IBM Tivoli Configuration Manager Warehouse Enablement Pack: Implementation Guide

Version 1.2

Edition notice

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Contents

1 About this document

This document describes the warehouse enablement pack for IBM® Tivoli® Configuration Manager. It covers the following topics:

Installing and configuring the warehouse pack

The data flow and data structures used by the warehouse pack

With this warehouse pack, you can load a subset of the Inventory and Software Distribution data into the central database warehouse.

1.1 Related Documentation

You can access many Tivoli publications online using the Tivoli Information Center, which is available on the Tivoli Customer Support Web site:

http://www.tivoli.com/support/documents/

The following sets of documentation are available to help you understand, install, and manage this warehouse pack:

IBM Tivoli Configuration Manager

Tivoli Enterprise™ Data Warehouse

IBM DB2, DB2 Data Warehouse Center, and DB2 Warehouse Manager

The following sections list and briefly describe these libraries.

1.1.1   IBM Tivoli Configuration Manager

The following IBM Tivoli Configuration Manager documents are available on the IBM Tivoli Configuration Manager Documentation CD:

IBM Tivoli Configuration Manager: Database Schema Reference, SC23-4783

Describes the schema used by the IBM Tivoli Configuration Manager configuration repository.

IBM Tivoli Configuration Manager: User's Guide for Inventory, SC23-4713

Explains the concepts and procedures necessary to effectively use the Inventory component of IBM Tivoli Configuration Manager and provides in-depth information about the commands used by the Inventory component.

IBM Tivoli Configuration Manager: User's Guide for Software Distribution, SC23-4711

Explains the concepts and procedures necessary to effectively distribute software over networks using the Software Distribution component of IBM Tivoli Configuration Manager.

IBM Tivoli Configuration Manager: Reference Manual for Software Distribution, SC23-4712

Provides in-depth information about the IBM Tivoli Configuration Manager commands used by the Software Distribution component and explains advanced features, concepts, and procedures necessary to effectively use the Software Distribution component.

1.1.2   Tivoli Enterprise Data Warehouse

The following Tivoli Enterprise Data Warehouse documents are available on the Tivoli Enterprise Data Warehouse Documentation CD:

Tivoli Enterprise Data Warehouse Release Notes, GI11-0857

Provides late-breaking information about Tivoli Enterprise Data Warehouse and lists hardware requirements and software prerequisites.

Installing and Configuring Tivoli Enterprise Data Warehouse, GC32-0744

Describes how Tivoli Enterprise Data Warehouse fits into your enterprise, explains how to plan for its deployment, and gives installation and configuration instructions. It provides an introduction to the built-in program for creating and running reports, and contains maintenance procedures and troubleshooting information.

Enabling an Application for Tivoli Enterprise Data Warehouse, GC32-0745

Provides information about connecting an application to Tivoli Enterprise Data Warehouse. This book is for application programmers who use Tivoli Enterprise Data Warehouse to store and report on their application's data, data warehousing experts who import Tivoli Enterprise Data Warehouse data into business intelligence applications, and customers who use their local data in the warehouse.

1.1.3 IBM DB2, DB2 Data Warehouse Center, and DB2 Warehouse Manager

The DB2 library contains important information about the database and data warehousing technology provided by IBM DB2, DB2 Data Warehouse Center, and DB2 Warehouse Manager. Refer to the DB2 library for help in installing, configuring, administering, and troubleshooting DB2. The DB2 library is available on the Tivoli Customer Support Web site. After you install DB2, its library is also available on your system.

The following DB2 documents are particularly relevant for people working with Tivoli Enterprise Data Warehouse:

IBM DB2 Universal Database for Windows Quick Beginnings, GC09-2971

Guides you through the planning, installation, migration (if necessary), and setup of a partitioned database system using the IBM DB2 product on Microsoft Windows.

IBM DB2 Universal Database for UNIX Quick Beginnings, GC09-2970

Guides you through the planning, installation, migration (if necessary), and setup of a partitioned database system using the IBM DB2 product on UNIX.

IBM DB2 Universal Database Administration Guide: Implementation, SC09-2944

Covers the details of implementing your database design. Topics include creating and altering a database, database security, database recovery, and administration using the Control Center, a DB2 graphical user interface.

IBM DB2 Universal Database Data Warehouse Center Administration Guide, SC26-9993

Provides information on how to build and maintain a data warehouse using the Data Warehouse Center.

IBM DB2 Warehouse Manager Installation Guide, GC26-9998

Provides the information to install the following Warehouse Manager components: Information Catalog Manager, warehouse agents, and warehouse transformers.

IBM DB2 Universal Database and DB2 Connect Installation and Configuration Supplement, GC09-2957

Provides advanced installation considerations and guides you through the planning, installation, migration (if necessary), and set up a platform-specific DB2 client. Once the DB2 client is installed, you then configure communications for both the client and server, using the DB2 GUI tools or the Command Line Processor. This supplement also contains information on binding, setting up communications on the server, the DB2 GUI tools, DRDA™ AS, distributed installation, the configuration of distributed requests, and accessing heterogeneous data sources.

IBM DB2 Universal Database Message Reference Volume 1, GC09-2978 and *IBM DB2 Universal Database Message Reference Volume 2*, GC09-2979

Lists the messages and codes issued by DB2, the Information Catalog Manager, and the Data Warehouse Center, and describes the actions you should take.

2   Overview

The following sections provide an overview of Tivoli Enterprise Data Warehouse and the IBM Tivoli Configuration Manager warehouse pack.

2.1   Overview of Tivoli Enterprise Data Warehouse

Tivoli Enterprise Data Warehouse provides the infrastructure for the following:

Extract, transform, and load (ETL) processes through the IBM DB2 Data Warehouse Center tool

Schema generation of the central data warehouse

Historical reporting

As shown in Figure 1, Tivoli Enterprise Data Warehouse consists of a centralized data store where historical data from many management applications can be stored, aggregated, and correlated.
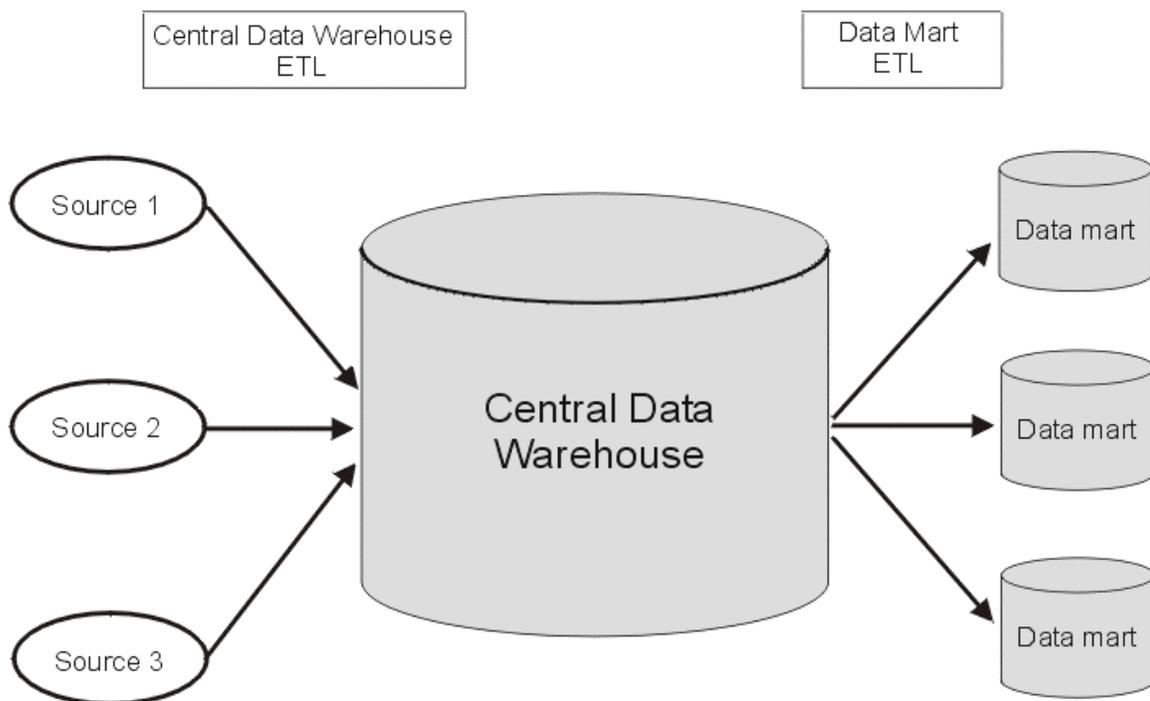
Figure 1. Tivoli Enterprise Data Warehouse overview

The *central data warehouse* uses a generic schema. As new components or new applications are added, more data is added to the database; however, no new tables or columns are added in the schema.

A *data mart* is a subset of a data warehouse that contains data tailored and optimized for the specific reporting needs of a department or team.

The *central data warehouse ETL* reads the data from the operational data stores of the application that collects it, verifies the data, makes the data conform to the schema, and places the data into the central data warehouse.

The *data mart ETL* extracts a subset of data from the central data warehouse, transforms it, and loads it into one or more star schemas, which can be included in data marts to answer specific business questions.

A program that provides these ETLs is called a *warehouse enablement pack*, or *warehouse pack*.

2.2 Overview of IBM Tivoli Configuration Manager Warehouse Enablement Pack

The IBM Tivoli Configuration Manager warehouse pack provides a central data warehouse ETL to extract historical software distribution and inventory information from the configuration repository and load it into the central data warehouse for cross-application reporting. Reports are provided for software distribution information; see "Reports" on page 30 for more information.

3 Installing and Configuring

The following sections describe planning for and installing Tivoli Enterprise Data Warehouse and the IBM Tivoli Configuration Manager warehouse pack.

3.1 Prerequisites

This warehouse pack has the following prerequisites:

 IBM Tivoli Configuration Manager, Version 4.2.2

 IBM DB2 Universal Database Enterprise Edition Version 7.2

 IBM DB2 Universal Database Enterprise Edition Version 7.2 Fixpak 10

 Tivoli Enterprise Data Warehouse Version 1.1

 Tivoli Enterprise Data Warehouse 1.1 Fix Pack 3 (1.1-TDW-FP03)

You can obtain the Tivoli Enterprise Data Warehouse and fix pack from the Tivoli Enterprise Data Warehouse Web site (http://www.ibm.com/software/sysmgmt/products/support/TivoliDataWarehouse.html). Click the Downloads link in the Self help section.

3.2 Supported hardware and software

Tivoli Configuration Manager Warehouse Enablement Pack, Version 1.1.0, supports IBM Tivoli Configuration Manager, Version 4.2.2 and all versions of DB2, Informix, Microsoft SQL Server, Oracle, and Sybase database products as listed in the IBM Tivoli Configuration Manager user's guides.

3.3 Limitations

There are no special limitations for this warehouse pack.

3.4 Database sizing considerations

There are no special database sizing considerations for this warehouse pack.

3.5 Data sources and targets

The data sources are as follows:

 The IBM Tivoli Configuration Manager configuration repository

 The MDist 2 database

The data targets are as follows:

 The central data warehouse

 The data mart

3.6 Pre-installation steps

If you do not have an existing ODBC system data source to access the Inventory and MDist 2 databases, you should create one now. Perform the following steps:

1. Click **Start->Setting->Control Panel**.
2. Open the **ODBC Data Sources**.
3. Click the **System DNS** tab.
4. Click **Add**.
5. Select a driver from the window and click **Finish**.
6. Fill in the **Data source name**, **Database alias**, and **Description** (optional) and click **OK**.

3.7 Installation procedure

To install the Tivoli Configuration Manager warehouse enablement pack, perform the following steps:

1. Make sure that IBM Tivoli Configuration Manager is installed and the configuration repository and MDist 2 database are available.

2. Make sure that Tivoli Enterprise Data Warehouse is installed. For instructions about installing Tivoli Enterprise Data Warehouse, refer to Installing and Configuring Tivoli Enterprise Data Warehouse.

3. Make sure that all prerequisite products and product patches are applied.

4. Perform any pre-installation steps as described in Pre-installation steps on page 9.

5. Install the warehouse pack as described in the instructions in *Installing and Configuring Tivoli Enterprise Data Warehouse*.

6. Perform the post-installation steps described in Post-installation steps on page 10.

3.8   Post-installation steps

After you install the IBM Tivoli Configuration Manager warehouse enablement pack, use the procedures in *Installing and Configuring Tivoli Enterprise Data Warehouse* to use the Data Warehouse Center to perform the following configuration tasks for data sources and targets:

1. Make sure the control database is set to TWH_MD.

2. Specify the properties for the configuration repository data source, INV_ODBC_Source. These properties are in the Database page.

    Set **Data source name** to the name of the ODBC connection for the configuration repository. The default value is INV_42.

    Set the **User ID** field to the Instance name for the configuration repository. The default value is invtiv.

    Set the **Password** field to the password used to access the configuration repository.

3. Specify the properties for the MDist 2 database data source, MDIST2_ODBC_Source. These properties are in the Database page.

    Set **Data source name** to the name of the ODBC connection for the MDist 2 database. The default value is mdist2.

    Set the **User ID** field to the Instance name for the MDist 2 database. The default value is mdist2.

    Set the **Password** field to the password used to access the MDist 2 database.

4. Specify the properties for the warehouse target INV_TWH_CDW_Target. These properties are in the Database page.

    In the **User ID** field to the user ID used to access the Tivoli Enterprise Data Warehouse central data warehouse database. The default value is db2admin.

    In the **Password** field, type the password used to access the central data warehouse database.

    Do not change the value of the **Data Source** field. It must be TWH_CDW.

5. Specify the following properties for the warehouse target INV_TWH_MART_Target. These properties are in the Database page.

    In the **User ID** field to the user ID used to access the Tivoli Enterprise Data Warehouse data mart database. The default value is db2admin.

    In the **Password** field, type the password used to access the data mart database.

    Do not change the value of the **Data Source** field. It must be TWH_MART.

6. Configure the ETL process steps in the INV_TivoliConfigurationManager_V4.2.2_Subject subject area.

7. Schedule the ETL process steps.

For a complete list of the process steps in this warehouse pack, see "ETL processes" on page 12.

4 Maintaining

4.1.1   Backing up and restoring

There are no special backup or restore issues for this warehouse pack.

4.1.2   Pruning

The INV.F_SWD_DAILY table needs to be pruned. The standard pruning mechanism defined in *Enabling an Application for Tivoli Enterprise Data Warehouse* is used.

5 ETL processes

This warehouse pack has the following processes.

5.1 INV_c10_ETL_Process

This process extracts data from the Configuration Manager 4.2.2 database and loads the data into the central data warehouse.

You can run this process repeatedly. For example, you can schedule this process to run weekly using the Data Warehouse Center scheduling functions. This way, the central data warehouse is updated with new data based on the data that has been collected during that week. Note that this process does not do an incremental extract for Inventory data; instead, each time this process is run, a complete copy of the selected data is extracted into temporary staging tables. This data is then compared to the existing data in the center data warehouse and only new or updated data is moved into the center data warehouse.

This process uses the fully qualified host name (IP_HOST), the IP address (IP_INTERFACE), or the IPX address (IPX_INTERFACE) to identify each of the endpoints from the Configuration Manager database. If neither a fully qualified host name nor an IP address in available for an endpoint, a record is created for the endpoint in the INVALID_IP_HOST table in the central data warehouse. You should check the INVALID_IP_HOST table regularly and modify endpoints so that either a fully qualified host name or an IP address is returned the next time the endpoint is scanned.

If two endpoints are found in the Configuration Manager database with the same fully qualified host name or the same IP address, a record is created for the endpoints in the INVALID_IP_HOST table in the central data warehouse. This can happen when a user replaces a workstation and reuses the IP address from the old workstation. In this case, Inventory will have two records containing the same fully qualified host name or IP address, or both. Because the INV_c10_ETL_Process ETL process does not know what to do in this case, it places that data for both endpoints into the INVALID_IP_HOST table and does not perform any further processing of the data for these endpoints.

This process has the following steps:

1. INV_c10_s010_extractInvData

    This step extracts Inventory data from the Configuration Manager 4.2.2 database and moves it into temporary staging tables in the central data warehouse.

2. INV_c10_s020_loadInvData

    This step transforms the data in preparation for loading into the central data warehouse and then loads the data into the central data warehouse.

5.2 DIS_c20_ETL_Process

This process extracts data from the Configuration Manager 4.2.2 and the MDist 2 databases and loads the data into the central data warehouse.

You can run this process repeatedly. For example, you can schedule this process to run every night using the Data Warehouse Center scheduling functions. This way, the central data warehouse will be updated with the new data based on the distributions that have been finished during that day. Note that once distribution record for an endpoint has been moved into the central data warehouse, it should not extracted a second time. Therefore, at each run, the DIS_c20_ETL_Process process only extracts the status of the distributions for the endpoint that have finished since last time it was run. Extracting only new data from a data source is called extract control. For more information, see "Extract Control Implementation" in section 6.5.

In addition, the prune measurement control parameter can control the amount of data extracted from the configuration repository. This feature automatically prunes measurement data that is older than a defined age. By default, the distribution status measurements are kept in the central data warehouse for one year. Therefore, it is not necessary to extract any distribution status preceding this. For information on changing this value, see Section 6.5. For complete details on extract control and prune measurement control, see *Enabling an Application for Tivoli Enterprise Data Warehouse*.

This process has the following steps:

1. DIS_c20_s010_extractInvData

This step extracts the necessary inventory data from the Configuration Manager 4.2.2 database and moves the data into temporary staging tables in the central data warehouse.

2. DIS_c20_s020_extractSWDData

    This step extracts software distribution data from the Configuration Manager 4.2.2 database and moves the data into temporary staging tables in the central data warehouse.

3. DIS_c10_s030_extractMDData

    This step extracts Software Distribution data from the multiplexed distribution database and moves the data into temporary staging tables in the central data warehouse.

4. DIS_c10_s040_loadInvData

    This step transforms the data in preparation for loading into the central data warehouse and then loads the data into the central data warehouse.

5.3   INV_m10_Mart_Process

This process extracts data from central data warehouse to mart database.

You can run this process repeatedly. For example, you can schedule this process to run every night using the Data Warehouse Center scheduling functions. This way, the data mart is updated with the new data that is put into central data warehouse. For more information, see "Extract Control Implementation" in section 6.5.

This process has the following step:

1. INV_m10_s010_buildMart

    This step extracts data from the central data warehouse to the mart database and transforms the data into star schema tables.

6 Generic schema implementation

Before reading this section, read about the generic schema for the Tivoli Enterprise Data Warehouse central data warehouse, which is described in *Enabling an Application for Tivoli Enterprise Data Warehouse*. That document defines the content of each table and explains the relationships between the tables in this document.

Shaded columns in the following tables can be translated by the application Translated columns are also indicated by an asterisk (*) after the column name.

6.1 *Component configuration*

6.1.1 Component type (table CompTyp)

CompTyp_Cd CHAR(17)	CompTyp_Parent_Cd CHAR(17)	CompTyp_Nm* VARCHAR(120)	CompTyp_Strt_DtTm TIMESTAMP	CompTyp_End_DtTm TIMESTAMP
IP_HOST	NULL	IP Host	2002-05-01 12:00:000	9999-01-01 00:00:00.0
IP_INTERFACE	NULL	IP Interface	2002-05-01 12:00:000	9999-01-01 00:00:00.0
IPX_INTERFACE	NULL	IPX Interface	2002-05-01 12:00:000	9999-01-01 00:00:00.0
INV_STORAGE	NULL	Storage	2002-05-01 12:00:000	9999-01-01 00:00:00.0
INV_MEMORY	NULL	Memory	2002-05-01 12:00:000	9999-01-01 00:00:00.0
DIS_SWD	NULL	Software Distribution	2002-05-01 12:00:000	9999-01-01 00:00:00.0
DIS_MDIST	NULL	Multiplexed Distribution	2002-05-01 12:00:000	9999-01-01 00:00:00.0
DIS_FILEPACK	NULL	Software Distribution File Pack	2002-05-01 12:00:000	9999-01-01 00:00:00.0

Note: Only attribute information for INV_SWD and INV_MDIST is collected.

6.1.2 Component (table Comp)

Comp_ID INTEGER	CompTyp_Cd CHAR (17)	Centr_Cd CHAR(6)	Cust_ID INTEGER	Comp_Corr_ID INTEGER	Comp_Nm VARCHAR (254)	Comp_Corr_Val VARCHAR (254)	Comp_Strt_DtTm TIMESTAMP	Comp_End_DtTm TIMESTAMP	Comp_Ds VARCHAR (254)
1	IP_HOST	CDW	1	0	host1.tivoli.com		2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
2	IP_HOST	CDW	1	0	host2.tivoli.com		2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
3	IPX_INTERFACE	CDW	1	0	12345678:123456789ABC		2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
4	INV_STORAGE	CDW	1	1	storage1	host1.tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
5	INV_STORAGE	CDW	1	2	storage1	host2.tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
6	INV_STORAGE	CDW	1	3	storage1	12345678:123456789ABC	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	

Comp_ID INTEGER	CompTyp_Cd CHAR (17)	Centr_Cd CHAR(6)	Cust_ID INTEGER	Comp_Corr_ID INTEGER	Comp_Nm VARCHAR (254)	Comp_Corr_ Val VARCHAR (254)	Comp_Strt_DtTm TIMESTAMP	Comp_End_DtTm TIMESTAMP	Comp_Ds VARCHAR (254)
7	INV_MEMORY	CDW	1	1	memory1	host1.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
8	INV_MEMORY	CDW	1	1	memory1	host1.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
9	INV_MEMORY	CDW	1	1	memory1	host1.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
10	INV_MEMORY	CDW	1	1	software1	host1.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
11	DIS_MDIST	CDW	1	0	1402114415.10 *(Mdist_id)*		2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
12	DIS_FILEPACK	CDW	1	0	Tivoli_JRE_NT 1.3.0		2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
13	DIS_SWD	CDW	1	1	1402114415.9	host1.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
14	DIS_SWD	CDW	1	2	1402114415.10	host2.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
15	DIS_FILEPACK	CDW	1	0	Tivoli_CCM_GUI 4.2		2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
16	DIS_SWD	CDW	1	1	1402114415.10	Host1.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
17	DIS_SWD	CDW	1	1	1402114415.11	host1.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	
18	DIS_SWD	CDW	1	2	1402114415.11	host2.Tivoli.com	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	

6.1.3   Component relationship type (table RelnTyp)

RelnTyp_Cd CHAR(6)	RelnTyp_Nm* VARCHAR(120)
PCHILD	Parent Child Relationship

6.1.4   Component relationship rule (table RelnRul)

CompTyp_Source_Cd CHAR(17)	CompTyp_Target_Cd CHAR(17)	RelnTyp_Cd CHAR(6)	RelnRul_Strt_DtTm TIMESTAMP	RelnRul_End_DtTm TIMESTAMP
IP_HOST	INV_STORAGE	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
IP_HOST	INV_MEMORY	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
IP_HOST	DIS_SWD	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0

CompTyp_Source_Cd CHAR(17)	CompTyp_Target_Cd CHAR(17)	RelnTyp_Cd CHAR(6)	RelnRul_Strt_DtTm TIMESTAMP	RelnRul_End_DtTm TIMESTAMP
IP_INTERFACE	INV_STORAGE	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
IP_ INTERFACE	INV_MEMORY	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
IP_ INTERFACE	DIS_SWD	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
IPX_INTERFACE	INV_STORAGE	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
IPX_ INTERFACE	INV_MEMORY	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
IPX_ INTERFACE	DIS_SWD	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0

6.1.5 Component relationship (table CompReln)

CompReln_ID INTEGER	Comp_Source_ID INTEGER	Comp_Target_ID INTEGER	RelnTyp_Cd CHAR(6)	CompReln_Strt_DtTm TIMESTAMP	CompReln_End_DtTm TIMESTAMP
1	1	4	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
2	2	5	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
3	3	6	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
4	1	7	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
5	1	8	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
6	1	9	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
7	1	10	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
8	1	13	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
9	2	14	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0
10	2	18	PCHILD	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0

6.1.6 Attribute type (table AttrTyp)

AttrTyp_Cd CHAR(17)	AttrTyp_Nm* VARCHAR(120)
LAST_IP_ADDRESS	Last IP Address
TME_OBJECT_ID	Tivoli Object ID
TME_LABEL	Tivoli Endpoint Label
MODEL	Model Number
SERIAL_NUMBER	Serial Number
OS_NAME	Operating System Name
OS_TYPE	Operating System Type
MAJOR_VERSION	Major Version Number
MINOR_VERSION	Minor Version Number
SUB_VERSION	Sub Version Number
INV_USER_NAME	PC User Name

AttrTyp_Cd CHAR(17)	AttrTyp_Nm* VARCHAR(120)
INV_DOMAIN_NAME	PC Domain Name
INV_WORKGROUP_NM	PC Workgroup Name
IP_HOSTNAME	IP Host Name
IP_DOMAIN	IP Domain
INV_IPX_ADDR	IPX Address
INV_PHYSICAL_MEM	Physical Memory
INV_NUM_CPU	Number of CPUs
INV_CPU_MANUFACT	CPU Manufacturer
INV_CPU_NAME	CPU Name
INV_CPU_MAX_SPEED	CPU Maximum Speed
INV_CPU_CUR_SPEED	CPU Current Speed
INV_CPU_FAMILY	CPU Chip Family
INV_CPU_MODEL	CPU Chip Model
INV_SYS_PURPOSE	System Purpose
INV_RECORD_TIME	Record Time
INV_STO_TYPE	Storage Type
MANUFACTURER	Manufacturer
MODEL	Model
INV_STO_SIZE_MB	Storage Size in MB
INV_MEM_TYPE	Memory Type
INV_MEM_PACKAGE	Memory Package
INV_MEM_SOCKET	Memory Socket Name
INV_MEM_SIZE_MB	Memory Size in MB
DIS_FP_NAME	Software Distribution File Pack Name
VERSION	Version of the File Pack
DIS_FP_SRC_HOST	Software Distribution Software Source Host
DIS_FP_TME_OID	Software Distribution File Pack OID
DIS_SD_ATIME	Software Distribution Software Activated Time
DIS_SD_OPERATION	Software Distribution Operation
DIS_SD_STATE	Software Distribution Operation State
DIS_MD_STATE	Current State of the Multiplexed Distribution Node
DIS_MD_SIZE_KB	Multiplexed Distribution Package Size in KB
DIS_MD_STTM	Multiplexed Distribution Start Time

AttrTyp_Cd CHAR(17)	AttrTyp_Nm* VARCHAR(120)
DIS_MD_ENDTM	Multiplexed Distribution Finish Time
DIS_MD_SRCAPPL	Multiplexed Distribution Source Application

6.1.7   Attribute rule (table AttrRul)

CompTyp_Cd CHAR(17)	AttrTyp_Cd CHAR(17)	AttrRul_Strt_DtTm TIMESTAMP	AttrRul_End_DtTm TIMESTAMP	AttrRul_Dom_Ind CHAR
IP_HOST	LAST_IP_ADDRESS	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	SERIAL_NUMBER	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	OS_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	OS_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	MAJOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	MINOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	SUB_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_USER_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_DOMAIN_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_WORKGROUP_NM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	IP_HOSTNAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	IP_DOMAIN	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_IPX_ADDR	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_PHYSICAL_MEM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_NUM_CPU	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_CPU_MANUFACT	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_CPU_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_CPU_MAX_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_CPU_CUR_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_CPU_FAMILY	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_CPU_MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	INV_SYS_PURPOSE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_HOST	TME_OBJECT_ID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	LAST_IP_ADDRESS	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N

CompTyp_Cd CHAR(17)	AttrTyp_Cd CHAR(17)	AttrRul_Strt_DtTm TIMESTAMP	AttrRul_End_DtTm TIMESTAMP	AttrRul_Dom_Ind CHAR
IP_INTERFACE	SERIAL_NUMBER	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	OS_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	OS_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	MAJOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	MINOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	SUB_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_USER_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_DOMAIN_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_WORKGROUP_NM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	IP_HOSTNAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	IP_DOMAIN	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_IPX_ADDR	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_PHYSICAL_MEM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_NUM_CPU	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_CPU_MANUFACT	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_CPU_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_CPU_MAX_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_CPU_CUR_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_CPU_FAMILY	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_CPU_MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	INV_SYS_PURPOSE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IP_INTERFACE	TME_OBJECT_ID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	LAST_IP_ADDRESS	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	SERIAL_NUMBER	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	OS_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	OS_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	MAJOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	MINOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	SUB_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_USER_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_DOMAIN_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_WORKGROUP_NM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N

CompTyp_Cd CHAR(17)	AttrTyp_Cd CHAR(17)	AttrRul_Strt_DtTm TIMESTAMP	AttrRul_End_DtTm TIMESTAMP	AttrRul_Dom_Ind CHAR
IPX_INTERFACE	IP_HOSTNAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	IP_DOMAIN	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_IPX_ADDR	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_PHYSICAL_MEM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_NUM_CPU	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_CPU_MANUFACT	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_CPU_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_CPU_MAX_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_CPU_CUR_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_CPU_FAMILY	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_CPU_MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	INV_SYS_PURPOSE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
IPX_INTERFACE	TME_OBJECT_ID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
INV_STORAGE	INV_STO_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
INV_STORAGE	MANUFACTURER	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
INV_STORAGE	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
INV_STORAGE	INV_STO_SIZE_MB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
INV_MEMORY	INV_MEM_SIZE_MB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
INV_MEMORY	INV_MEM_SOCKET	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
INV_MEMORY	INV_MEM_PACKAGE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
INV_MEMORY	INV_MEM_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_FILEPACK	DIS_FP_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_FILEPACK	VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_FILEPACK	DIS_FP_TME_OID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_FILEPACK	DIS_FP_SRC_HOST	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_SWD	DIS_SD_ATIME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_SWD	DIS_SD_OPERATION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_SWD	DIS_SD_STATE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_SWD	DIS_MD_STATE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_SWD	DIS_FP_TME_OID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_SWD	DIS_MD_SIZE_KB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_MDIST	DIS_MD_SIZE_KB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_MDIST	DIS_MD_STTM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N

CompTyp_Cd CHAR(17)	AttrTyp_Cd CHAR(17)	AttrRul_Strt_DtTm TIMESTAMP	AttrRul_End_DtTm TIMESTAMP	AttrRul_Dom_Ind CHAR
DIS_MDIST	DIS_MD_ENDTM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N
DIS_MDIST	DIS_MD_SRCAPPL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	N

6.1.8   Attribute domain (table AttrDom)

This warehouse pack does not generate the attribute domain table.

6.1.9   Component attribute (table CompAttr)

CompAttr_ ID INTEGER	Comp_ID INTEGER	AttrTyp_Cd CHAR(17)	CompAttr_Strt_DtTm TIMESTAMP	CompAttr_End_DtTm TIMESTAMP	CompAttr_Val VARCHAR(254)
1	1	TME_OBJECT_ID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	1624025952.2.506+#TMF_Endpoint::Endpoint#
2	2	TME_OBJECT_ID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	1624025952.5.506+#TMF_Endpoint::Endpoint#
3	3	TME_OBJECT_ID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	1624025952.9.506+#TMF_Endpoint::Endpoint#
4	1	TME_LABEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	host1
5	2	TME_LABEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	host2.dev.tivoli.com
6	3	TME_LABEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Machine3
7	1	SERIAL_NUMBER	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	2157749125
8	2	SERIAL_NUMBER	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	238P1RM
9	3	SERIAL_NUMBER	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	2157749133
10	1	MAJOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	4
11	2	MAJOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	5
12	3	MAJOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	4
13	1	MINOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	0
14	2	MINOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	8
15	3	MINOR_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	0
16	1	SUB_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Generic
17	2	SUB_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Service Pack 6
18	3	SUB_VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Generic
19	1	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	IBM 6862R1U
20	2	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Sun Ultra 5/10 UPA/PCI (UltraSPARC)
21	3	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	IBM 6862R1U
22	1	OS_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Windows NT
23	2	OS_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	SunOS

CompAttr_ ID INTEGER	Comp_ID INTEGER	AttrTyp_Cd CHAR(17)	CompAttr_Strt_DtTm TIMESTAMP	CompAttr_End_DtTm TIMESTAMP	CompAttr_Val VARCHAR(254)
24	3	OS_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Windows NT
25	1	OS_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	WINNT
26	2	OS_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	SunOS
27	1	OS_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	WINNT
28	1	INV_USER_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Host1
29	3	INV_USER_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Machine3
30	1	INV_DOMAIN_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Tivoli-NT
31	3	INV_DOMAIN_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Tivoli-NT
32	1	LAST_IP_ADDRESS	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	146.84.34.121
33	2	LAST_IP_ADDRESS	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	146.84.34.8
34	1	IP_DOMAIN	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	tivoli.com
35	2	IP_DOMAIN	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	tivoli.com
36	1	IP_HOSTNAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	host1
37	2	IP_HOSTNAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	host2
38	1	INV_PHYSICAL_MEM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	392616
39	3	INV_PHYSICAL_MEM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	392616
40	2	INV_NUM_CPU	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	1
41	1	INV_NUM_CPU	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	1
42	3	INV_NUM_CPU	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	1
43	2	INV_CPU_CUR_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	450
44	1	INV_CPU_CUR_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	270
45	3	INV_CPU_CUR_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	270
46	2	INV_CPU_MAX_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	450
47	1	INV_CPU_MAX_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	270
48	3	INV_CPU_MAX_SPEED	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	270
49	2	INV_CPU_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Pentium II
50	1	INV_CPU_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	UltraSPARC IIi
51	3	INV_CPU_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Pentium II
52	2	INV_CPU_MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	5
53	1	INV_CPU_FAMILY	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	6
54	3	INV_CPU_FAMILY	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	6
55	4	INV_STO_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Hard Disk

CompAttr_ID INTEGER	Comp_ID INTEGER	AttrTyp_Cd CHAR(17)	CompAttr_Strt_DtTm TIMESTAMP	CompAttr_End_DtTm TIMESTAMP	CompAttr_Val VARCHAR(254)
56	5	INV_STO_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Hard Disk
57	6	INV_STO_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Hard Disk
58	4	INV_STO_SIZE_MB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	6297480
59	5	INV_STO_SIZE_MB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	4102
60	6	INV_STO_SIZE_MB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	6297480
61	5	MANUFACTURER	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Maxtor
62	4	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Seagate
63	5	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Maxtor 90640D4 PAS2
64	6	MODEL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Seagate
65	7	INV_MEM_SIZE_MB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	128
66	8	INV_MEM_SIZE_MB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	128
67	9	INV_MEM_SIZE_MB	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	128
68	7	INV_MEM_PACKAGE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	DIMM
69	8	INV_MEM_PACKAGE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	DIMM
70	9	INV_MEM_PACKAGE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	DIMM
71	7	INV_MEM_SOCKET	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	DIMM 0
72	8	INV_MEM_SOCKET	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	DIMM 1
73	9	INV_MEM_SOCKET	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	DIMM 2
74	7	INV_MEM_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	SDRAM
75	8	INV_MEM_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	SDRAM
76	9	INV_MEM_TYPE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	SDRAM
77	12	DIS_FP_NAME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Tivoli_JRE_NT
78	12	VERSION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	1.3.0
79	12	DIS_FP_TME_OID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	2108173294.1.700#SoftwarePackage::Spo#
80	12	DIS_FP_SRC_HOST	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	2108173294.1.347#TMF_ManagedNode::Managed_Node#
81	13	DIS_SD_ATIME	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	2002-01-23 18:38:44
82	13	DIS_SD_OPERATION	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	INSTALL
83	13	DIS_SD_STATE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	IC---
84	13	DIS_MD_STATE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	6
85	13	DIS_FP_TME_OID	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	2108173294.1.700#SoftwarePackage::Spo#

CompAttr_ ID INTEGER	Comp_ID INTEGER	AttrTyp_Cd CHAR(17)	CompAttr_Strt_DtTm TIMESTAMP	CompAttr_End_DtTm TIMESTAMP	CompAttr_Val VARCHAR(254)
86	13	DIS_MD_SIZE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	6419
87	11	DIS_MD_SIZE	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	6419
88	11	DIS_MD_STTM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	2002-04-28 16:42:00.0
89	11	DIS_MD_ENDTM	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	2002-04-28 18:12:00.0
90	11	DIS_MD_SRCAPPL	2002-05-01 12:00:00.0	9999-01-01 00:00:00.0	Software Distribution

6.2   Component measurement

6.2.1   Measurement group type (table MGrpTyp)

MGrpTyp_Cd CHAR(6)	MGrpTyp_Nm* VARCHAR(120)
SWDIST	Software Distribution Operation Status
MDIST	Multiplexed Distribution Status

6.2.2   Measurement group (table MGrp)

MGrp_Cd CHAR(6)	MGrpTyp_Cd CHAR(6)	MGrp_Parent_Cd CHAR(6)	MGrp_Nm* VARCHAR(120)
DISDST	DISMD		Host Distribution Status
DISOPR	DISSWD		Host Operation Status

6.2.3   Measurement group member (table MGrpMbr)

MGrp_Cd CHAR(6)	MGrpTyp_Cd CHAR(6)	MsmtTyp_ID INTEGER
DISDST	MDIST	1
DISDST	MDIST	2
DISOPR	SWDIST	3
DISDST	MDIST	4
DISDST	MDIST	5
DISDST	MDIST	6
TOT_E	GROUP	1
TOT_E	GROUP	2
TOT_E	GROUP	3
TOT_E	GROUP	4
TOT_E	GROUP	5
TOT_E	GROUP	6

6.2.4   Measurement unit category (table MUnitCat)

MunitCat_Cd CHAR(6)	MunitCat_Nm* VARCHAR(120)
TM	Time Duration
QTY	Quantity
PRC	Percentage

RT	Rate

6.2.5   Measurement unit (table MUnit)

MUnit_Cd CHAR(6)	MUnitCat_Cd CHAR(6)	Munit_Nm* VARCHAR(120)
KBps	RT	Kilobytes per Second
QTY	QTY	Quantity
Min	TM	Minutes
Sec	TM	Seconds

6.2.6   Time summary (table TmSum)

The period over which a measurement may be summarized.

TmSum_Cd CHAR	TmSum_Nm* VARCHAR(120)
D	Daily

6.2.7   Measurement source (table MSrc)

MSrc_Cd CHAR(6)	MSrc_Parent_Cd CHAR(6)	MSrc_Nm* VARCHAR(120)
Tivoli	NULL	Tivoli Application
DIS	Tivoli	IBM Tivoli Software Distribution
INV	Tivoli	IBM Tivoli Inventory

6.2.8   Measurement type (table MsmtTyp)

MsmtTyp_ID INTEGER	MUnit_Cd CHAR(6)	MSrc_Cd CHAR (6)	MsmtTyp_Nm VARCHAR(120)	MsmtTyp_Ds VARCHAR(254)
1	QTY	DIS	Distribution Success	1 indicates that the distribution was a success and 0 indicates a failure
2	QTY	DIS	Distribution Failure	1 indicates that the distribution was a failure and 0 indicates a success
3	QTY	DIS	Verify Failure	1 indicating a verify failure after the operation was successful
4	Sec	DIS	Distribution Elapsed Time	Wall clock time to distribute the file pack to a host
5	Sec	DIS	Receiving Time	Receiving time for distributing the file pack to a host. Basically filters out interrupts, down endpoints etc.
6	KBps	DIS	Distribution Transfer Rate	Distribution rate calculated as a ratio of distribution size/distribution elapsed time

6.2.9   Component measurement rule (table MsmtRul)

CompTyp_Cd CHAR(17)	MsmtTyp_ID INTEGER
DIS_SWD	1

CompTyp_Cd CHAR(17)	MsmtTyp_ID INTEGER
DIS_SWD	2
DIS_SWD	3
DIS_SWD	4
DIS_SWD	5
DIS_SWD	6

6.2.10   Measurement (table Msmt)

Msmt_ ID BIGINT	Comp_ ID INTEGER	MsmtTyp_ ID INTEGER	TmSum _Cd CHAR	Msmt_ Strt_Dt DATE	Msmt_ Strt_Tm TIME	Msmt_ Min_Val FLOAT	Msmt_ Max_ Val FLOAT	Msmt_ Avg_Val FLOAT	Msmt_ Tot_Val FLOAT	Msmt_ Smpl_ Cnt INTEGER	Msmt_ Err_Cnt INTEGER
1	11	1	D	06-06-2002	12:00:00				1.0		
2	11	2	D	06-06-2002	12:00:00				0.0		
3	15	1	D	06-06-2002	12:00:00				1.0		
4	15	2	D	06-06-2002	12:00:00				0.0		
5	11	3	D	06-06-2002	12:00:00				1.0		
6	11	4	D	06-06-2002	12:00:00				30		
7	11	5	D	06-06-2002	12:00:00				30		
8	11	6	D	06-06-2002	12:00:00				213.9		

6.3   Helper tables

This warehouse pack does not generate helper tables.

6.4   Exception tables

There is an exception table when data that is not valid is detected for customers, centers, and hosts.

Also, an INVALID_IP_HOST table tracks when a host name is reused but the original machine was not deleted from inventory tables. See section 5.1 for more information

6.5   Incremental extraction

There is no extract control on the inventory source database because all the data is extracted on a daily basis. If the ETL determines that there is a new component or there has been a change in a component attribute, that data is updated in the

component and component attribute tables. This is because inventory data is updated regularly because of dynamic data, such as the amount of memory used.

Software Distribution tables use extract control. A column indicates the last update time. This is used to extract new data only.

Which distribution status the DIS_c20_ETL_Process ETL process extracts from the source database is controlled by both the ExtCtl_From_DtTm column value of the TWG.Extract_Control table and the PMsmtC_Age_In_Days column value of the TWG. Prune_Msmt_Control table in the central data warehouse table.

To view the ExtCtl_From_DtTm value for extracting data from source database, run the following SQL command:

```
Select ExtCtl_From_DtTm from TWG.Extract_Control where
ExtCtl_Source='DIST_NODE_STATE' or ExtCtl_Source='SD_H_INST'
```

To view the ExtCtl_From_DtTm value for the populated TWG.Msmt table, run the following SQL command:

```
Select ExtCtl_From_DtTm from TWG.Extract_Control where
ExtCtl_Source='inv.stage_dis_swd' or ExtCtl_Target='TWG.MSMT'
```

By default this value is 1970-01-01-00.00.00.000000. This value is updated automatically after each run of the DIS_c20_ETL_Process ETL process, so that at the next run of the process, only distributions completed since the preceding run of the process are extracted. You should not change this value manually, as altering the value could result in either missing data or duplicated data. All the timestamps in the central data warehouse are stored in UTC.

The Software Distribution status to be extracted by the DIS_c20_ETL_Process ETL process is further limited by the PMsmtC_Age_In_Days value in TWG.Prune_Msmt_Control. To view this value, enter the following SQL command:

```
Select PMsmtC_Age_In_Days from TWG.Prune_Msmt_Control where MSrc_Cd='DIS' and
TmSum_Cd='D'
```

PMsmtC_Age_In_Days is a date duration value in format yyyymmdd. Preceding zeros are not included. By default this value is 10000, which indicates one year. The Prune Control feature of the central data warehouse will automatically remove measurement data older than the data duration specified.

Before running the DIS_c20_ETL_Process ETL process for first time, ensure that the PMsmtC_Age_In_Days value is set to the value you want. To change this value, run the following command at the DB2 command line, where duration indicates the date duration you want.

```
Update TWG.Prune_Msmt_Control set PMsmtC_Age_In_Days ='duration' where MSrc_Cd='DIS'
and TmSum_Cd='D'
```

The standard extract control mechanism is used for populating the dimension table, fact table, and metric dimension table in the data mart database. The extract control of the INV_m10_Mart_Process ETL process is controlled by ExtCtl_From_IntSeq column value of the TWG.Extract_Control table. The value is updated automatically after each run of the INV_m10_Mart_Process ETL process; at the next run of the process, only new Comp and new Msmt values in CDW are extracted to data mart database.

The prune control for pruning data from fact table inv.F_SWD_FACT is 300 by default, which indicates 3 months.

To view this value, enter the following SQL command:

```
Select PmartC_Duration from inv.prune_mart_control where Table_Name='inv.F_SWD_DAY'
```

Before running the INV_m10_Mart_Process ETL process for first time, ensure that the PmartC_Duration value is set to the value you want. To change this value, run the following command at the DB2 command line, where duration indicates the date duration you want:

```
Update inv.prune_mart_control set PmartC_Duration='duration' where
Table_Name='inv.F_SWD_Day'
```

7 Data mart schema information

The following sections contain the definition of star schemas, metric dimension tables, data marts, and reports provided with the IBM Tivoli Configuration Manager warehouse pack.

Shaded columns in the following tables can be translated by the application. *Installing and Configuring Tivoli Enterprise Data Warehouse* contains instructions for installing support for additional languages.

7.1 Star schemas

Before using this section, read about the data mart schema for the Tivoli Enterprise Data Warehouse central data warehouse, which is described in *Enabling an Application for Tivoli Enterprise Data Warehouse*. That document defines the content of each table and explains the relationships between the tables in this document.

This warehouse pack provides the following star schemas.

7.1.1 INV Daily Configuration Manager Star Schema

The following table defines the star schema. The description of the star schema can be translated.

Description of star schema (in IWH_STARSCHEMA)	Configuration Manager 4.2 daily star schema
Name of fact table	Inv.f_swd_day
Name of metric dimension table	Inv.d_swd_metric
Names of other dimension tables	Inv.d_swd_host
	Inv.d_swd_dist

7.1.1.1 Fact table INV.F_SWD_DAY

You should expand the number of foreign key columns in this section to the amount needed for your application.

Metric_ID INTEGER	IP_HOST _ID INTEGER	DIST_ID INTEGER	Meas_date TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_ count DOUBLE
1	1	9	06-06-2002				1	
4	1	9	06-06-2002				000100	
5	1	9	06-06-2002				000080	
6	1	9	06-06-2002				100	

7.2 Metric dimension tables

This section describes the metric dimension tables used by the star schemas in this warehouse pack.

7.2.1 INV.D_SWD_METRIC

Metric_ ID INTEGER	Met_ category* VARCHAR (254)	Met_desc* VARCHAR (254)	Met_name* VARCHAR (254)	Met_units* VARCHAR (254)	Min_ exists CHAR (1)	Max_ exists CHAR (1)	Avg_ exists ir CHAR (1)	Total exists CHAR (1)	Msrc_nm* VARCHAR (254)
1	Host Distribution Status	1 indicates that the distribution was a success and 0 indicates a	Distribution Success	QTY	N	N	N	Y	DIS

		failure							
2	Host Distribution Status	1 indicates that the distribution was a failure and 0 indicates a success	Distribution Failure	QTY	N	N	N	Y	DIS
3	Host Operation Status	1 indicating a verify failure after the operation was successful	Verify Failure	QTY	N	N	N	Y	DIS
4	Host Distribution Status	Wall clock time to distribute the file pack to a host	Distribution Elapsed Time	Sec	N	N	N	Y	DIS
5	Host Distribution Status	Receiving time to distribute the file pack to a host	Distribution Receiving Time	Sec	N	N	N	Y	DIS
6	Host Distribution Status	Distribution rate calculated as a ratio of distribution size/distribution elapsed time	Distribution Transfer Rate	KBpS	N	N	N	Y	DIS

7.3   Dimension tables

The following sections describe the dimension tables (other than metric dimension tables) used by the star schemas in this warehouse pack.

7.3.1   Dimension table INV.D_SWD_HOST

The following columns are used in this dimension table. You should expand the number of columns in this section to the amount needed for your application.
HOST_ID
HOSTNAME
OS_TYPE
OS_NAME
OS_VERSION
SYSTEM_PURPOSE
IP_ADDR_OCTET1
IP_ADDR_OCTET2
IP_ADDR_OCTET3
IP_ADDR

7.3.2   Dimension table INV.D_SWD_DIST

The following columns are used in this dimension table. You should expand the number of columns in this section to the amount needed for your application.
DIST_ID
DIST_SIZE
SD_ACTION
FILEPACK_NAME
FILEPACK_VERSION

7.4   Data marts and reports

This warehouse pack provides the following data mart.

7.4.1   Data mart INV Configuration Manager Data Mart

This data mart uses the following star schemas:

> INV Daily Configuration Manager Star Schema

> INV Weekly Configuration Manager Star Schema

> INV Monthly Configuration Manager Star Schema

7.4.1.1   Reports

This data mart provides the following prepackaged reports.

7.4.1.1.1   Distribution failures related to package size

This extreme case report compares the size of a file pack distribution to the number of failures for those distributions.

7.4.1.1.2   Distribution status by distribution id

This summary report shows successful and failed distributions by distribution id, grouping them by file pack name and host operation requested. Operations are Remove, Install or Commit.

7.4.1.1.3   Distribution results by file pack and operation

This summary report shows successful and failed distributions by file pack, grouping them by operation requested.

7.4.1.1.4   Operation results by file pack, host and operation

This summary report shows successful and failed distributions by file pack, grouping them by host and operation requested.

7.4.1.1.5   Success rate of distributions by distribution id

This extreme case report compares the distribution to the percent of successful distributions, sorting them in ascending order.

7.4.1.1.6   Success rate of distributions by file pack name

This extreme case report compares the file pack to the percent of successful operations, sorting them in ascending order.

7.4.1.1.7   Success Rate of distributions by time

This health check report examines the success rate of distributions over time. It will show trends to determine if distributions are performing better or worse over time.

7.4.1.1.8   Elapsed distribution time to target

This extreme case report compares the wall clock time spent distributing file packages to a host. It will list the hosts that have spent the most time to get file pack distributions.

7.4.1.1.9   Receiving distribution time by target

This extreme case report compares the time spent receiving file package distributions to a host. It will list the hosts that have spent the most time receiving data.

7.4.1.1.10   Distribution transfer rate by file package in KB/sec

This extreme case report compares the average time spent distributing file packages to a host. It will list the hosts that have spent the most time to get file pack distributions.

7.4.1.1.11   File pack distributions that have the most failures

This extreme case report compares the file pack distributions to the number of failures. It will list the file packs that have the most distribution failures.

7.4.1.1.12   Distributions that have the most failures

This extreme case report compares distributions to the number of failures. It will list the distributions with the most failures.

7.4.1.1.13   Operating systems that have the most distribution failures

This extreme case report compares the type of operating system to the number of distribution failures. It will list the operating systems with the most failures.

7.4.1.1.14   Networks that have the most distribution failures

This extreme case report compares the third octet of the ip_address to the number of failures. It will list the sub-nets with the most failures.

7.4.1.1.15   Operations in verify failure state

This extreme case report compares the success of the operations by file package. It will list the file packages with the lowest success rate.

7.4.1.1.16   Hosts that have the most distribution failures

This extreme case report compares hosts to the number of distribution failures. It will list the hosts with the most failures.

--------------------- **End of Document** ---------------------