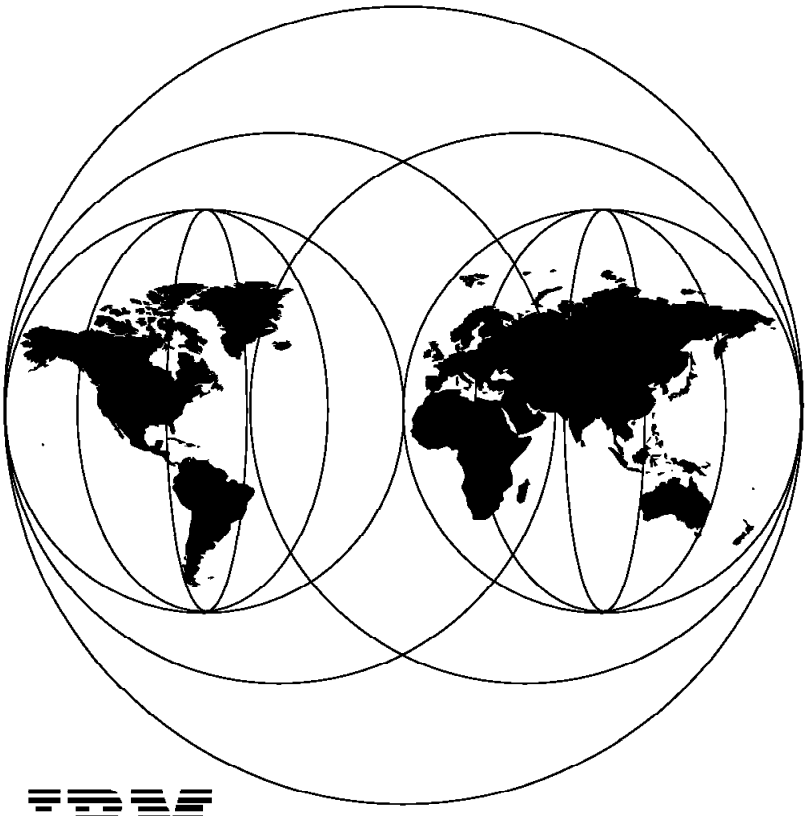
International Technical Support Organization

SG24-4707-00

An Introduction to Configuration Management and ConfigTool

April 1996



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International Technical Support Organization
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Take Note!

Before using this information and the application that is described in this publication, be sure to read the general information under “Special Notices” on page ix.

First Edition (April 1996)

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Abstract

This redbook is intended for management or technical personnel who have responsibility for configuration or inventory management of their local area network (LAN) environments. It discusses some of the challenges and problems being faced in many organizations today in the configuration management discipline and in the control of inventory and assets.

This book first gives you an introduction to the configuration management discipline and some of the areas that need to be considered. It then describes an application called IBM Configuration Management Tool for OS/2 (ConfigTool), which can be used to get started in the configuration management of your LAN environments. This book is a subset of the redbook *Getting Started With Configuration Management Using ConfigTool*, SG24-4667 (available May 1996), which contains more in-depth detail on ConfigTool, and the ConfigTool application itself.

This book is useful for anyone involved in trying to provide effective configuration management of their LAN environments.

(89 pages)

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Figures

Special Notices

This publication is intended to help anyone involved in the configuration and inventory management tasks of an organization to understand some of the challenges and problems being faced in this area. It will also give an introduction on the IBM Configuration Management Tool for OS/2 application which can be used to get started in providing effective configuration management of your local area network (LAN) environments. The information in this publication is not intended as the specification of any programming interfaces that are provided by IBM Configuration Management Tool for OS/2.

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Preface

This redbook looks at some of the challenges facing many organizations today that are trying to deal with the task of providing effective configuration management of their network environments.

It provides an introduction to configuration management and describes some of the areas that need to be considered when getting started in configuration management. It then provides an overview of an application called IBM Configuration Management Tool for OS/2 (ConfigTool) that can help you get started (or make your ongoing tasks easier!) in the configuration management of your local area network (LAN) environments. It describes what ConfigTool is and can do, and then takes you through some examples of using it.

This book is useful for anyone involved in dealing with the effective configuration management of their LAN environments.

How This Document is Organized

The document is organized as follows:

- Chapter 1, “Introduction”

  This chapter gives you an introduction into some of the challenges being faced in today′s environment when managing IT resources. It gives you an introduction to the configuration management discipline, and also discusses the close relationship of configuration management to the other tasks or disciplines involved in the overall management of your environment.

- Chapter 2, “What Is Configuration Management?”

  This chapter goes into more detail on what Configuration Management is all about, and some of the areas this very broad discipline covers.

- Chapter 3, “Getting Started with Configuration Management”

  This chapter describes some of the steps involved in getting started with configuration management. This includes things such as understanding what data you need where, looking at processes, and finally, the functionality required in the tools to perform configuration management.

- Chapter 4, “What Products Collect LAN Configuration Data?”

  This chapter describes some of the LAN management products available today that provide portions of the configuration data, and information that is necessary to provide a complete view of your LAN environment.

- Chapter 5, “What Is IBM Configuration Management Tool for OS/2?”

  This chapter describes an application called IBM Configuration Management Tool for OS/2 (ConfigTool) which can help you get started in the configuration management of your LAN environments. It takes you through what ConfigTool is and can do, and describes how it works with other LAN products to provide a central configuration database. It also takes you through the ConfigTool graphical interface and shows examples of how it can be customized to suit individual requirements.

Related Publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this document.

- *OS/2 LAN Server 3.0 Quick Reference,*, S96F-8434
- *LAN NetView Management Utility User's Guide*, SC30-3555
- *LAN Station Manager User's Guide*, SC31-7108
- *IBM NetFinity Manager for OS/2 Version 3.0*, S41H-6268
- *IBM NetFinity Services for OS/2 Version 3.0*, S41H-6270

International Technical Support Organization Publications

- *LAN Network Manager V1.1, LAN Network Manager V1.0 and LAN Station Manager V1.0*, GG24-3942
- *LAN Management Processes (Alerts/Monitoring) Using NetFinity*, SG24-4517

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Chapter 1. Introduction

Information technology is the term that encompasses the rapidly expanding range of equipment (computers, data storage, network, and communications devices), applications, and services (such as end-user computing, help desk, and application development) used by organizations in support of the business to deliver data, information and knowledge to end users, and is seen as a means to provide strategic value to all parts of a business. However, information technology is not free from cost constraints and budget reductions, and any new technology must be justified by the return it provides to the business in terms of cost competitiveness, competitive leadership, and strategic advantage.

The challenge for the 90s is to address the issue of increasing user productivity with distributed hardware and software, while at the same time minimizing the costs required to manage these more complex, distributed, multivendor, multiprotocol environments.

To achieve these objectives, organizations must have the appropriate facilities in place to effectively manage their information services. This includes both processes and tools for operations management, problem management, change management, and facilities for configuration management.

Effective systems management is a critical factor for information systems to be able to provide more value to the business, while, at the same time, contain costs. They are also critical to those businesses trying to keep the hidden costs of distributed systems in check, and keeping their end users productive to the business. Effective and integrated management tools are acknowledged as being one of the keys to containing the rising support costs being experienced by many organizations.

1.1 Definition of Configuration Management

The definition of configuration management can be stated as:

An enterprise configuration is the set of resources (hardware and software) and connectivity that provide the electronic exchange of business information within an enterprise and with external customers. The connectivity can be physical, such as the cabling between machines, or logical, such as the connection of programs and transaction applications with databases and remote customer locations. Configuration management is the processes and functions to manage the enterprise configuration.

The recent explosive growth in distributed systems and local area networks has added to the complexity of the configuration management task. Distributed systems are often administered locally, while resources may be planned for and financed from a central enterprise control point. The reverse may also be the case; distributed systems are planned and purchased locally, and the task of managing and maintaining the environment put back to the central IT department. Both of these cases can lead to multiple types of products, and multiple protocols being in use in the LAN environment, and only increase the complexity of managing and keeping control of the environment.

Systems and networks today are also increasingly dynamic. Resources can often be moved without service interruption or notice. While this adds to configuration flexibility, it makes managing the assets of the business less predictable and more time consuming to maintain accurate inventory data.

Following are some questions that, although simple, for some enterprises may be challenging to answer.

- Do you know where your assets are?
- Do you know how many workstations your company has?
- Do you know the exact configuration of all those workstations?
- Do you know how often and where a particular piece of (standard) software is installed?
- Do you know who is using/responsible for which workstations in your company?
- Are you sure that the usage of all these expensive assets (printers, memory, disk space, processing power, software, etc.) is optimized in your company?

Configuration management can be seen as one of the most critical systems management disciplines. It spans the administration and operations of networks and systems, and must provide data to many different users and applications (such as problem, change and asset) in the enterprise. It is also one of the hardest disciplines to quantify in terms of the value to the business.

Configuration management can also be one of the most difficult and time consuming of the management disciplines. Collection and maintenance of configuration data can be labor intensive and therefore expensive. This results in many organizations either spending a lot of money on trying to perform some configuration management functions, or by not having effective control or knowledge of what is really in their networks. Configuration management is also one area where automation is critical in order to reduce the number of personnel required to perform the tasks involved.

As the complexity of the distributed environments continues to rise, the demands on managing them will only increase unless we do something. The potential for runaway costs in managing and maintaining a large network is high unless an investment is made in both automation and in effective and integrated management tools.

1.2 Interrelationship of Management Disciplines

To provide an integrated management solution, each of the management functions should interact. For example, functions defined in the business management, performance management, and problem management disciplines need to access and use the configuration management information. Requirements may be fed to configuration processes as a result of the planning processes in the business management tasks. Processes in change management, performance management, or problem management may present specific requirements based on configuration enhancements or changes determined by their analysis.

Figure 1 on page 3 gives an overview of the close interrelationship of configuration management with the other management disciplines.

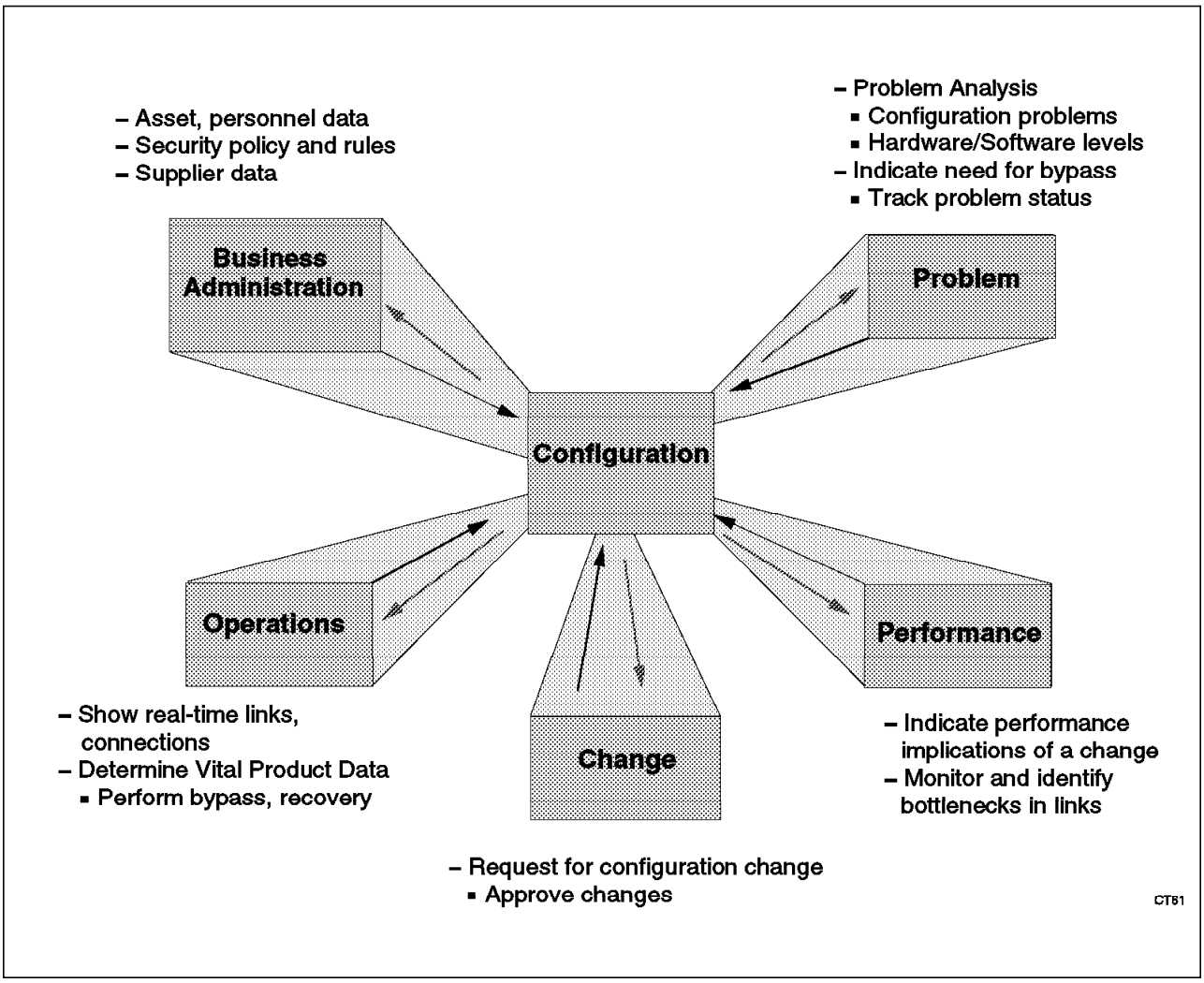

Figure 1. Configuration Management Relationships

The following few pages take you through each of the disciplines shown above and describe them, and how they interact with configuration management.

1.2.1 Business Management

Business management covers some of the following areas:

- **Inventory Management**

  Inventory management is the application that runs against the configuration data, helping to answer such questions as ″What resources do I have?″, ″What software do I have running on the workstations?″, and ″What does my configuration look like?″. Some people would also consider this a subtask of the configuration management discipline.

- **Asset Management**

  Asset management is involved with the lifecycle management of the enterprise resources and can include such topics as contract, invoice, purchase order, and vendor management, and budget/financial analysis. Some people would also consider this a subtask of the configuration management discipline.

- **Security Management**

Security management is concerned with the administrative security tasks and should provide a single-system image of the enterprise security systems. It includes the establishment and enforcement of security policy, the management of security services, and the management of security mechanisms.

1.2.2 Change Management

Change management is the discipline that manages and controls the introduction of changes into an information systems environment. Change management is involved in any planned alterations to an information systems environment. It includes the planning, scheduling, distributing, synchronizing, installing, activating, and monitoring of changes to data processing resources.

Configuration management should be able to pass information on the current configuration to the change management discipline. Change management would then be responsible for coordinating and implementing configuration changes, and on successful completion, be capable of feeding the updated data back into the configuration management process.

1.2.3 Operations Management

Operations management is the day-to-day running of the business, ensuring networks are kept operational and problems or outages are detected and resolved in the shortest possible time.

Operations management functions can change the current state of resources in the system. These state changes may cause alerts to trigger processes that will alter the state of the current configuration.

1.2.4 Performance Management

Performance management tools should allow you to monitor and highlight potential problems or bottlenecks in your network. Current configuration data needs to be available to determine if alternate paths/configurations would relieve or help avoid any performance issues being experienced.

Capacity planning can also be seen as a subtask of this discipline and allows you to plan for future growth of your network and system environment. Without the knowledge of your current configuration, accurate capacity planning tasks become difficult and less effective.

1.2.5 Problem Management

Problem management is the process of managing problems and incidents from their detection through to their final resolution. This discipline includes the detection, analysis, recovery, resolution, and tracking of problems and incidents occurring in the information system. The objective of problem management is to reduce the resources required for problem determination and to provide better availability of information system resources.

Problems can often be very difficult to fix if you do not know what the resource that is having the problem is, how that resource is configured, its network connections, the software that is running on it, etc. Access to configuration functions are also required by problem management to help determine related incidents and support impact assessment of a problem.

1.3 Why Are These Relationships Important?

Each of the management functions or disciplines (problem, change, operations, etc.) closely interact with each other. They each provide information that the other may need to be aware of, and in most cases information that may drive functions or actions in the other discipline(s). For example, performance measurements may detect traffic problems within the network. These problems may result in changes (change management) being made to the configuration (configuration management) of the network to enable more reliable service (operations management) to end users.

Accurate management data is vital, and the ability to share data among the disciplines is becoming more important in the effective management of an enterprise. Effective management tools should allow you to quickly and easily obtain the information you need to manage and control the environment and resolve error conditions.

One of the key pieces in providing this type of data sharing and integration is by the use and adherance to a common data model. Management data needs to be kept in a standard format with a common way of describing the data contained within it. This is what will allow multiple management applications to obtain access to the information they need without requiring duplication of effort or of data.

Chapter 2. What Is Configuration Management?

This chapter covers in more detail what this author believes configuration management is all about. It takes you through some questions that relate to configuration management, some of the tasks included in this very broad topic, and it finally looks at some of the value and benefits of having effective configuration management present in your enterprise.

2.1 Configuration Management Questions

Configuration management is possibly the most ambiguous of all the management disciplines. The term configuration management often means different things to different people. It often depends on the role that person performs in the organization as to what their definition of configuration management is. To help understand some of the areas that this author believes configuration management can cover, the following is a list of questions that help define some of the tasks or functions that can be involved in this discipline. They are relevant and can be asked in both the local area network (LAN) and ″glass house″ environments.

- What do I have? (What are my information assets, my inventory?)
- Where is what I have? (Do I have up-to-date accountable information?)
- How much is what I have costing me? (Is the configuration financial data accurate and managed?)
- Is the configuration meeting my business needs? (Has my staff planned and designed the most cost-effective solution to the business requirements?)
- What happens to the business when a router or a bridge fails? How can we recover and bypass this failure?
- What equipment has to work to keep our new application available?
- What hardware and software is required on my users′ workstations to install a new business application, and will their current machine′s configuration handle it?
- What do I really need to track?
- How can I keep up with the moves, adds, and changes of my equipment and personnel?
- How do the information systems resources we have and the money we are spending on information systems relate to giving us a competitive advantage?
- How can I understand if users are making changes to the systems?
- How can I relate resources to their owners?
- Can I find out quickly the planned configuration additions?
- How can I validate the effect of a configuration change?
- Is there a way to model potential configuration changes?
- Can I see both physical and logical connections to understand the effect of a problem on service?
- How can I centrally change configurations or attributes of the configuration?

- Is there an easy way to determine the physical environment needed for my resources?

This is only a partial list of questions that customers ask of their configuration management systems. However, it indicates the complexity and broad scope of enterprise configuration management. If one considers the configuration as a large complex corporate object, then these and other functions are the operations or methods that are applied to the configuration to plan, control, and optimize its ability to serve the needs of the business.

2.2 The Two Sides of Configuration Management

While there are many different kinds of configuration data and users, most enterprises organize their information systems into the following two parts:

1. The planning or administrative part
2. The operational part

Management of the thousands of resources and connections in a configuration requires careful control and planning to achieve business objectives and avoid errors. The planned/administrative part of configuration management is an enterprise′s control of its computing equipment or assets. It includes functions for things such as inventory control, design of configurations, connectivity information, financial data, recovery procedures, and optimization functions. The chief objectives of the planned configuration are to provide cost-effective use of computing resources and to meet the business objectives of the enterprise.

The operational configuration is the actual running configuration functioning in support of the business. The operational part is responsible for the day-to-day running and availability of the systems and networks. Actual resources (resource names) and network connectivity of resources is discovered, the status of these network resources are monitored, and states within the configuration are altered or controlled. The chief objectives of operational configuration management are the availability and performance of the configuration.

Each of these sides should be integrated so the administrative part can perform the plan and distribute functions, and then the operations part can perform the monitor, control and refresh functions. There must be data flows between each of these sides for integrated configuration management.

Figure 2 on page 9 gives an overview of these two parts to the configuration management discipline and some of the tasks involved in each.

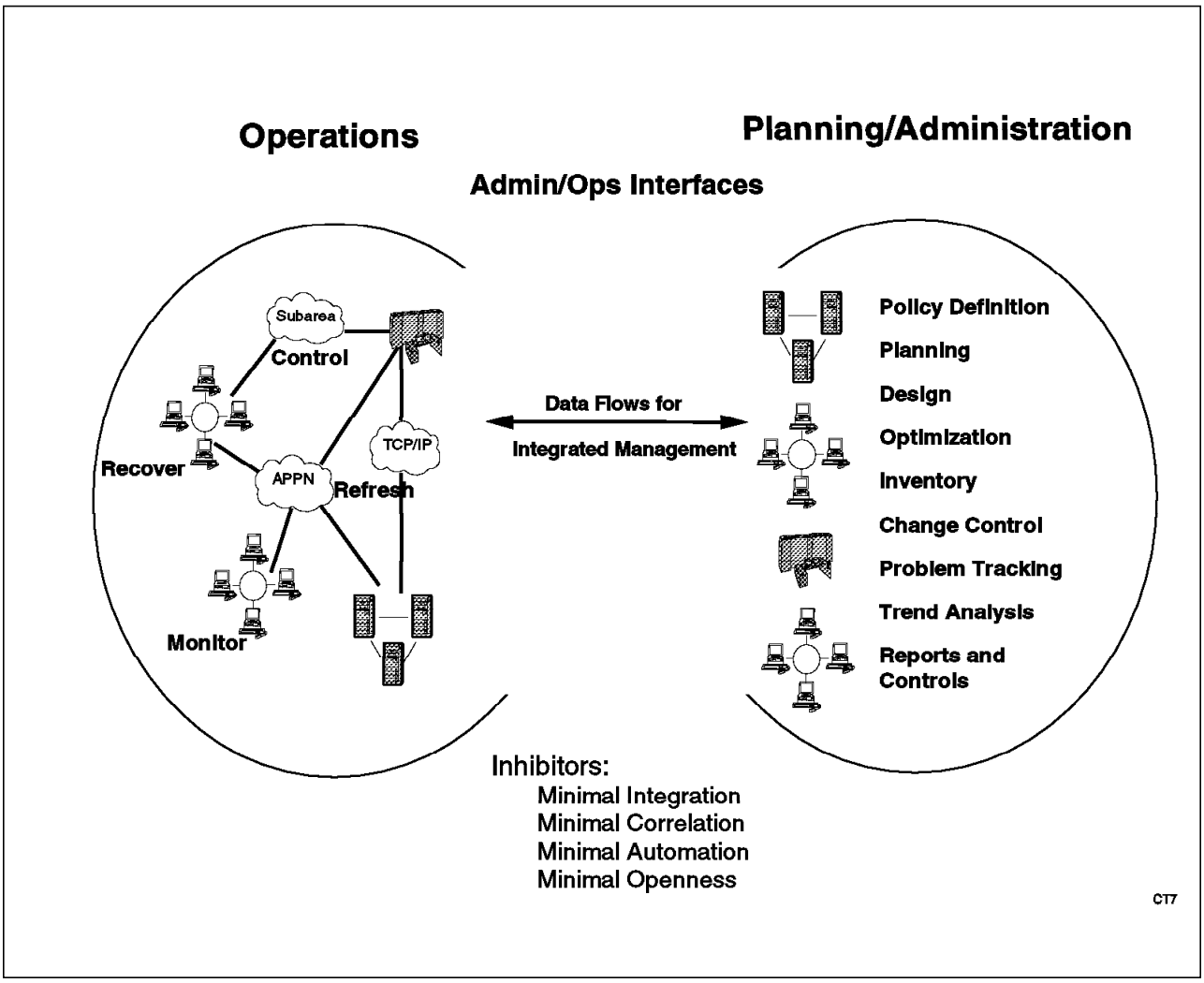

Figure 2. Data Flows within Configuration Functions

There should be specific flows of information between these two sides, as for example when planned configurations (hardware and software) are distributed to operational managed systems, or when automatically detected changes to the running systems are alerted to the administrative environment to verify and control the planned changes. The flow of information and updates between the planned and operational configuration keeps the operational configuration functioning within planned objectives, and the planned configuration current with the latest information.

2.3 Configuration Management Task Overview

Following is an overview of some of these tasks involved in the configuration management discipline.

- **Policy Definition**

  The objective of this task is to define the configuration management-specific policies that the enterprise/business will use. This is one of the first steps in addressing configuration management. All of the tasks in the configuration management set should be able to be viewed in the context of the overall business and corresponding technical goals of the enterprise.

- **Plan**

  The plan task involves the actual determination of what is required in your environment. What types of hardware do you need for your different departments, what software needs to be running on them, etc., to support their specific business function.

- **Design**

  The design task includes the design of hardware, software, and application configurations for your environment. This would also include both logical and physical connectivity designs.

- **Validate**

  The validate task is the function that looks at the design you have created and ensures that it will be a valid, running configuration. This ensures that resources are not connected in an incorrect or unintended way.

- **Optimize**

  The optimize task ensures that the performance of the operational configuration is meeting planned objectives and making the best use of system resources. Optimize functions may initiate changes to be made to the operational configuration. The change task should be fed by the performance management functions.

- **Change**

  This task interacts with the change management functions. A change can be either a physical or logical change in hardware configuration, or in the software in the environment. The configuration change tasks takes the planned configuration changes and prepares and passes the information to the change management functions for distribution and implementation of the actual change.

- **Distribute**

  The distribute task involves the actual distribution of change to the operational configuration and includes functions such as software distribution. The distribute task is a logical flow from the change task.

- **Monitor**

  The monitor task is for the day-to-day monitoring of the operational configuration to ensure that resources are available for the business functions required. Some people will consider this a task of operations management. However, it is still monitoring of the active configuration, and the interaction with configuration management data and tasks is often essential.

- **Refresh**

  The refresh task sends or receives dynamic updates from the operational, running configuration to the planned, administrative configuration.

- **Track**

  The track task includes the asset and inventory functions. This is the ability to track both the hardware and software in your environment, and to answer questions such as how many software licenses X do I have, and where is machine ABC located. This task may also include tasks to track assets for usage so that organizations/departments can be charged for what they use.

- **Recover**

The recover task is involved in the operational side of configuration management. When resources fail, recovery needs to take place to get the end user working again. This could be to resolve the problem, or to make a change to the configuration to find alternative paths/resources so that the problem can by by-passed. Some people will consider this a task of problem or operations management; however, interaction with configuration data and tasks is often essential.

- **Cost**

  This task could also be considered to be in the business management discipline. When a machine or piece of software is purchased and then installed in the configuration, the new resource must be first paid for, and then information on the ongoing support and maintenance costs for that resource maintained.

- **Billing**

  This task includes things such as charging for the use of equipment or services to different departments or organizations.

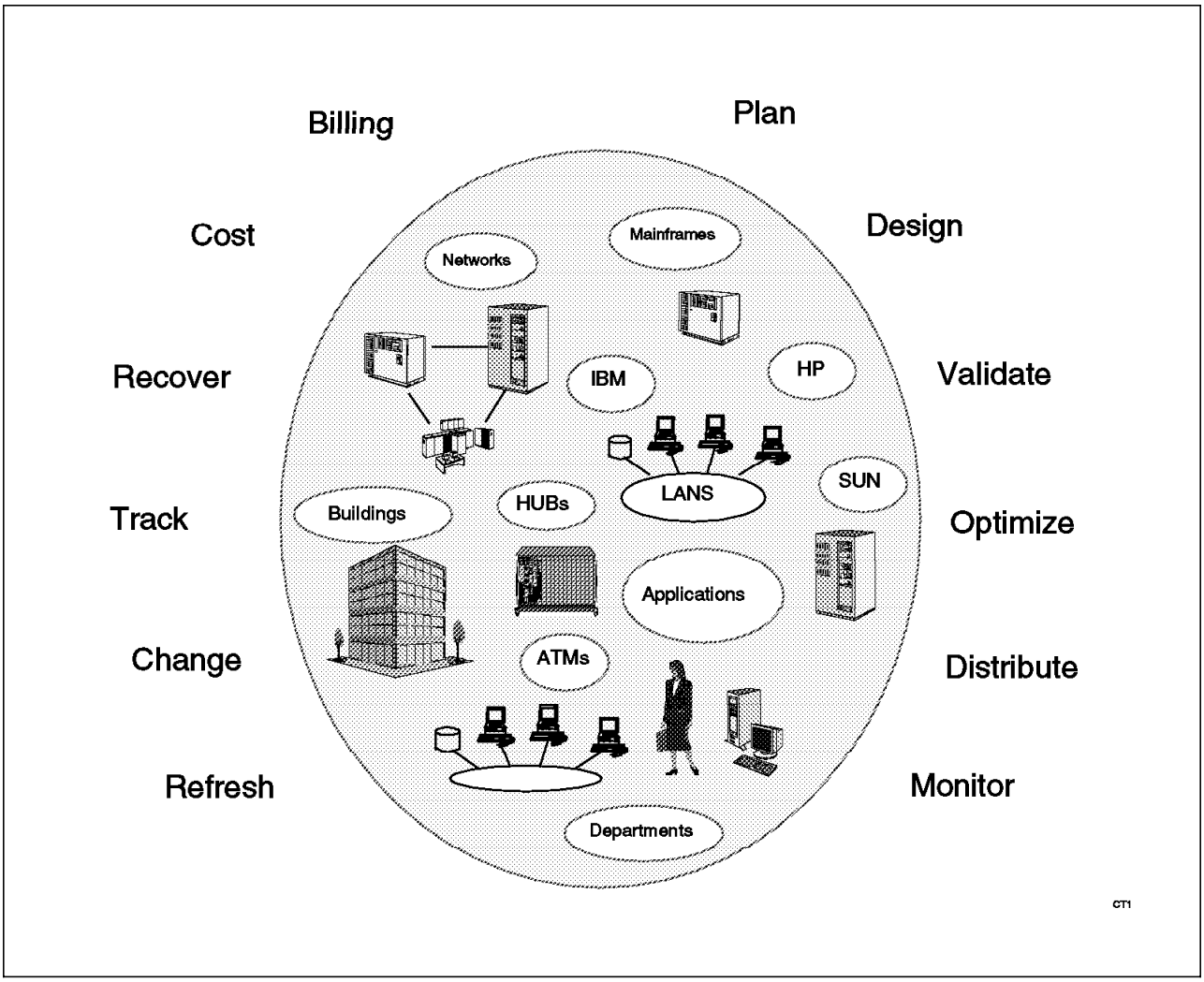

Figure 3. Configuration Management Tasks

These two sides of configuration management can include details from the entire enterprise as shown in Figure 3. Organizations need to be able to define,

display, delete, or query both system and network information, which can include information on the following:

- Host/CPU
- DASD, tape, printers
- External cooling equipment
- Communications equipment
- WAN routers
- LAN adapters
- LAN bridges and brouters
- LAN servers and printers
- Private Branch Exchange (PBX) equipment, etc.

The operational configuration functions must manage all kinds of resources (hardware, network, software and applications), and all their associated components (such as programs and files). It must also be capable of handling all the relationships between these resources (not only the hierarchical parent-child relationship).

The administrative configuration functions must maintain inventory information of all these enterprise resources. It involves maintaining the basic resource information such as a description of the resource and its relationship to other resources. It also must allow the tracking of what resources are in the enterprise, where they are located, and who uses, owns and supports them. The administrative side also includes all the financial details associated with resources, such as the initial cost, and the ongoing maintenance and support costs.

2.4 Configuration Management - Challenging but Vital

Keeping track of computer related assets can be labor-intensive and tedious. With a large number of networked resources and an ever changing network configuration, it is frequently impossible to know exactly where installed systems, cards, printers, software applications, and other network resources are. However, to understand user queries, perform effective problem determination, control costs, and to make the most of existing resources, effective configuration management is essential.

Many studies have recognized that one of the greatest costs of ownership is associated with managing and maintaining the networked workstations, as well as the end-user support tasks. When looking at configuration management, one of the most important factors in LAN costs is the large impact of the LAN administration and physical LAN support tasks. With effective and automated tools in place, configuration management has the potential for significant reduction of expenses.

Automating the configuration management process will also help keep you up-to-date with what is installed on each workstation and provides invaluable information for technical support, software and hardware change management, and systems auditing.

Successful configuration management is also key to achieving integrated, systems management solutions that span both administration and operations.

The following are some of the benefits that can be realized:

- Better efficiency

  An increase in automation applied to the task of collecting configuration management data can significantly reduce the amount of time and effort involved in keeping track of the enterprise resources.

- Improved customer service

  Effective configuration management ensures that information fed to the change and problem management processes is accurate. This will assist in the implementation of effective changes and stops any outages that may occur due to changes based on inaccurate information. It will also ensure that accurate information is available where and when it is needed to help resolve problems as quickly as possible.

- Greater productivity

  Effective configuration management means that personnel should be able to easily find the information they need without physically needing to check equipment or go to multiple databases to gather the required data.

- Increased control

  The LAN environment provides significant challenges when trying to keep track of all the hardware and software components that can be installed on user workstations. Having effective configuration management in place will lead to increased control of what is really out in your LAN environments. For example:

  – Knowing what software is really installed on your user workstations and ensuring that the appropriate software licenses are in place.

  – Making sure that resources are being effectively used. For example, detection of unused disk space on a machine that can be redeployed elsewhere in the organization.

Chapter 3. Getting Started with Configuration Management

Before looking at all the different management products that are currently available to perform some form of configuration management, it is essential to take a step back and look at some of the following areas that also need to be considered when doing configuration management. This chapter goes into more detail about some of the areas where organizations need to question what it is they want and need to achieve out of configuration management, and make some decisions relevant to their business requirements. The following are these areas:

- **The Data**
  - Where is it today?
  - Who needs access to it?
  - How do I collect it?
  - Is there information missing that I need?
- **The Processes**
  - What processes are in place today?
    - Formal
    - Informal

    These processes can include configuration, change, and operational processes.
  - What works and what doesn't?
  - Is there something missing?
- **The Tools**
  - Do you have the right tools for the job?
  - Do all the tools work together?
  - Do the tools meet your needs for data and processes?

Please note!

This chapter discusses the needs and processes required in configuration management. Some of these areas can be addressed by the ConfigTool application described in this book for the LAN environment. This chapter is not intended to imply that all of the needs and processes described are supported by ConfigTool.

3.1 The Users of Systems Management

Each of the people involved with supporting and managing or maintaining network hardware and software have different duties or tasks that they perform. Each also has different data requirements to perform these tasks. For example, operations personnel will want to know resource names and the connectivity relationships that exist between them. Management may want to have asset information to know how money is being spent on information system resources. Network personnel may want information necessary for problem determination

such as cable attachment locations and protocols supported by various workstations.

A process structure only becomes relevant when related to people and business needs. Most medium and large organizations will allocate distinct administrative and operational roles, dividing systems management responsibilities.

One of the first things you should do is look at the people who will be using configuration data and understand what each of their requirements are, that is, what data they need. Figure 4 shows an example of some of the different users in an organization and the sorts of functions and requirements they may have that may need to access configuration management data.

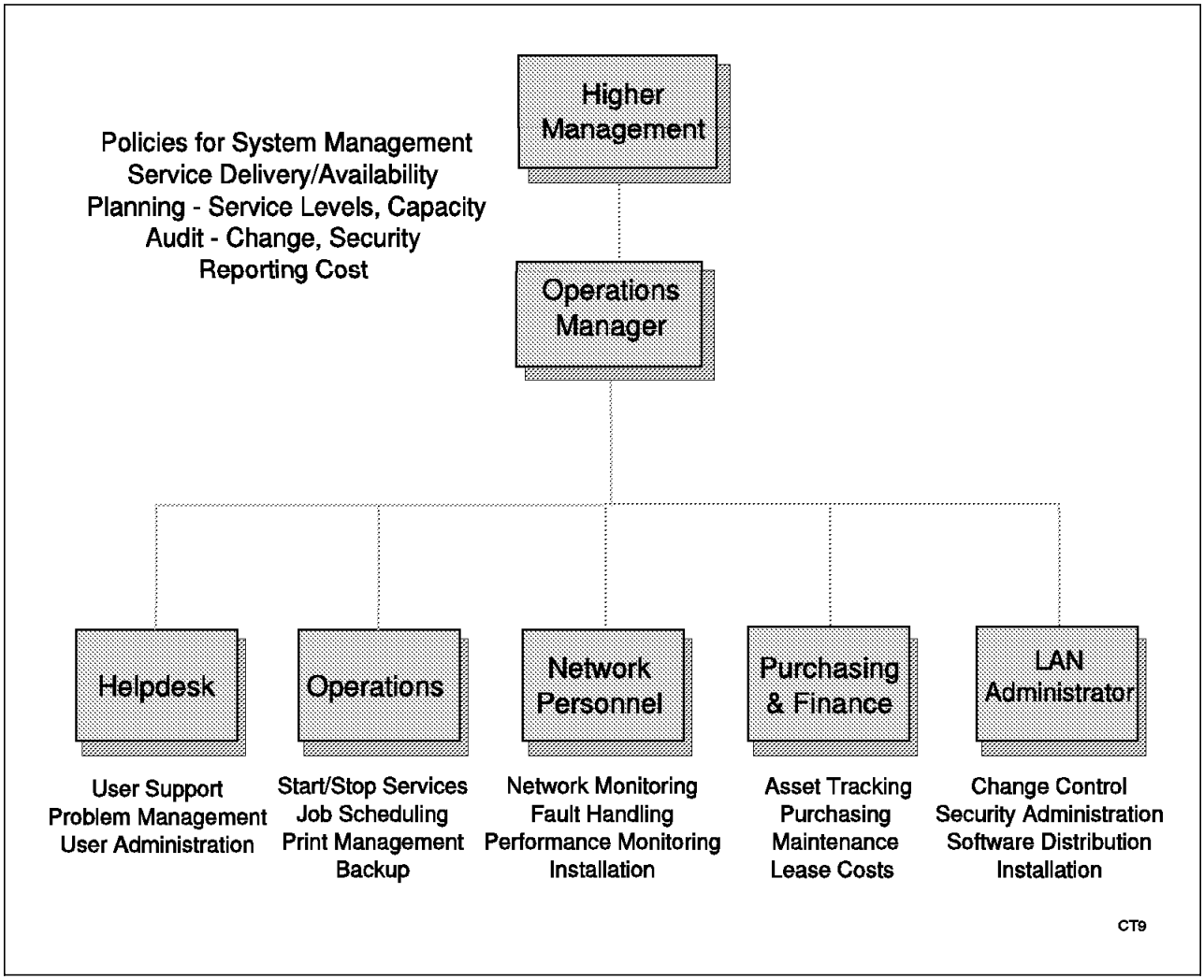

Figure 4. Operational Roles and Their Systems Management Responsibilities

Different companies may allocate the roles in different ways, but they should ensure that all of the responsibilities are covered and that the tools provide information required by each. Following are further examples and descriptions of different types of users and the data they may require:

- The higher management of a company is responsible for assuring that their information systems department is delivering the services that the rest of the business requires at a cost that is affordable. Therefore, their interest in systems management is to assure that they get the right return for their IT

investment. They are interested in seeing reports and presentations that depict this information.

- The CIO or operations manager has overall responsibility for services availability and delivery, and exercises this through setting policies and managing the processes for planning, change, implementation, auditing and reporting. All of this will also be controlled within a financial structure limiting the cost of the operation.
- The systems manager or administrator is responsible for planning, distributing, and installing changes to systems, applications or operating software, and data. This person is also responsible for managing the addition, deletion, modification, and examination of resources (administrative configuration management), as well as administering the authorized access to network resources and data (security management).
- The network manager is responsible for planning and managing the initial installation of network resources and remote systems. This will often be in conjunction with a local LAN administrator, who will have some delegated responsibilities. The network manager will also handle the day-to-day monitoring of the network and will respond to faults, performance and operational issues that arise, and handle events generated by the network. In addition, the network manager will perform the monitoring of resource usage, using tools to create data for performance analysis and to assist in determining future capacity requirements.
- The asset management personnel may be involved in both planning for new equipment, and maintaining records of what resources they currently have installed and where. They will use configuration management for retrieving accurate data about currently used information system resources, and any excess inventory/equipment.

  Financial and purchasing personnel will also be involved in tracking the assets within the organization. They will want to know information to ensure that new resources have been received and paid for, and to get information on ongoing maintenance charges for these resources.
- The operations personnel may have the responsibility for overseeing the initiation and termination of application services, batch job scheduling, and operation of utilities for backup and other housekeeping. The operator may be the point of control for tape services, and printing and distributed printers, managing output queues and monitoring printer operation. Operator functions may also overlap with some of the tasks of a network manager.
- The role of the help desk is an increasingly important role in many companies, and may be set up in a hierarchical fashion with some tasks handled at a departmental or location level. The help desk frequently performs user administration functions, such as adding, removing, and modifying user characteristics. In addition, they perform problem management, which includes reporting, tracking, and resolving problems.

  Help desk personnel will use configuration management to accurately identify the user environment without requiring a heavy question/answer mechanism. They will also use configuration management for problem determination functions.
- The configuration management personnel may be responsible for designing the logical and physical connections between all information system resources. They will use configuration management to build up a single reference database for all relevant configuration data.

- The change management personnel are responsible for the planning and implementation of a change, once a change has been requested in an appropriate manner. Configuration management functions will be needed to have a clear understanding of the environment where the change must take place both from the logical and physical perspectives.
- The trouble shooters are the people with responsibility for the problem determination and the problem resolution/verification, once an incident has been opened. Configuration management functions will be used to assist in analyzing and resolving the problem.

Organizations may have some, all, or more of the above roles within their organization. The point to be made here though, is that each of these users will require access to the configuration data, and each will have different types of data requirements and uses for this information. Each of the user′s needs should be considered when planning for and implementing effective configuration management for the enterprise.

3.2 Getting Started - The Data

The next step in getting started in configuration management is to look at the data. It is important to realize that this step should be related to the previous section, the users of configuration data. You must first understand the data needed by each of your users before looking at the data you have.

Figure 5 on page 19 shows some of the steps that should be considered when looking at the data required for configuration management.

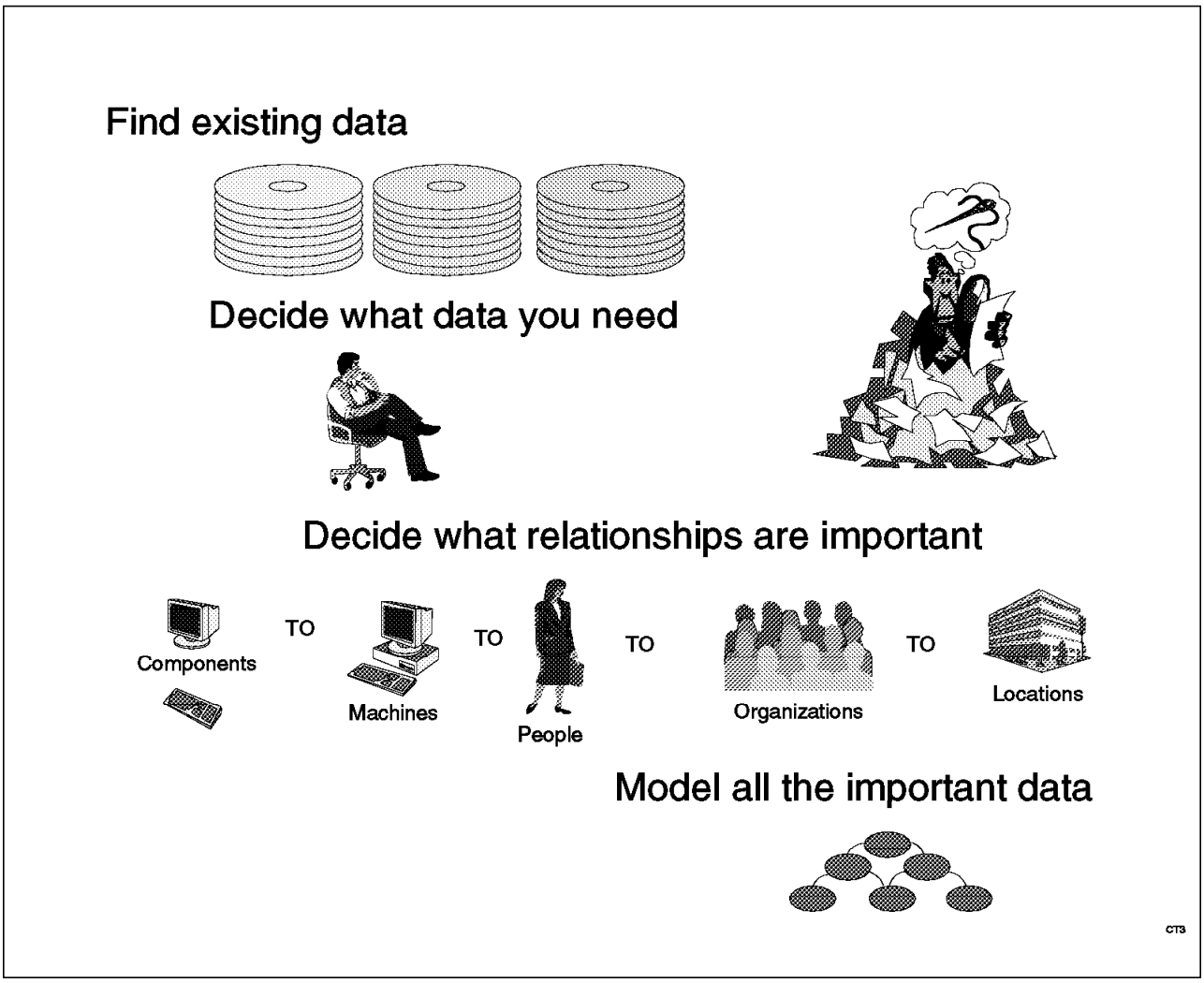

Figure 5. Looking at the Data - What It Is, Where It Is, What Is Important

Following is a description of some of these tasks and decisions shown in the previous diagram that need to be considered:

- **Find Your Existing Data**

  This task will involve finding the data that you currently have. This could be in your LAN products, your management products, purchasing or financial databases, or in filing cabinets in some cases.

- **Decide What Data You Need**

  This next step involves the analysis of the data you have. Do I need all this data? What data is missing that I need to get? How or where can I get it? Does the data meet my user requirements? Once again during this analysis step, it is important to always relate it back to your user or business requirements. In some cases, the analysis may be:

  ″This information would be nice to have. However, it is not critical, and the costs to update and maintain the data outweighs the benefit we would receive″.

- **Decide What Relationships Are Important**

  The next step is to decide what relationships are important and need to be defined between the objects or pieces of your configuration. These

relationships could be things such as matching components to machines to people to organizations to locations.

The definition of relationships is very important in the effective maintenance and control of configuration data. To try to put this into simple terms, the following is an example of some relationships that might need to be defined:

- A tape drive called TD001 is attached to
- A workstation named WS134 which
- Has a user called Mary Smith who
- Works in the Networking Services Organization which
- Is located in Building 339, New York

A logical relationship should be defined between each of these components and would allow the capability for your help desk operator, for example, to type in WS134 and be displayed with all data described above. Physical, logical, people, and organizational relationships are all important, and should be considered when implementing configuration management.

- **Naming Conventions**

  Another critical area and one that is sometimes not thoroughly considered is that of naming conventions. In today's environments which can often involve thousands to millions of objects or resources, not having a carefully thought out and constructed naming convention for constructing your configuration can quickly lead to incorrect, ambiguous, or duplicate names, which can ultimately lead to error conditions and lost productivity.

- **Model All the Important Data**

  Modelling is a subtask of the design phase. It is the modelling of the physical or logical hardware, software, applications, and environmental aspects of your configuration. It involves modelling the configuration to determine the effect of changing certain parameters in the operational environment, ensuring the most efficient and cost effective use of resources in line with your business requirements.

3.3 Getting Started - The Processes

The next step in getting started is to look at your processes. These are the functions that describe what you do with the data and how you do it.

For example:

- When a user calls the help desk to look at a problem, what are the steps that need to be followed to get the problem resolved? What configuration data do they need from the user? What department do they pass the problem on to?
- When a user requires a new piece of software on their workstation, what steps do they follow to get this? How do they order the new piece of software? How do they know if their workstation has enough memory or disk space for the new software, and if it doesn't, what do they do to get an upgrade to their workstation?
- When that new piece of software and the hardware upgrade required to support it needs to be installed, how does the change occur? What happens if it was unsuccessful? If it was successful, how is the configuration data updated to reflect this upgrade?

- How is the purchasing department notified that the new software is now installed and can be paid for?
- How is the new hardware upgrade reflected on the maintenance agreement for this vendor?
- How is a new router configured and installed on the backbone network?
- When that new router is installed in the environment, who is allowed to access and change configuration parameters on the resource?

The answers to these questions should be the processes that are followed within your organization. It is often helpful to not only understand these processes, but to question if they are the most productive, cost-effective and meeting the business requirements. This can involve analyzing the answers to questions such as the following:

- What are your current processes?
- Can processes be improved?
- Are all the right processes in place?
- How can we be efficient without being bureaucratic?

Figure 6 on page 22 shows some of the main processes involved in configuration management.

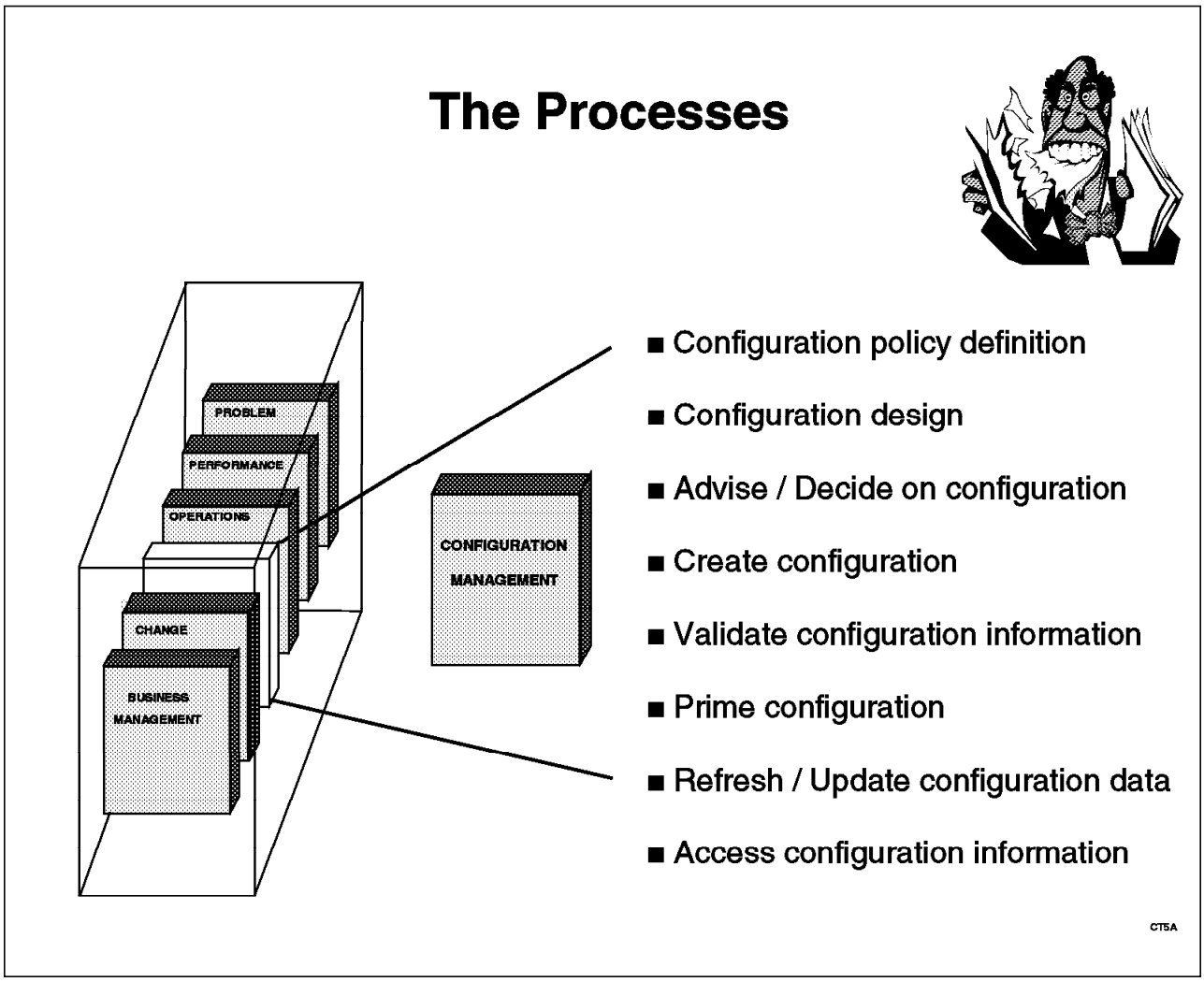

Figure 6. Looking at the Processes - What Steps Need to Be Followed

Following is a description of each of these processes:

- **Configuration Policy Definition**

  The objective of this task is to define the configuration management specific policies that the enterprise/business will use. This is one of the first steps in addressing configuration management. All of the tasks in the configuration management set should be able to be viewed in the context of the overall business and corresponding technical goals of the enterprise. All of the tasks and operations associated with the enterprise resources (and their connectivity) should be able to be governed by the enterprise′s policies.

- **Configuration Design**

  Configuration design includes the design of hardware, software, and application configurations. The objective of this task is to produce a validated configuration model which consists of the resources described in the design process, required support resources and features, and the relationships of resources to one another.

- **Advise/Decide on Configuration**

  The objective of the advise task is to proactively analyze configuration and business requirements and make specific recommendations for optimization

of expense, throughput, or other business objectives. For example, ensuring that the planned configuration meets performance objectives (performance optimization).

The objective of the decide task is to make configuration decisions about the running network or system based on real-time events. These events might include a performance degradation or an unplanned outage for which a recovery plan is in place. The recovery plan is what would be done when operations personnel are alerted to an error condition.

- **Create Configuration**

  The objective of this task is to build and manage a configuration description that is resource-specific, allowing differences among various resources to be incorporated into the overall configuration plan. The configuration may be a section of a network, a system (such as a host), programmable workstations, or the entire enterprise.

- **Validate Configuration**

  The objective of the validate task is to ensure that configuration resources are described accurately and correctly, ensuring that resources are not connected with one another in an incorrect or unintended way.

  Validation can confirm that an isolated resource is described properly (for example a LAN adapter), or it can confirm that the interconnection between multiple resources is accurate (for example the transmit/receive buffer sizes used between a workstation and host).

- **Prime Configuration**

  No large configuration is randomly assembled, even if resources and connectivity can be identified automatically either now or in the future. An enterprise configuration should be a carefully planned structure, using financial, performance, capacity, and reliability parameters in its construction and maintenance. The planned configuration should be the controlling management tool for the maintenance of the operational configuration.

  Ideally, the planned changes to the operational configuration are distributed to the managed environments from a validated, optimized planned configuration. The objective of the priming task is to send configuration data from the planned configuration database to the operational configuration database.

- **Refresh/Update Configuration Data**

  The objective of the refresh/update task is to send or receive dynamic updates from the operational, running configuration to the planned, administrative configuration. Refresh is the inverse configuration data flow of priming and provides information regarding the actual running configuration. This includes hardware and software alerts, hardware and software component self-identification, and configuration changes without service interruption. It also includes refresh updates made as a result of a query and changes that may have been made outside the change management process.

- **Access Configuration Information**

  Other disciplines require access to configuration information. Requests for configuration information can vary. The objective of the access configuration information task is to allow access to the configuration information by other users and applications/disciplines.

There should be a logical flow of information between each of these processes as shown in Figure 7 on page 24.

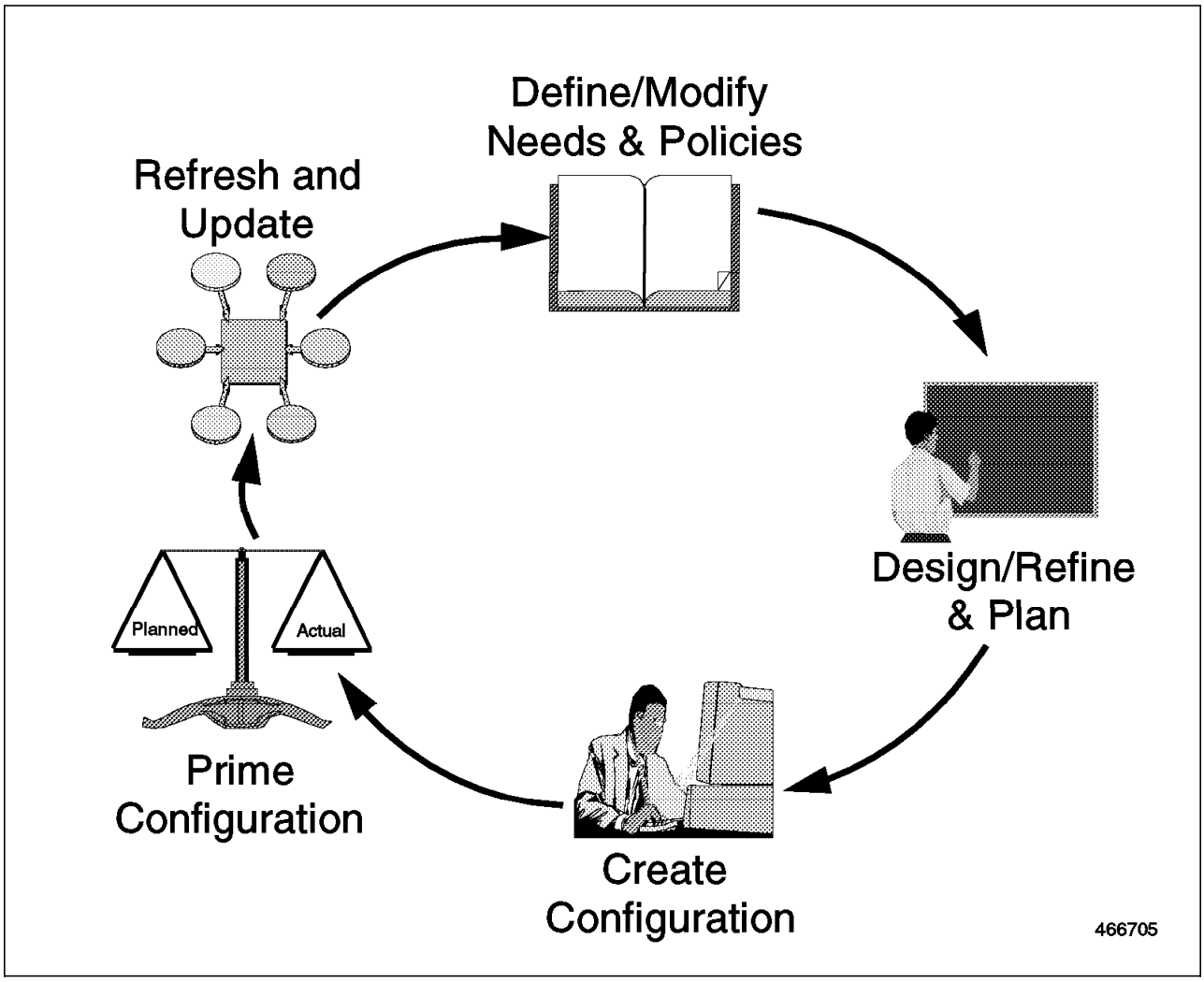

Figure 7. Configuration Management Processes

Once again, it is important to remember the two sides of configuration management discussed in Chapter 2, “What Is Configuration Management?” on page 7, which ensure that the planned/administrative configuration is in synchronization with the operational/running configuration.

To enforce these two sides of configuration it is essential that data flows from the inventory repository to the running systems and networks be specified and automated, so that changes to the configuration are controlled through a planned change process. It is also true that in large configurations, the sheer number of resources requires an automated feedback loop to verify the consistency between the planned and running configuration.

3.4 What Tools Do You Need?

All of the users discussed previously need access to data. They need processes to follow, which have been previously described, and then tools to perform their roles effectively. The tools provide information to them for decision-making, and a way of taking actions. Each user will typically be accessing different tools or systems management applications which are specialized for their tasks. However, the same type of systems management information could be needed by several systems management applications, and utilized by several users. This is especially true for configuration data, inventory and status information, and problem records.

Therefore, it is highly desirable that applications be based upon common data to ensure that all users are accessing consistent and accurate data, with which they are able to make consistent and accurate decisions.

A systems management solution that meets these requirements helps organizations reduce the cost of management, improve service availability, and provide greater speed and accuracy of response to users. In addition, this solution could be implemented to distribute, control and enforce company policy and standards.

Configuration management requirements include the capability to collect, distribute, and monitor levels, and update hardware and software configurations nondisruptively through the network.

The primary function required by a configuration management system is the ability to manipulate configuration and inventory data in a consistent manner across an enterprise. This includes the ability to create, retrieve, update, delete, and inquire about configuration and inventory data. Some examples of tasks are the following:

- User adds workstation ABC to the inventory.
- User assigns person X as the technical contact for workstation ABC.
- User requests a list of the workstations with 32 MB of memory.
- After a report of a power loss in building XYZ, user requests the number of workstations that have been affected by the loss.
- User requests a list of the installed software on workstation ABC.
- User bulk loads the inventory from location XYZ into the central system.

The ability to manipulate configuration and inventory data in a consistent manner across an enterprise also includes the need to extract configuration and inventory data from other sources and load it into the configuration management database. The other sources of configuration and inventory data across an enterprise typically include existing network management products (for example, NetFinity) or ″home grown″ sources such as a Lotus 1-2-3 spreadsheet.

The application that is described in this book provides each of the above capabilities. IBM Configuration Management Tool for OS/2 (ConfigTool) defines and implements a LAN configuration management database and implements a subset of the full SystemView Administrative data model. It automatically takes hardware and software configuration data from managed client workstations, LAN servers, and LAN management products within your network. Please refer

to Chapter 5, “What Is IBM Configuration Management Tool for OS/2?” on page 43 for details on ConfigTool.

Chapter 4. What Products Collect LAN Configuration Data?

The application that is described in this redbook, called IBM Configuration Management Tool for OS/2 (ConfigTool) provides configuration management functions for the LAN environment. Before going into detail about ConfigTool, it is first helpful to understand some of the products (both management and networking products) that provide different configuration functions, and collect portions of configuration data that is essential for a complete view of your LAN environment (resources and user information).

This chapter first discusses some of the challenges in LAN configuration management today when trying to understand where and how you can obtain all of your LAN configuration data. It then describes some of the LAN management and networking products that are available that provide portions of the required data, and that can be integrated into a ConfigTool configuration management solution.

4.1 The Configuration Management Problem

One of the problems in today's environments is that no longer is a workstation just a workstation. In today's distributed world a workstation can be running multiple protocols, with multiple LAN adapters, performing multiple business functions, and possibly supporting multiple users. One resource or workstation could also be managed by multiple LAN management products, each of them giving a specific subset or view of the status and configuration of that machine. One physical resource could now be one or many of the following:

- LAN Server
- Network resource
- Lotus Notes server
- Business application
- Communications gateway
- End-user file server
- Internet gateway
- Management server
- Print server

Figure 8 on page 28 depicts the overlap of configuration data that could easily occur in today's distributed, multiprotocol environments, where multiple products will be managing and controlling some portion of your total network. In many cases there will be an overlap of the data collected, and each product may have their own way of describing the same thing, making integration and correlation difficult.

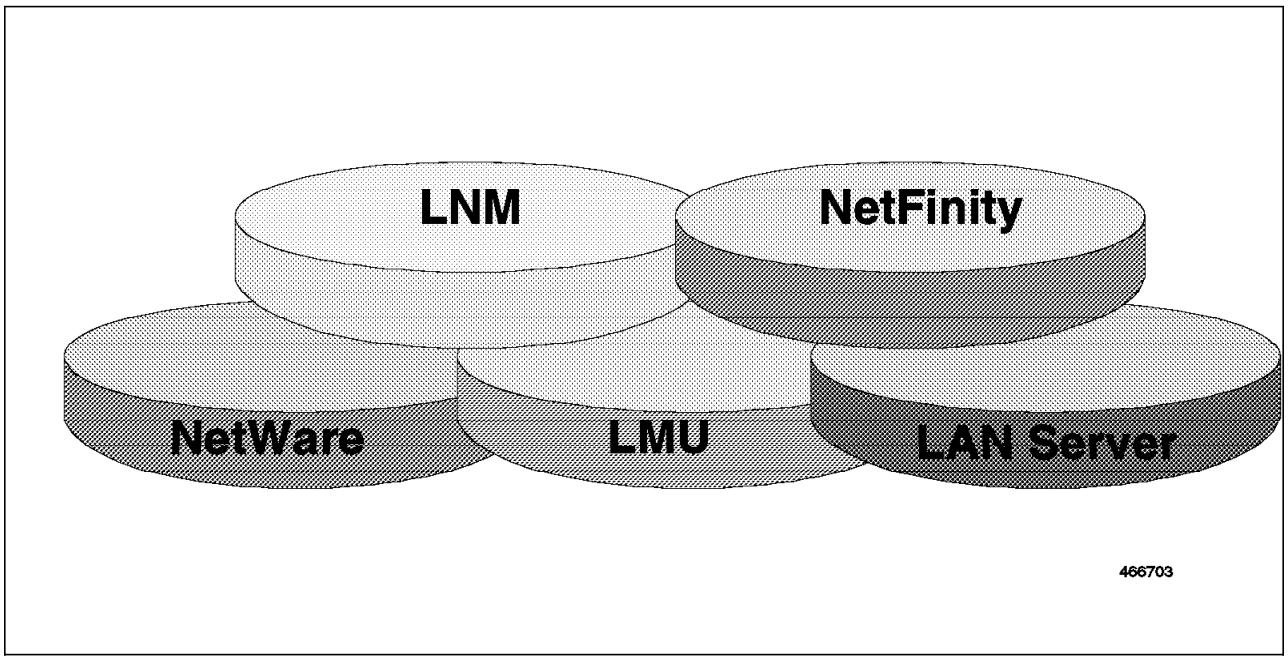

Figure 8. LAN Management Products that Contain Configuration Data

The challenge in today's environment is to be able to gather all of this data from multiple products and to correlate the data to get an overall picture of that one resource.

4.1.1 Sources of Configuration Data

The inherent flexibility, along with the wide range of hardware, software and communication resources that are available today for configuring a computer network, often presents an organization with an extraordinary amount of configuration and inventory data. All of this data is sometimes very difficult to manage at the enterprise level.

The configuration and inventory data is often tracked by each owning organization or location within an enterprise, in a format (for example a relational database, flat file, spreadsheet) that is often determined by the owner, if it is tracked at all. The sources for configuration and inventory data within an enterprise also includes today's network management products, which have the ability to dynamically discover configuration and inventory data. These multiple sources of configuration and inventory data within an enterprise present a problem in that each owning organization may have its own way to store and manage the data, and the data may not always agree across databases. Therefore, there is often no consistent process for the administrative configuration management across an enterprise.

Configuration data needed for effective configuration management to be put in place can be found in some of the following places, and as shown in Figure 9 on page 29:

- User-defined databases
- System level managers (products such as NetView for MVS and NetView for AIX)
- Vendor data
- Purchasing

- Mid-level managers (products such as NetFinity and LAN Network Manager)
- Operations
- Change (management/control)

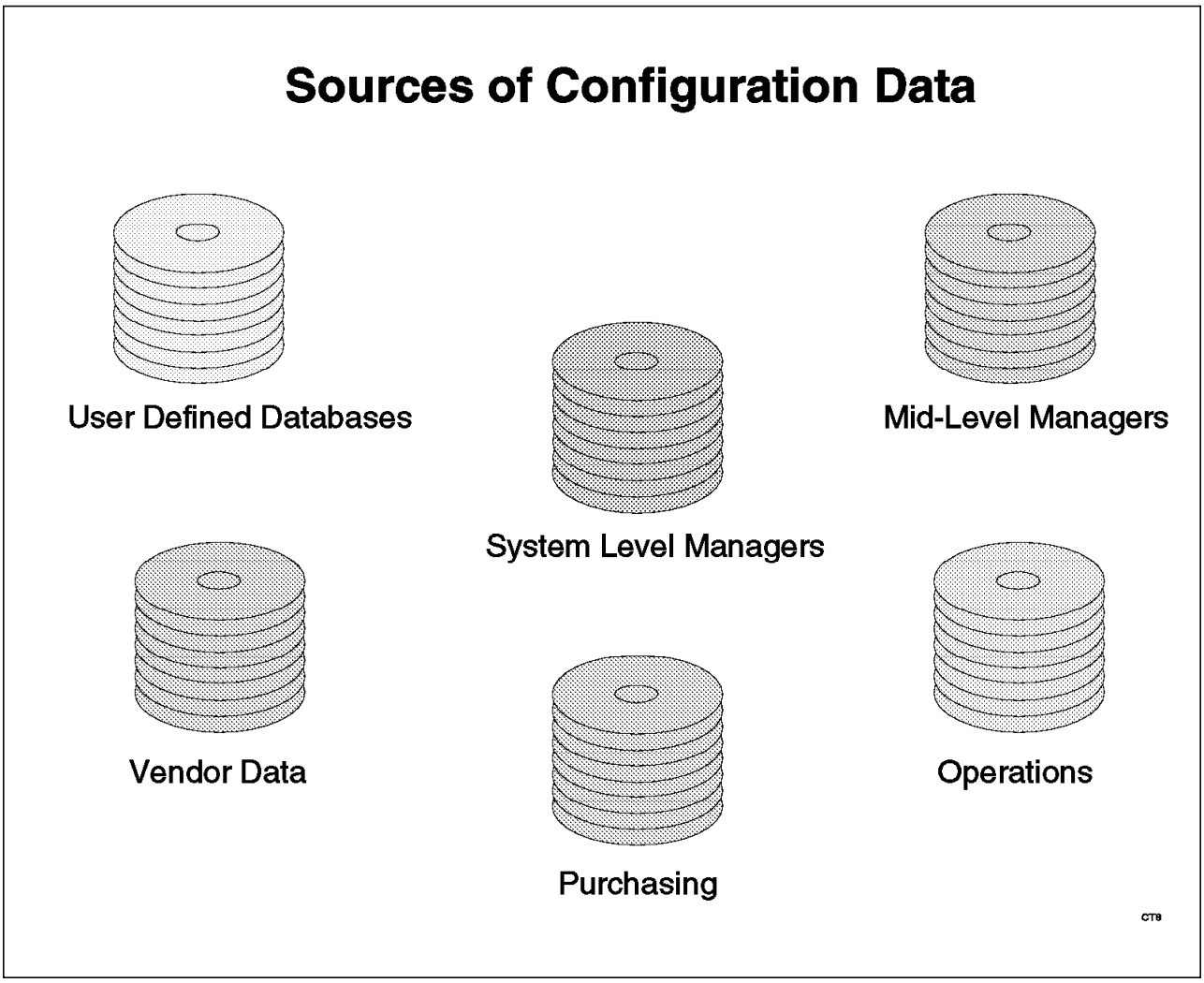

Figure 9. Sources of Configuration Data

To try and put this into simpler terms, if a user calls up with a workstation problem, the information you may need to find out can include the following:

- How is their resource connected to the network and is it working? (Information obtained from mid-level manager.)
- Is the application they are trying to use available? (Information may need to be obtained from the system level manager.)
- Who is the person responsible for this machine and what is their phone number? (Information obtained from possibly a user-defined database.)
- Is the machine still under warranty? (Information obtained possibly from a purchasing database.)
- If it is not under warranty, is there a maintenance agreement and what is the name and address of the vendor who supports it? (Information obtained possibly from a vendor database.)

Chances are that the above scenario would not happen often. However, it does point out that there could potentially be multiple places where the configuration data necessary to resolve a user's problem resides in multiple data stores.

One of the biggest concerns or irritations many organizations are facing is having to enter management data into a database manually, or worse still, (re)entering it into multiple databases. Entry or collection of software and hardware data needs to be as automatic and dynamic as possible, with a goal of entering the data once into a shared database.

Many organizations are looking for a way to gather all of this data centrally from these different management components or databases. This requires the ability to query the management applications and request information about their managed devices. However, current products in enterprise management will often implement their own "proprietary" databases.

Even more importantly, these databases often implement their own data model. There is a certain overlap in the scope of these models, but in principle, they are often too different to enable a simple way of accessing and/or consolidating the underlying data. Figure 10 depicts some of these management products, but you can also add many others, such as Microsoft's SMS.

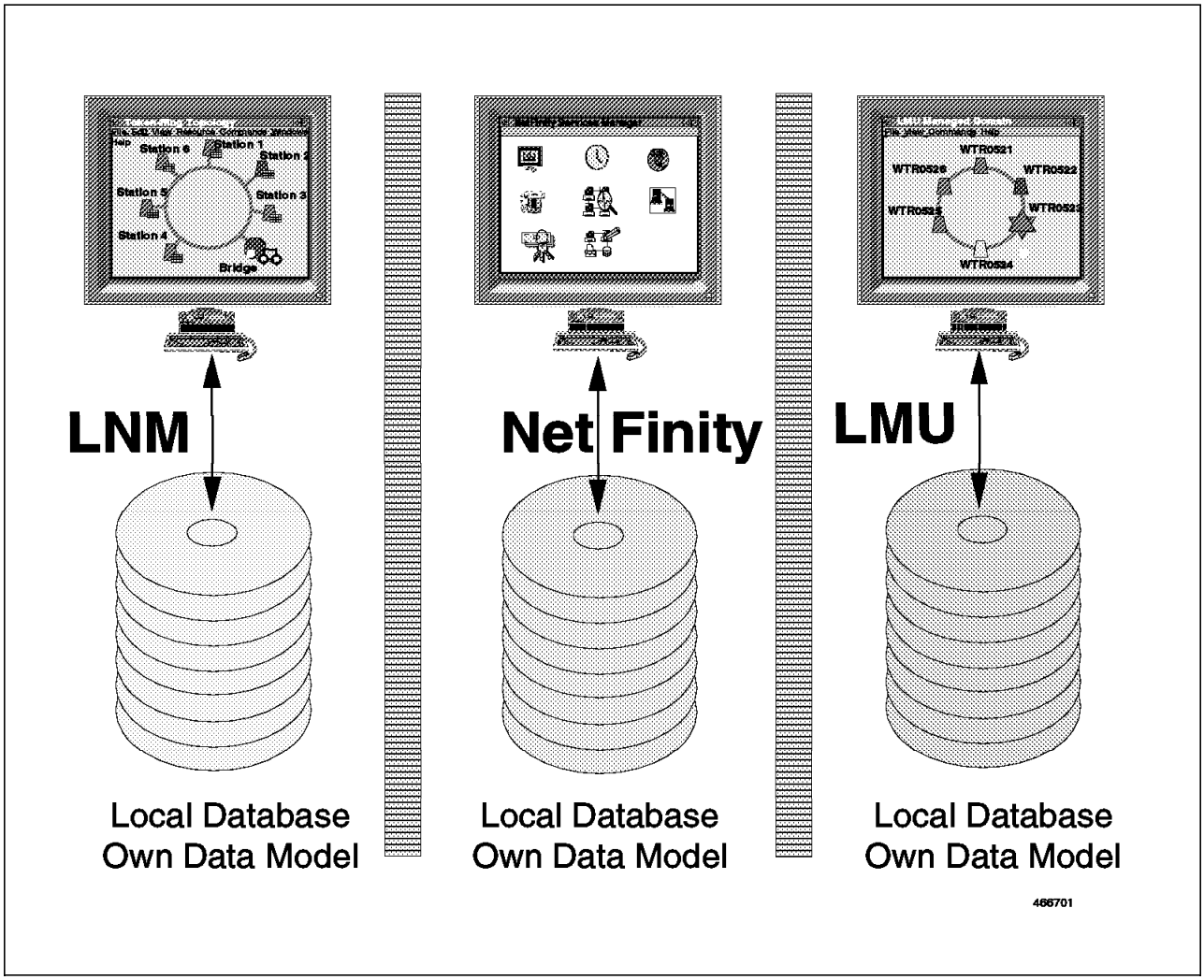

Figure 10. LAN Management Products

LAN network operating systems can also be included in this diagram such as IBM′s LAN Server, Novell′s NetWare and Microsoft′s NT.

The important factor, however, is that each of the different management or networking products available will probably have their own type of database and their own way of describing the configuration data.

The configuration database should be the common data store on which solutions aimed at the execution of the other management processes can be built upon for managing/configuring the workstation environment such as software distribution, asset management, registration, etc. It should be the point of integration for various products and tools.

4.2 Products for the Local Area Network Environment

The local area network environment can be made up of bridges, routers, hubs, switches, gateways and workstations. Each of these devices will also have different components and features associated with them such as adapters, drives, and software.

The following section takes you through some of the different LAN management (mid-level managers) and networking products currently available, which provide management applications and contain portions of the required configuration data. It gives an overview of the functions they perform, and more importantly describes some of the configuration data that they collect and store about their managed environment.

4.2.1 LAN Network Manager

The LAN Network Manager product enables the management of multisegment IBM token-ring networks, broadband and baseband IBM PC networks, hubs (CAUs), and the LAN bridges that connect a token-ring segment and an Ethernet segment. It provides facilities to manage the LAN media and the LAN adapters in the token-ring environment.

LAN Network Manager provides functions to support the following:

- Access control, which allows the detection and removal of unauthorized adapters and bridges.
- Asset management, by keeping track of adapter locations.
- Workstation configuration, which relies on the information maintained by the LAN Station Manager product.
- IBM bridges, including automatic link, status, and performance data.
- IBM 8230 and follow-on hubs, providing their status, configuration, and the possibility of enabling or disabling their lobe receptacles.

LAN Network Manager also allows you to build a configuration table of resources in the network together with a detailed set of station-identifying information. LAN Network Manager stores all the information it knows about the network in DB2/2 tables. These tables of LAN configuration data make up the LAN Network Manager database.

The following is a list of some of the tables which LAN Network Manager provides:

- Bridge Definition table
- Bridge Performance table
- Controlled Access Unit table
- CAU Lobe Location table
- Configuration table
- Event Log table
- Location Definition table
- PC Information table
- Station Definition table
- Token-Ring Attachment Data table

Please note:

Some of this information will only be available if the LAN Station Manager product is running on the workstatations being managed by the LNM.

Figure 11 shows an example of the information that can be collected for all LAN adapters being managed by the LAN Network Manager.

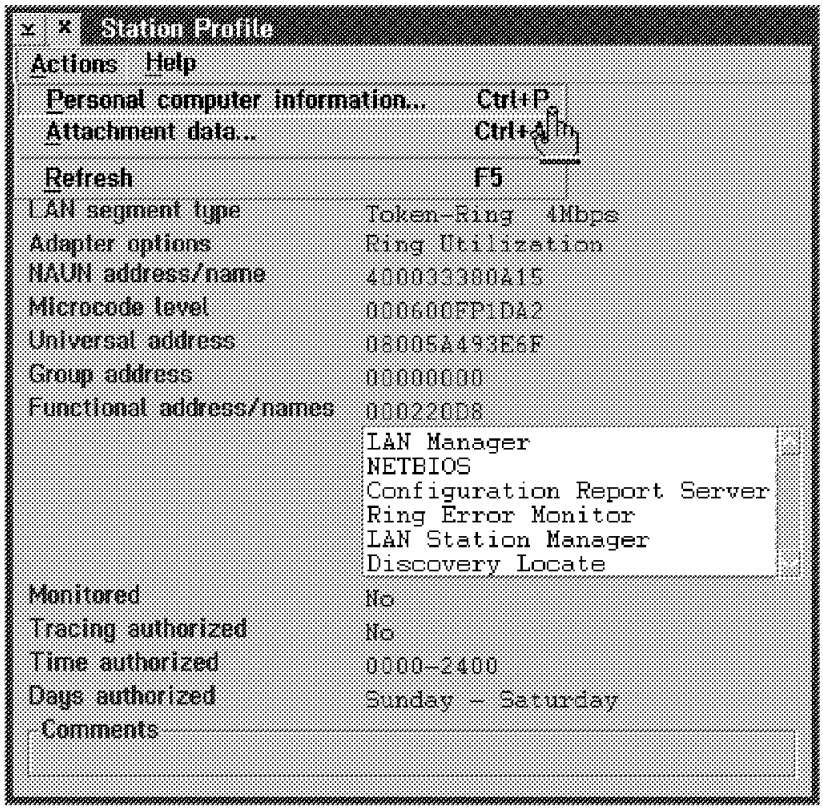

Figure 11. LAN Adapter Information

Figure 12 on page 33 shows the additional information that can be obtained from those workstations with the LAN Station Manager product installed. This information is obtained by selecting **Personal computer information** from the Actions pull-down menu as shown in the previous figure.

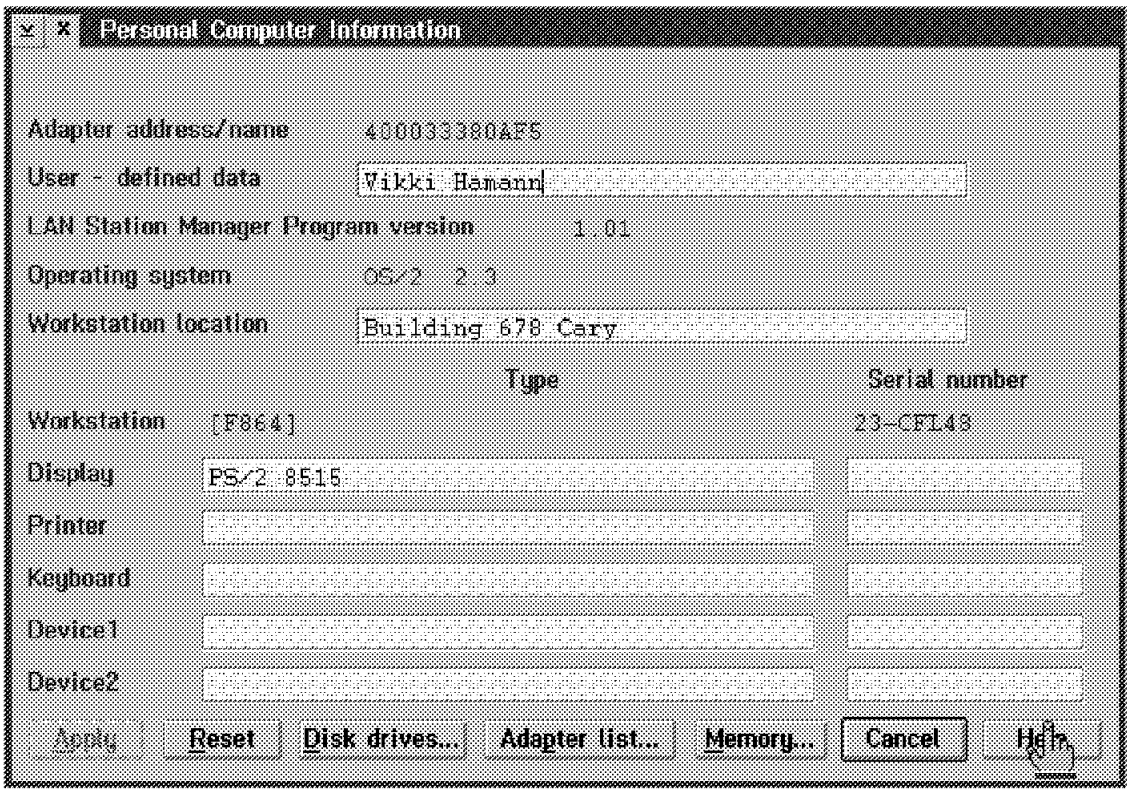

Figure 12. LAN Station Manager Information

From this window you can select additional information that is collected by LAN Station Manager such as, disk drives and the adapters and memory installed on the resource.

Figure 13 on page 34 shows the LAN Station Manager setup interface which allows you to define this additional configuration and inventory data for the workstation. This setup is executed on the actual machine running the LAN Station Manager product.

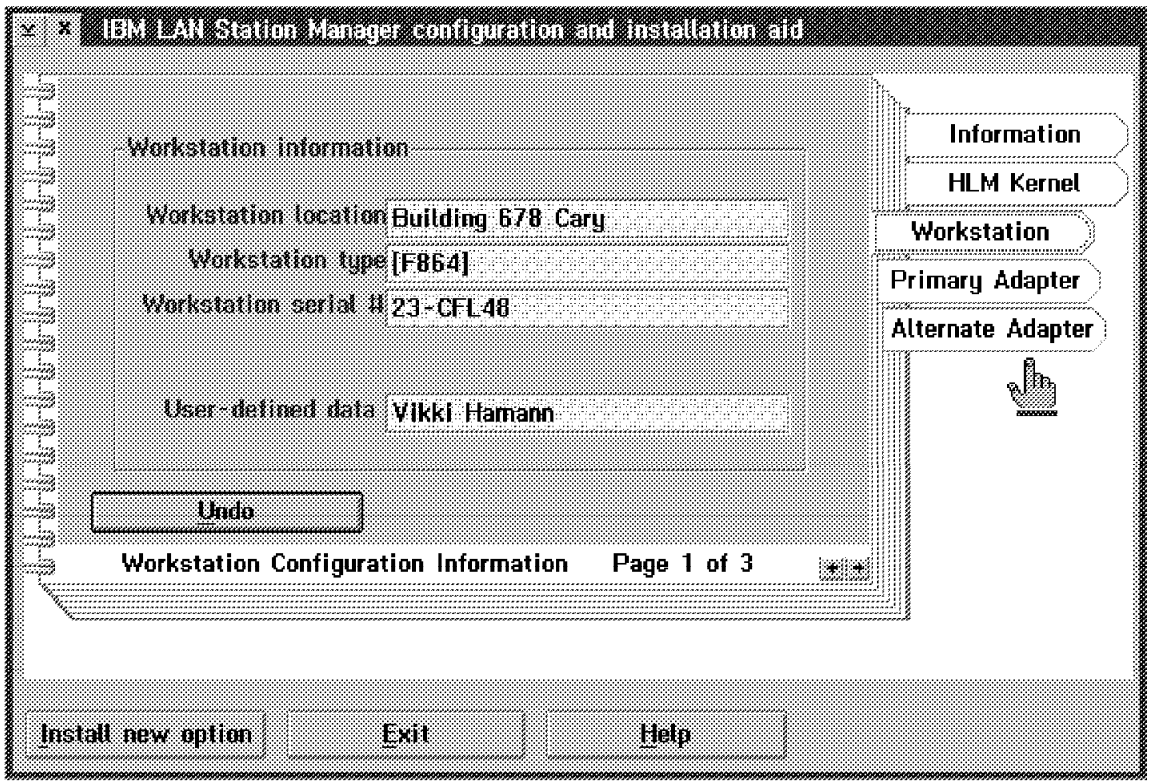

Figure 13. LAN Station Manager Setup

4.2.2 LAN NetView Management Utilities

IBM LAN NetView Management Utilities is an OS/2-based product to assist with and automate the management of systems in local or bridged, local area networks. It will manage devices on token-ring and Ethernet networks and can see across bridges to give you management capability for an entire logical local area network. It will manage OS/2 clients and servers and NetWare servers, with a subset of its function also available to DOS, Windows and Macintosh clients.

LMU was designed around a hierarchical concept with a managing system and a managed system. The managed system is the client workstation. These are the actual end users on the network. Managed systems report into a managing system that holds the database for the network. This database can contain extensive configuration data about the managed workstations.

LMU provides you with some of the following functions:

- A transport method by which system management applications can be invoked remotely and system management data sent to a collection point.
- A set of LAN system management applications. These applications collect and report information necessary to access and manage the LAN environment, and respond to certain user-specified fault conditions. These applications include configuration (hardware and software), performance, operations, and fault management.
- Software to maintain a DB2/2 database that contains the response information from the management applications.

- A graphical user interface (GUI) to provide visual representation of the workstations managed by LMU. The GUI also provides an easy-to-use interface for submitting commands to the local workstation or to remotely monitored workstations.
- A job scheduler which can perform regular tasks like file purges and backups to run at the appropriate time without operator intervention. The scheduler includes options for daily, weekly, and monthly executions. With the group edit, these selected commands can be sent to a single machine, or to a predefined group of machines.

LMU′s configuration application will collect vital product data about the OS/2, DOS, Windows, and NetWare server workstations in which an LMU client (managed workstation) is running. LMU can either display this data on the workstation screen, or place the data in a central DB2/2 database. The information that can be collected includes the following:

- Machine type
- CPU type
- Keyboard type
- Monitor adapter and display type
- Fixed disk type and size
- Diskette type and size
- Logical drive characteristics
- Installed Micro Channel adapter types and slot numbers
- Local and universal token-ring addresses
- Operating system
- SYSLEVEL information for installed software (OS/2)
- Date, time and size of user-specified files
- User-defined data

Figure 14 on page 36 shows an example of displaying the configuration information of our workstation through the LMU GUI. Most of this information is automatically collected from workstations that are running the LMU client application.

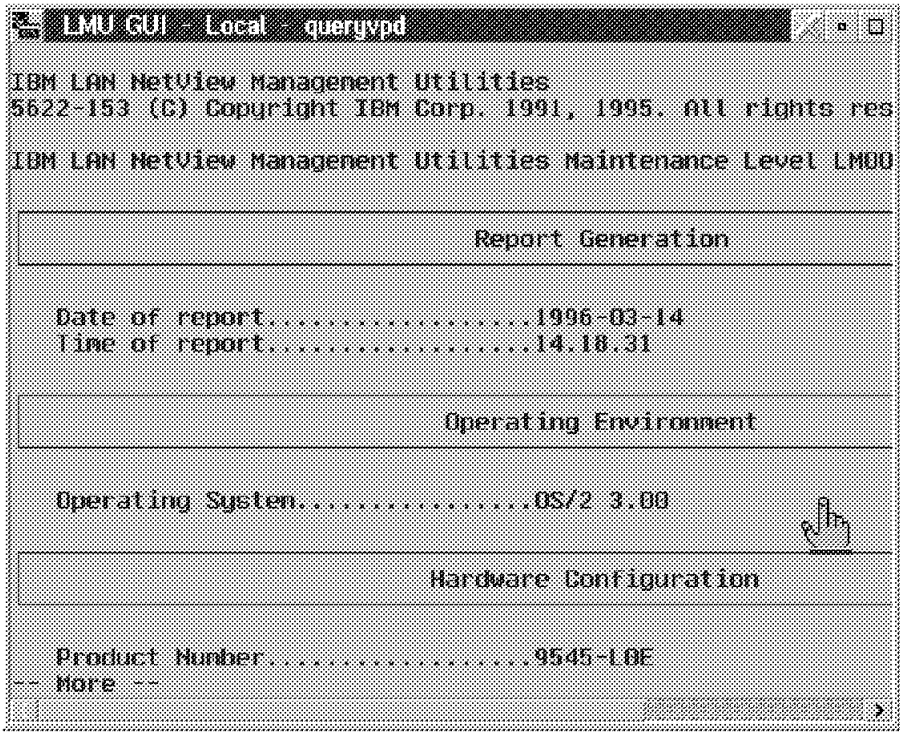

Figure 14. Collected LMU Configuration Data

The command to collect and display configuration data can also be executed via command line input. The following is the complete output from the LMU QUERYVPD command:

```
IBM LAN NetView Management Utilities
5622-153 (C) Copyright IBM Corp. 1991, 1995. All rights reserved.

IBM LAN NetView Management Utilities Maintenance Level LM00230


                          Report Generation

   Date of report.................1996-03-14
   Time of report.................14.30.36


                       Operating Environment

   Operating System..............OS/2 3.00


                       Hardware Configuration

   Product Number.................9545-L0E
     System Serial Number          23CFL43
   Processor......................486 DX4
     Processor Speed               75 MHz
   CoProcessor....................80486
   Bus Type.......................AT 16-Bit

   Total Memory..................36480 KB = 35.6 MB
```

```
   Equipment List..................1 Parallel Port(s)
                                   1 Serial Port(s)
                                   1 Diskette Drive(s)
                                   1 Fixed Disk(s)
                                   Math CoProcessor

   Serial Port 1...................COM1
     Baud rate                      1200 bps
     Data bits                     7
     Parity                        Even
     Stop bits                     1

   Diskette Drive 1................3.50"  - 1474K - 80 Tracks - Type 4

   Fixed Disk 1....................771.0 MB = 790272 KB = 809238528 bytes

   Keyboard Type...................84 Key Enhanced

   Current Display.................PS/2 Color 6312/6314/6319

   Primary Node Address............08005AA648C3
   Primary Universal...............08005AA648C3


   Total Slots.....................0


                              Logical Drives

   FAT     Drive C.................   9.1 of   10.8 MB free ==>  15% full
   FAT     Drive D.................  37.3 of  100.1 MB free ==>  62% full
   FAT     Drive E.................  67.4 of  100.1 MB free ==>  32% full
   FAT     Drive F................. 256.5 of  557.9 MB free ==>  54% full


                                  User Data

USERVPD.DAT was not found. No data exists.


                           Critical File Information

CRITFILE.DEF was not found. No data exists.
```

LMU provides two files called USERVPD and CRITFILE which allow you to add information on the workstation on which an LMU client is running. USERVPD allows you to enter user information such as owner and location of the workstation. CRITFILE allows you to define critical files running on the workstation.

4.2.3 NetWare

NetWare is a LAN operating system, written by Novell, Inc. Its strengths are file and print sharing. It can also be used as an application or database server. NetWare has about 60% of the marketplace for LAN operating systems. In other words, three in every five LANs have NetWare in some form or another running on them.

The NetWare network operating system contains all of the following key elements needed to support server-based applications:

- Connection services
- Data services
- Directory services (NetWare 4.x)
- Reliability services
- Integrated management services

NetWare supports many communication protocols. However, the most widely used protocol used to transport network traffic among NetWare servers and DOS, Windows and OS/2 workstations is the NetWare IPX/SPX protocol.

NetWare provides some of the following functions:

- **Network Services**

  File and print capabilities that are the primary services offered. In addition, it provides services such as network management, communications, messaging, database, directory, software distribution, etc.

- **NetWare Directory Services (NDS)**

  NetWare Directory Services (NetWare 4.0) is a network-wide distributed database that helps to manage and administer the file server or file servers in the network.

  This is simply a directory like a phone or address book that helps you locate information. The NDS organizes objects in a hierarchical tree structure. The basic unit of the directory tree is an object. Objects can be users, printers, servers, etc. Each resource or object can be assigned properties and assigned values. For example, a user object can be assigned properties such as an address, user ID and phone number.

- **Integration**

  NetWare 4.0 provides integration of DOS, OS/2, Windows, Macintosh and UNIX desktop operating systems. This includes the ability for files to be shared among multiple operating systems by saving files on the server both in the native desktop language of the workstation creating the file, and a copy of the file created in each of the other desktop languages supported by the network.

- **Network Management**

  NetWare management agents allow you to monitor, control and troubleshoot network hardware and software. These agents can do things such as trigger a process within a server when it encounters one or more predefined conditions, for example, available cache buffers are low, there is not enough memory for cache, or there is an error writing the directory tables to disk.

4.2.4 NetFinity

NetFinity is designed to manage clients and servers attached to a LAN in the DOS/Windows, OS/2 and NetWare environments. It works with both IBM and non-IBM hardware to provide a comprehensive LAN management system.

NetFinity is distributed in the form of NetFinity Services and the NetFinity Manager. NetFinity Services is the base or agent code that is placed on all of the systems to be managed. NetFinity Manager is the management application

that controls all NetFinity services. NetFinity Manager requires NetFinity Services to be installed, and will automatically discover workstations on the LAN that also have NetFinity Services installed. The NetFinity Manager currently supports NetBIOS, IPX and TCP/IP protocols, and runs under DOS/Windows and OS/2.

The following is a list of some of the NetFinity functions available:

- **System Monitor Service**

  System Monitor Service allows you to monitor vital system resources such as CPU, memory and disk usage, and disk read-write errors.

- **Alert Manager Service**

  Alert Manager Service allows you to receive alerts generated by other NetFinity utilities and applications.

- **File Transfer Service**

  File Transfer Service allows you to move files between a local and remote PC.

- **Event Scheduler Service**

  Event Scheduler Service enables you to automate a range of systems management tasks. You can schedule a task for execution at a predetermined time, such as during the night, for either one PC or a whole group of PCs. You can also log the results of those scheduled events so that you know if there has been a problem.

- **Remote Session Service**

  Remote Session Service allows you to execute remote commands on PCs running NetFinity Services.

- **Screen View Service**

  Screen View Service allows you to see exactly what is displayed on an agent′s screen at any moment in time.

There are two additional functions of NetFinity that are particularly relevant when looking at configuration management, which are the System Profile Service and the System Information Tool.

- **System Profile Service**

  The System Profile Service allows you to store a variety of system and user specific information such as the user′s name, department, and location, the system type, serial number and other relevant notes. It provides a quick overview of who owns the system and what functions the system is usually used for. This data can be exported as both ASCII files and SQL database files.

- **System Information Tool**

  The System Information Tool enables you to access detailed information on the hardware and software configuration of your system. All of this information can be saved in SQL database file format.

Figure 15 on page 40 shows the main window of the NetFinity Services Manager. From here all the functions described above can be selected.

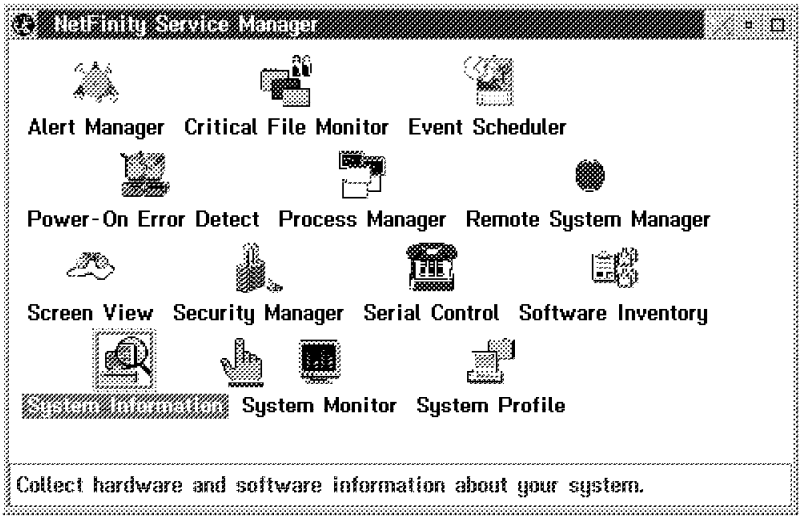

Figure 15. NetFinity Services Manager Main Selection Window

The System Information icon can be selected from the above window, and takes you to the System Information graphical interface (shown in Figure 16) from where you can select from the following types of configuration data:

- Adapter Information
- Disk Information
- Keyboard Information
- Memory Information
- Mouse Information
- Operating System Information
- Model and Processor Information
- Printer Information
- Parallel and Serial Port Information
- Video Subsystem Information
- Vital Product Data

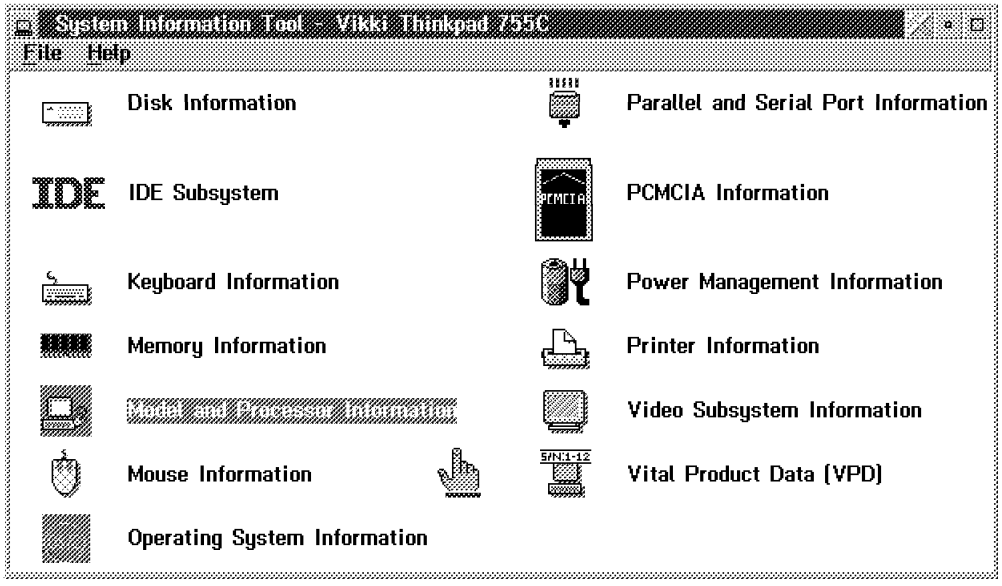

Figure 16. System Information Tool Main Window

Figure 17 on page 41 shows one example of the information that can be collected and displayed. This example is a list of the currently installed hardware features of the machine we are using.

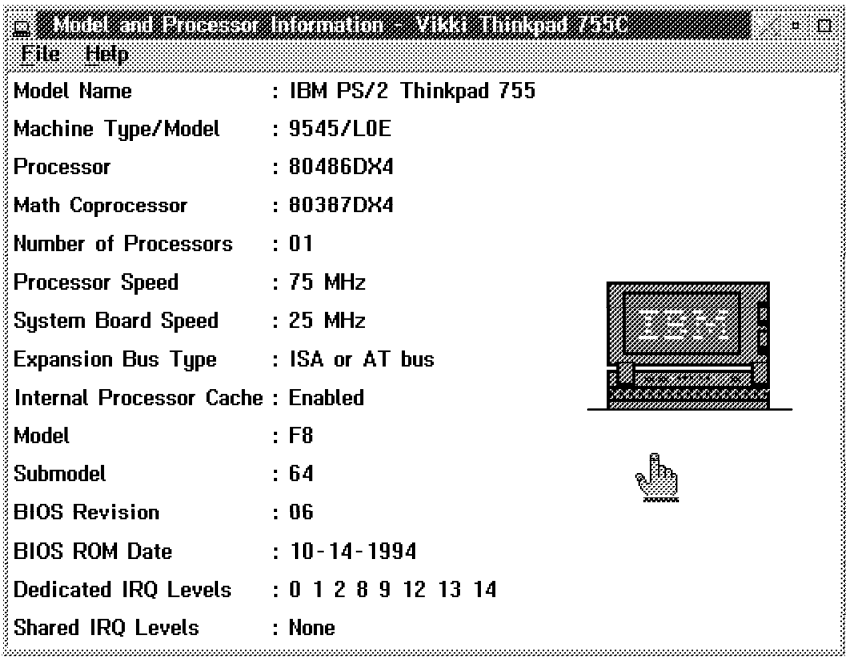

Figure 17. Display of Installed Hardware

NetFinity also provides the System Profile tool which allows users to add personal information such as name, address, phone number, etc. Figure 18 on page 42 and Figure 19 on page 42 show examples of the types of information that can be entered into the NetFinity System Profile tool.

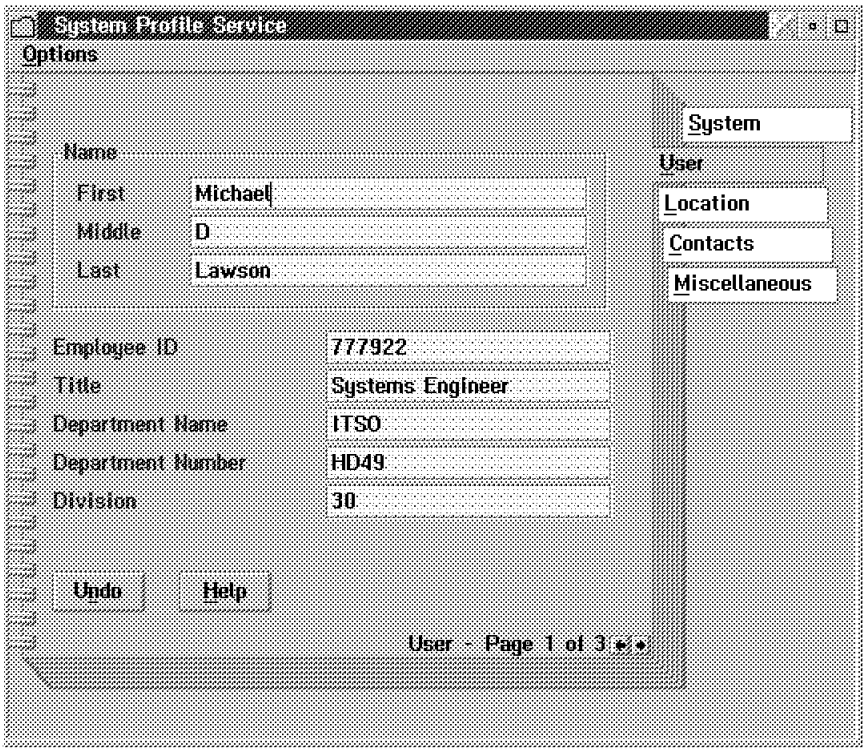

Figure 18. User Personal Information

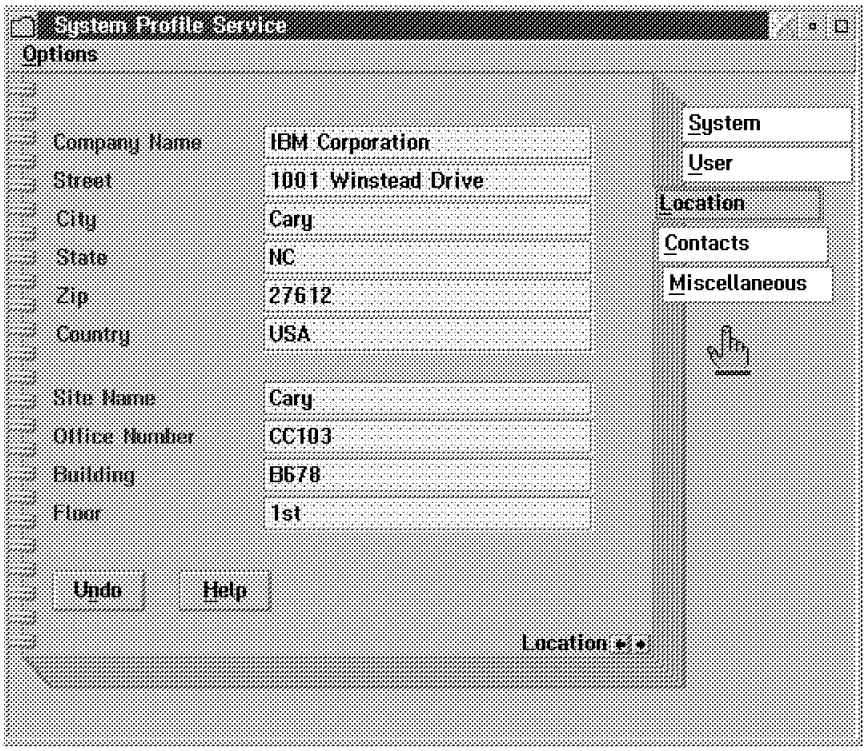

Figure 19. Address and Location Information

Chapter 5. What Is IBM Configuration Management Tool for OS/2?

This chapter describes the IBM Configuration Management Tool for OS/2 (ConfigTool) application which can help you get started in the configuration management of your LAN environments. This chapter takes you through the following:

- What ConfigTool Is and What It Does
- The Components of ConfigTool
- An Overview of the Data Extracting and Importing Processes
- Examples of Using the ConfigTool Graphical Interface

5.1 What Is ConfigTool?

ConfigTool is a LAN configuration management application running on OS/2 that allows tracking of workstation hardware and software configuration data (retrieved from OS/2, DOS, and/or Windows workstations), physical and logical network information, as well as administrative information such as personnel, locations, etc. ConfigTool collects configuration data on workstations as well as LAN devices (for example, bridges, CAUs, MAUs) and logical and physical network data (LAN Server and NetWare data such as LAN user IDs and authorizations, segment and segment connection data, etc.).

ConfigTool provides some of the following capabilities:

- Collects and updates hardware, software, and configuration data from workstations throughout the network without the need to install any data extractor or agent code on the client workstations.
- Collects and updates hardware configuration and organizational data from NetFinity-enabled workstations.
- Provides the capability to collect data from non-LAN connected machines by using diskettes.
- Collects and updates domain data from IBM LAN Server and NetWare server environments.
- Collects and updates data from the databases of LAN management products such as LAN Network Manager, and LAN NetView Management Utilities.
- Provides a graphical user interface that enables users to view, alter, add, and list the data.
- Provides the ability to associate organizational data with the system data, such as owners or room numbers with workstations.
- Provides a manual data entry facility for building and updating configuration data.
- Provides extensive customizable reporting features that can also be used to print reports.
- Uses a subset of the SystemView Administrative data model for defining the LAN resources.

Some of the most powerful facilities in ConfigTool are its extract and import capabilities. ConfigTool will extract data from existing sources and then import and/or update the data into the ConfigTool database.

ConfigTool can also extract and import workstation hardware, software, and software definitions (for example, CM/2, DB2/2, TCP/IP for OS/2). The software extractor reads SYSLEVEL information and searches for software on hard disks according to a reference list that can be customized by you.

One of the major goals of ConfigTool is to extract a maximum amount of data automatically from the managed workstations and the network and leave only a minimum amount of data to be entered manually. Examples of things that may need to be entered manually are the relationships between administrative and configuration data, such as the ownership of a workstation by a person. ConfigTool integrates configuration data coming from various sources in a single DB2/2 database as shown in Figure 20, and allows the user to access all configuration data in a common way.

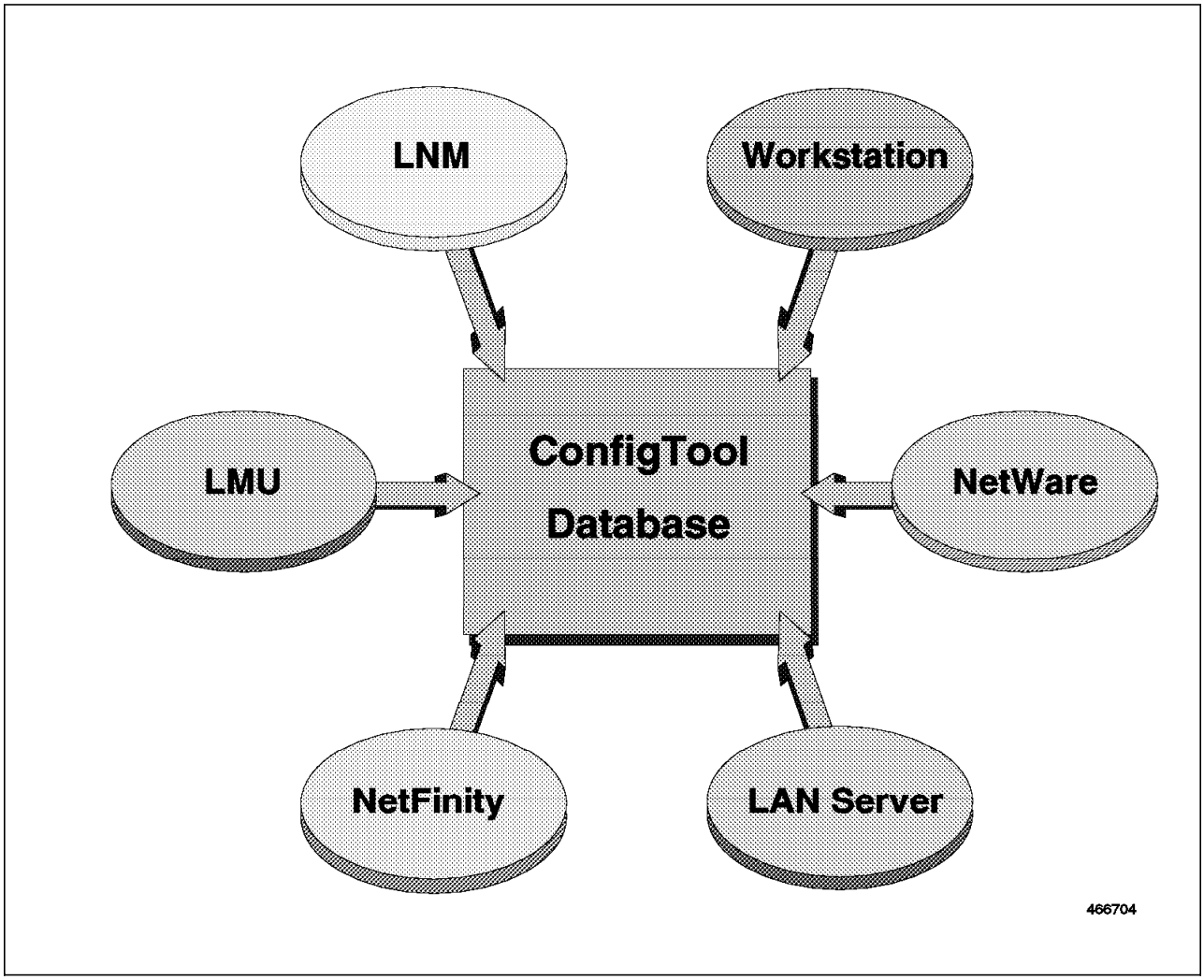

Figure 20. Extract the Data from Where It Is Stored

ConfigTool provides an object-oriented graphical user interface (GUI). The GUI also includes a Query Editor that allows you to define different query objects for the different types of configuration data you need to retrieve. You can also

optionally hide specific objects and/or specific groups of attributes from the graphical user interface. For example, if you do not have the IBM LAN Server or LAN Network Manager products installed, you may want to remove these objects (icons) from the GUI. This feature allows ConfigTool to be effectively used by small customers as well as larger customers.

ConfigTool also provides a user exit that allows you to register user-defined functions to an object in the graphical user interface which can be triggered from ConfigTool.

5.1.1 The Data That Can Be Extracted

ConfigTool supports the following environments and collects and stores the following types of configuration data:

- **LAN Domain/Server data**
  - Network resources
  - Alias names
  - Groups/user IDs
  - Authorizations
- **LAN Network Manager Data**
  - Segments
  - Bridges
  - Controlled access units
  - Adapters
  - LAN Station Manager data
- **LAN Workstation Data**

  Collected from either LAN connected or non-LAN connected workstation utilities.
  - Vital product data/hardware data
  - Software data
  - Software configuration parameters (CM/2, DB2/2, TCP/IP, LAN Server requester, Novell NetWare requester)
  - Protocol configuration parameters (TCP/IP, SNA)
- **LAN NetView Management Utilities Data**
  - Vital product data
  - Software data
  - System data
- **NetWare Data (3.12 and 4.10)**
  - Vital product data
  - Software data
  - Groups/users
  - Organizational data (person, organization, location, address)
  - Printer queues
  - File resources
- **NetFinity Data**
  - Vital product data
  - Software data
  - Organizational data (person, organization, location, address)
- **SNA Data**

This is collected via workstation utilities from definitions in the CM/2 product.

  - Network node, peer and host links
  - PUs and XIDs
  - Local and partner LU 6.2 definitions

- **TCP/IP Data**

  This is collected via workstation utilities from definitions in the TCP/IP for OS/2 product.

  - Host name and IP address
  - Subnet mask and domain name

5.2 ConfigTool Components

ConfigTool consists of the following components:

- **Database**

  This is the central component of ConfigTool and holds all of the collected and manually entered data. It uses the LAN subset of the full SystemView Administrative Data Model.

- **The Data Extractors**

  The Data Extractors extract data from various sources such as workstations, servers, and the databases of other management products and put them into intermediate flat files.

- **Data Importer**

  The generic/common Data Importer reads the intermediate flat files that are created by the data extractors and imports this data into the ConfigTool database.

- **User Interface**

  The graphical user interface enables the user to view, alter, and add data in the ConfigTool database.

- **Reporting Facilities**

  These facilities enable the user to list and print data contained in the ConfigTool database.

Figure 21 on page 47 gives an overview of the extract and import processes that ConfigTool uses.

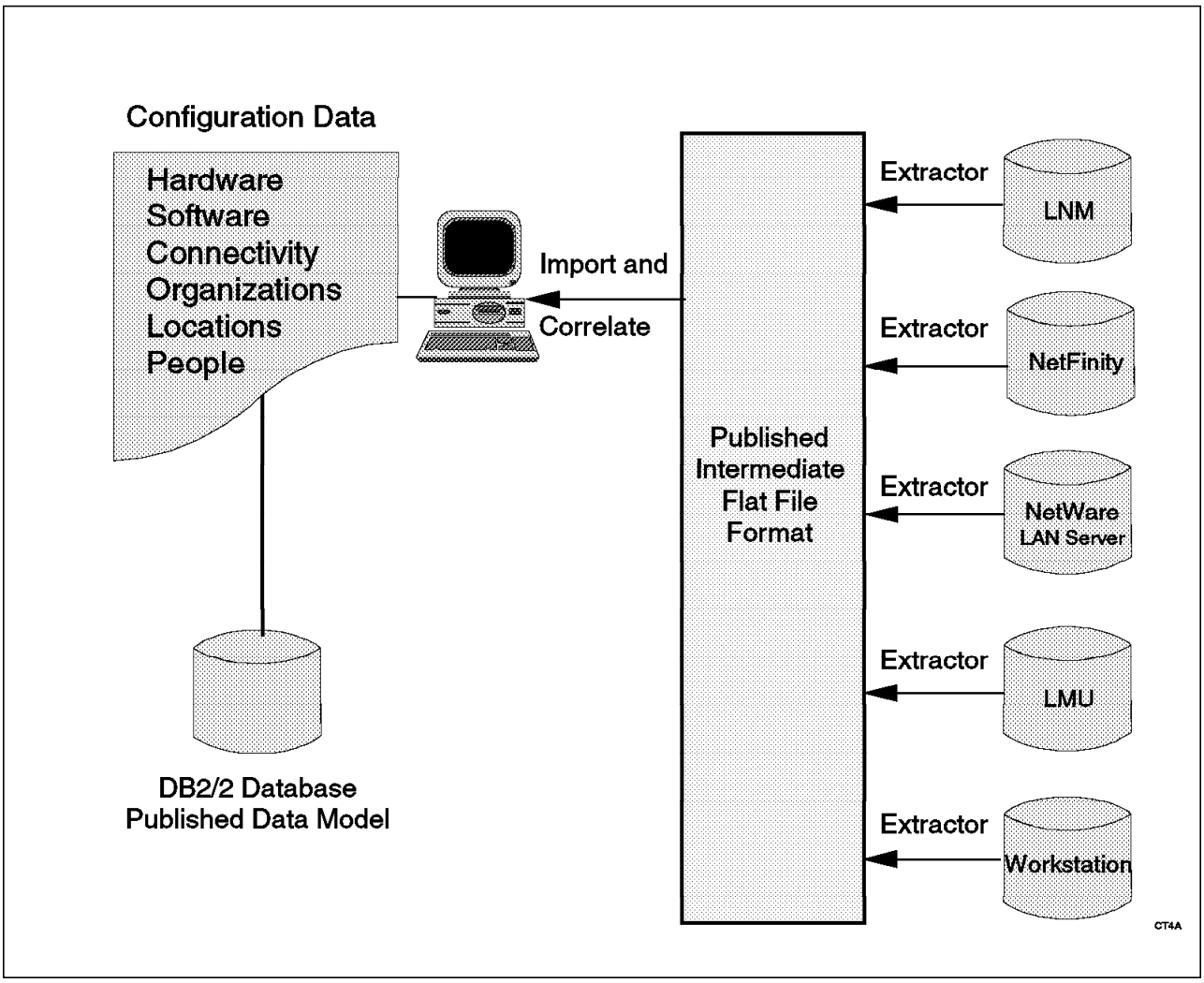

Figure 21. Extract and Import Process

5.2.1 The Data Extractors

The ConfigTool Data Extractors will take data from existing configuration and inventory data sources (listed below) and create a flat file that can be loaded by a common importer.

ConfigTool is shipped with the following set of LAN configuration data extractors:

- Workstation hardware configuration data extractor (DOS, Windows 3.1, and OS/2)
- Workstation software configuration data extractor (DOS, Windows 3.1, and OS/2)
- Workstation software definition extractor (CM/2 including SNA data, TCP/IP for OS/2, DB2/2, OS/2 printer queues)
- IBM LAN Server extractor
- IBM LAN Network Manager (LNM) extractor
- IBM LAN NetView Management Utilities (LMU) extractor
- IBM NetFinity extractor
- Novell NetWare extractor

The data extractors produce the intermediate flat files that contain the extracted objects and relationships from the workstations and different management products.

In many cases, you want to run the different extractors on machines located throughout your network. For example, you can run the LAN Server extractor on each of your Domain Controllers. The intermediate flat files that are created can then be transported over the network to a central site where they can be processed by the Data Importer to load the data into the ConfigTool database.

5.2.2 The Data Importer

The ConfigTool Data Importer is a utility that processes the flat file that was generated by the Data Extractor and loads the ConfigTool database. The Data Importer allows you to load objects of any class supported by ConfigTool.

The importer reads the flat files produced by the extractors and loads all of the objects and their attributes and relationships into the ConfigTool database. The import of the objects consists of the following steps:

- Identify an object in the database using the rules defined in an object identification file. The object identification file (OID) specifies the rules by which ConfigTool searches the database to determine if an existing object needs to be updated or a new object created.
- If the object could be identified as an object in the database, update the object.
- If the object could not be identified as an object in the database:
  - Provide default values for specific attributes that have not been set by the extractor
  - Insert the object into the database
- After the objects have been imported from the intermediate flat file, delete outdated objects and relationships from the ConfigTool database according to the rules specified in the object identification file.

All changes that occur in the database during import are logged in a file. These log files can be used to track the changes of objects over time.

You could write your own data extractors (for example, to load administrative data from your organizational database). By adhering to the format of the flat file, it is possible for you to import configuration and inventory data from sources that are not supported by the supplied set of extractors. The extractors that you write must produce intermediate flat files in the appropriate syntax, and you must ensure that the object identification file provides the appropriate rules for the objects in your flat file.

Please note!

The ConfigTool data model is not extendable at this time.

The format of the flat file that is created by the extractors and the data model used by ConfigTool is published in the Reference Manual supplied when ordering the redbook *Getting Started With Configuration Management Using ConfigTool*, SG24-4667. This redbook also contains an example of creating an extractor to collect and then import user and location administrative data.

Please refer to 5.8, “How to Obtain ConfigTool” on page 85 for a description of what this redbook package contains.

5.3 Understanding ConfigTool Terminology

The rest of this chapter takes you through the ConfigTool graphical user interface and show examples of its use. It also takes you through some of the reporting facilities available within ConfigTool. It is first helpful though, to understand some of the terminology that will be used during the rest of this chapter for navigating through the ConfigTool GUI.

- **Query Objects**

  Query objects represent database queries. The icon that is displayed is simply a representation of a query for a specific object class.

- **Query Object Container**

  A query object container simply contains a collection of query objects. Containers look like an OS/2 window with icons in them that can be selected.

- **Query Result Container**

  Query result containers display the results of a query. Each icon that is displayed represents a real instance of an object for a specific query that is in the configuration database, for example, a workstation named ABC. Once again, the query result container looks like an OS/2 window with icons in it.

- **Database Objects**

  A database object represents an object in the ConfigTool database. The attributes of these objects can be viewed when you select or open one of them.

- **Database Object Notebooks**

  A database object notebook appears when a database object is opened. These notebooks contain input fields and static text fields that explain the attributes, and also relationship pages.

- **Folders**

  In ConfigTool you will see the term *Create folder* used. Creating a folder allows you to create your own query object container represented by an icon. Folders can be created and nested to any level. You can then create your own customized queries and group them in folders.

- **Template Folders**

  The template folder holds standard query objects that can be used to create new query objects.

- **Drop Hole**

  The drop hole is used to define relationships between different objects. The drop hole appears in notebook containers, along with the Open icon view pushbutton.. Open icon view allows you to display a list of queries, one for each class that you are allowed to drop into the drop hole. You can further restrict these query objects before selecting.

  For example, if you were displaying a workstation notebook and had the Locations page active, you could check the **Open icon view**, which would display an unrestricted query location object. Upon selecting this object, it will display all location objects currently defined in the database. If you

wanted to establish a relationship between one of the location objects and this workstation, you would drag the location object to the drop hole that is displayed on this page. All attributes belonging to the location object would then be linked to the workstation object; the relationship would be defined.

5.4 The ConfigTool Graphical User Interface

Once you have loaded the ConfigTool database with configuration data, either through the extractors, or manually, you can then view that data through the ConfigTool GUI.

The main components of the ConfigTool GUI are containers and notebooks. As previously described, containers are used to show sets of objects and notebooks are used to present object details (attributes and relationships). The edit mode allows you to change the attributes of objects and/or change their relationships.

The GUI is fully object-oriented and provides drag and drop capabilities. The GUI provides a common way of presenting objects for all supported classes. You can directly navigate from one object notebook to a related object notebook without requiring you to close the current notebook and search for the related object. For example, if we open a workstation object, we would be shown a notebook similar to that shown in Figure 22.

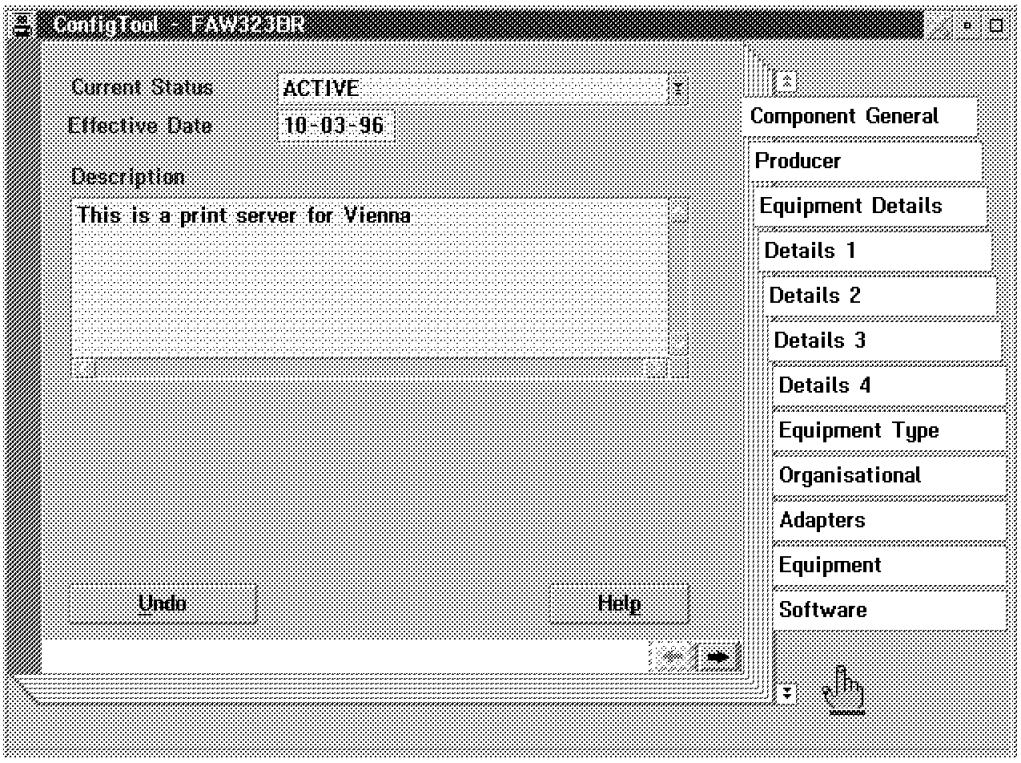

Figure 22. Notebook for Workstation

To get additional pages of the notebook, you simply click on the arrows displayed at the bottom of the notebook page as shown in the above figure. Each notebook has different numbers and types of pages depending upon the object that was selected and the attributes associated with the object.

You can also change or add both attribute values and relationships associated to the object. For example, you may get a call from a user to advise that they have just changed location of this workstation. This means that we need to change the location currently associated with this workstation. To do this, we will select the **Open icon view** push button on the Location page. This displays a query that when double clicked will show all the location objects currently defined in ConfigTool as shown in Figure 23.

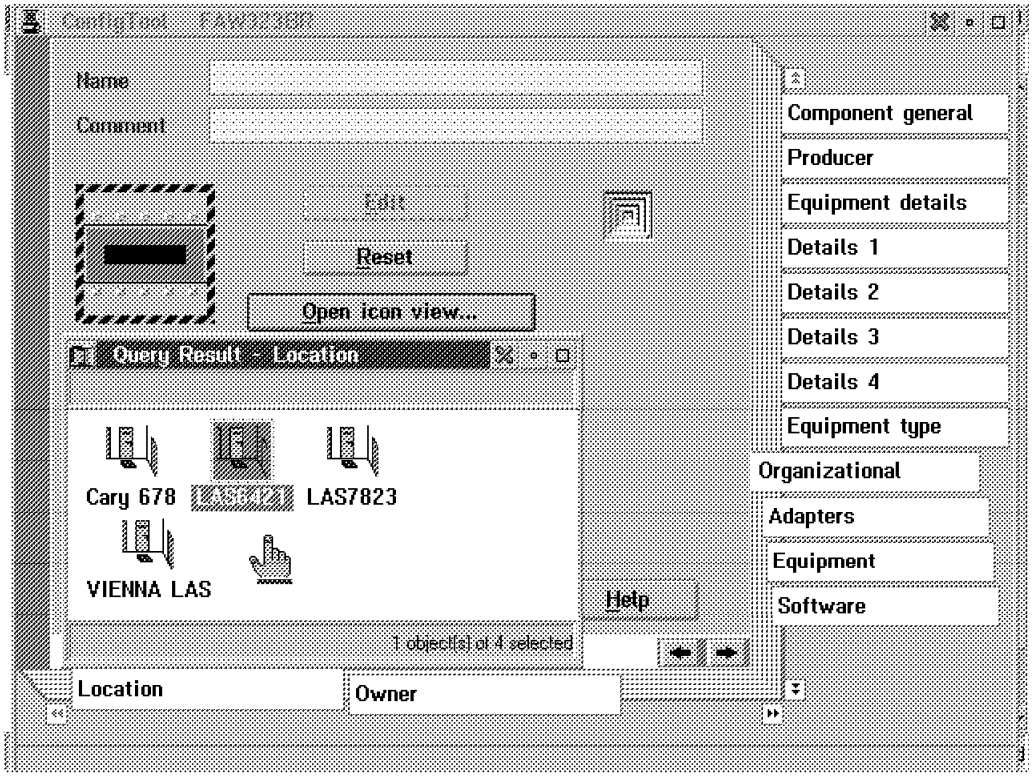

Figure 23. Open Icon View of All Defined Locations

If we wanted to look at the details of one of these locations, we would simply double-click on the relevant location object to display its notebook with attributes as shown in Figure 24 on page 52.

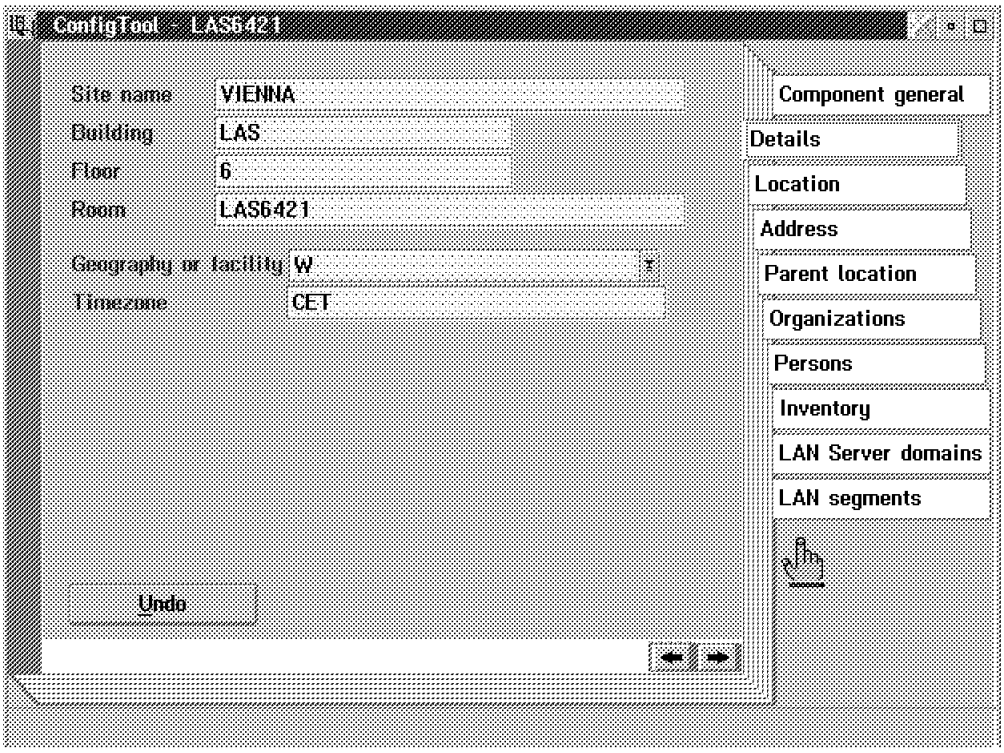

Figure 24. Selected Location Notebook

If we wanted to then change the location for the workstation, we would simply close the location notebook which would return us to the workstation notebook, and then drag the new location icon to the drop hole as shown in Figure 25 on page 53.

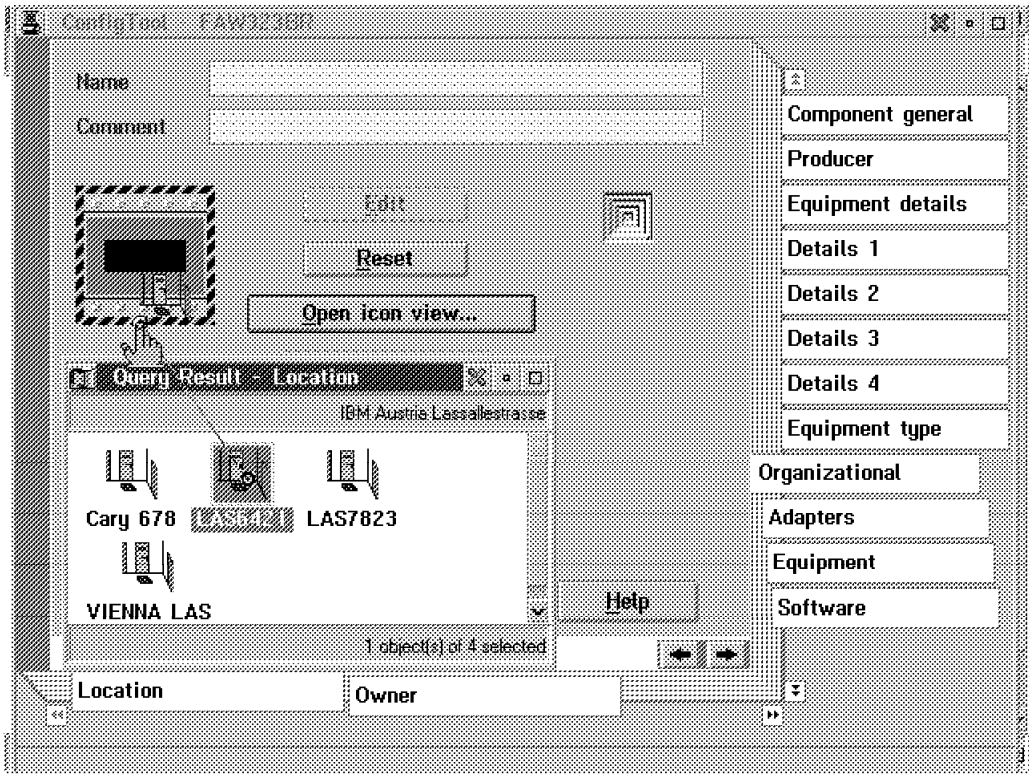

Figure 25. Changing Location for a Workstation Using Drag and Drop

Figure 26 shows the new location that is now defined for this workstation.

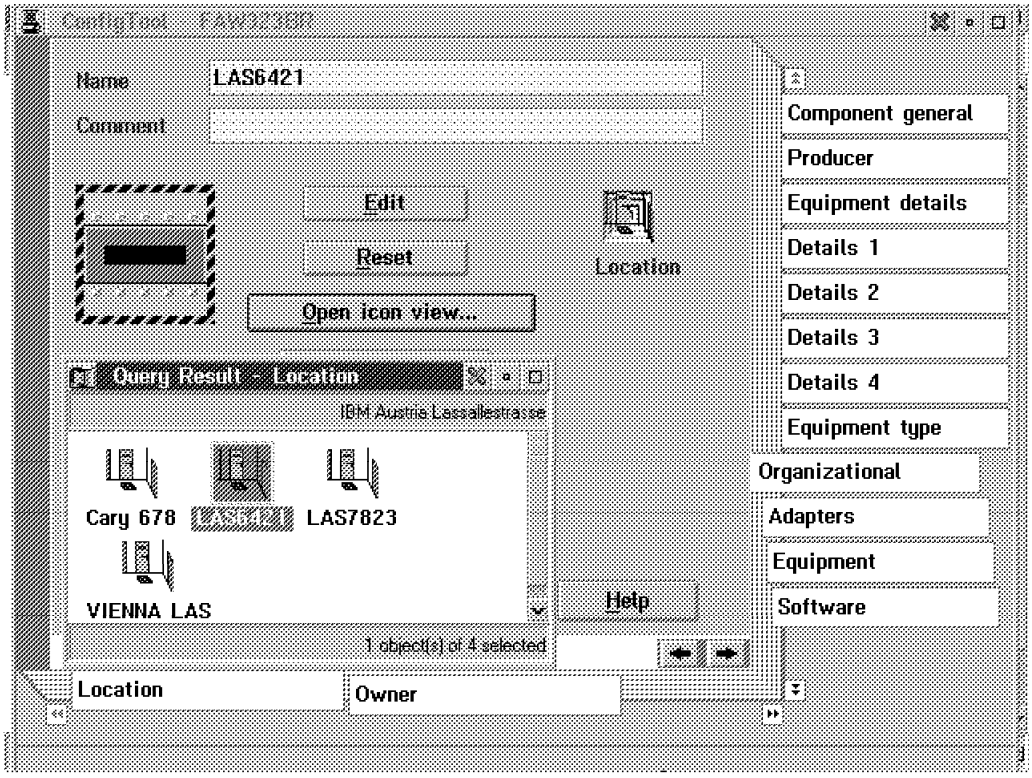

Figure 26. The New Location Details for Workstation

Installation of ConfigTool creates a ConfigTool icon on your OS/2 desktop which is used to start the ConfigTool application. Figure 27 on page 54 shows the window that is displayed with each of the available functions within ConfigTool, such as importing data from different environments, creating reports, and selecting the ConfigTool graphical user interface.

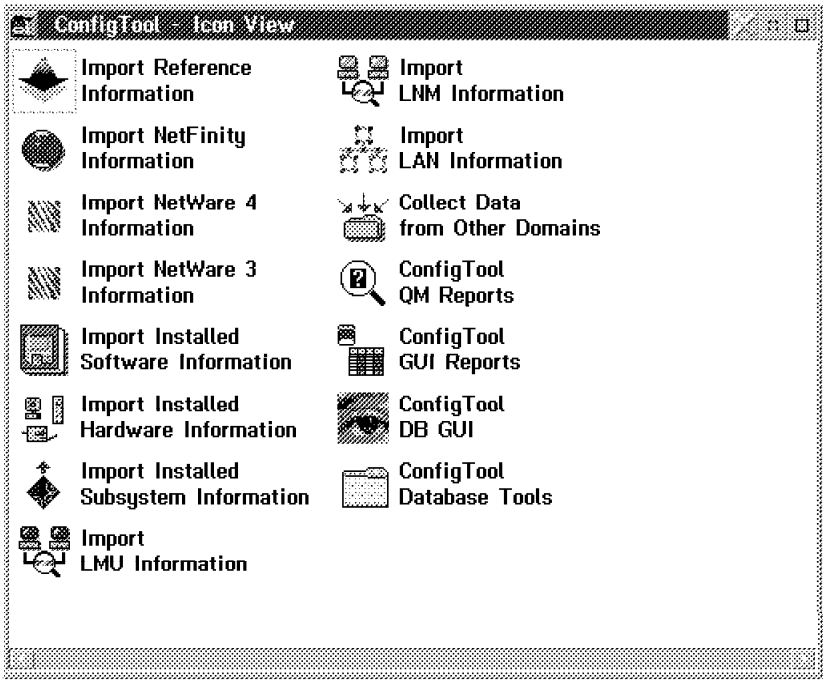

Figure 27. Main Icon Selection for ConfigTool

Figure 28 on page 55 shows the main view selection (root folder) window of the ConfigTool graphical interface that is displayed after selecting the DB GUI icon from the previous window. Each of the icons in this window represents a default query for every class of object in the database. The default queries provided on the main view selection window are for all of the objects in the database. If you double-click on one of these objects, you are shown a query result container with all objects of that class in the database.

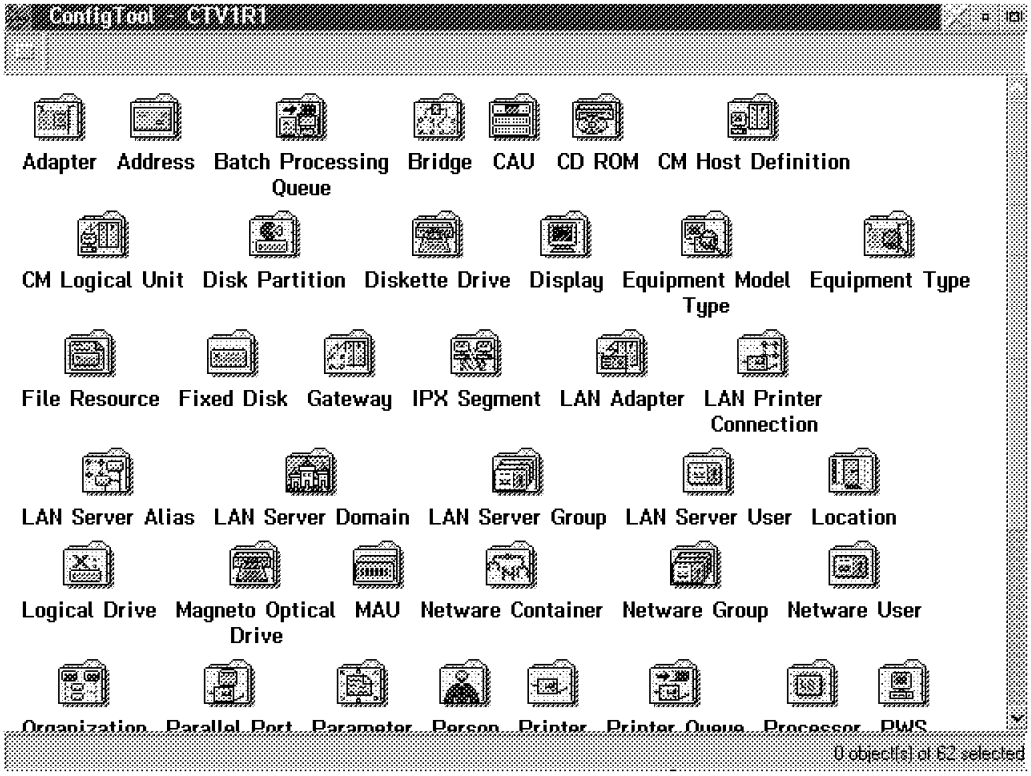

Figure 28. ConfigTool Main View Selection Window

Figure 29 on page 56 shows an example of the window that is displayed after selecting the Software icon from the main ConfigTool window. This is showing us all software objects currently defined in the ConfigTool database.

One very useful tool of ConfigTool is the Progress Indicator. This is just under the title bar in the top left-hand corner, and flashes red while ConfigTool is accessing the database.

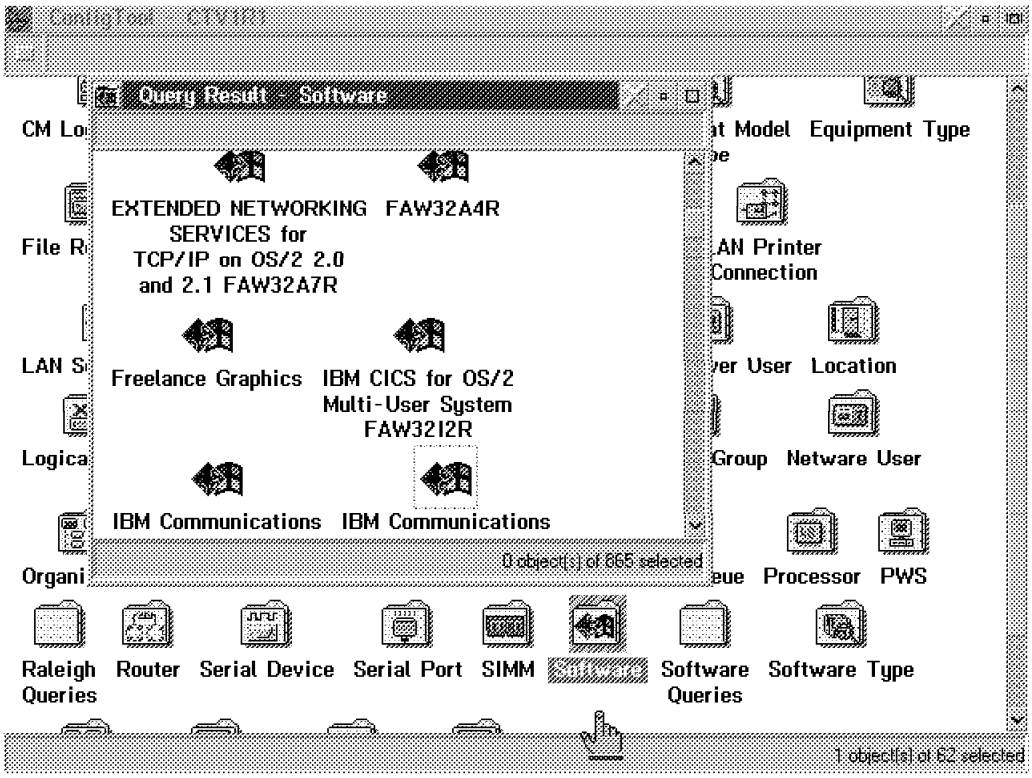

Figure 29. Result of Software Query

In the above window, you see a field in the bottom right-hand corner that tells you how many objects the query result produced. At the top right of the window you would also see a description of the object that is currently selected.

You can create new objects of any type defined in ConfigTool, by selecting the appropriate query icon, clicking with the right mouse button to open a menu, and then selecting **New**. Figure 30 on page 57 shows an example of how to create a new NetWare user.

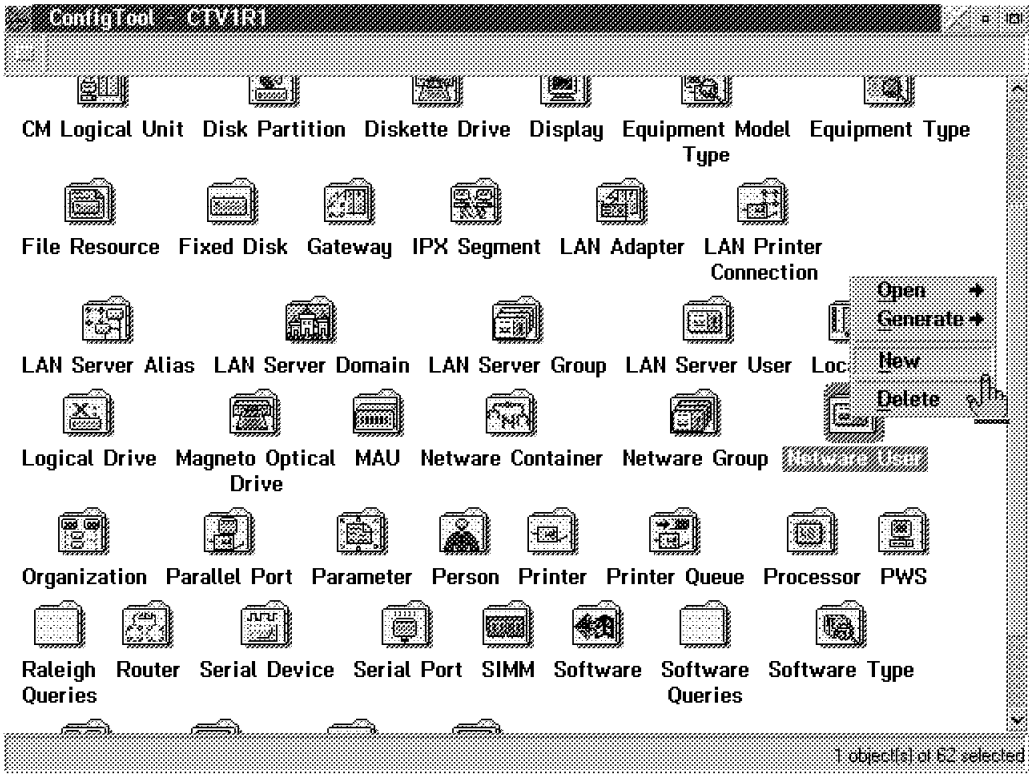

Figure 30. Creating a New NetWare User

Upon selecting the new option, you are taken to a notebook which allows you to enter all details about the new NetWare user. Figure 31 shows the NetWare user notebook and each of the available pages.

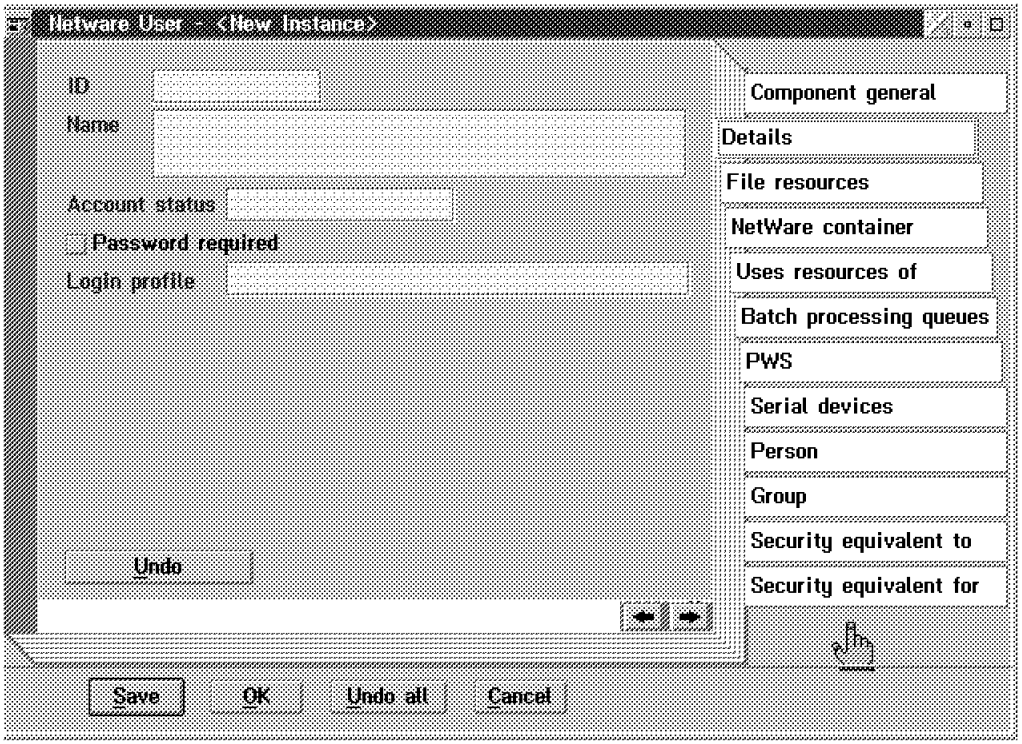

Figure 31. Opening the Notebook to Input Details

Most of the data that you have in ConfigTool will probably be imported through the use of extractor tools. However, you may still need to define some data and relationships manually such as defining a relationship between a LAN Server domain and its location, or the organization owning it. Figure 32 on page 58 shows an example of the notebook page for a LAN Server domain.

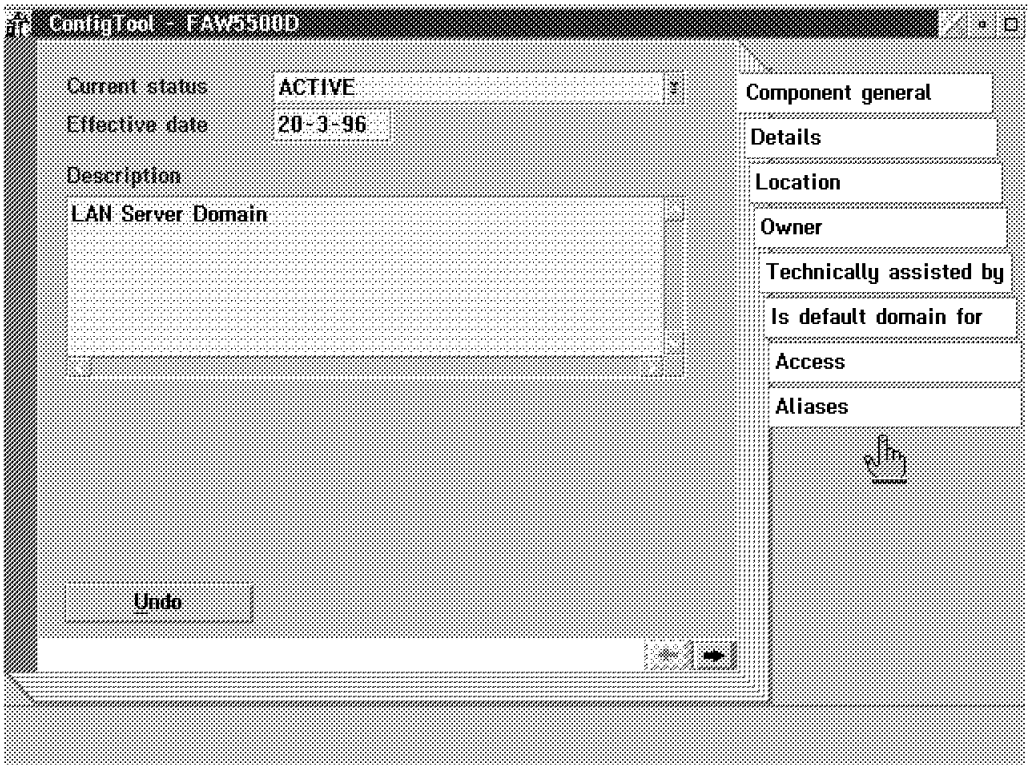

Figure 32. Notebook for LAN Server Domain

If this domain was recently installed, we may want to add administrative information such as organization, or the LAN administrator responsible for it. This can be done using ConfigTool's drag and drop capabilities.

Figure 33 on page 59 shows the Owner page of the notebook. There is currently no defined owner, so we will select **Open icon view**, which shows us the different organizational objects currently defined in ConfigTool. To define the new owner (establish a relationship), we simply drag the appropriate organization object to the drop hole. By doing this, the "dropped" organization object is now linked to the LAN Server domain object.

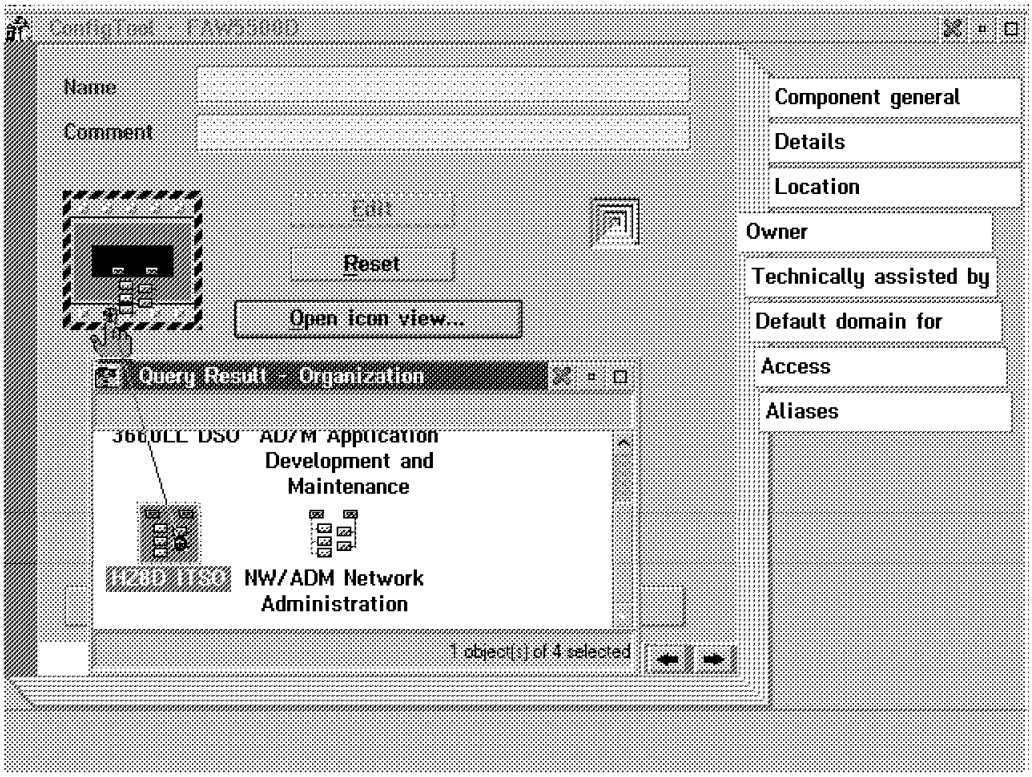

Figure 33. Establishing Relationship Between LAN Server Domain and Owner

Figure 34 shows us the newly assigned organization to the LAN Server domain FAW5500D.

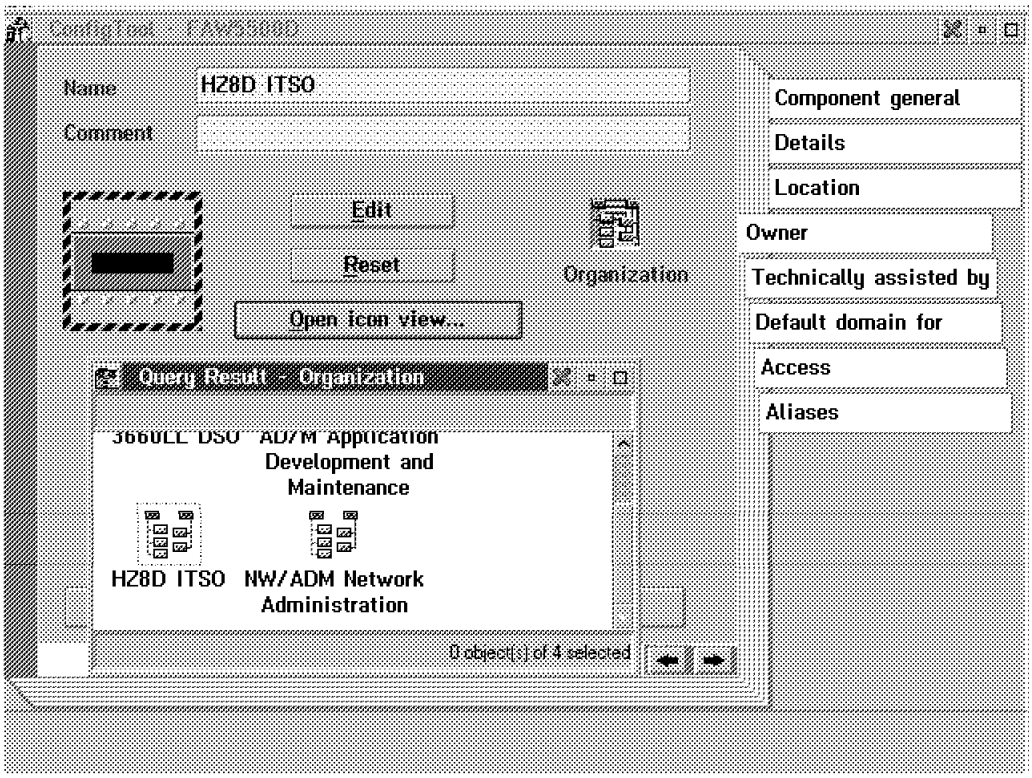

Figure 34. New Organization Assigned to the LAN Server Domain FAW5500D

Next we may want to update information on the person who will be responsible for this LAN Server domain. Figure 35 on page 60 shows the window that is displayed to us after selecting the **Open view selection** push button on the Technically assisted by notebook page.

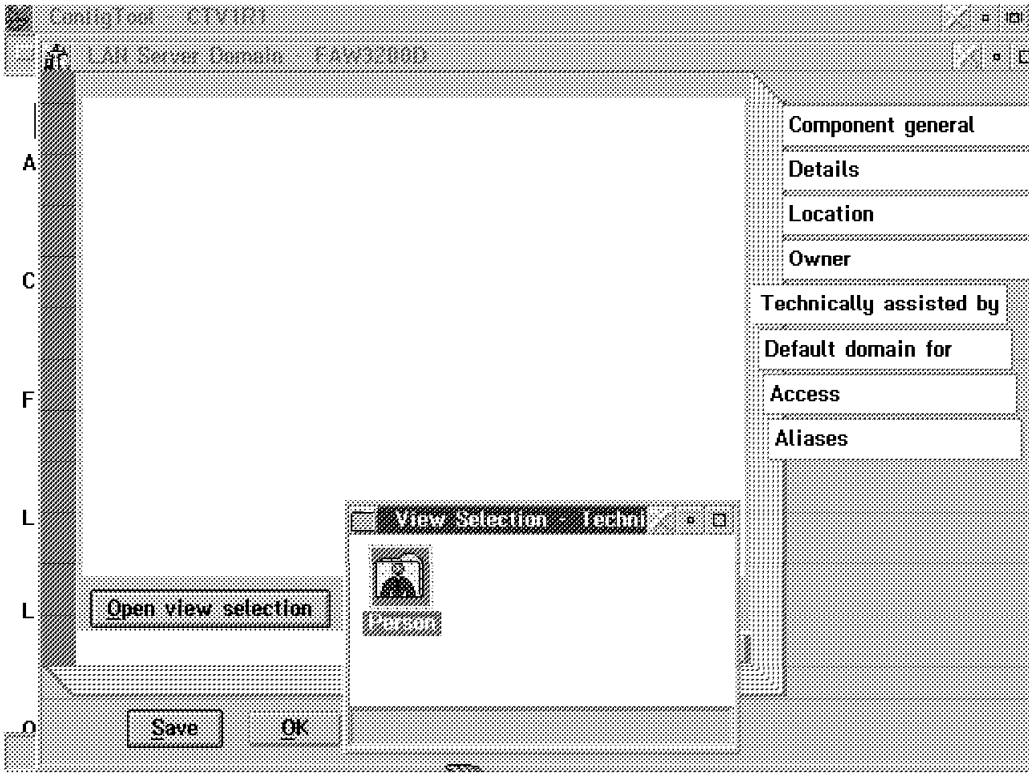

Figure 35. Show Person Query Opened From the LAN Server Domain Notebook

Figure 36 on page 61 shows the window that is displayed with all the people currently defined in ConfigTool. We can now drag the specific person who will be technically responsible for this LAN Server Domain to the notebook page (establish a relationship) as shown. The assisting persons are displayed in a container relationship page in the LAN Server domain notebook. This will allow you to assign more than one person to the domain.

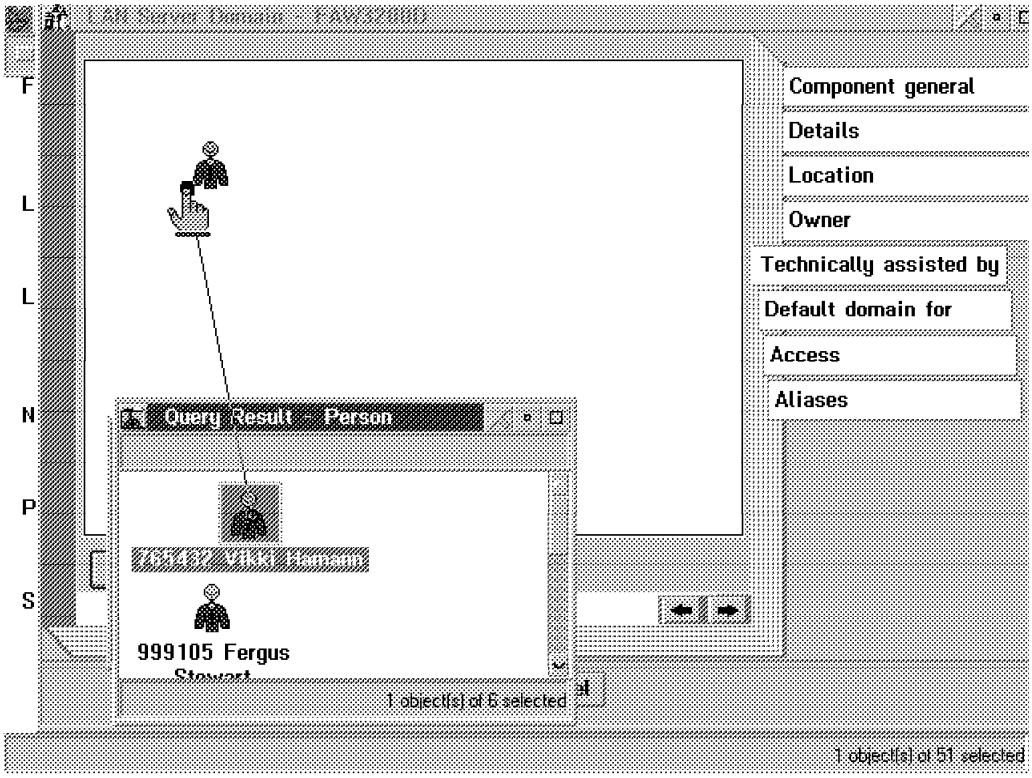

Figure 36. Dragging Person Object to Notebook to Define Relationship

Figure 37 shows the new person object defined to the LAN Server Domain FAW3200D.

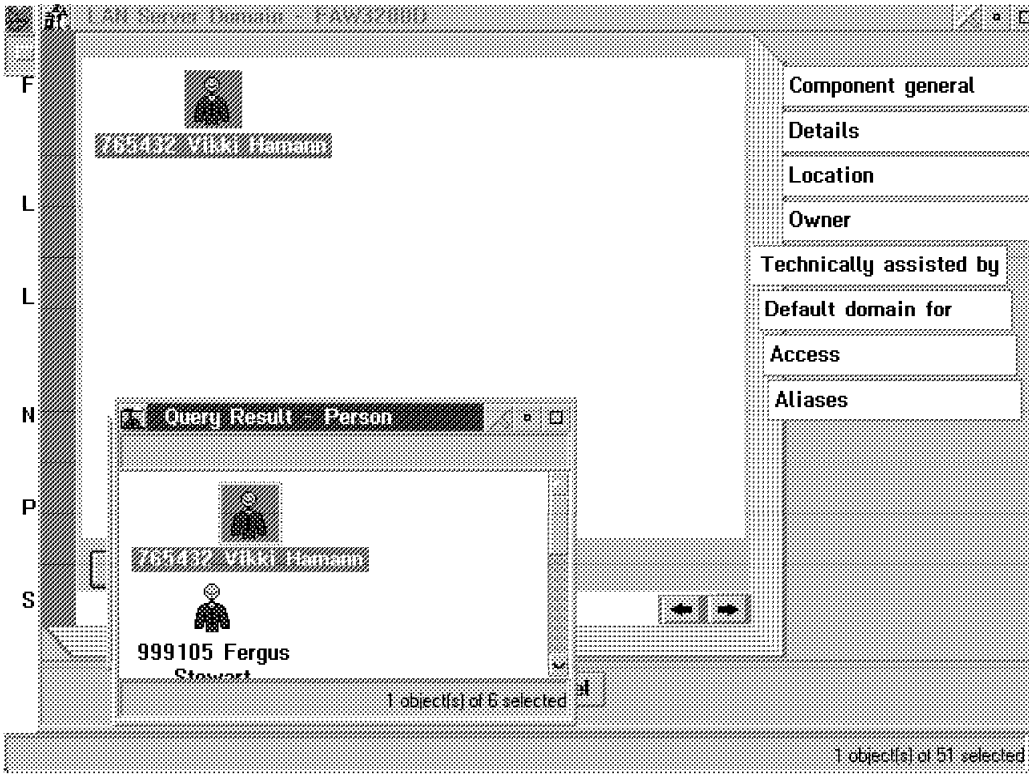

Figure 37. Relationship Established Through Drag and Drop

You can also define your own queries and group them in folders that may be nested. We have defined a folder called Raleigh Queries which can be seen from previous windows. After selecting this icon, a window is displayed with each of the different types of queries (query objects) that we have created. This is shown in Figure 38.

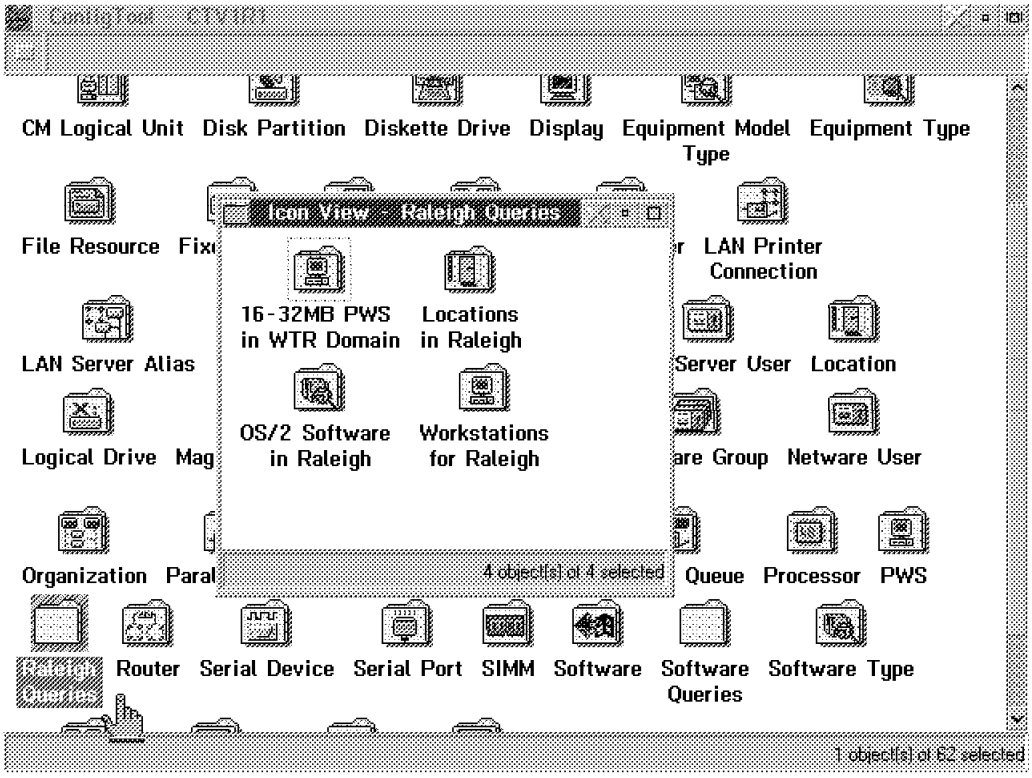

Figure 38. Raleigh Queries Folder

We then select one of the queries to display the objects within it. Figure 39 on page 63 shows the results of selecting the query to display all workstations with 16-32 MB of memory in the WTR LAN Server domain.

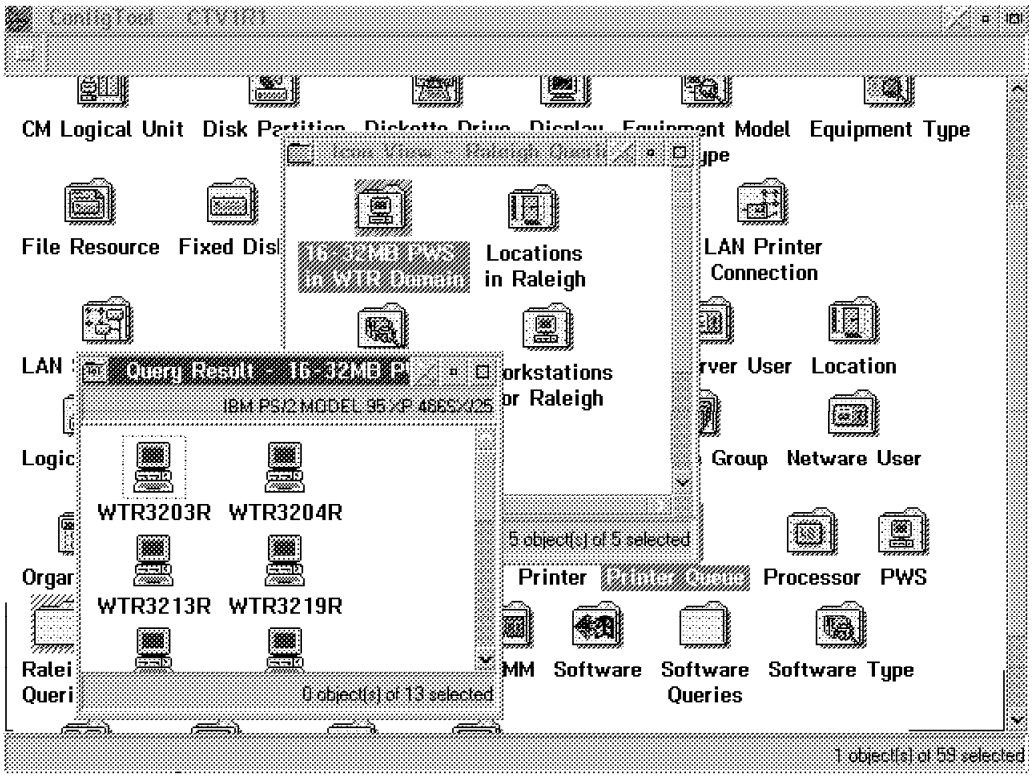

Figure 39. Result of Selecting 16-32 MB Query

From this window, we could select each of the workstation objects to display the actual attributes associated with the workstation, such as adapters installed and software running on it, etc. The notebook shows each of the attributes and relationships currently defined for the workstation object.

5.5 The ConfigTool Query Editor

ConfigTool has a very easy-to-use query editor that does not require any SQL knowledge to use. The query editor allows you to quickly create customized queries and save them as objects in ConfigTool.

Queries are handled in the same way as other objects in ConfigTool. The queries are shown in view selection containers, and properties or attributes are shown in notebooks. Query criteria can be combined by using logical AND as well as OR operators. Again, OS/2 drag-and-drop facilities are used to define relationships to be used within the query.

ConfigTool is shipped with predefined template queries for every object class in the ConfigTool database. These template queries can be copied or moved between folders. You can define any number of additional queries in the main window or in user-created folders that can be nested. These query editor capabilities allow you to create a customized GUI to the ConfigTool database to suit your individual requirements.

5.5.1 A Query Example

The following section steps you through an example of defining a query that would allow you to check the installed software on workstations in the Raleigh location to check that you have all the appropriate software lisences. This example queries for all OS/2 software installed on the Raleigh workstations. However, it could be quickly and easily modified for different software types and different location or department criteria.

Our first step is to create a new folder on the main view selection window. This is done by clicking the right mouse button in a window (not over an object) as shown in Figure 40 and selecting the **Create folder** option.

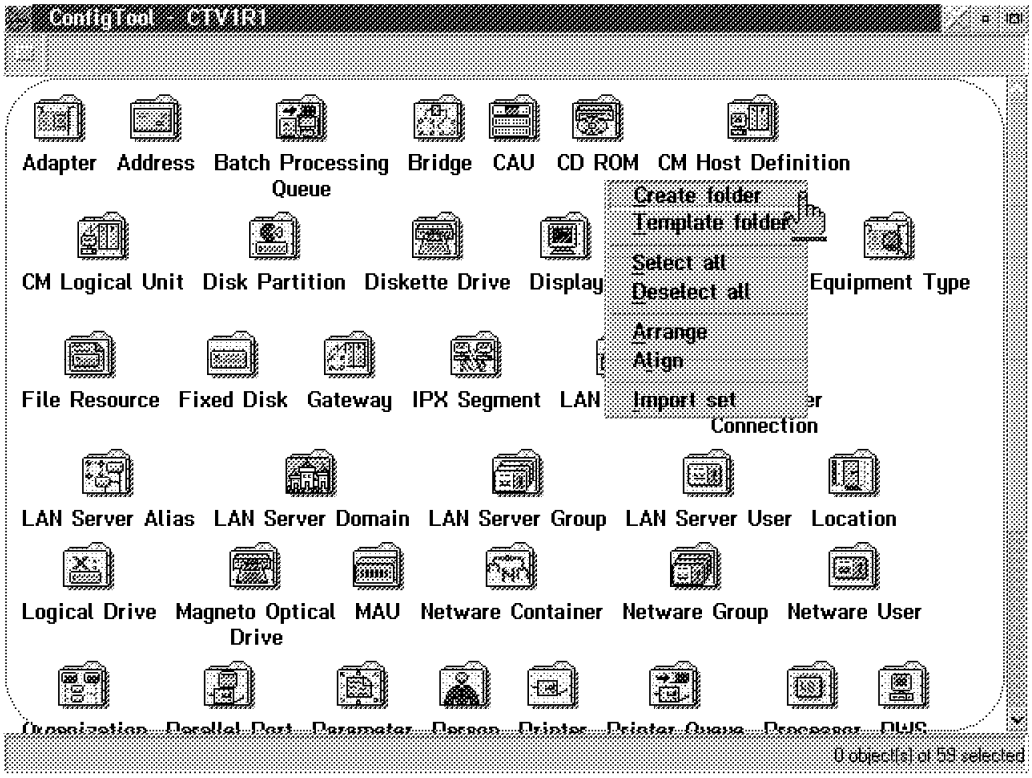

Figure 40. Creating a New Folder

We can then rename this new folder with the text that we want. In this example, we rename it to **Software Queries.** This is done by using the Alt key and mouse button 1 over the current text as shown in Figure 41 on page 65.

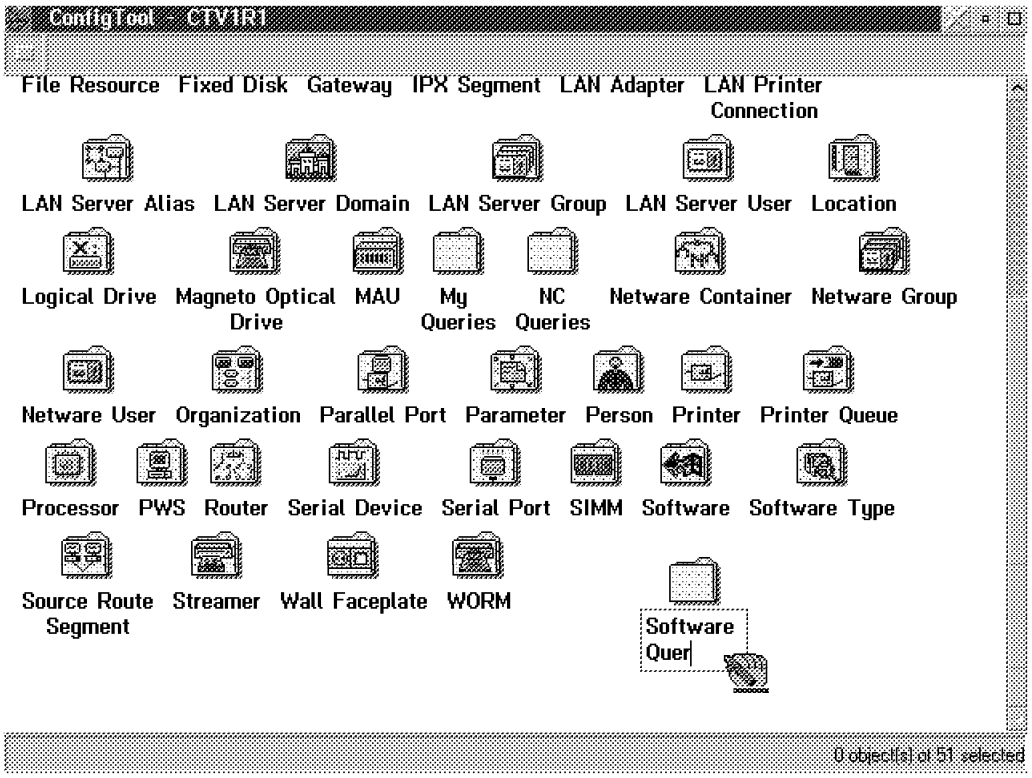

Figure 41. Renaming the Newly Created Folder

Next, we double-click on this new software query folder, which takes us to an empty window where we can begin creating our query objects. By clicking with the right mouse button in this window, we open up a menu that allows us to select **Template Folder**, as shown in Figure 42 on page 66.

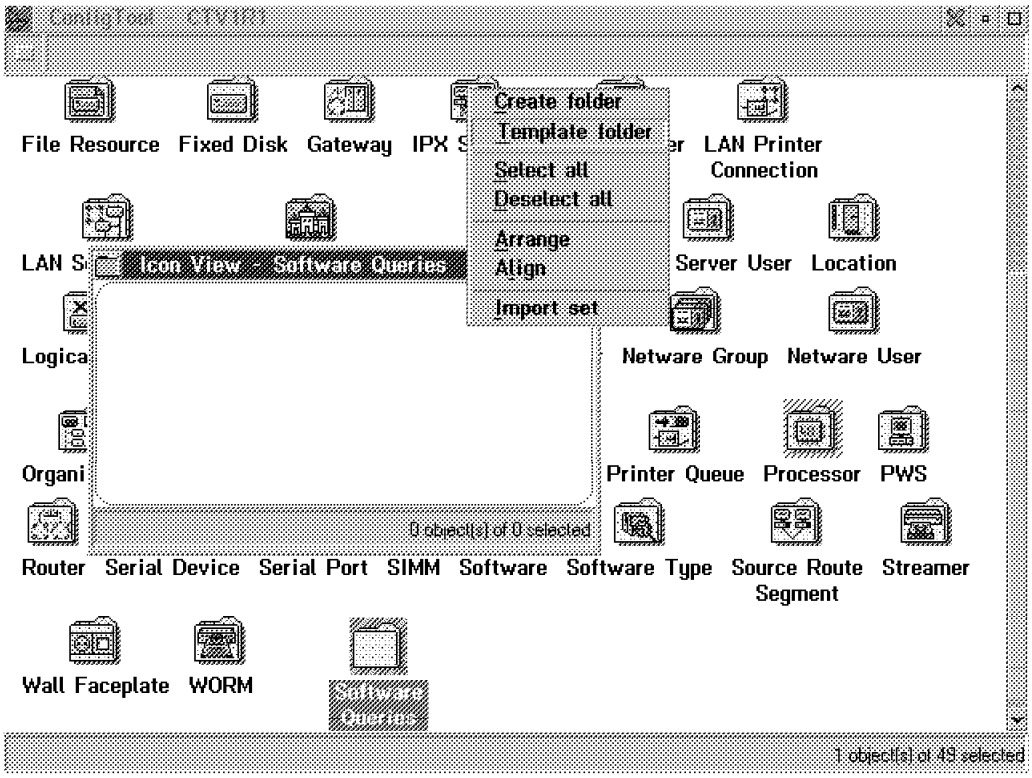

Figure 42. Selecting Template Folder to Create Our New Queries

A new query can be copied from an existing query or from a template. Template objects are provided for each object type supported by ConfigTool. Figure 43 on page 67 shows the template folder from where we can drag each of the different object types that we will need to create our query object. These are the Software Type, Software, PWS and location objects.

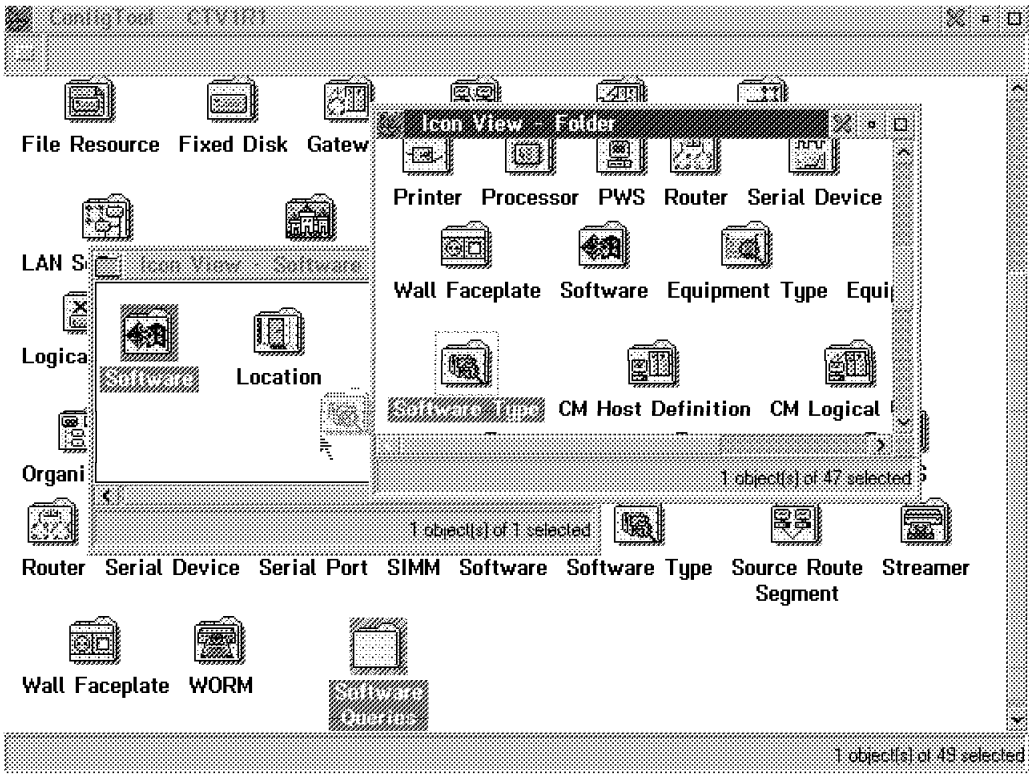

Figure 43. Dragging Templates to our Software Queries Folder

Figure 44 on page 68 shows our Software Queries folder with each of the different template objects. The first thing we do is to rename the Software Type object to **OS/2 Software in Raleigh**. The software type object is used as the base of our query.

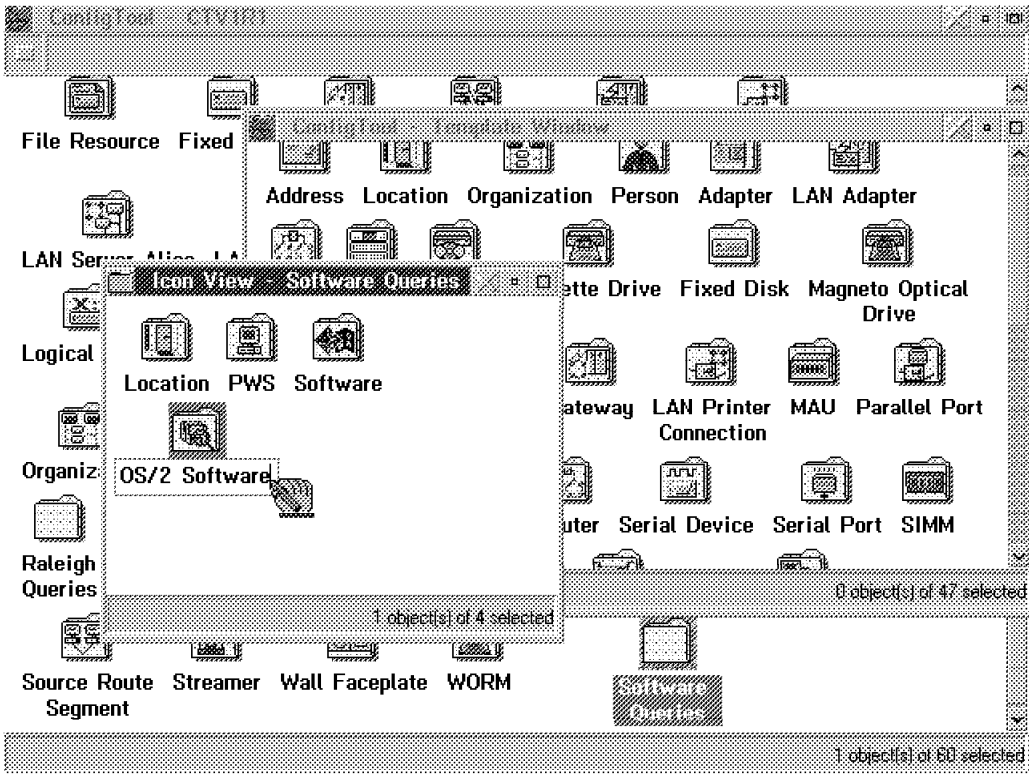

Figure 44. Renaming the Software Type Object

We now define our actual query. This is done by opening the settings notebook for our query object from where we can define the different query criteria that we will use. To open the notebook we select our query object, then the right mouse button which pops up a menu, and then select the **Open Settings** option as shown in Figure 45 on page 69.

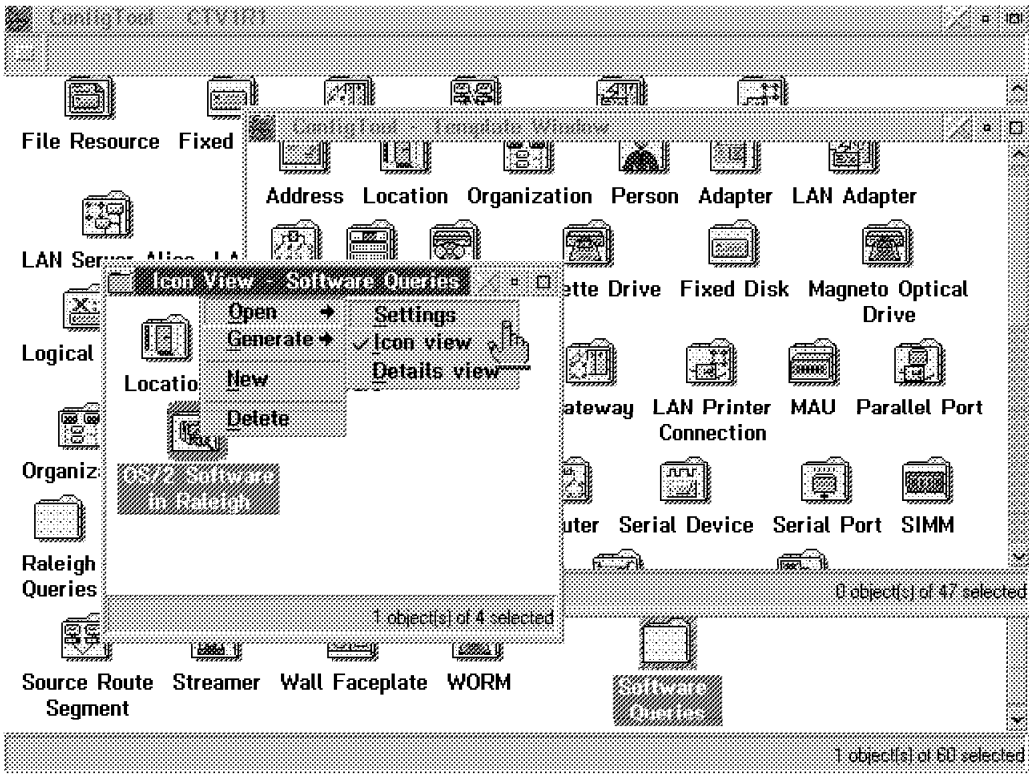

Figure 45. Opening Settings for Query

Figure 46 shows the Query Editor settings window. This page allows us to define a description of our query and to begin defining the scope of our query.

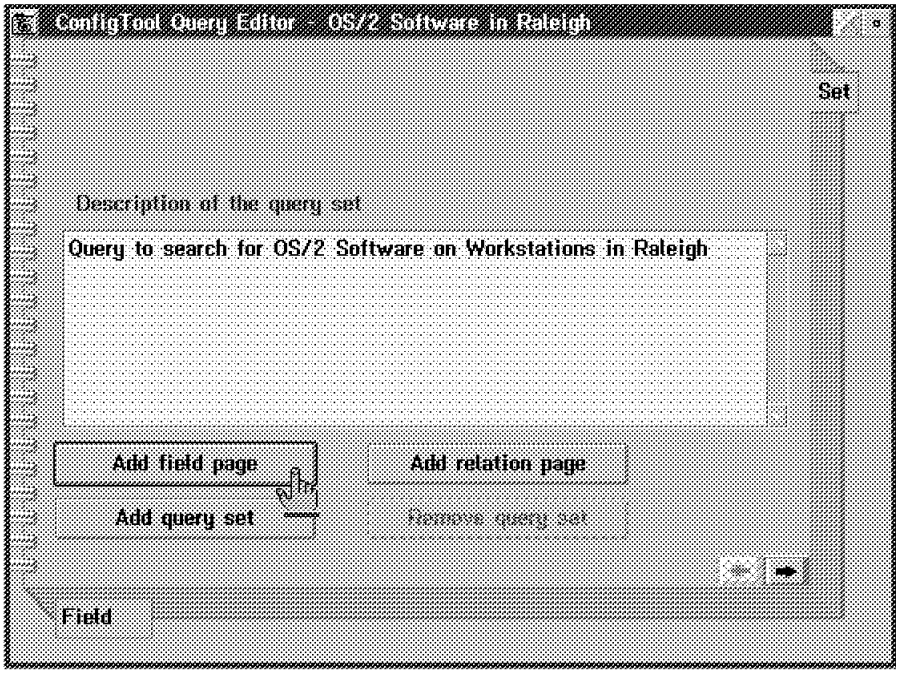

Figure 46. The ConfigTool Query Editor Settings Page

From the above window, we select the **Add field page** push button which allows us to define the specific fields in the database that we want to query.

Following are the different criteria that we will be defining for this query.

- Define the Software Type field to search for OS/2 Software.
- Define a relationship between the Software Type and actual Software objects (*is assigned to* relationship).
- Define the relationship between the Software Objects and PWS objects (*is installed on* relationship).
- Finally define the relationship between the PWS objects and the Raleigh Location object (*is at* relationship).

Figure 47 shows the Query Definition window that is displayed upon selecting **Add fields page** from the Query Editor window of the software type query.

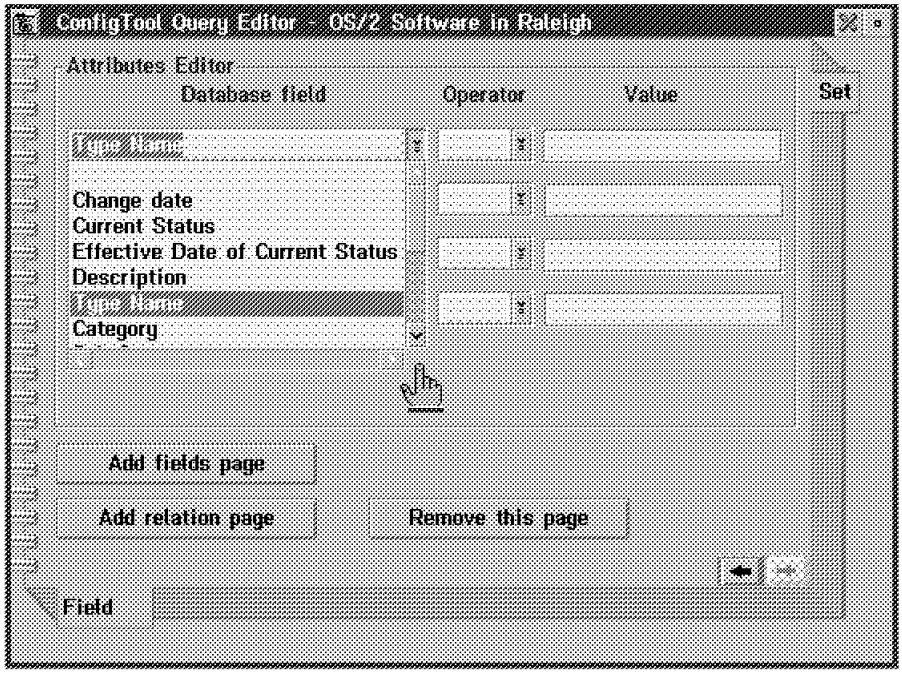

Figure 47. The Query Definition Window

Each settings window has a pull-down menu option that allows you to select the criteria for the query definition. Figure 47 shows this pull-down menu with the different fields that are available to be queried for the software type objects. We select **Type Name**.

The next step is to define the operator field that contains the mathematical operators (=, <, >, etc.) that will be used with the query. In our example, we select the **LIKE** operator, which means that we want to search for all objects that contain OS/2 in their name. This searches for all types of OS/2 software, not just the OS/2 base operating system. The Operator field is shown in Figure 48 on page 71.

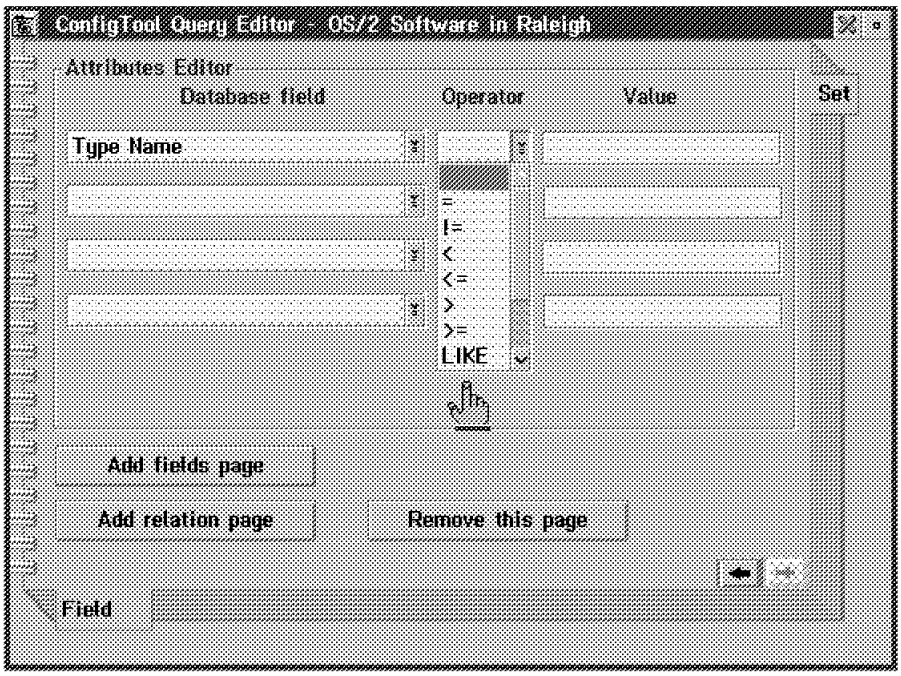

Figure 48. The Operator Field

Finally we enter the actual value we want to define, which is *OS/2*. Both the * and ? wildcard values can be used within the Query Editor. Figure 49 shows our completed field definitions page.

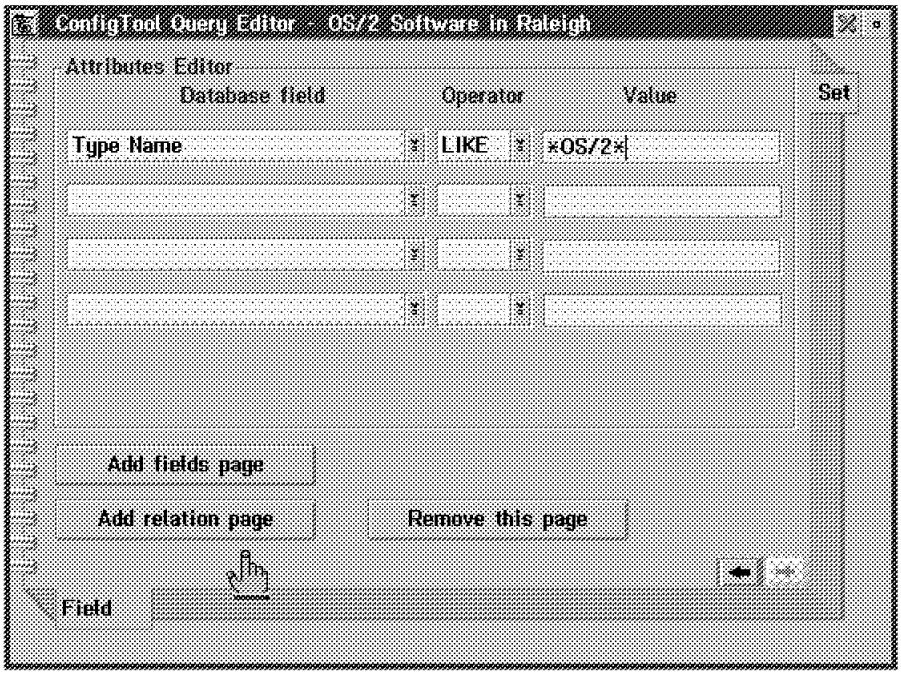

Figure 49. Query Definition for OS/2 Software Types

We could also define the query further by using individual types of OS/2 software, or for certain versions or CSD levels of software. We can also use multiple sets, fields and relationship pages, and field values, for example to search for workstations with both DB2/2 and CM/2 installed.

When using a single fields page or multiple pages within a single set, the logical AND operator will be used. If you wanted to use the OR operator, you would need to create fields pages in difference sets, which would cause the contents of each fields page to have the OR operator applied to them.

The next step in creating our query is to define the different relationships we want to use in our query. The first relationship to define is between our Software type and Software objects. A relationship is defined by selecting the **Add relation page** push button shown in the previous window.

Figure 50 shows the Relation Editor notebook page where we will drag the software object to the drop hole. This action will define the *is assigned to* relationship as shown in Figure 51 on page 73.

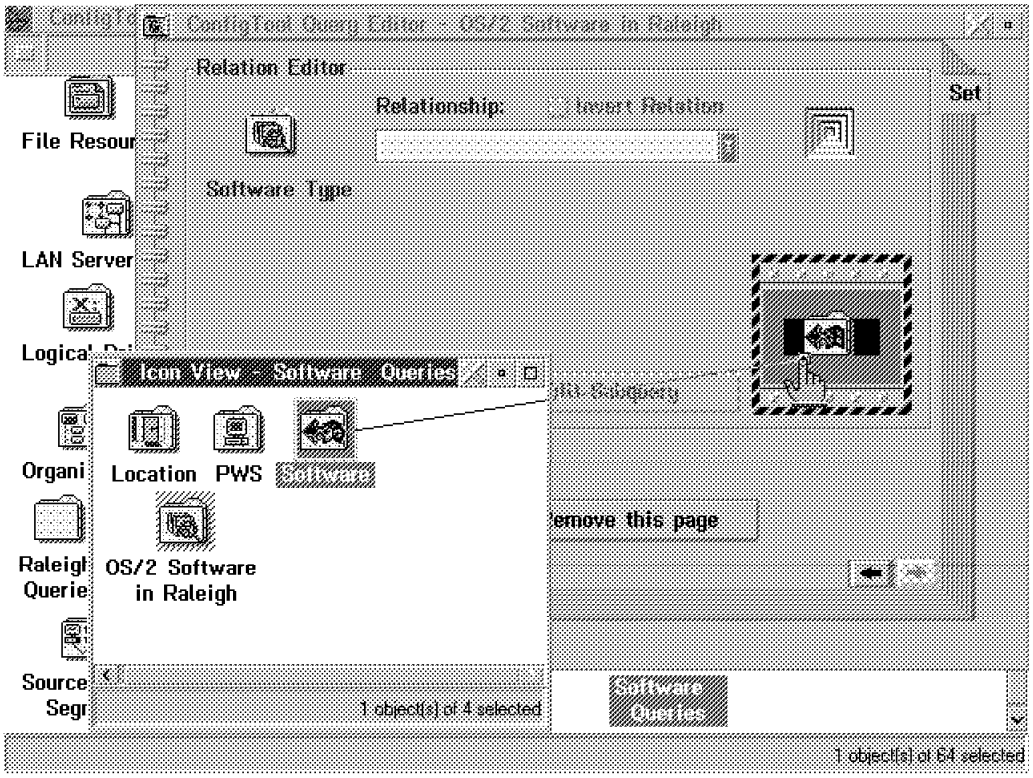

Figure 50. Adding the Installed on Software Relationship

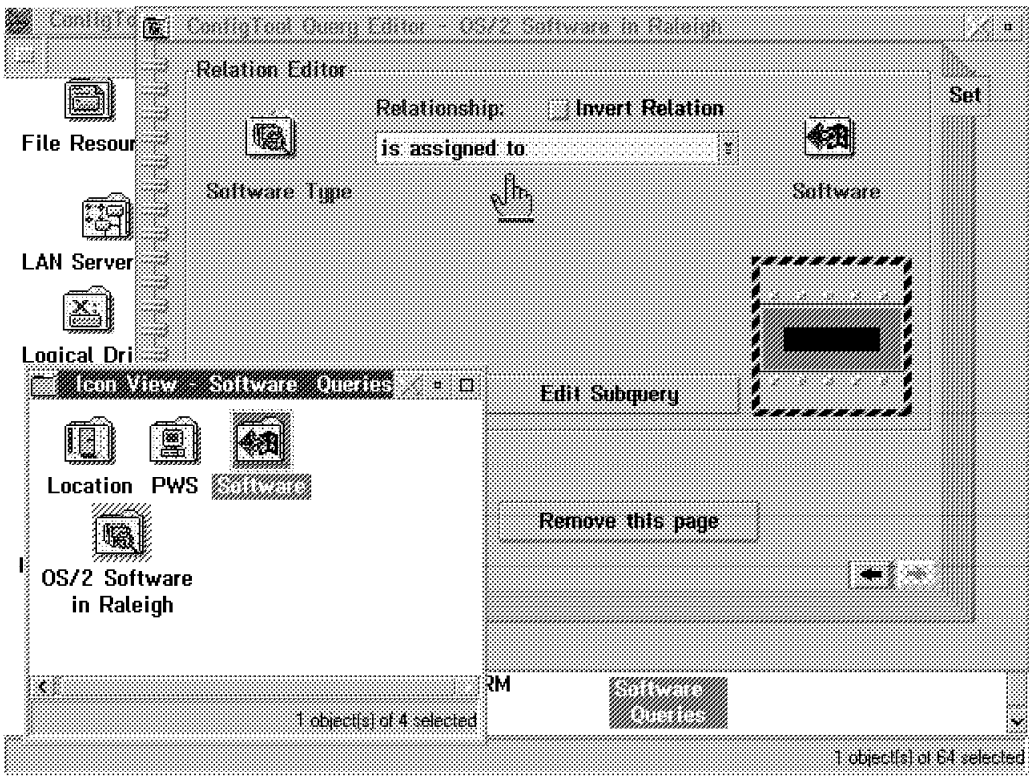

Figure 51. Software Relationship Defined

Next we want to define the Software objects to the PWS objects. We select the **Edit Subquery** push button from the previous window which takes us to the notebook of another query. This will allow us to restrict the software now to PWS objects. Figure 52 on page 74 shows us dragging the PWS object to the drop hole. This action defines the *is installed on* relationship as shown in Figure 53 on page 74.

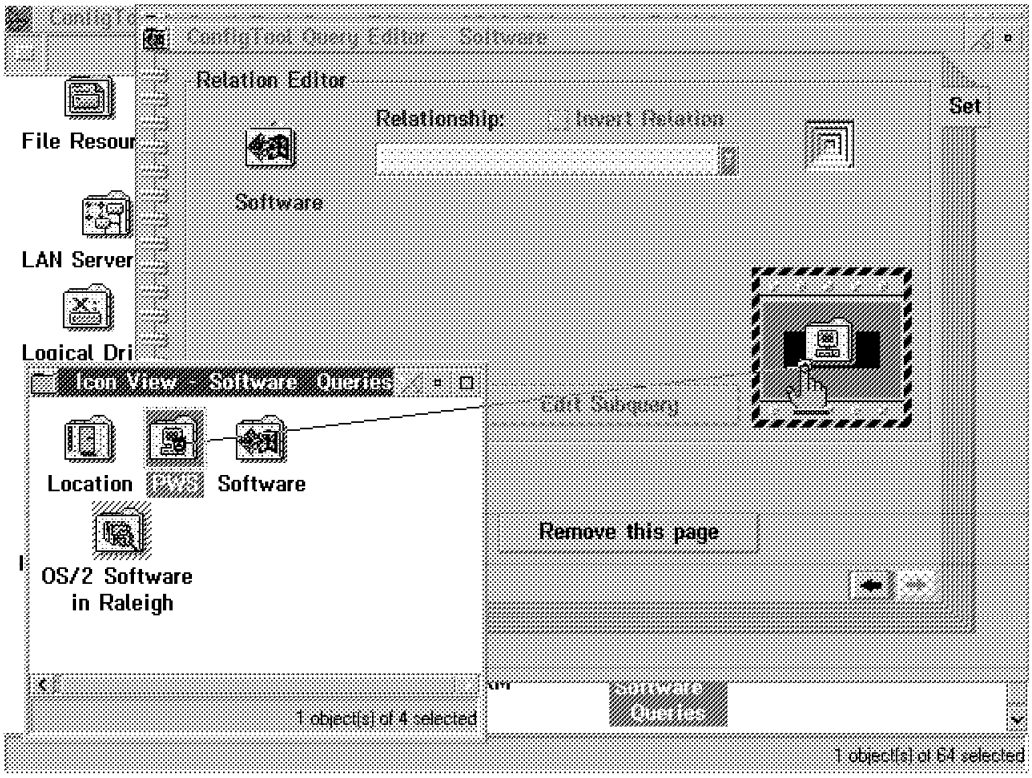

Figure 52. Adding a Relationship to this Query

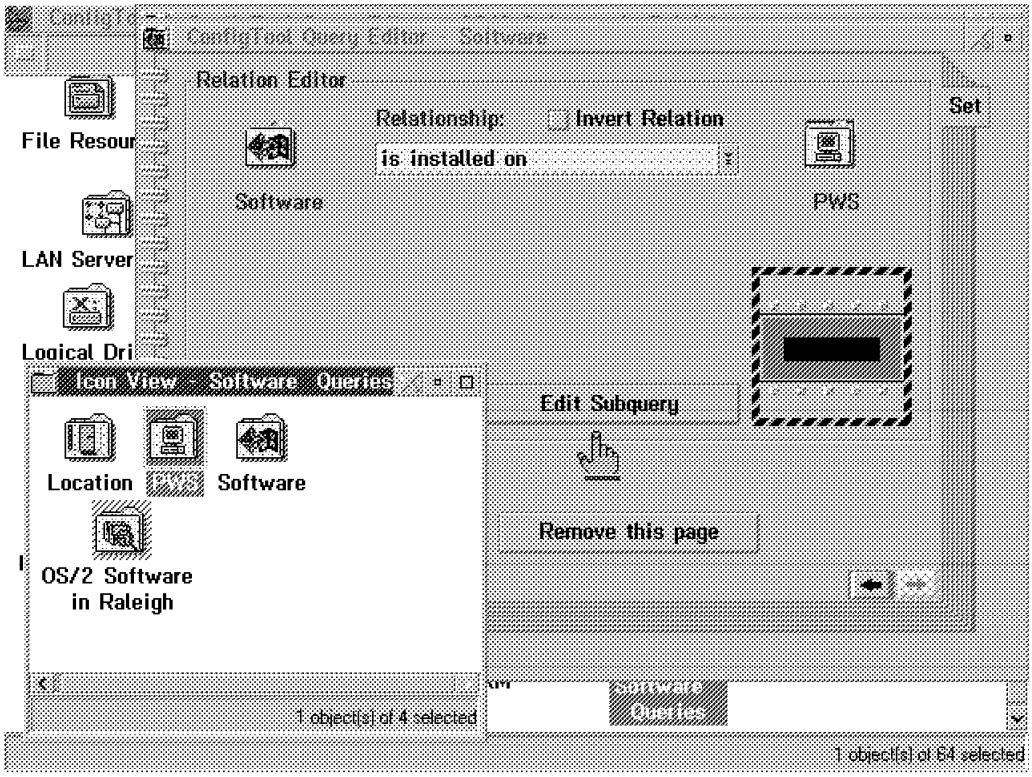

Figure 53. Workstation Relationship Defined

Finally, we define the actual location that we want to limit our query to, which is the Raleigh location. The following two steps must be performed here:

1. The location object must first have a field page defined limiting the Query to the Raleigh location.
2. The location object must then be dragged to our OS/2 Software Query.

Figure 54 shows the fields page that we used in the location object.

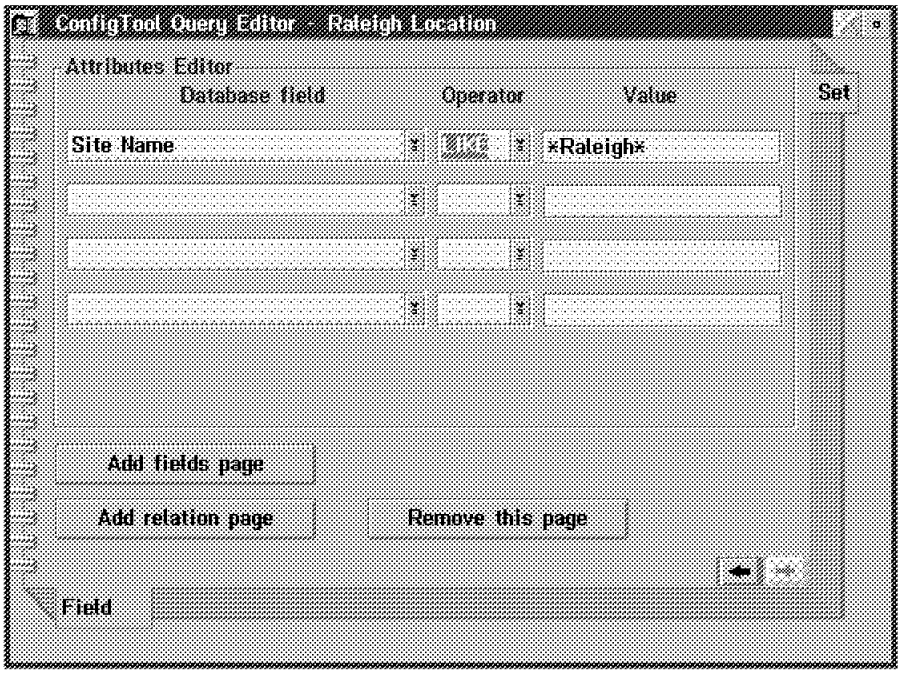

Figure 54. Fields Page of Our Raleigh Location Object

We can now drag our Raleigh Location object to the drop hole to define the final relationship within our query as shown in Figure 55 on page 76.

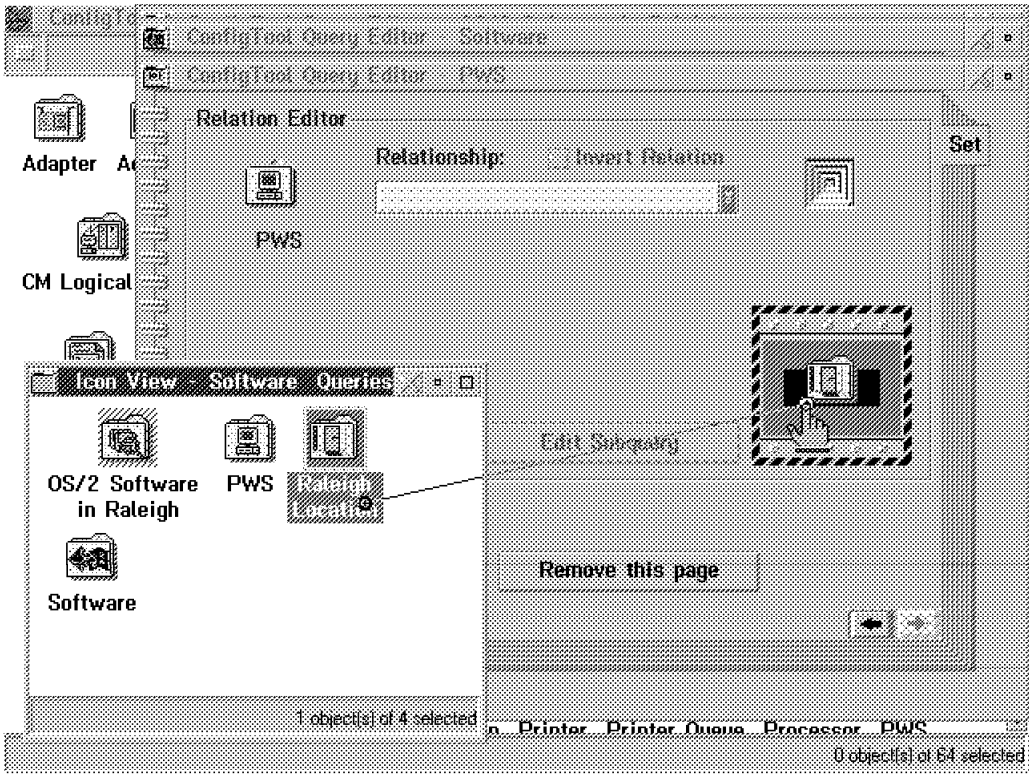

Figure 55. Adding the Raleigh Location Relationship

Figure 56 shows the *is at* relationship defined to our PWS query.

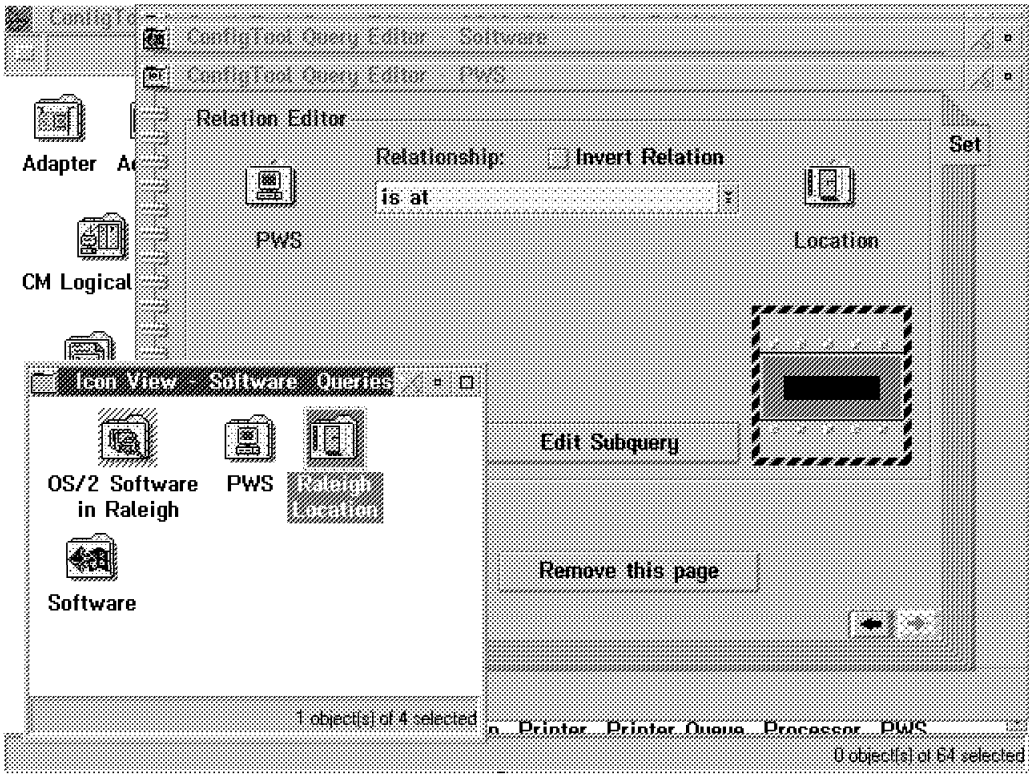

Figure 56. Is At Relationship Defined

Figure 57 on page 77 shows the results of our query to display all OS/2 software installed on workstations in the Raleigh location.

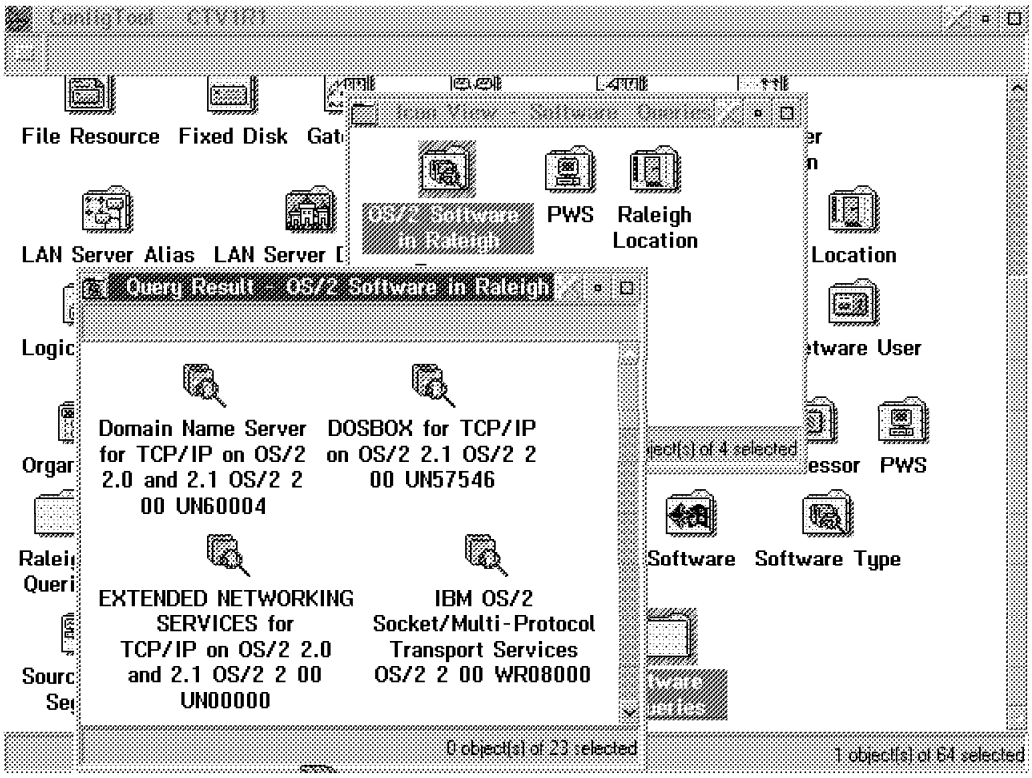

Figure 57. Results of Our Query!

5.6 Reporting Features

One very important feature when looking at configuration management products is the ability to provide reporting mechanisms. Most organizations will run regular reports for each of the management functions and tasks such as problem and changes, and of course for configuration management.

ConfigTool provides two functions for requesting reports:

- The GUI ConfigTool reporting interface which provides predefined reports.
- Predefined Query Manager (QM) queries to produce reports. Specific queries are provided for the different groups of objects in the database. These queries can be changed and extended by you. This option will actually take you into DB2/2 Query Manager.

Both of the above functions can be selected from the main icon view as shown in Figure 58 on page 78.

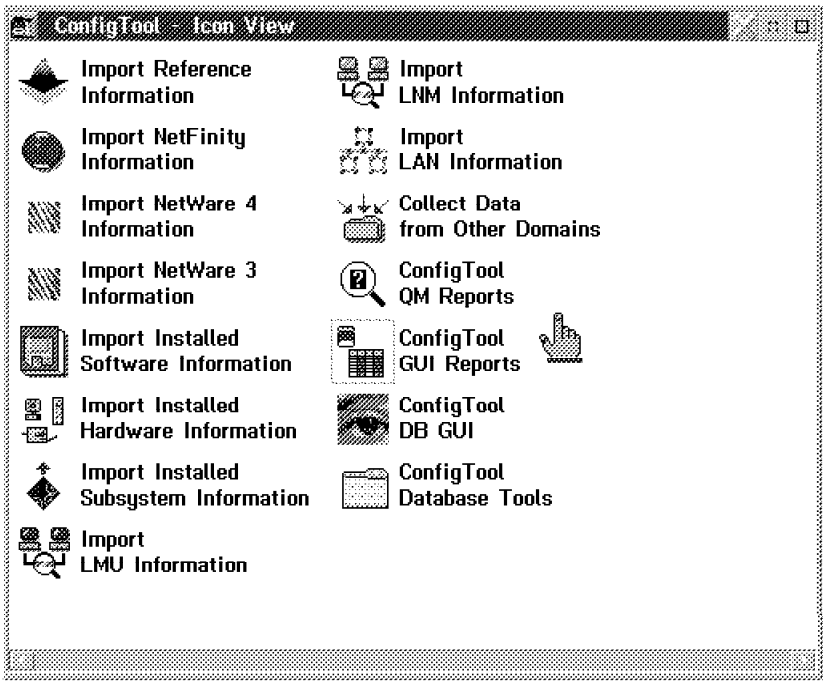

Figure 58. Selecting ConfigTool Reporting Functions

Figure 59 shows the ConfigTool-supplied reports that are available. It was opened by double-clicking on the ConfigTool Reports icon shown in the previous figure. Different reports are provided for the different query groups listed on the left-hand side of the following winddow.

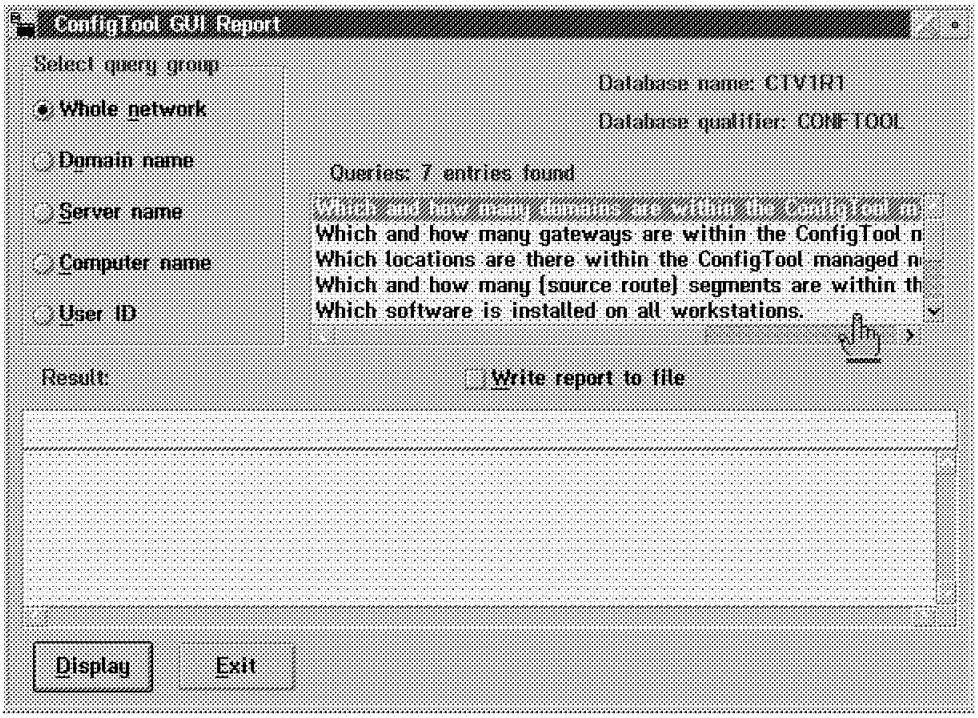

Figure 59. ConfigTool Supplied Reports

Figure 60 on page 79 shows the results of selecting the query to display the types of software installed on the workstations defined.

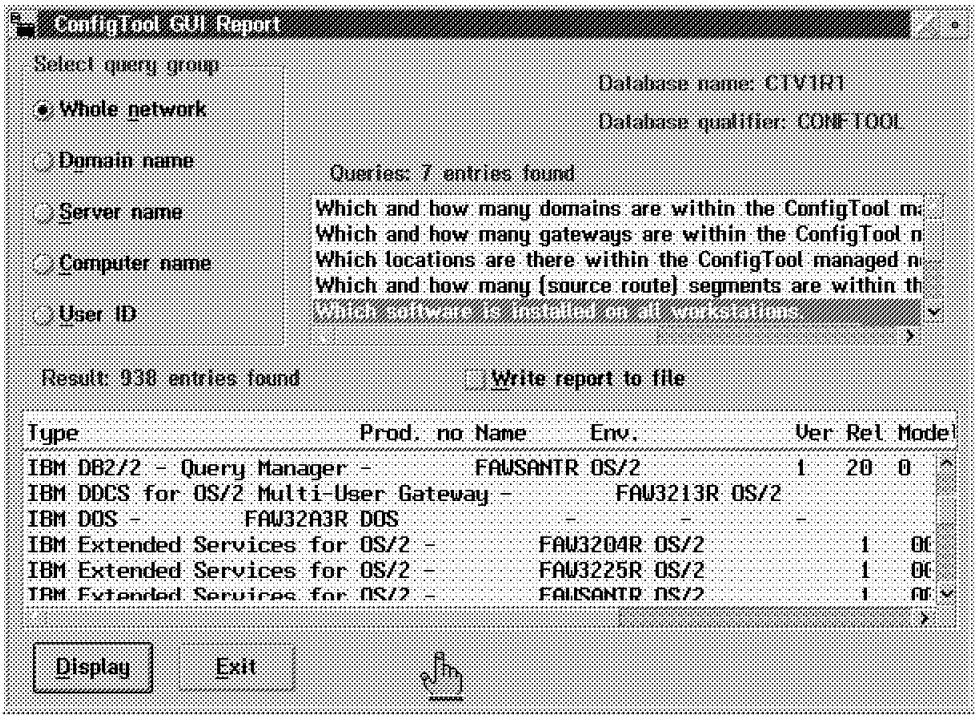

Figure 60. Result of GUI Query

Figure 61 shows a list of the supplied QM reports. Each of these types of reports can be selected, which then takes you to a list of the individual reports. Figure 62 on page 80 shows you a list of the predefined types of reports that are available.

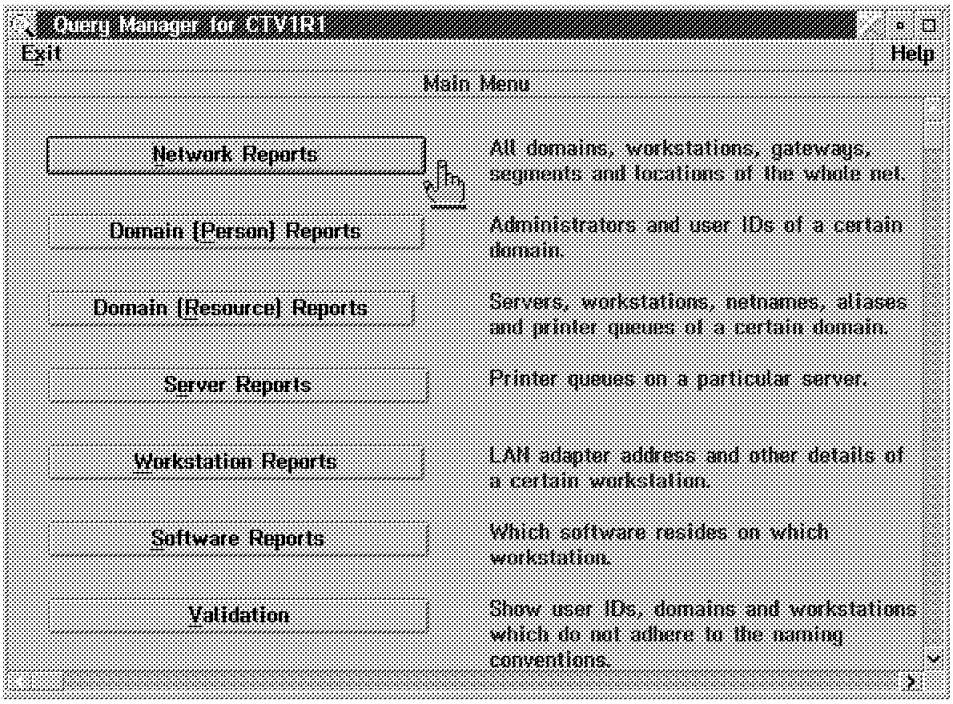

Figure 61. Predefined Query Manager Reports in ConfigTool

Figure 62 on page 80 shows you the individual network reports which are supplied.

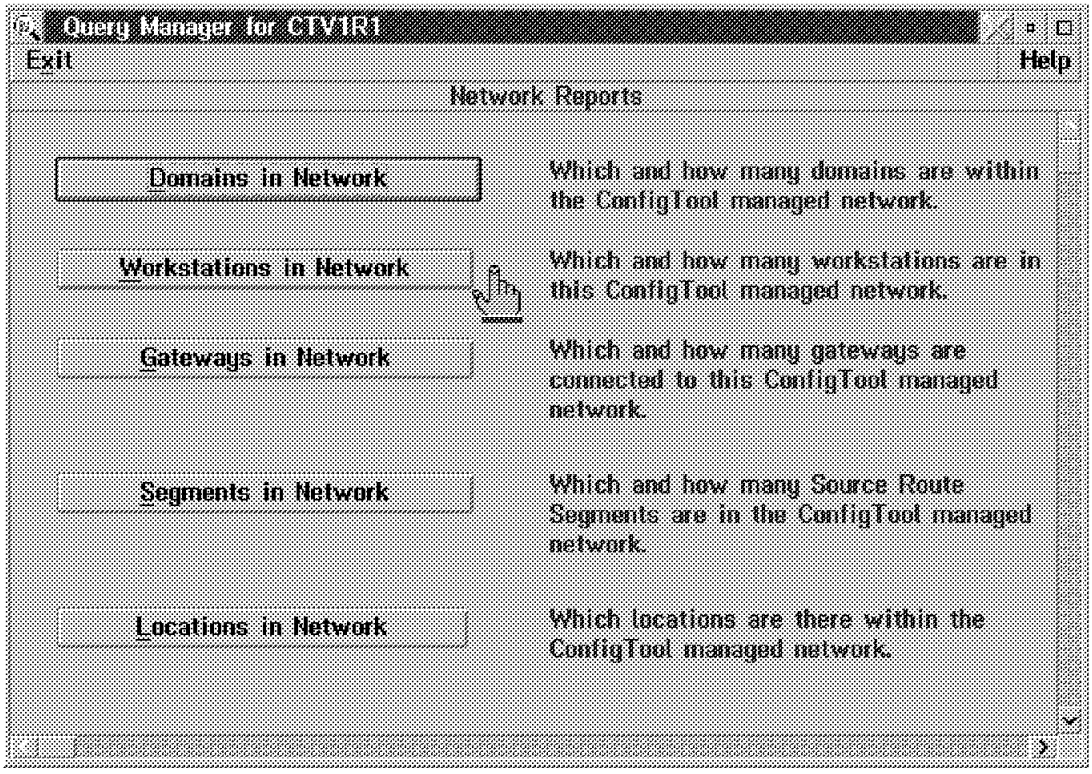

Figure 62. Predefined Network Reports

Figure 63 shows the ouput from selecting the **Workstations in Network** query.

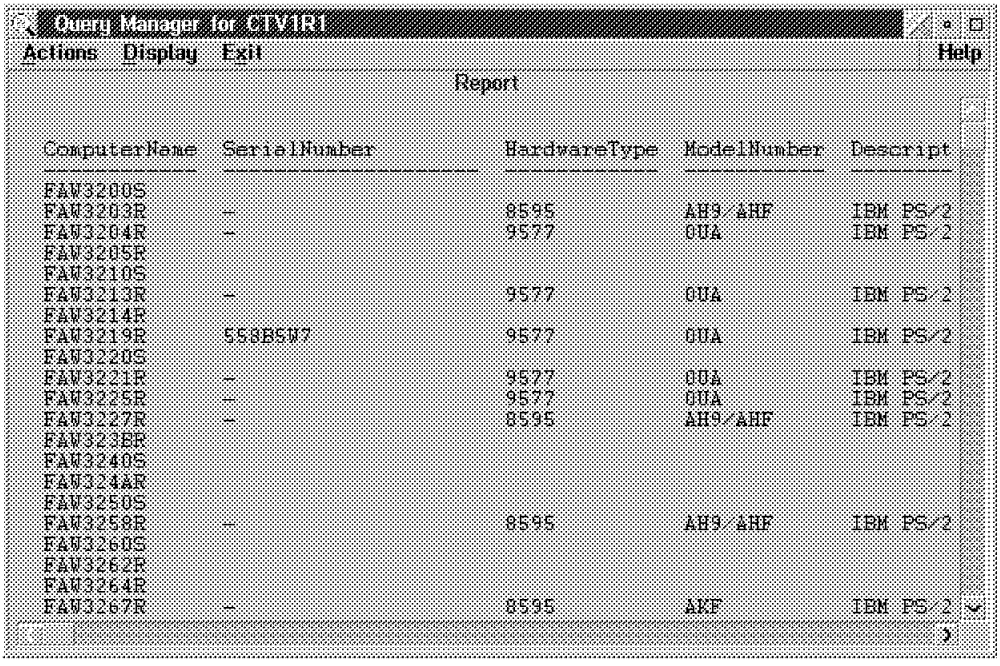

Figure 63. Workstations in Network Report

5.6.1 Generate SQL Query Function

Another very useful function available from the ConfigTool GUI is the Generate SQL Query function. This allows you to copy the SQL query used on any query object to the OS/2 clipboard. This SQL query can then pasted into DB2/2 and customized further if required. The following few pages step you through this function.

In the Query Editor section we described how to create a query to search for all OS/2 Software in the Raleigh Location. If the Raleigh management requested regular printed reports on this, we could easily create the query to run and store in DB2/2. Figure 64 shows our OS/2 Software Queries for Raleigh folder. From this window we would select the query object, and then push the right mouse button to display the pop-up menu. From this menu we would select the **Generate, SQL query** options as shown.

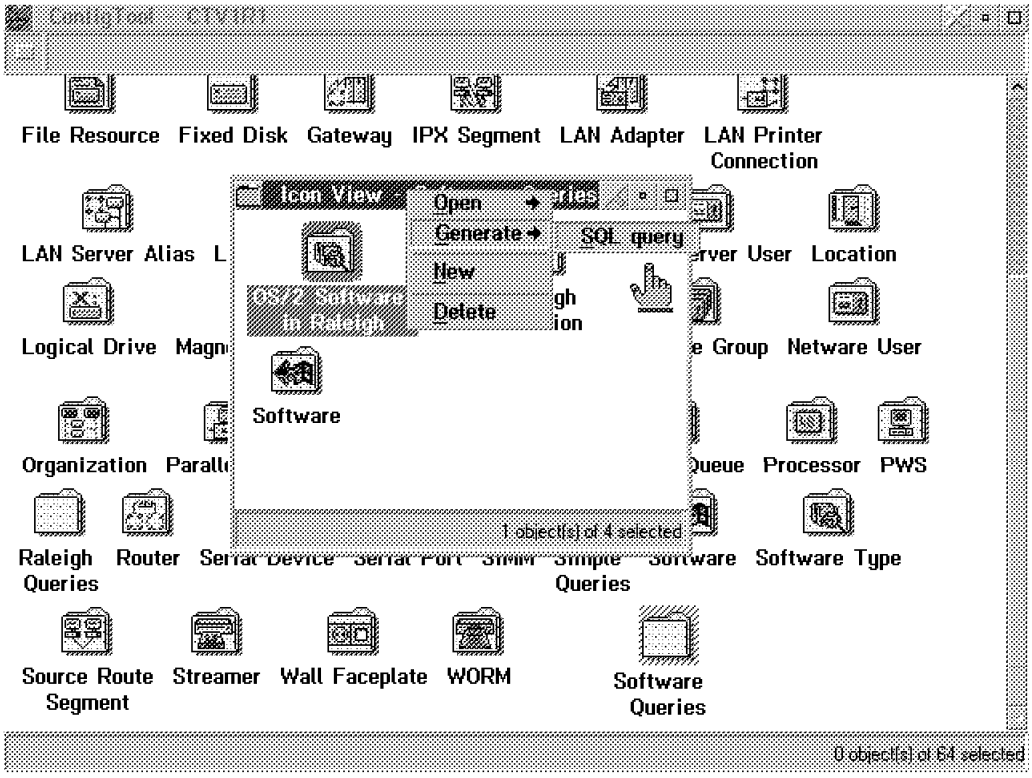

Figure 64. Selecting the Generate SQL Query Option

Upon selecting the generate function, the SQL query defined for the object is copied to the OS/2 clipboard and a message displayed similar to that shown in Figure 65 on page 82.

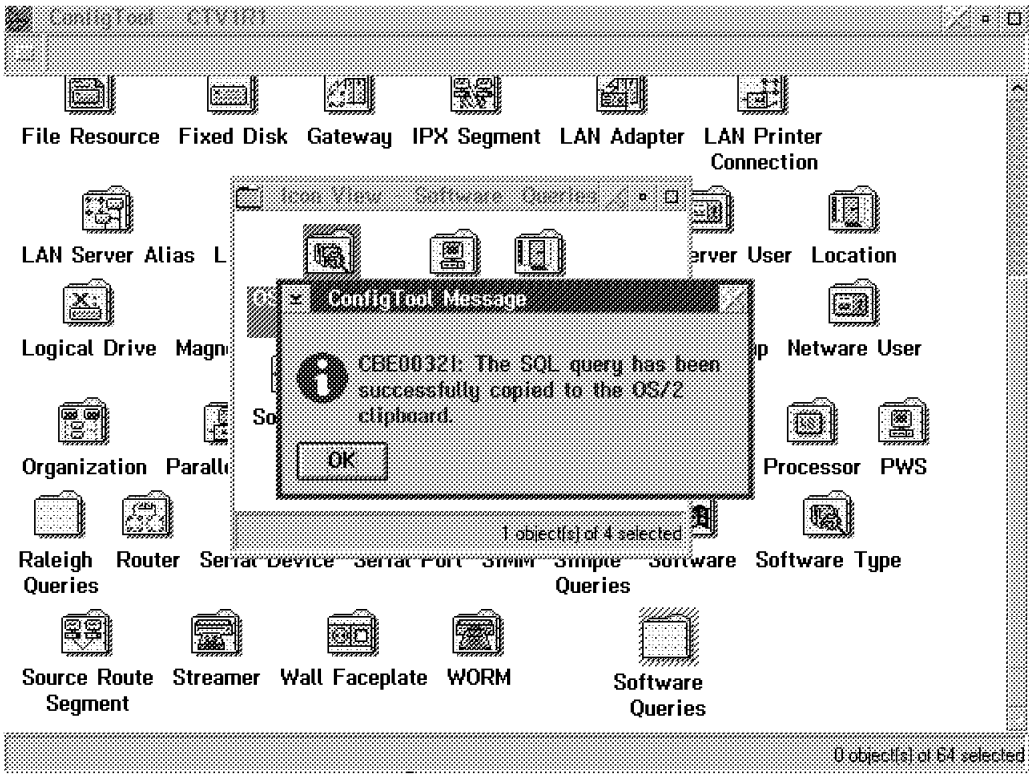

Figure 65. SQL Query Successfully Generated

We can now go into DB2/2 Query Manager and simply *paste* the SQL query into a new query page as shown in Figure 66.

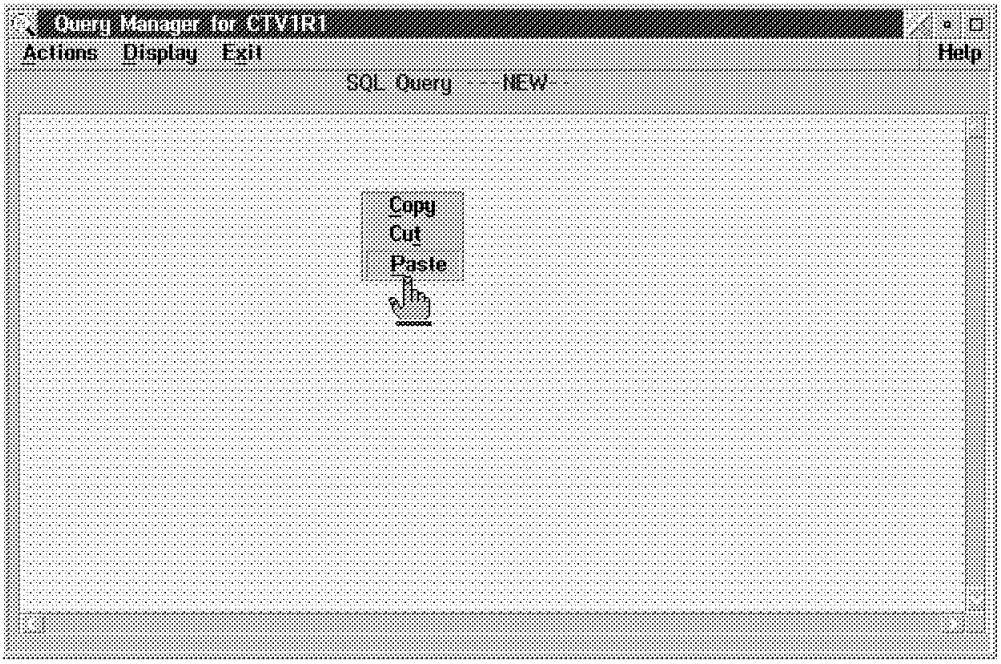

Figure 66. Paste SQL Query into DB2/2 Query Manager

Figure 67 on page 83 shows the SQL query that has been copied into Query Manager.

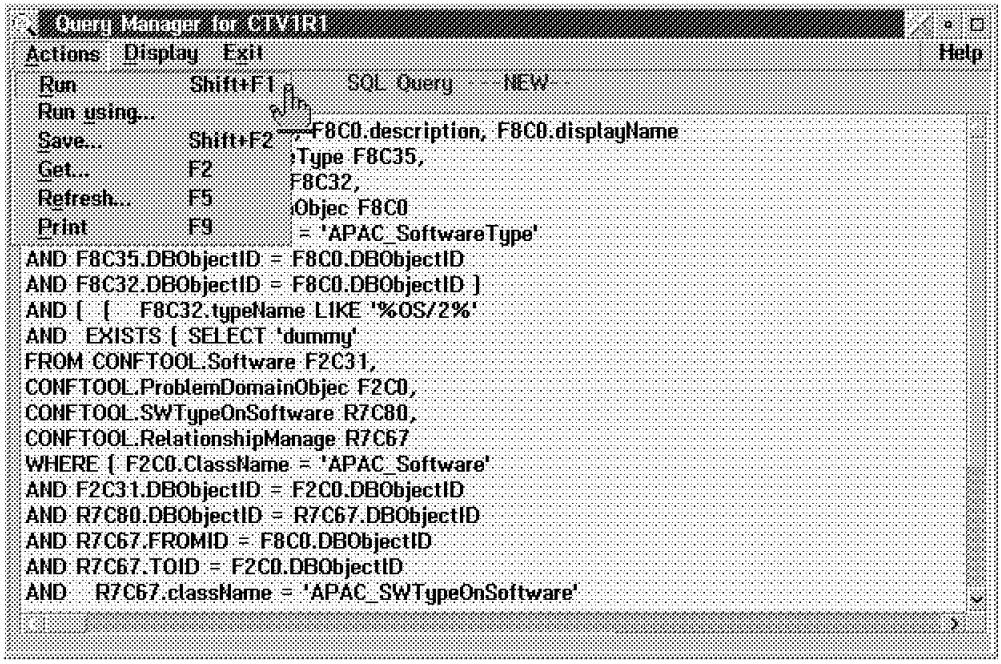

Figure 67. SQL Query Successfully Copied

Once the query has been copied you can run the query and also save the query to be run and printed on a regular basis. Figure 68 shows the results of running the OS/2 Software in Raleigh query.

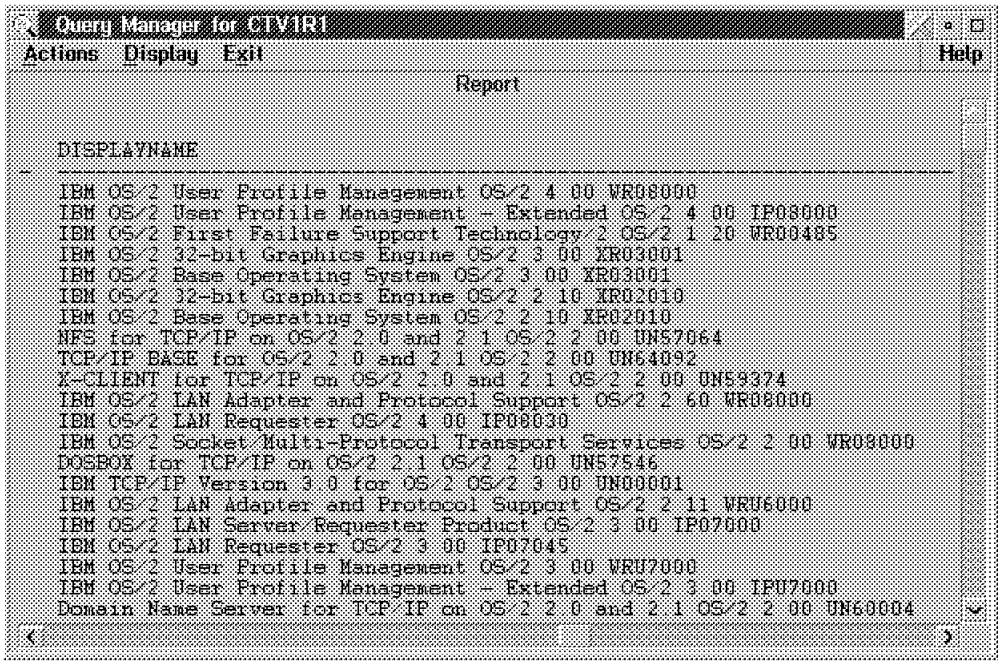

Figure 68. Results of Query

The Generate SQL Query function as you can see, is significantly simpler than coding SQL statements directly into DB2/2, and can be used to create reports that need to be regularly run for your configuration management requirements.

More complex queries can be created, however, through products such as Query Manager and Visualizer Flight for DB2 which is available for the OS/2 Version 3.0 environment (IBM Visualizer Flight for Warp Version 1.0, Program Product 5622-557).

5.7 ConfigTool Operating Requirements

The ConfigTool GUI can be implemented both on stand-alone machines (even on laptops or notebooks) as well as in client/server environments where the program is placed on a shared resource (independent from the ConfigTool database) and can be used by any number of users. All of the data from client workstations, servers and various products are collected into the central ConfigTool database. You would then just copy the user interface component to the various workstations that will be accessing the central ConfigTool database. Using the remote database facilities of DB2/2, users can access this central database.

The ConfigTool client hardware and software information retrieval tools for DOS/Windows and OS/2 workstations also do not need to be installed on the end-user workstations, but can be set up as shared tools by making use of for example IBM LAN Server features. This saves you from the task of distributing code to thousands of managed workstations. The redbook *Getting Started With Configuration Management Using ConfigTool*, SG24-4667, describes how to set this up using the facilities of IBM LAN Server. However, the principles of how this is done can be used to establish the same procedures with other LAN networking products such as Novell NetWare.

5.7.1 Hardware Requirements for the Managing System

The following is the hardware required for the managing system and the importer:

- An IBM or IBM-compatible 80486 75Mhz processor workstation or better, which supports OS/2 as its base operating system
- A workstation with at least 16 MB memory. Memory of 24 MB or more is recommended for better performance.
- A workstation with at least 30 MB free hard disk space. In addition to that you need 4 MB temporarily during the installation.

  Please note that you will also need to consider hard disk space of the configuration database itself (including the DB2/2 product) and how many objects it will be supporting for your environment in addition to the 30 MB listed above.

5.7.2 Hardware Requirements for the Extractors

The following is the hardware required for the extractors:

- An IBM or IBM compatible 80386 processor workstations or better.
- 4 MB free disk space on your hard disk. In addition to that you need 2 MB temporarily during the installation.

5.7.3 Software Requirements for the Managing System

- OS/2 Warp Version 3.0
- IBM DB2/2 1.2 or higher or DB2/2 2.1 (with at least fix pack 8080)

5.7.4 Software Requirements for the Extractors

The software required for the extractor programs is OS/2 2.0 or above, except for the Workstation Extractor that runs under DOS 3.3 and above, Windows 3.1, and OS/2 1.3 as well.

5.8 How to Obtain ConfigTool

The ConfigTool application is provided when ordering the redbook SG24-4667. This redbook package will include the following:

- *Getting Started With Configuration Management Using ConfigTool* (redbook)
- *The ConfigTool application*

  The application will be supplied on CD-ROM.
- *ConfigTool Reference Guide*

This redbook will be available to order from 10 May 1996.

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International Technical Support Organization
An Introduction to Configuration Management and ConfigTool
April 1996

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