name*, enter a descriptive name that identifies your system.

For *IP address*, enter either the symbolic name or dotted IP address for your System i system.

For the *TCP/IP port*, use the port that was selected during the System i installation process, by default **{default port}** is used.



On the *ODBC* tab, specify a name for your ODBC data source and press **[New]** to create a data source for this system. If you already have a Client Access ODBC data source that is configured to your system, you can specify your existing data source. If you choose to create a data source, you will see a display similar to the following.



Specify the name of the System i as defined in your connection software, and select the data source type that you want, and press **[Continue]**. You must have either Client Access or HIT ODBC installed to use this fast path interface for creating your data source. If you have another ODBC provider, you must create the data source with the ODBC Administrator utility that is provided with Windows and then specify the data source name within the *System Properties* window on the *ODBC* tab.

After you have created your data source and specified values for all of the appropriate prompts on the *System properties* window, press **[OK]** to create the connection definition.

Connecting to a system

Select the system that you want to work with from the list provided in the *System i system* window, and press the **[Connect]** button. Enter your user profile and password and press **[Connect]**.

3.2 Install Policy Managers

Note: you must complete this step before the policies you define will take effect.

insure/RESOURCES consists of software that runs on both the System i and your PC. Once the basic software has been installed on the System i and PC you need to decide which query commands or interfaces you want to define rules for. Until you specify which interfaces you want to manage, any policies you create and assign will not be enforced.

To install the insure/RESOURCES policy manager for an interface, choose the **Configure** option from the main menu and then choose the **Install policy manager** option. You will then be presented with a window that shows the possible interfaces you can manage with insure/RESOURCES. If you have already installed a policy manager for an interface, it will be checked and grayed out. If the interface does not have a policy manager installed, it will contain a blank checkbox indicating it is not currently enabled. Choose the interfaces you want to manage, click the checkbox, and then click the **Install** button.

Once this step is complete, you can define policies and assign them to users by interface.

3.3 insure/RESOURCES workspace

The insure/RESOURCES workspace (main window) is divided into several sections. On the left of the main window is a tree that contains a list of objects that are manipulated or used by insure/RESOURCES. At the top level is an information-only node that gives you a brief summary of the main steps in the use of insure/RESOURCES.

Secondly, there is a **Policies** part of the tree where you display, change, or create new policies. Under the main Policy node is a list of interfaces supported by insure/RESOURCES. If you click on an interface name (e.g. **Run Query (RUNQRY)**) you will see a set of tabs on the right side of the screen that indicate what controls you can put in place for that particular interface.

If you expand the tree for an interface, you will see built-in policies or custom policies you have defined.

The next major section of the tree shows **Users** and the policies currently assigned to them. If you expand this part of the tree, you will see all user and group profiles on your system. You will also see a special profile called *PUBLIC that you can use to easily

assign a policy to all users on your system in a single step. If a user or group profile has policies currently assigned to it you will be able to expand the list under that profile to see those policies.

Finally, there is a **Reports** portion of the tree. This section allows you to see the built-in insure/RESOURCES report categories (on the left) and the associated reports that fall in that category (on the right).

3.4 Define your workday

The next step is to define your workday. The time frames defined as part of the workday will be used to control the time ranges in which the insure/RESOURCES policies will be enforced. It is highly recommended that you choose these time frames carefully since altering them after rules have been assigned to users may mean you have to reassign policies.

To define the workday, you can either use the **Configuration** menu item followed by the **Define workday...** option or choose the “define workday” icon from the main toolbar.

Once you have brought the window up to define time periods, you can specify the name of the time period, a description of that period, a start time, and an end time. The name of the time period can be up to 18 characters and the description can be up to 128 characters. When you have finished defining a new time period, just hit the **Add** button. If you define a new timeframe that overlaps an existing period, you will be told what effect that change will have before actually adding it to the list of time periods.

3.5 Define policies

As you proceed with implementing your resource environment, you may decide either to define your own policies or to use the predefined policies provided as part of insure/RESOURCES. You should understand how to create a policy before moving on to the planning stage, because some planning methods require creation of policy definitions.

3.5.1 Predefined policies

Centerfield Technology ships a set of predefined policies with insure/RESOURCES for each interface supported. You will find policies for logging, for allowing jobs to run faster, and for forcing jobs to run slower. When deciding whether these policies are right for your environment, here are some attributes of each to note:

1. **Logging:** On the Resource Controls tab, “Log threshold exceeded event” is checked for each threshold. On the Tracking tab, Log Operational Detail is

-
- checked, and several options in the Advanced dialog are checked as well.
 2. **Faster:** On the Resources Defaults tab, the job settings are adjusted to allow the job to run faster than it would by default.
 3. **Slower:** On the Resources Defaults tab, the job settings are adjusted to force the job to run slower than it would by default.

You may use these policies as they are, adjust them to your liking, or use them as models for defining your own policies.

3.5.2 Defining new policies

To create a new policy based on another policy (such as a predefined insure/RESOURCES policy), highlight that policy name. On each tab, change the options as you require for your new policy. On the Summary tab, give the policy a new name and press the Create button. A new policy will be created, and the existing policy will be left unchanged.

To create a new policy from defaults, without basing it on another policy, highlight the name of the interface you are creating the policy for. Go to each tab and select the options you want for that policy. On the Summary tab, give the policy a name, and click Create.

3.6 Plan for policy implementation

The planning step is where you decide which policies are right for your environment. The insure/RESOURCES policies can let you control the following:

- Access to the interfaces (RUNQRY, OPNQRYF, ODBC, STRSQL, RUNSQLSTM)
- Resources when using a query tool including setting the job priority, timeslice, and query parallelism.
- Per-query rules based on the expense of the query including the ability to change the priority or timeslice, log information about the query, send messages about the query, call your program, or cancel the query.
- Log information about who, what, and when queries are run and what their expected impact was.
- Changing accounting codes to enable granular tracking of query requests and assistance to job accounting software.
- Diagnostic help such as the production of job logs and forcing those joblogs to a predetermined out queue.

There are three approaches you may take to insure/RESOURCES policy implementation.

3.6.1 Fast-Path Planning approach

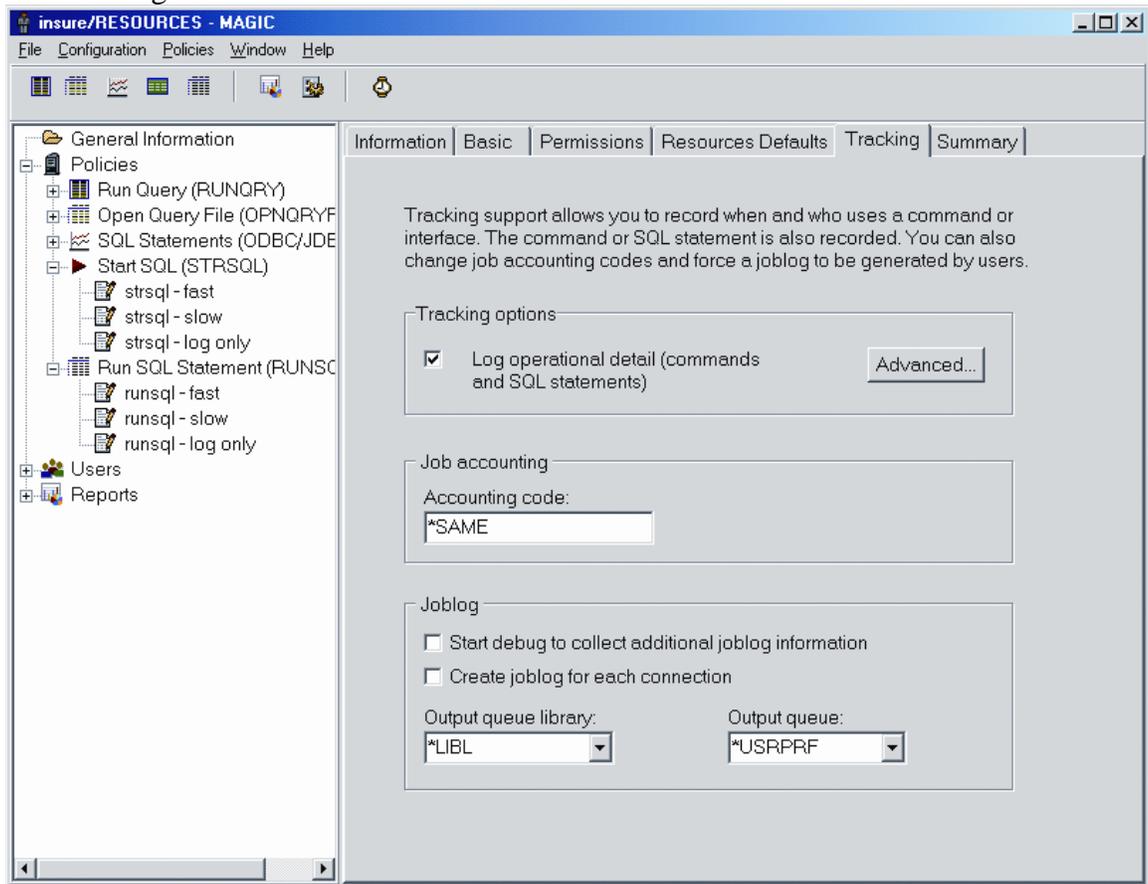
The first method is to look at the existing built-in policies and assign them to users based on the knowledge of your environment. Use this approach if you feel confident the policy is going to accomplish your goals based on its work management and logging settings, or if you have an immediate problem that needs resolution.

3.6.2 Environment-Monitoring Planning process

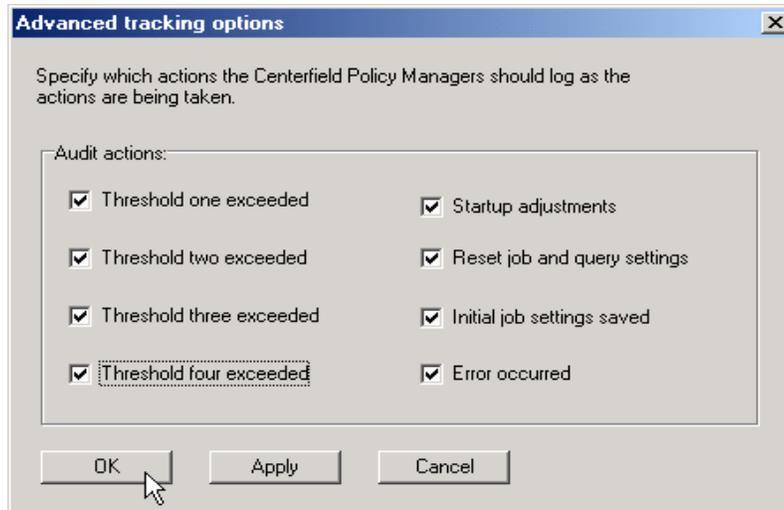
This approach is meant to be used when you need to gather information about how users are currently using your environment before you define and apply policies.

For each interface, define a new policy in which none of the defaults are changed except on the Tracking tab. The critical steps in the Environment-Monitoring process are:

1. Check the 'Log operational detail' checkbox in the Tracking options section of the Tracking tab



2. Click the Advanced button in the Tracking options section of the Tracking tab, and check the desired actions for logging.



Apply these new, “tracking-only” policies to all users. Periodically run the reports to gain insight into user activity. When you are confident you understand the nature and extent of user activity via the interfaces controlled by insure/RESOURCES, you can either assign the shipped, pre-defined policies to certain users, or create and customize policies to assign.

3.6.3 Feedback Planning process

The third approach is to assign policies to users but tell insure/RESOURCES they should not be enforced. With this approach, insure/RESOURCES will monitor queries but not make any changes. Instead, the changes it would have made can be logged, and reports run against that information. The reports can then be used to further refine the policies or as the basis for truly ‘enforcing’ the rules you have set up. The steps are:

1. Define ‘simulation mode’ policies. (To do this, check “Do not implement actions” on the Basic tab.)
2. Assign those policies to active query users and let them run in simulation mode
3. Run reports on insure/RESOURCES information
4. Based on the information determined in step 3, make policy adjustments
5. Go back to step 3 until no changes are necessary in step 4.
6. Change the ‘simulation mode’ policies into ‘real’ policies

In the first step, define policies as you normally would, but on the Basic tab click the check box to indicate ***Do not implement actions, only log events (simulation mode)***.

The second step is to assign the simulation policies to active users. When enough time has passed so that these users have run a variety of queries, data will have been collected that indicates the degree and type of query activity on your system. The length of time you should wait before taking the next step will depend on the amount of activity you

have on your system.

The third step is to run insure/RESOURCES reports to determine the pattern of queries and the actions that would have been taken had the policies been enforced. insure/RESOURCES comes with a variety of built-in reports to help you see what kind of query activity you have and what policies will help you achieve your management goals. These reports give you information such as:

- Who is running queries
- When the queries are running
- How often the queries are running and with what interface
- The rule actions that would have been taken based on that query activity

This information will allow you to determine the correct settings, reasonable thresholds, and appropriate data collection levels.

The fourth step is to make policy adjustments based on the reports run in step three. If you do have to make policy adjustments, then you should wait for more query activity to occur before again running reports and making further adjustments.

Once you no longer have to make adjustments to the policies, you can then update the policies so they “go live”. To do this simply edit them and uncheck the ***Do not implement actions*** box.

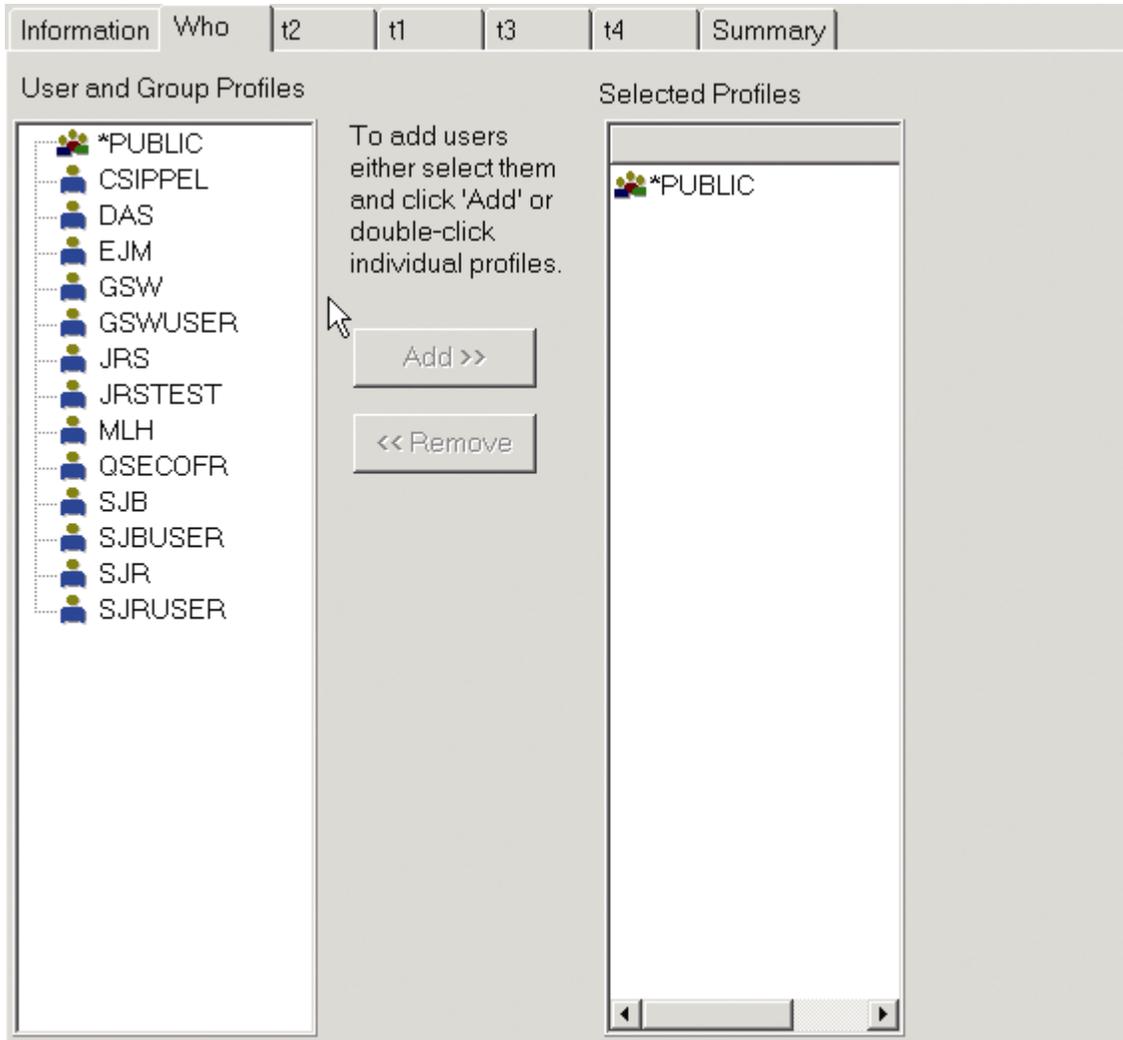
3.7 Policy assignment

The next step is to assign desired policies to users (either in “simulation mode” or to actually be enforced). When policies are assigned to users for a specific part of the workday, those rules are enforced immediately.

There are two methods to assign policies to users: drag-and-drop or through the use of dialogs. The drag-and-drop method is easiest for assigning a small number of policies to few users. The dialog method is much more efficient for assigning multiple policies, for multiple users, across multiple time periods.

To assign a policy using drag-and-drop, simply identify the policy you want to assign, drag it with the mouse to the user profile you want to assign it to, and drop it on that user. Once the policy is assigned, it will appear under that user in the tree.

For assigning multiple policies through dialogs, use the ***Policies*** menu item and the ***Assign policies*** submenu. In this case you will be presented with a set of tabs on the right side of the screen that will allow you to choose user profiles, policies, and time periods.



To assign policies do the following:

1. On the **Who** tab, select the users you want to define a common set of policies for. This can be done by a) highlighting the user profile and clicking **Add** or b) double clicking the user profile or c) highlighting multiple profiles using standard Windows keys (e.g. holding the control key down and clicking the desired profiles) and then clicking the **Add** button.
2. On the next tabs (which represent time periods in your workday), you will be given a list of interfaces to assign policies for. For each time period (i.e. on each tab) specify the policy that should be applied for the given interface.
3. On the **Summary** tab, you will be shown a list of profiles that are being assigned policies as well as the actual policy names assigned to each time period. Once you are satisfied with the results, just click the **Apply** button.

Once you have applied the policies, the user tree will be refreshed to show that the

assignments have been made. Under each user you will see the combination of policy name and associated time period so you can tell at a glance what is currently being enforced.

3.8 Monitor policy impacts and make adjustment

After policies are assigned to users, the insure/RESOURCES policies can be monitored to ensure they are accomplishing your management goals. Built-in reports provide the necessary information for making adjustments to policies and timeframes.

For example, running the Operation Adjustments report will tell you what kind of adjustments were made (if actually enforcing policies) or would have been made (if in “simulation mode”). Using this information you may decide that you should make adjustments to policies to either enforce the policy more frequently or less often.

The insure/RESOURCES reports can tell you:

- Policies you have defined and who they are assigned to.
- The number and type of queries that are being run on your system.
- Time periods with the most activity.
- The number of queries falling into each of the thresholds defined in the policy editors.
- The actions taken by insure/RESOURCES as queries were run when the rules were enforced.
- The actual text of the query if the policy was set up to log each request.

4 Advanced Topics

This section describes more detailed and advanced features of the insure/RESOURCES tool. It will also present alternative approaches to accomplishing various goals and provide tips on product use.

4.1 Configuration features

This section will describe how to properly configure insure/RESOURCES so you can start to define and enforce policies.

4.1.1 Install Policy Managers

If you find that policies are not being enforced for a particular interface, the first step should be to make sure that a policy manager has been installed for the interface via the *Configuration* and *Install policy manager...* menu items.

4.1.2 Uninstall Policy Managers

To disable any policy enforcement for an interface, go to the *Configuration* and *Uninstall policy manager...* menu item. This sequence will bring up a dialog that will allow you to prevent policies from being defined for a given interface. If a given interface has its checkbox clicked, simply unclick that interface and click the *Apply* button.

4.1.3 Workday definition

This section describes in more detail how to define your workday so policies can be assigned to users for specific time periods. It is highly recommended that you choose your workday time periods carefully. If existing time periods are changed later, the changes could have an impact on the policies currently assigned to users since the policy timeframe is part of the assignment information. For example, if you decide to delete a time period, the policies assigned to users during that time period will also be removed since the named timeframe will no longer exist.

As described earlier, to define the workday, you can either use the *Configuration* menu item followed by the *Define workday...* option or choose the “define workday” icon from the main toolbar.

4.1.3.1 Using the workday shipped with insure/RESOURCES

Centerfield ships a pre-defined workday as part of insure/RESOURCES. It is intended to provide a starting point for defining your own time periods, but can be used as-is if you wish. As pointed out earlier it is best if time periods remain fairly static once they have been defined to minimize the amount of rework that may be necessary if they change significantly at a later time.

4.1.3.2 Adding a time period

To add a time period, specify the name of the time period, a description of that period, a start time, and an end time. The name of the time period can be up to 18 characters and the description can be up to 128 characters. When you have finished defining a new time period, just hit the **Add** button. If you define a new timeframe that overlaps an existing period, you will be told what effect that change will have before actually adding it to the list of time periods.

4.1.3.3 Updating a time period

To update an existing time period, simply highlight that period. When it is highlighted, its information will show up in the top part of the window and can be edited as you wish. To change a name, description, start time, or end time just type over the existing value or adjust it via the appropriate control. Once you are done changing the period's attributes click the **Update** key and the impact of those changes will be shown to you. If you wish to accept the changes just click the **Ok** button or to reject the changes click the **Cancel** button.

4.1.3.4 Deleting a time period

To delete a time period, just click on the desired time period and click the **Delete** button. You will be warned that all policies assigned to user's for that time period will be removed as well. If you still wish to delete the policies just click the **Ok** button otherwise click the **Cancel** button.

4.2 Policies

This section describes insure/RESOURCES policies and the effect of each option on the command or interface it applies to. Note that not all options are available for every interface. When defining a new policy you will be presented with the valid options for that interface.

4.2.1 Inspecting existing policies

To determine the attributes of an existing policy, you simply need to highlight the given policy on the left part of the insure/RESOURCES main window. Once the policy is highlighted, click on the tabs shown on the right part of the window and examine each of the attributes.

4.2.2 Creating new policies

Policies can be created in two ways:

- Using default values as a base
- Using attributes from an existing policy as a base

To create a policy using either method, click on the name of the interface you want to define the policy for, right click the mouse, and choose the creation method of your choice. Alternatively, you can choose the **Policy** menu item followed by the **Define policies** submenu. This second method uses default values to prime the new policy.

When the “default values” are chosen, insure/RESOURCES chooses values that let the interface run as it would without policies. Therefore, changes must be made to the default definition to initiate changes in the way the interface runs.

When the “use existing policy” method is used, the attributes of the existing policy are used as a base for the new policy.

4.2.3 Policy values

This section will describe each of the policy options and how that option will impact the execution of the chosen interface. The sections that follow will describe each of the options listed on the tabs that appear when the create option has been chosen.

4.2.3.1 Basic

This tab lets you specify whether the values you will be defining for this policy apply to batch jobs, interactive jobs, or both. This gives you the flexibility to assign different policies to the same user, for the same time of day, depending on whether the user’s job is running in batch or interactive.

The basic tab also allows you to define ‘simulated policies’. The actions defined by a ‘simulated’ policy are never actually taken, but the actions that *would have been* taken can be logged. This logged information can be used as input into the planning process so policies are created for maximum impact and assigned to the most appropriate users.

4.2.3.2 Permissions

The permissions tab allows the administrator to allow or disallow the use of a command or interface. If you need to prevent the use of a certain interface, for certain users, during certain time periods, you will need to define a policy that prevents its use. If you choose to disallow the use of an interface, no other options will be allowed.

4.2.3.3 Resources defaults

The resources defaults tab lets you define the job and query control attributes that are put into effect when the command or interface is first used. For example, you may want all

users of RUNQRY to run at a lower priority than the rest of your interactive users. If you define a run priority of 30 to be used by a RUNQRY policy, the users assigned this policy will run at a priority of 30 regardless of their prior setting.

Job run priority: This is the priority for the job running the interface when it is used.

Time slice end pool: This is the pool the job is transferred to if the job's timeslice end is reached.

Timeslice: This is the number of milliseconds the job is allowed to run before being put on hold while another job gets to use the CPU.

Maximum query processing time: This is the maximum amount of time the query should be allowed to run. If the query optimizer estimates the request will take longer than this number of minutes the query will not be allowed to run. See the System i CHGQRYA command for more information about this setting.

Parallelism allowed: This setting controls the use of parallelism. For a further description of this option and possible settings, see the help for the parallel options on the CHGQRYA command.

Parallel processing degree: This value, only valid when "Parallelism allowed" is set to a value other than *NONE, is used to control how many processors are used by a single query. For further information on this setting see the System i CHGQRYA command.

Use multiple asynchronous jobs: This setting allows multiple jobs to be used by the query processor to implement a query. For further information see the CHGQRYA command.

Job Types this policy should apply to: This setting allows you to specify whether this policy should apply to interactive jobs, batch jobs, or both. This allows you to treat interactive and batch jobs differently, even if run by the same user during the same time of day.

4.2.3.4 Resource Controls

While the Resources Defaults settings determine overall settings for each interface, the Resource Controls tab allows you to specify *per-query rules* based on performance thresholds. If you want to define different actions to be taken based on the expected runtime of the query, these attributes let you customize rules insure/RESOURCES enforces.

Note: The Resource Controls tab appears only for the Run Query and Open Query File interfaces.

Thresholds: You are allowed to define four different performance thresholds. For example, you may want to define actions to be taken for queries that take between 20 seconds and 60 seconds and another set of actions for queries between 61 seconds and 120 seconds. Actions to be taken for each threshold are defined on the tabs on the lower part of the window.

As you adjust the time ranges for each threshold, the other threshold ranges will

automatically be adjusted as you move from one threshold range to another (to ensure there are not overlapping ranges).

Threshold actions: You can specify a number of different actions to be taken when queries fall into a threshold range.

Log threshold exceeded event: This option will force an entry to be logged in the Centerfield action table that indicates that the threshold limit was exceeded. The results of this table are made available through the insure/RESOURCES built-in reports.

Send message to message queue: This option will result in a message being sent to the System i message queue specified on the right. This will allow operators to be informed of query events so they are aware they are about to run. It also allows other third-party software to be utilized to make system changes based on query activity.

Change job run attributes: This option allows job attributes to be changed on the basis of the estimated query runtime. For a description of the settings see the Resources defaults information. Besides being able to choose the job's run attributes based on the expected expense of the query, you can also choose to limit when those rules are applied. To specify additional rule criteria, choose the **Options** button. On the **Threshold Options** window you can choose to change run attributes for all jobs, only interactive jobs, or only batch jobs. You can also choose to implement the changes if your system is busy (i.e. running at more than a predetermined CPU threshold).

Call a program: This option allows you to specify a program to be called when a threshold has been exceeded. By calling a program you supply, you have the ability to record information, change job attributes, or take any other action that makes sense for your situation.

Cancel the query or SQL statement: This option will cancel the request. In all cases, the query will not be allowed to run based on the amount of system resources it is expected to take.

4.2.3.5 Tracking

This tab allows options to be specified that allow you to keep track of query activity. The tracked information can be used for a variety of purposes (planning, user management, etc.). The information tracked is made available in the insure/RESOURCES reports.

Tracking options: If you check the **Log operational detail** option, information will be put in Centerfield files about query requests. To track specific requests, click on the **Advanced...** button. If you choose "Advanced", you will be allowed to track the following types of events or requests:

- An indication that the query threshold was exceeded. Each threshold can be tracked individually, so if only the most expensive thresholds are important you can choose to log only those events.

-
- The first use of an individual command or query.
 - The resetting of job attributes
 - The act of saving the job's initial settings before its run attributes are modified.
 - Errors that occur while enforcing insure/RESOURCES rules.

Job accounting: This option allows you to utilize software from other third parties that build on job accounting information. You can choose to specify a different job accounting value when using a given interface so you can track job activity on a very granular level.

Job log: These settings control the generation and creation of a job log. The first option, ***Include SQL and database activity***, will force additional query optimization to be put in the joblog as queries execute. The ***Create joblog for each connection*** option forces a job log to be created and optionally will put the job log in a specified out queue.

4.2.3.6 Summary

The summary tab allows you to give your policy a name and description. It also provides a consolidated view of your policy so you can verify the policy reflects your intents before actually creating it. When you click on the Summary tab, you are presented with a place to name the policy and type in a longer description. If the policy already exists, you are allowed to update the policy.

4.3 Policy assignment

This section describes the methods used to assign policies to users. When policies are assigned to users for a specific part of the workday, those rules are enforced immediately.

There are two methods to assign policies to users – drag-and-drop or through the use of dialogs. The drag-and-drop method is easiest for assigning a small number of policies to few users. The dialog method is much more efficient for assigning multiple policies, for multiple users, across multiple time periods.

To assign a policy using drag-and-drop, simply identify the policy you want to assign, drag it with the mouse to the user profile you want to assign it to, and drop it on that user. Once the policy is assigned, it will appear under that user in the tree.

For assigning multiple policies through dialogs, use the ***Policies*** menu item and the ***Assign policies*** submenu. In this case you will be presented with a set of tabs on the right side of the screen that will allow you to choose user profiles, policies, and time periods.

To assign policies do the following:

1. On the ***Who*** tab, select the users you want to define a common set of policies for. This can be done by a) highlighting the user profile and clicking ***Add*** or b) double

-
- clicking the user profile or c) highlighting multiple profiles using standard Windows keys (e.g. holding the control key down and clicking the desired profiles) and then clicking the **Add** button.
2. On the next tabs (which represent time periods in your workday), you will be given a list of commands/interfaces to assign policies for. For each time period (i.e. on each tab) specify the policy that should be applied for the given interface.
 3. On the **Summary** tab, you will be shown a list of profiles that are being assigned policies as well as the actual policy names assigned to each time period. Once you are satisfied with the results, just click the **Apply** button.

Once you have applied the policies, the user tree will be refreshed to show that the assignments have been made. Under each user you will see the combination of policy name and associated time period so you can tell at a glance what is currently being enforced.

5 Scenarios for product use

This section discusses the topic of resource management in general, as well as ways to approach resource management with insure/RESOURCES. It describes several common resource issues and a step-by-step approach to address them.

insure/RESOURCES is intended to control and optimize resource usage. This discussion shows how the features of insure/RESOURCES help you achieve your query management goals in your environment.

5.1 Issues

With the advent of client/server tools and application development, several changes happened which made performance management more difficult. For example:

- Access to data with reports became based on tools which use ODBC and SQL
- Many more users now have the ability to query and report on data
- Unlike traditional transaction systems, the demands on the system are not as predictable. For example, individual queries may have widely varying resource needs.
- Most work is now done in batch jobs communicating with an attached PC rather than a direct-attached terminal or 5250 emulator.

These environmental differences make traditional management techniques inadequate to diagnose and fix performance problems.

Several issues are very common. The first is the runaway query. An ill-formed query or a request for a large amount of data can easily bog down a large System i. Since query requests are often ad-hoc, it is not possible to predict when they will occur or who will cause them.

Another problem is the difficulty of using parallel processing for queries. At the highest level, parallelism is controlled by a system value. As a result parallelism is either turned off for the system or turned on. As a practical matter, you may want to not use parallelism during peak hours so bread-and-butter applications run well. After hours however, to process queries more quickly it might be desirable to allow parallelism and thus cut processing time.

5.2 Challenges

The challenge with these environments is to proactively manage users to prevent performance problems while at the same time fully utilizing machine resource when it is available. insure/RESOURCES allows you to balance the conflicting requirements by

providing:

- The ability to define flexible rules for resource usage to define who can use resources and when they can be used.
- The capability to exploit system resources through traditional (e.g. job priority) and nontraditional (e.g. query parallelism) methods

5.3 Purpose

insure/RESOURCES is intended to provide Information Technology (IT) personnel the capability to manage a query environment far better than they can do with built-in system features. Because many business processes depend on regular queries and reports, IT often is challenged by the highly variable and unpredictable nature of those requests. As a result the IT department needs to manage their system in a way that ensures the critical business applications run well, while still allowing users to access data via queries and reports. insure/RESOURCES helps achieve this goal by helping system administrators:

Balance Resources: insure/RESOURCES balances system resources so production applications are not slowed down by queries. To protect bread-and-butter applications, insure/RESOURCES allows you to define business rules that are automatically enforced. Depending on the needs of the user and the availability of resources, queries can be prioritized lower or higher relative to other work on the system.

Restrict Access: During critical times when the completion of processing is critical, it may be necessary to restrict end-users so they do not run reports. This may be necessary for two reasons:

1. To help ensure the time-critical processing completes without interference from ad hoc query activity or
2. To ensure the end-user running reports does not see inconsistent data. For example, if month-end processing does a mass update of a file that is queried on a regular basis, you may want to make sure queries are not run when the batch job that updates the file is active.

Track query activity: IT departments often do not have a good idea which query tools are being used, when they are used, and by whom. Furthermore, they may not have any idea what kinds of queries are being run. As a result, the systems or application administrators may not be able to properly manage activity or help their users get the most out of the data available to them. For example, the IT department may produce a summary file that should be used to generate popular reports. Without knowledge of what queries are being run, it is impossible to determine if the summary table is being used or whether the end-users are continuing to query the production files directly. Furthermore, it may be beneficial to give end-users education on the best way to query data. With knowledge of which users are running queries and what kinds of questions they are asking the IT department can direct its education efforts toward the users and

queries that will provide the most benefit to their internal customers.

5.4 Policies for resource management

Resource policies fall into two general categories: prevention and optimization. Each policy you define will fall into one category or another as described below.

Problem prevention: Resource policies allow you to control:

- Maximum query runtime
- The priority of the job servicing a client via one of the supported interfaces
- The lock timeout value

Performance optimization: Resource policies also allow you to minimize the time required to run a query through control of:

- Job priority
- The many levels of disk I/O and CPU parallelism
- The use of multiple systems to execute queries

The first step is to identify the resource policies in these two categories that are important to your installation and applications.

Resource policies can be defined to control the following aspects of ODBC resource consumption:

- Maximum query times
- Job run priority
- Maximum lock wait time
- Parallelism allowed & level
 - *OPTIMIZE
 - *MAX
 - *SYSLVL
 - *IO
 - *NBRTASKS
- Use of Asynchronous jobs
- Use of DB2 Multi-system

6 Support

Centerfield Technology Inc. is committed to providing our customers with support as problems or questions arise. Support includes minor enhancement releases and upgrades which might be necessary as OS/400 and i5/OS releases become available.

6.1 Contact Information

Internet

Web support pages are maintained at www.centerfieldtechnology.com. Updated documentation, how-to's, FAQs, and a list of known problems will become available as needed.

E-mail

To contact technical support by email, send email requests to support@centerfieldtechnology.com.

Fax

To contact technical support by fax, send your request to **(888) 908-3073**.

Phone

You can call 507-287-8119 for technical support. Telephone support is available from 8:00 AM to 5:00 PM CST.

6.2 Additional Information

- Visit Centerfield Technology's HomeRun web site www.centerfieldtechnology.com to find the latest software patches for HomeRun. Follow the support link from the home page.
PTFs listed in this document are current as of the date this document was released. There are times where IBM releases PTFs applicable to the functions our software uses after the document release date. Accordingly, we strongly recommend you visit our website periodically and verify that all listed PTFs are applied on your system.

7 Appendixes

7.1 System-wide installation impacts

HomeRun changes some settings on your IBM System i™ system at installation time that can affect your current system configuration and activity. The HomeRun modifications that may have system-wide impacts are limited to:

- Changing system values
- Ending currently active Centerfield servers, jobs, and monitors
- Configuring network attributes
- Modifying subsystem configurations
- Adding exit points

This section also details information on HomeRun's use of the following IBM System i™ features:

- TCP/IP usage
- Job scheduler usage
- Authorities on installed libraries
- CL Commands and APIs used
- Programs which adopt authority

7.1.1 System Values

The HomeRun toolset helps you handle issues like performance, security, and usage tracking which requires special system privileges. Because the product installs software that performs privileged operations, it requires certain system values that control authority and application privileges to be set to certain values. The following table shows the list of system values and a description of the HomeRun installation requirements.

QALWUSRDMN	This system value is checked at installation to ensure that the value is either *ALL or that it contains the {PROGRAM LIBRARY} library as one of the libraries that allows user domain objects. HomeRun requires this setting because it stores and directly accesses user space objects in the {PROGRAM LIBRARY} library. If the system value is not set properly for HomeRun, the installation support modifies the setting to include the {PROGRAM LIBRARY} library.
------------	---

QALWOBJRST	This system value is checked at installation to ensure that the value is either *ALL, or that it at least allows system state objects (*ALWSYSSTT) and objects that adopt owner authority (*ALWPGMADP) to be restored. HomeRun requires this setting because it restores objects with these attributes into the {PROGRAM LIBRARY} and {DATA LIBRARY} library. If the system value is not set properly for HomeRun, the installation will fail.
QUSEADPAUT	This system value is checked at installation time to ensure that the system does not restrict the list of user profiles that are allowed to modify programs to use adopted authority. HomeRun requires this because depending on the system program temporary fix (PTF) level, this system value can also control users that are allowed to run programs that adopt *OWNER authority. If the system value is not set properly for HomeRun, the installation will fail.

HomeRun references several other system values at run time to determine information about your system configuration. The following are other system values that are referenced at run time:

- QACGLVL
- QDATE
- QDAY
- QYEAR
- QMONTH
- QSRLNBR

7.1.2 Servers, Jobs, and Monitors

You need to ensure that the objects that will be replaced by the HomeRun installation and the resources that are being modified by the installation are not used or locked by other jobs on the system prior to starting the product installation. HomeRun creates and replaces objects in the {PROGRAM LIBRARY} and {DATA LIBRARY} libraries. You should ensure that there are no objects locked in these libraries prior to installing the software. However, even if you do not check these libraries before you start the installation, the HomeRun installation checks that some of the common jobs that can hold critical locks or cause other problems are always ended before letting the installation continue.

7.1.3 Database Monitor and HomeRun

Several features within HomeRun build on top of the IBM System i™ database monitor support (STRDBMON command). The HomeRun installation ends the database monitor if it is actively collecting system-wide activity. It ends the monitor to help ensure that there are no locks on files within the {DATA LIBRARY} library.

7.1.4 Subsystems and Work Management

The HomeRun server software handles:

- Managing and processing incoming requests from the administrative console software
- Enforcing user access policies configured by the administrative console software
- Scheduling of any activity requested by the administrative console
- Maintaining data collection information

The HomeRun server uses its own work management configuration to control how HomeRun client jobs are started. At installation time or using the HomeRun CFGSVR IBM System i™ command, you define the subsystem that HomeRun activity should run in. By default the Centerfield server will run in its own subsystem defined by the XCSBS80 subsystem description in the program library. It is highly encouraged that you use this subsystem to isolate the Centerfield server from other system work. At installation time, an autostart job entry is put into the QUSRWRK subsystem. This autostart entry will automatically start the Centerfield subsystem and server so you do not normally have to start the server manually after an IPL. **If you use the default subsystem (XCSBS80) you can skip the rest of this section.**

The job queue is used as the starting point for starting new HomeRun client jobs. The job queue entry that is added is for the XCTCP job queue that is found in the *{PROGRAM LIBRARY}* library. If you are changing an existing configuration or installing over a previous version of a HomeRun server, the existing job queue entry is first removed and then the new entry is added to the specified subsystem. The command that HomeRun uses to add the job queue entry is similar to the following. The default subsystem is XCSBS80, and the sequence number begins at 50. If 50 is not available, the number is automatically incremented by the HomeRun configuration support until an unused sequence number is found.

```
ADDJOBQE SBS(subsystem description) JOBQ({PROGRAM LIBRARY}/XCTCP) MAXACT(*NOMAX) SEQNBR(50)
```

A secondary job queue entry, XCAUTODBA, is used to schedule background work for HomeRun's AutoDBA feature. By default it is placed at SEQNBR(60).

The routing entry that HomeRun installs controls the routing of the HomeRun client jobs. It must be added to the same subsystem that has the XCTCP job queue entry. The routing entry uses the XCTCP routing data for comparison and calls the QCMD program. The XCTCP job class is specified as the job class for the routing entry. The command that HomeRun uses to add the routing entry is similar to the following. The default subsystem is XCSBS80, and the sequence number begins at 170. If 170 is not available, the number is automatically incremented by the HomeRun configuration support until an unused sequence number is found. The second routing entry is added for work that should be run at a lower priority level and therefore uses a different class than the rest of

the server jobs.

ADDRTGE SBSD(subsystem description) SEQNBR(170) CMPVAL(varies by release) PGM(QSYS/QCMD) CLS({PROGRAM LIBRARY}/XCTCP)

ADDRTGE SBSD(subsystem description) SEQNBR(180) CMPVAL(varies by release) PGM(QSYS/QCMD) CLS({PROGRAM LIBRARY}/XCTCPBJ)

If you are changing an existing configuration or installing over a previous version of HomeRun, the existing routing entry is not removed. It should not cause any harm to your existing application environment to leave it installed in a subsystem that is no longer used by HomeRun. If you want to remove it, you need to remove it using standard work management support available on the IBM System i™. You can use a command similar to following. Before issuing the command, you need to make sure that the sequence number used on the remove routing entry command is the sequence number for the HomeRun routing entry. You can check the routing entries by using the WRKSBSD command and displaying the routing entries for the subsystem that you want to change. For more information about performing work management activities, see IBM System i™ work management documentation.

RMVRTGE SBSD(subsystem description) SEQNBR(170)

RMVRTGE SBSD(subsystem description) SEQNBR(180)

The HomeRun installation creates objects within the {PROGRAM LIBRARY} installation library to support these and other work management changes on your system. The following are objects that are created by the HomeRun installation support that can be used for work management control.

Object Name	Object Type	Description
XCTCP	Job description	Job description used to set job properties for HomeRun administration client jobs
XCTCP	Job class	Job class used to set job properties for HomeRun administration client jobs
XCTCPBJ	Job class	Jobs class used to run jobs that may run long- running operations and should execute at a lower priority than other work.
XCTCP	Job queue	Job queue used to start HomeRun administration client jobs
XCHLP	Job description	Used by the XCHELPER background job

XCIAFINDER	Job description	Used by the XCIAFINDER background job (V5R4 and higher)
XCPC	Job description	Used by the XCPC background job
XCSTRSVR	Job description	Used by the autostart job entry
XCSCRUBBER	Job description	Job description used to set job properties for the HomeRun Collection Scrubber job
{PROGRAM LIBRARY}	Output queue	Output queue used for upcoming product enhancements

You can modify the objects used for controlling work management, but your changes will not be preserved when you upgrade to the next version of HomeRun.

7.1.5 Exit points

The following exit point is added during HomeRun product installation:

Exit Point	HomeRun Program Name
QIBM_QWT_JOBNOTIFY	XCDTAQ

This exit point is used by the Usage Tracker for insure/INDEX and insure/ANALYSIS. At installation time, no jobs are ended and no subsystems are ended. However, if you want to have the Usage Tracker monitor for specific new jobs that start (that is, if you choose the *Filtered jobs* Profile type), you will need to end and restart any subsystems in which those jobs might start before your monitor will take affect. This only needs to be done once after the installation of HomeRun.

Three other exit points are optionally added at installation time. A prompt will appear that asks if these exit points should be added so that additional types of data collection can be done by HomeRun. By default they are installed, but they can be bypassed if so desired. The three exit points are:

Exit Point	HomeRun Program Name
QIBM_QSQ_CLI_CONNECT	XCCLINIT
QIBM_QZDA_INIT	XCODBCINIT
DDM exit point (DSPNETA)	XCDDM

7.1.6 TCP/IP Usage

The HomeRun server uses TCP/IP to communicate with the HomeRun clients. The server and client applications communicate almost exclusively using a TCP application.

The application is written to use proprietary application data flows to give fast and efficient performance.

The IBM System i™ and personal computer sockets applications communicate with each other through TCP ports. Ports are used by the TCP protocol to identify a unique origin or destination of communication with a TCP application. TCP ports can be any numeric value from 1 to 65535. TCP applications that are commonly used, like ftp and telnet, use pre-assigned port numbers. Pre-assigned port numbers are called well-known TCP ports. The well-known TCP port numbers range between 1 and 1023 and should not be used when you configure HomeRun. If you specify one of these ports, it can affect the operation of the application that normally uses the well-known port. When you install HomeRun, a port and associated application service is configured. The service name for HomeRun is CENTERFIELD_SERVER_80 and the port by default is **{default port}**. If the **{default port}** port is already used by another application, the port number is incremented until a free port is found. The command that HomeRun uses to add the service and port configuration is similar to the following. You can check the port and service configuration after you install by using the WRKSRVTBLE command and locating the CENTERFIELD_SERVER_80 in the service list.

```
ADDSRVTBLE SERVICE(CENTERFIELD_SERVER_80) PORT({default port})  
PROTOCOL('tcp') TEXT('Centerfield Technology Server')
```

In addition to the proprietary communications method, HomeRun uses an ODBC connection to handle report requests made by the administration client. HomeRun requires an iSeries Navigator ODBC connection. When the HomeRun client is installed, the auto-configuration support will attempt to configure an ODBC data source if the supported ODBC driver can be detected.

7.1.7 Job Scheduler Usage

The IBM System i™ built-in job scheduler is used by several components of HomeRun. Events that can cause jobs to be placed on the job scheduler are:

- Scheduling a Database Profiler data collection
- Scheduling Index Create requests using insure/INDEX or Visual SQL Explain
- Cleaning database collections using the Collection Scrubber
- Autonomic Database Assistant (AutoDBA) analysis and actions

7.1.8 Default public authority of libraries

The *{PROGRAM LIBRARY}* and *{DATA LIBRARY}* libraries are created with the default create authority set to *CHANGE.

7.1.9 Command Language (CL) Commands Used by

HomeRun

HomeRun is continually being enhanced and modified, so the list of CL commands used by HomeRun also continues to change. The following is a list of CL commands that are used by HomeRun. If you have modified command defaults or installed an application that either replaces or changes any of the following commands, you should contact Centerfield Technology to discuss the impacts that the changes may have on HomeRun.

NOTE: This list may change without notice and is not guaranteed to be complete for the most current version of software.

ADDPFTRG	CHKTAP	DLTJRN	IF	RTVMBRD
ADDMON*	CLOF	DLTJRNRCV	GOTO	RTVMSG
ADDEXITPGM	CPROBJ	DLTOVR	MONMSG	RTVNETA
ADDJOBQE	CPYF	DLTPGM	MOVOBJ	RTVOBJD
ADDJOBSCDE	CPYSPLF	DLTSP*	OPNDBF	RTVSYVAL
ADDMSGD	CRTDTAARA	DLTSPLF	OVRDBF	SAVOBJ
ADDRTGE	CRTDUPOBJ	DLTUSRSPC	OVRPRTF	SBMJOB
ADDSRVTBLE	CRTJRN	DO	PASSWORD*	SNDPGMMSG
ALCOBJ	CRTJRNRCV	DSPDBR	PGM	SNDRCVF
CALL	CRTLF	DSPFD	PRTSQLINF	STRDBG
CALLPRC	CRTLIB	DSPJOB	RETURN	STRDBMON
CFGSVR*	CRTOUTQ	DSPJOBLOG	RCVF	STRHOSTSVR
CHGACGCDE	CRTPF	ENDDBG	RCVMSG	STRJRNPf
CHGJOB	CRTSAVF	ENDDBMON	RMVJOBQE	STRSVR*
CHGLIBL	CRTSP*	ENDDO	RMVJOBSCDE	STRTCPSVR
CHGNETA	CRTSRCPF	ENDHOSTSVR	RMVMSGD	
CHGOBJOWN	CRTUSRPRF	ENDJOB	RMVPFTRG	
CHGQRYA	DCL	ENDJRNPf	RMVMON*	
CHGSYSLIBL	DCLF	ENDPGM	RNMOBJ	
CHGSYSVAL	DLCOBJ	ENDPJ	RSTOBJ	
CHGVAR	DLTDTAARA	ENDSVR*	RTVDTAARA	
CHKOBJ	DLTF	ENDTCPSVR	RTVJOBA	

* Indicates Centerfield Technology command

7.1.10 OS/400 System APIs Used by HomeRun

HomeRun is continually being enhanced and modified so the list of system application interfaces (APIs) used by HomeRun also continues to change. The following is a list of system APIs and header files that contain API interfaces that are used by HomeRun. If you have installed programs that either replace or change any of the following APIs, you should contact Centerfield Technology to discuss the impacts that the changes may have on HomeRun.

NOTE: This list may change without notice and is not guaranteed to be complete for the most current version of software. This list may not include every API that is used if the API name does not match the included source member (i.e. the name of the API is in the source file and used by Centerfield but not explicitly listed here).

CEELOCT	QUSDLTUS	QWTSETP
QCMDEXC	QUSGEN	QWCRSVAL
QDBRTVFD	QUSLJOB	QUSRTVEI
QDBLDBR	QUSLMBR	QUSMBRD
QLICHGLL	QUSLOBJ	QUSRTVFD
QMHRVTVM	QUSPTRUS	QUSCHGPA
QMHSNDPM	QUSRJOBI	QDBBRCDS
QSYGETPH	QUSRMBRD	QTNADDCR
QSYRLSPH	QUSRTVUS	QUSMIAPI
QUSCHGUS	QWCRJBST	QDMLOPNF
QTNRMVCR	QWCRSSTS	QMHRSNEM
QUSEC	QWCLOBJL	QPMWKCOL
QJOURNAL	QMHRCVPM	QWDL SJBQ
QTOCNETSTS	QPMLPFRD	QWCLSCDE
QWCCHGTN	QWDL SBSE	
QPMLPMGT	QUSCUSAT	

7.1.11 Programs Adopting *OWNER Authority

The following programs adopt *OWNER authority. All HomeRun programs are compiled to use adopted authority.

Program Name	Description
XCACTODBC	Retrieve actively connected user access jobs
XCADDJE	Add job notify exit point
XCADDJOB CFG	Add job configuration command processor
XCADDUAE	Add the remote monitoring support
XCADVIX	Advise indexes
XCAUDOPR	Audit a client request
XCJBCFGPOP	Change job history prompt override processor
XCCFGMONHS	Configure monitor history auditing
XCCFGMONHP	Configure monitor history prompt override program
XCCHGODBCA	Change run time attributes of a user access job
XCCHKCMTCTL	Check commitment control driver program



XCCMD	Internally used by client software to run a Command Language (CL) command
XCCMT (service program)	Commitment control API interfaces
XCDSPLICINF	Display system license information
XCENDHLPCP	End helper command processing program
XCENDSCRBR	End scrubber job command processor
XCHELPER	Background job reading job notify data queue
XCHLP	Main helper job program
XCIAFINDER	Read journal to retrieve recommended indexes
XCIP	Capture IP address for job
XCJOBUTIL (service program)	Job APIs that require job control authority
XCJDELOG	Look at JDE logs
XCJDEINI	Edit JDE.INI file
XCJOBPRF	Start a database monitor collection for a job
XCLOCKCF	Lock APIs
XCLSTJOB	List jobs APIs
XCMONHST	Monitor job history to audit table
XCMTXWAIT	Mutex APIs
XCPASS	License entry and verification
XCPERFCOLL	Performance collector APIs
XCPMSUB	Dynamically substitute parameters for a parameterized SQL SELECT statement
XCPRFCRT	Create a database collection profile
XCPRFDTL	Delete a database collection profile
XCPRFEND	End a Database Profiler collection
XCPRFENDAP	End all active Database Profiler collections
XCPRFRNM	Rename a database collection profile
XCPRFSTR	Start a Database Profiler collection
XCOWCFG	Configure server for OneWorld environment
XCREPBLD	Build Database Profiler repository
XCREPDLT	Delete repository
XCRTVCFGVAL	Retrieve configuration value
XCRMVJBCFG	Remove job configuration
XCRMVUAE	Remove the remote monitoring support
XCSCDTRG	Schedule requested work (used as trigger program for XCSCD file)
XCSCRUB	Remove unneeded collection data
XCSEMWAIT	Semaphore APIs

XCSIGNON	Check password at sign on time and swap user profile to signed in user
XCSPDPCMD	Internally used by client software to run an OS/400 command and return spool file output
XCSQLEXEC	Internally used by client software to run non-SELECT SQL statement with commitment control
XCSQLEXEC0	Internally used by client software to run non-SELECT SQL statement without commitment control
XCSQLSEL	Internally used by client software to run SQL SELECT statement with system naming
XCSQLSEL2	Internally used by client software to run SQL SELECT statement with SQL naming
XCSTRHLPCP	Start helper command processing program
XCSTRSVR	Start the Centerfield server
XCSYSUTIL (service program)	System information APIs
XCTRIGGER	Trigger program for configuration files
XCTRIGGERM	Trigger program for job monitor configuration files
XCDBGUTIL (service program)	Debug utilities