



**IBM Tivoli Decision Support for OS/390  
Version 1.6 (NPM)  
Warehouse Enablement Pack, Version 1.2.0  
Implementation Guide**

**for Tivoli Data Warehouse, Version 1.2**

**Note:**

Before using this information and the product it supports, read the information in Notices on page 27.

**First Edition (February 2004)**

This edition applies to IBM Tivoli Decision Support for OS/390 Version 1.6 and to all subsequent releases and modifications until otherwise indicated in new editions.

**© Copyright International Business Machines Corporation 2004. All rights reserved.**

US Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

# Contents

|   |           |
|---|-----------|
| 1 About this guide .....  | 1         |
| <b>1.1 Who should read this guide .....</b>   | <b>1</b>  |
| <b>1.2 Publications .....</b>   | <b>1</b>  |
| 1.2.1 IBM Tivoli Decision Support for OS/390 library .....                              | 1         |
| 1.2.2 Tivoli Data Warehouse library .....   | 2         |
| 1.2.3 Related publications .....  | 2         |
| 1.2.3.1 IBM DB2, DB2 Data Warehouse Center, and DB2 Warehouse Manager library .....     | 2         |
| 1.2.3.2 IBM Redbooks .....  | 3         |
| 1.2.4 Accessing publications online .....   | 4         |
| 1.2.5 Ordering publications .....   | 4         |
| <b>1.3 Accessibility .....</b>  | <b>4</b>  |
| <b>1.4 Contacting software support .....</b>  | <b>4</b>  |
| <b>1.5 Participating in newsgroups .....</b>  | <b>5</b>  |
| <b>1.6 Typeface conventions .....</b>   | <b>5</b>  |
| 2 Overview .....  | 6         |
| <b>2.1 Overview of Tivoli Data Warehouse .....</b>                                      | <b>6</b>  |
| <b>2.2 Overview of the warehouse pack for Tivoli Decision Support for OS/390 .....</b>  | <b>7</b>  |
| <b>2.3 Data source and targets for Tivoli Decision Support for OS/390 (NPM) .....</b>   | <b>8</b>  |
| 3 Installing and configuring the warehouse pack .....                                   | 12        |
| <b>3.1 Prerequisite hardware and software .....</b>                                     | <b>12</b> |
| <b>3.2 Product notes and limitations .....</b>  | <b>12</b> |
| <b>3.3 Database-sizing considerations .....</b>   | <b>12</b> |
| <b>3.4 Pre-installation procedures .....</b>  | <b>13</b> |
| <b>3.5 Installation of the warehouse pack .....</b>                                     | <b>13</b> |
| <b>3.6 Post-installation procedures .....</b>   | <b>13</b> |
| 3.6.1 How to change the default schema name of Tivoli Decision Support for OS/390 ..... | 13        |
| 3.6.2 How to schedule ETL processes .....   | 14        |
| <b>3.7 Migration from a previous release of the warehouse pack .....</b>                | <b>14</b> |
| <b>3.8 Uninstallation of the warehouse pack .....</b>                                   | <b>14</b> |
| <b>3.9 Multiple data centers .....</b>  | <b>14</b> |
| <b>3.10 Multiple customer environments .....</b>  | <b>14</b> |
| 4 Maintenance and problem determination .....   | 16        |
| <b>4.1 Backing up and restoring .....</b>   | <b>16</b> |
| <b>4.2 Deleting data in the Central Data Warehouse .....</b>                            | <b>16</b> |
| 4.2.1 Deleting measurement data (table Prune_Msmt_Control) .....                        | 16        |
| <b>4.3 Maintenance of customized environments .....</b>                                 | <b>16</b> |
| <b>4.4 Problem determination .....</b>  | <b>16</b> |
| 5 ETL process .....   | 17        |
| <b>5.1 D10_c05_NPM_Process .....</b>  | <b>17</b> |
| 6 Central Data Warehouse information .....  | 18        |
| <b>6.1 Component configuration .....</b>  | <b>18</b> |
| 6.1.1 Component type (table CompTyp) .....  | 18        |
| 6.1.2 Component extension (table Comp_ext) .....  | 18        |
| 6.1.3 Component (table Comp) .....  | 18        |
| 6.1.4 Component relationship type (table RelnTyp) .....                                 | 19        |
| 6.1.5 Component relationship rule (table RelnRul) .....                                 | 19        |
| 6.1.6 Component relationship (table CompReln) .....                                     | 20        |
| 6.1.7 Component type keyword (table CompTyp_Keyword) .....                              | 20        |
| 6.1.8 Attribute type (table AttrTyp) .....  | 20        |
| 6.1.9 Attribute rule (table AttrRul) .....  | 20        |
| 6.1.10 Attribute domain (table AttrDom) .....   | 20        |
| 6.1.11 Component attribute (table CompAttr) .....                                       | 20        |
| 6.1.12 Component type relationship (table CTypReln) .....                               | 21        |
| 6.1.13 Component attribute type relationship (table ATypReln) .....                     | 21        |
| <b>6.2 Component measurement .....</b>  | <b>22</b> |

|   |           |
|---|-----------|
| 6.2.1 Measurement group type (table MGrpTyp).....                 | 22        |
| 6.2.2 Measurement group (table MGrp).....                         | 22        |
| 6.2.3 Measurement group member (table MGrpMbr).....               | 22        |
| 6.2.4 Measurement unit category (table MUnitCat).....             | 22        |
| 6.2.5 Measurement unit (table MUnit).....                         | 23        |
| 6.2.6 Measurement alias names (table MTypReIn).....               | 23        |
| 6.2.7 Time summary (table TmSum).....                             | 23        |
| 6.2.8 Measurement source (table MSrc).....                        | 23        |
| 6.2.9 Measurement source history (table MSrcHistory).....         | 23        |
| 6.2.10 Measurement type (table MsmtTyp).....                      | 24        |
| 6.2.11 Component measurement rule (table MsmtRul).....            | 24        |
| 6.2.12 Measurement (table Msmt).....                              | 25        |
| 6.2.13 Threshold measurement objective (table Mobj).....          | 25        |
| 6.2.14 Threshold measurement objective range (table MobjRng)..... | 25        |
| 6.2.15 Threshold severity level (table SevLvl).....               | 25        |
| <b>6.3 Component events.....</b>                                  | <b>26</b> |
| <b>6.4 Helper tables .....</b>                                    | <b>26</b> |
| <b>6.5 Exception tables .....</b>                                 | <b>26</b> |
| <b>6.6 Incremental extraction .....</b>                           | <b>26</b> |
| Notices.....  | 27        |

# 1 About this guide

This document describes the warehouse enablement pack, Version 1.2.0 for IBM Tivoli® Decision Support for OS/390® Version 1.6 (NPM)®. This warehouse enablement pack (hereafter referred to as warehouse pack) is created for Tivoli Data Warehouse, Version 1.2 and it is used to load NPM data for IBM Tivoli Decision Support for OS/390 into a central data warehouse.

With this implementation guide, you can install and configure the warehouse pack and analyze the data structures it uses.

## 1.1 Who should read this guide

This guide is for people who do any of the following activities:

- Plan for and install the warehouse pack
- Use and maintain the warehouse pack
- Create new reports
- Create additional warehouse packs that use data from this warehouse pack

Administrators and installers should have the following knowledge or experience:

- Basic system administration and file management of the operating systems on which the components of Tivoli Data Warehouse are installed
- An understanding of the basic concepts of relational database management
- Experience administering IBM DB2 Universal Database

Additionally, report designers and warehouse pack creators should have the following knowledge or experience:

- An understanding of the source data and application
- Data warehouse information and design, extract, transform, and load (ETL) processes, and online analytical processing (OLAP)

## 1.2 Publications

This section lists publications in the Tivoli Data Warehouse library and other related documents. It also describes how to access Tivoli publications online and how to order Tivoli publications.

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

- IBM Tivoli Decision Support for OS/390
- IBM Tivoli Data Warehouse
- Crystal Enterprise
- IBM DB2, DB2 Data Warehouse Center, and DB2 Warehouse Manager
- IBM Redbooks

**Note:** The documentation for Crystal Enterprise is available on the Crystal Enterprise CD, which is distributed with Tivoli Data Warehouse.

### 1.2.1 IBM Tivoli Decision Support for OS/390 library

The following documents are available in the Tivoli Data Warehouse library:

- *Tivoli Decision Support for OS/390, Network Performance Feature Reference, Version 1.6.0*, SH19-6822  
Provides information for network analysts or programmers who are responsible for setting up the network reporting environment.
- *Tivoli Decision Support for OS/390, Administration Guide, Version 1.6*, SH19-6816  
Provides information about customizing Tivoli Decision Support for OS/390.

## 1.2.2 Tivoli Data Warehouse library

The following documents are available in the Tivoli Data Warehouse library. The library is available on the Tivoli Data Warehouse Documentation CD as well as online, as described in “Accessing publications online” on page 4.

- *Tivoli Data Warehouse Release Notes*, SC32-1399  
Provides late-breaking information about Tivoli Data Warehouse and lists hardware requirements and software prerequisites.
- *Installing and Configuring Tivoli Data Warehouse*, GC32-0744  
Describes how Tivoli Data Warehouse fits into your enterprise, explains how to plan for its deployment, and gives installation and configuration instructions. It contains maintenance procedures and troubleshooting information.
- *Enabling an Application for Tivoli Data Warehouse*, GC32-0745  
Provides information about connecting an application to Tivoli Data Warehouse. This book is for application programmers who use Tivoli Data Warehouse to store and report on their application data, data warehousing experts who import Tivoli Data Warehouse data into business intelligence applications, and customers who put their local data in Tivoli Data Warehouse. This document is available only from the IBM Web site.
- *Tivoli Data Warehouse Messages*, SC09-7776  
Lists the messages generated by Tivoli Data Warehouse, and describes the corrective actions you should take.

## 1.2.3 Related publications

The following sections describe additional publications to help you understand and use Tivoli Data Warehouse.

### 1.2.3.1 IBM DB2, DB2 Data Warehouse Center, and DB2 Warehouse Manager library

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, which is available on the IBM Web site:

<http://www-3.ibm.com/software/data/db2/library/>

After you install DB2, its library is also available on your system.

The following DB2 documents are particularly relevant for people working with Tivoli 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, which is 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 DB2 Data Warehouse Center.
- *IBM DB2 Warehouse Manager Installation Guide*, GC26-9998  
Provides information on how 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 of a platform-specific DB2 client. 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 DB2 Data Warehouse Center, and describes the actions you should take.
- *IBM DB2 UDB for z/OS and OS/390 Administration Guide*, SC26-9931  
Provides information on how to administer DB2 UDB on z/OS and OS/390 systems.
- *IBM DB2 UDB for z/OS and OS/390 An introduction to DB2 for OS/390*, SC26-9937  
Provides start-up information for DB2 for OS/390 users.
- *IBM DB2 UDB for z/OS and OS/390 Messages and codes*, GC26-9940  
Lists the messages and codes issued by DB2 on z/OS and OS/390 systems.
- *IBM DB2 UDB for z/OS and OS/390 Installation Guide*, GC26-9936  
Provides information on how to install DB2 UDB on z/OS and OS/390 systems.
- *IBM DB2 UDB for z/OS and OS/390 Diagnosis Guide and Reference*, LY37-3740  
Provides information on how to understand DB2 errors and instruct corrective actions that should be taken.

### 1.2.3.2 IBM Redbooks

IBM Redbooks are developed and published by the IBM International Technical Support Organization, the ITSO. They explore integration, implementation, and operation of realistic customer scenarios. The following Redbooks contain information about Tivoli Data Warehouse:

- *Introduction to Tivoli Enterprise Data Warehouse*, SG24-6607  
Provides a broad understanding of Tivoli Data Warehouse. Some of the topics that are covered are concepts, architecture, writing your own extract, transform, and load processes (ETLs), and best practices in creating data marts.

- *Planning a Tivoli Enterprise Data Warehouse Project*, SG24-6608  
Describes the necessary planning you must complete before you can deploy Tivoli Data Warehouse. The guide shows how to apply these planning steps in a real-life deployment of a warehouse pack using IBM Tivoli Monitoring. It also contains frequently used Tivoli and DB2 commands and lists troubleshooting tips for Tivoli Data Warehouse.

## 1.2.4 Accessing publications online

The publications CD or product CD contains the publications that are in the product library. The format of the publications is PDF, HTML, or both.

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli Software Information Center Web site. The Tivoli Software Information Center is located at the following Web address:

<http://publib.boulder.ibm.com/tividd/td/tdprodlist.html>

**Note:** If you print PDF documents on other than letter-sized paper, select the **Fit to page** check box in the Adobe Acrobat Print dialog. This option is available when you click **File** → **Print**. **Fit to page** ensures that the full dimensions of a letter-sized page print on the paper that you are using.

## 1.2.5 Ordering publications

You can order many Tivoli publications online at the following Web site:

<http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>

You can also order by telephone by calling one of these numbers:

- In the United States: 800-879-2755
- In Canada: 800-426-4968
- In other countries, for a list of telephone numbers, see the following Web site:

<http://www.ibm.com/software/tivoli/order-lit/>

## 1.3 Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. For the warehouse pack, you use the interfaces of IBM DB2 and the Crystal Enterprise. See those documentation sets for accessibility information.

## 1.4 Contacting software support

If you have a problem with a Tivoli product, refer to the following IBM Software Support Web site:

<http://www.ibm.com/software/sysmgmt/products/support/>

If you want to contact customer support, see the IBM Software Support Guide at the following Web site:

<http://techsupport.services.ibm.com/guides/handbook.html>

The guide provides information about how to contact IBM Software Support, depending on the severity of your problem, and the following information:

- Registration and eligibility
- Telephone numbers, depending on the country in which you are located
- Information you must have before contacting IBM Software Support

## 1.5 Participating in newsgroups

User groups provide software professionals with a forum for communicating ideas, technical expertise, and experiences related to the product. They are located on the Internet, and are available using standard newsreader programs. These groups are primarily intended for user-to-user communication, and are not a replacement for formal support. You can use Web browsers like Netscape Navigator or Microsoft Internet Explorer to view these newsgroups:

Tivoli Data Warehouse

<news://news.software.ibm.com/ibm.software.tivoli.enterprise-data-warehouse>

## 1.6 Typeface conventions

This guide uses the following typeface conventions:

### **Bold**

- Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip** and **Operating system considerations**)
- Column headings in a table
- Keywords and parameters in text

### *Italic*

- Citations (titles of books, diskettes, and CDs)
- Words defined in text
- Emphasis of words (words as words)
- Letters as letters
- New terms in text (except in a definition list)
- Variables and values you must provide

### Monospace

- Examples and code examples
- File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
- Message text and prompts addressed to the user
- Text that the user must type
- Values for arguments or command options

## 2 Overview

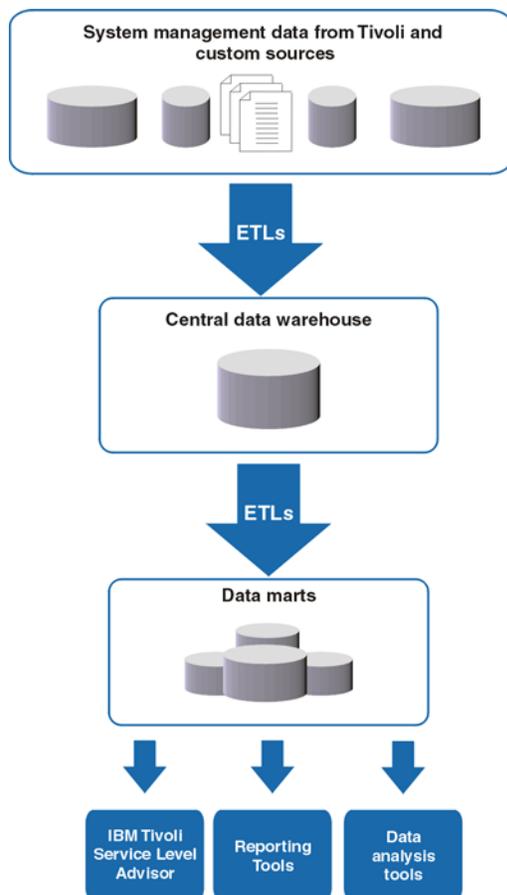
The following sections provide an overview of Tivoli Data Warehouse and the warehouse pack for Tivoli Decision Support for OS/390 NPM Component.

### 2.1 Overview of Tivoli Data Warehouse

Tivoli 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 reports

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



**Figure 1. Tivoli Data Warehouse basic architecture**

The *Central Data Warehouse* uses a generic schema that is the same for all applications. As new components or new applications are added, more data is added to the database; however, no new database objects are added in the schema.

A *data mart* is a subset of a data warehouse that contains data that is 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 simply *warehouse pack*.

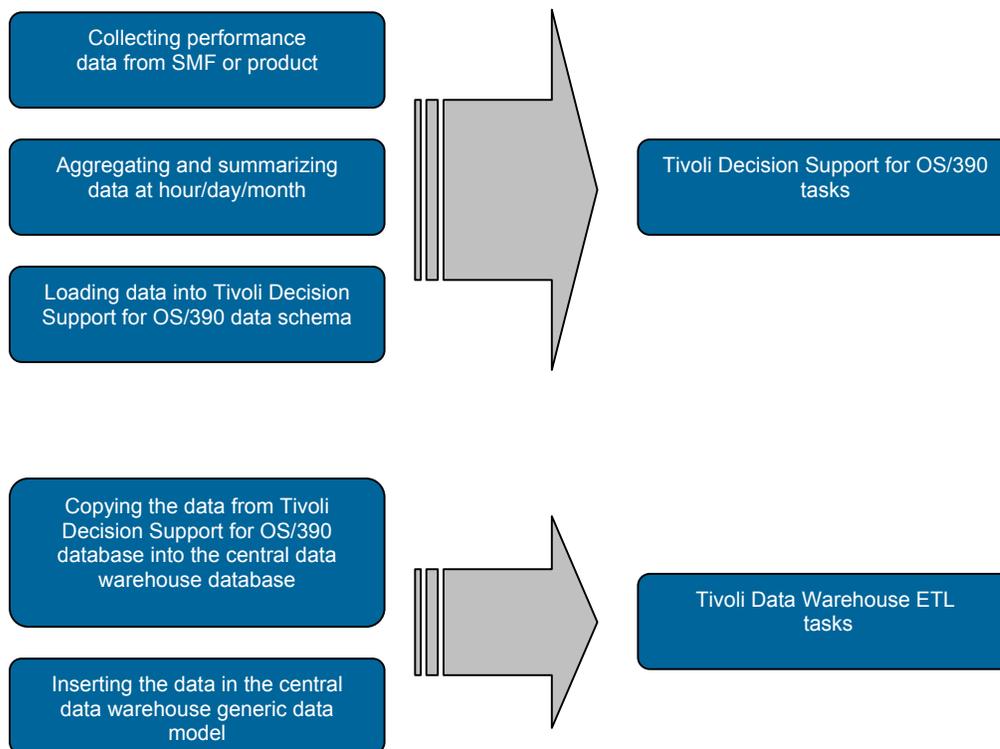
The ETLs are typically scheduled to run periodically, usually during non-peak hours.

## 2.2 Overview of the warehouse pack for Tivoli Decision Support for OS/390

Tivoli Decision Support for OS/390 is structured with several components relative to the different applications where it collects data. Consequently the extract transform and load processes are also defined as different Subject Areas according to each Tivoli Decision Support component. For instance in the “DB2 Warehouse Center” you can find the following Subject Areas, if the corresponding warehouse enablement packs were installed:

- D01\_TDS/390-MVS\_v1.6.0\_Subject\_Area (ETLs for Tivoli Decision Support for OS/390 System performance feature MVS component)
- D07\_TDS/390-OPC\_v1.6.0\_Subject\_Area (ETLs for Tivoli Decision Support for OS/390 System performance feature OPC component)
- D09\_TDS/390-RACF\_v1.6.0\_Subject\_Area (ETLs for Tivoli Decision Support for OS/390 System performance feature RACF component)

The relationship between Tivoli Decision Support and Tivoli Data Warehouse through the ETL processes varies according to the different tasks they perform. The graph below shows what has been just stated:



**Figure 2. Overview of the warehouse pack for Tivoli Decision Support for OS/390**

This figure refers only to the Central Data Warehouse (CDW) loading, because this warehouse pack does not provide either data marts or reports.

To understand how Tivoli Decision Support for OS/390 interacts with Tivoli Data Warehouse, see that topic in *Installing and Configuring Tivoli Data Warehouse*.

## 2.3 Data source and targets for Tivoli Decision Support for OS/390 (NPM)

The following table shows the corresponding Tivoli Decision Support for OS/390 source locations for the Central Data Warehouse OS/390 component types and measurement types managed by warehouse pack.

| <b>Tivoli Decision Support for OS/390 source Table name</b> | <b>Tivoli Decision Support for OS/390 Source field or Source formula</b>                         | <b>Tivoli Data Warehouse CompTyp_Cd (C) MsmtTyp_Nm (M) AttrTyp_Cd (A)</b> |
|---|--|---|
| NW_NPM_TRANS_SUM_H  | NETWORK_NAME   | (C) 'SNA_NETWORK'   |
|   | APPLICATION_NAME   | (C) 'NETWORK_APPL'  |
|   | OPER_SEC   | (M) 'NPM Operator Transit Time'   |
|   | NETW_SEC   | (M) 'NPM Network Transit Time'  |
|   | HOST_SEC_TOTAL   | (M) 'NPM Host Transit Time'   |
|   | OPER_TRAN  | (M) 'NPM Operator Transactions'   |
|   | NETW_TRAN  | (M) 'NPM Network Transactions'  |
|   | HOST_TRAN_TOTAL  | (M) 'NPM Host Transactions'   |
|   | OPER_SEC/OPER_TRAN   | (M) 'NPM Operator Response Time'  |
|   | NETW_SEC/NETW_TRAN   | (M) 'NPM Network Response Time'   |
| HOST_SEC_TOTAL/HOST_TRAN_TOTAL                              | (M) 'NPM Host Response Time'   |   |
| NW_NCP_UTIL_H   | NETWORK_NAME   | (C) 'SNA_NETWORK'   |
|   | NCP_NAME   | (C) 'SNA_CCU'   |
|   | 100*(MEASURED_HOURS-FREE_CYCLE_HOURS)/<br>MEASURED_HOURS<br>CCU_UTIL_MAX_PCT<br>CCU_UTIL_MIN_PCT | (M) 'NPM CCU Utilization'   |
|   | 100*NCP_SLOWDOWN_HOURS/MEASURED_HOURS  | (M) 'NPM NCP Slowdown'  |
|   | 100*BFR_USED_COUNT/BFR_TOTAL_COUNT<br>BFR_UTIL_MAX_PCT<br>BFR_UTIL_MIN_PCT                       | (M) 'NPM NCP Buffer Utilization'  |
| NW_LINE_UTIL_H  | NETWORK_NAME   | (C) 'SNA_NETWORK'   |
|   | NCP_NAME   | (C) 'SNA_CCU'   |
|   | LINE_NAME  | (C) 'SNA_LINE'  |
|   | PROTOCOL  '   DUPLX  | (A) 'SNA_LINE_TYPE'   |
|   | UTILIZATION_PCT  | (M) 'NPM Line Utilization'  |
|   | (CHAR_SENT_MB+CHAR_RECEIVED_MB)*1000000/<br>(MEASURED_HOURS*3600)                                | (M) 'NPM Line Speed'  |
|   | OUTQUEUE_TOTAL_PIU   | (M) 'NPM Line Outbound Queue Length'                                      |
| NW_PU_UTIL_H  | NETWORK_NAME   | (C) 'SNA_NETWORK'   |
|   | NCP_NAME   | (C) 'SNA_CCU'   |
|   | LINE_NAME  | (C) 'SNA_LINE'  |
|   | PU_NAME  | (C) 'SNA_PU'  |
|   | PROTOCOL  '   DUPLX  | (A) 'SNA_LINE_TYPE'   |
|   | PROTOCOL   | (A) 'SNA_PU_TYPE'   |
|   | CHAR_SENT_MB*1000000   | (M) 'NPM Line-PU Bytes Sent'  |
|   | CHAR_RECEIVED_MB*1000000   | (M) 'NPM Line-PU Bytes Received'  |
|   | CHAR_RETRANSMIT  | (M) 'NPM Line-PU Bytes Retransmitted'                                     |
|   | ERRORS_TOTAL   | (M) 'NPM Line-PU Errors'  |

|                 |   |                                       |
|-----------------|---|---------------------------------------|
| NW_NEO_UTIL_H   | NETWORK_NAME  | (C) 'SNA_NETWORK'                     |
|                 | NCP_NAME  | (C) 'SNA_CCU'                         |
|                 | LINE_NAME   | (C) 'SNA_LINE'                        |
|                 | PU_NAME (NEO_RESTYPE='NEOPU')                               | (C) 'SNA_PU'                          |
|                 | 'NEO' (NEO_RESTYPE='NEOLINK', 'NEOPU')                      | (A) 'SNA_LINE_TYPE'                   |
|                 | 'NEO' (NEO_RESTYPE='NEOPU')                                 | (A) 'SNA_PU_TYPE'                     |
|                 | UTILIZATION_PCT (NEO_RESTYPE='NEOLINK')                     | (M) 'NPM Line Utilization'            |
|                 | (BYTES_SENT+BYTES_RCV)/MEASURED_SEC (NEO_RESTYPE='NEOLINK') | (M) 'NPM Line Speed'                  |
|                 | OUTQUEUE_TOTAL_PIU (NEO_RESTYPE='NEOLINK')                  | (M) 'NPM Line Outbound Queue Length'  |
|                 | BYTES_SENT (NEO_RESTYPE='NEOPU')                            | (M) 'NPM Line-PU Bytes Sent'          |
|                 | BYTES_RCV (NEO_RESTYPE='NEOPU')                             | (M) 'NPM Line-PU Bytes Received'      |
|                 | BYTES_RETRANS (NEO_RESTYPE='NEOPU')                         | (M) 'NPM Line-PU Bytes Retransmitted' |
|                 | ERRORS_TOTAL (NEO_RESTYPE='NEOPU')                          | (M) 'NPM Line-PU Errors'              |
| NW_NTRIL_UTIL_H | NETWORK_NAME  | (C) 'SNA_NETWORK'                     |
|                 | NCP_NAME  | (C) 'SNA_CCU'                         |
|                 | LINE_NAME   | (C) 'SNA_LINE'                        |
|                 | 'NTRI LOGICAL'  | (A) 'SNA_LINE_TYPE'                   |
|                 | UTILIZATION_PCT   | (M) 'NPM Line Utilization'            |
|                 | (BYTES_SENT+BYTES_RCV)/MEASURED_SEC                         | (M) 'NPM Line Speed'                  |
|                 | OUTQUEUE_TOTAL_PIU  | (M) 'NPM Line Outbound Queue Length'  |
| NW_NTRIP_UTIL_H | NETWORK_NAME  | (C) 'SNA_NETWORK'                     |
|                 | NCP_NAME  | (C) 'SNA_CCU'                         |
|                 | LINE_NAME   | (C) 'SNA_LINE'                        |
|                 | 'NTRI PHYSICAL'   | (A) 'SNA_LINE_TYPE'                   |
|                 | UTILIZATION_PCT   | (M) 'NPM Line Utilization'            |
|                 | (BYTES_SENT+BYTES_RCV)/MEASURED_SEC                         | (M) 'NPM Line Speed'                  |
|                 | OUTQUEUE_TOTAL_PIU  | (M) 'NPM Line Outbound Queue Length'  |
| NW_ODLCL_UTIL_H | NETWORK_NAME  | (C) 'SNA_NETWORK'                     |
|                 | NCP_NAME  | (C) 'SNA_CCU'                         |
|                 | LINE_NAME   | (C) 'SNA_LINE'                        |
|                 | 'ODLC'  | (A) 'SNA_LINE_TYPE'                   |
|                 | UTILIZATION_PCT   | (M) 'NPM Line Utilization'            |
|                 | (TOTAL_KBYTES_SENT+TOTAL_KBYTES_RCVD)*1000/MEASURED_SEC     | (M) 'NPM Line Speed'                  |
|                 | Not applicable  | (M) 'NPM Line Outbound Queue Length'  |
| NW_ODLCP_UTIL_H | NETWORK_NAME  | (C) 'SNA_NETWORK'                     |
|                 | NCP_NAME  | (C) 'SNA_CCU'                         |
|                 | LINE_NAME   | (C) 'SNA_LINE'                        |
|                 | SLU_PU_NAME   | (C) 'SNA_PU'                          |
|                 | 'ODLC'  | (A) 'SNA_LINE_TYPE'                   |
|                 | 'ODLC'  | (A) 'SNA_PU_TYPE'                     |
|                 | TOTAL_KBYTES_SENT*1000                                      | (M) 'NPM Line-PU Bytes Sent'          |
|                 | TOTAL_KBYTES_RCVD*1000                                      | (M) 'NPM Line-PU Bytes Received'      |
|                 | TOTAL_KBYTES_RXMIT*1000                                     | (M) 'NPM Line-PU Bytes Retransmitted' |
|                 | Not applicable  | (M) 'NPM Line-PU Errors'              |
|                 | UTILIZATION_PCT   | (M) 'NPM Line Utilization'            |
| NW_X25LN_UTIL_H | NETWORK_NAME  | (C) 'SNA_NETWORK'                     |
|                 | NCP_NAME  | (C) 'SNA_CCU'                         |
|                 | LINE_NAME   | (C) 'SNA_LINE'                        |
|                 | 'X.25'  | (A) 'SNA_LINE_TYPE'                   |
|                 | UTILIZATION_PCT   | (M) 'NPM Line Utilization'            |

|                  |  |                                       |
|------------------|--|---------------------------------------|
|                  | (BYTES_SENT+BYTES_RCV)/MEASURED_SEC      | (M) 'NPM Line Speed'                  |
|                  | OUTQUEUE_TOTAL_PIU                       | (M) 'NPM Line Outbound Queue Length'  |
| NW_X25NI_UTIL_H  | NETWORK_NAME                             | (C) 'SNA_NETWORK'                     |
|                  | NCP_NAME                                 | (C) 'SNA_CCU'                         |
|                  | LINE_NAME                                | (C) 'SNA_LINE'                        |
|                  | PU_NAME                                  | (C) 'SNA_PU'                          |
|                  | 'X.25'                                   | (A) 'SNA_LINE_TYPE'                   |
|                  | 'X.25 VIRTUAL CIRCUITS'                  | (A) 'SNA_PU_TYPE'                     |
|                  | BYTES_SENT                               | (M) 'NPM Line-PU Bytes Sent'          |
|                  | BYTES_RCV                                | (M) 'NPM Line-PU Bytes Received'      |
|                  | BYTES_RETRANS                            | (M) 'NPM Line-PU Bytes Retransmitted' |
| ERRORS_TOTAL     | (M) 'NPM Line-PU Errors'                 |                                       |
| NW_X25PU_UTIL_H  | NETWORK_NAME                             | (C) 'SNA_NETWORK'                     |
|                  | NCP_NAME                                 | (C) 'SNA_CCU'                         |
|                  | LINE_NAME                                | (C) 'SNA_LINE'                        |
|                  | PU_NAME                                  | (C) 'SNA_PU'                          |
|                  | 'X.25'                                   | (A) 'SNA_LINE_TYPE'                   |
|                  | 'X.25 PU'                                | (A) 'SNA_PU_TYPE'                     |
|                  | BYTES_SENT                               | (M) 'NPM Line-PU Bytes Sent'          |
|                  | BYTES_RCV                                | (M) 'NPM Line-PU Bytes Received'      |
|                  | BYTES_RETRANS                            | (M) 'NPM Line-PU Bytes Retransmitted' |
| ERRORS_TOTAL     | (M) 'NPM Line-PU Errors'                 |                                       |
| NW_FRRYL_UTIL_H  | NETWORK_NAME                             | (C) 'SNA_NETWORK'                     |
|                  | NCP_NAME                                 | (C) 'SNA_CCU'                         |
|                  | LINE_NAME                                | (C) 'SNA_LINE'                        |
|                  | 'FRAME RELAY LOGICAL'                    | (A) 'SNA_LINE_TYPE'                   |
|                  | UTILIZATION_PCT                          | (M) 'NPM Line Utilization'            |
|                  | (BYTES_SENT+BYTES_RCV)/MEASURED_SEC      | (M) 'NPM Line Speed'                  |
|                  | OUTQUEUE_TOTAL_PIU                       | (M) 'NPM Line Outbound Queue Length'  |
| NW_FRRYP_UTIL_H  | NETWORK_NAME                             | (C) 'SNA_NETWORK'                     |
|                  | NCP_NAME                                 | (C) 'SNA_CCU'                         |
|                  | LINE_NAME                                | (C) 'SNA_LINE'                        |
|                  | 'FRAME RELAY PHYSICAL'                   | (A) 'SNA_LINE_TYPE'                   |
|                  | UTILIZATION_PCT                          | (M) 'NPM Line Utilization'            |
|                  | (BYTES_SENT+BYTES_RCV)/MEASURED_SEC      | (M) 'NPM Line Speed'                  |
|                  | OUTQUEUE_TOTAL_PIU                       | (M) 'NPM Line Outbound Queue Length'  |
| NW_FRRYLM_UTIL_H | NETWORK_NAME                             | (C) 'SNA_NETWORK'                     |
|                  | NCP_NAME                                 | (C) 'SNA_CCU'                         |
|                  | LINE_NAME                                | (C) 'SNA_LINE'                        |
|                  | PU_NAME                                  | (C) 'SNA_PU'                          |
|                  | 'FRAME RELAY PHYSICAL'                   | (A) 'SNA_LINE_TYPE'                   |
|                  | 'FRAME RELAY LOCAL MANAGEMENT INTERFACE' | (A) 'SNA_PU_TYPE'                     |
|                  | BYTES_SENT                               | (M) 'NPM Line-PU Bytes Sent'          |
|                  | BYTES_RCV                                | (M) 'NPM Line-PU Bytes Received'      |
|                  | BYTES_RXMIT                              | (M) 'NPM Line-PU Bytes Retransmitted' |
|                  | ERRORS_TOTAL                             | (M) 'NPM Line-PU Errors'              |
| NW_FRRYPS_UTIL_H | NETWORK_NAME                             | (C) 'SNA_NETWORK'                     |
|                  | NCP_NAME                                 | (C) 'SNA_CCU'                         |
|                  | LINE_NAME                                | (C) 'SNA_LINE'                        |
|                  | PU_NAME                                  | (C) 'SNA_PU'                          |
|                  | 'FRAME RELAY PHYSICAL'                   | (A) 'SNA_LINE_TYPE'                   |

|  |                                |                                       |
|--|--------------------------------|---------------------------------------|
|  | 'FRAME RELAY PHYSICAL STATION' | (A) 'SNA_PU_TYPE'                     |
|  | BYTES_SENT                     | (M) 'NPM Line-PU Bytes Sent'          |
|  | BYTES_RCV                      | (M) 'NPM Line-PU Bytes Received'      |
|  | BYTES_RXMIT                    | (M) 'NPM Line-PU Bytes Retransmitted' |
|  | ERRORS_TOTAL                   | (M) 'NPM Line-PU Errors'              |

## 3 Installing and configuring the warehouse pack

This section describes the installation and configuration of the warehouse pack.

### 3.1 Prerequisite hardware and software

Before installing the warehouse pack for Tivoli Decision Support for OS/390 NPM component, you must install the following software:

- IBM Tivoli Decision Support for OS/390 Version 1.6 Network Performance feature with the following component:
  - Network NPM Transit Time Component
  - Network NCP Utilization Component
  - Network Line Utilization Component
  - Network PU Utilization Component
  - Network NEO Utilization Component
  - Network NTRI Utilization Component
  - Network ODLC LAN and PU Utilization Component
  - Network X25 Utilization Component
  - Network Frame Relay Utilization Component<sup>1</sup>
- IBM DB2 Universal Database, Version 7.2
- IBM DB2 Universal Database for z/OS and OS/390, Version 7
- Tivoli Data Warehouse, Version 1.2 and its prerequisites
- Crystal Enterprise and its prerequisites

This warehouse pack supports Central Data Warehouses on DB2 UDB for z/OS and OS/390.

Refer to the *Tivoli Data Warehouse Release Notes* and *Tivoli Decision Support for OS/390 Administration Guide* for specific information about hardware prerequisites, database and operating system support, and product prerequisites. For late-breaking news about prerequisites, refer to the following IBM Software Support Web site:

<http://www.ibm.com/software/sysmgmt/products/support/>

### 3.2 Product notes and limitations

For performance and disk capacity reasons, data from Tivoli Decision Support for OS/390 can only be stored in the Central Data Warehouse database on OS/390 system.

In addition, place Tivoli Decision Support for OS/390 in the same DB2 subsystem as Central Data Warehouse.

To avoid resource contention, warehouse packs on OS/390 must be run in sequence. See the following sections for instructions on how to install and schedule multiple Tivoli Decision Support for OS/390 warehouse packs.

### 3.3 Database-sizing considerations

Refer to the “Estimating the size of your Tivoli Data Warehouse deployment” in *Installing and Configuring Tivoli Data Warehouse* manual.

---

<sup>1</sup> **Note:** In the next of this document this set of components will be referred as ‘NPM Component’ because Tivoli Netview Performance Monitor (NPM) is the source of data implemented with this pack.

### 3.4 Pre-installation procedures

There are no pre-installation procedures for this warehouse pack.

### 3.5 Installation of the warehouse pack

To install this warehouse enablement pack, perform the following steps:

1. Make sure that Tivoli Decision Support for OS/390 is installed and the data source is available.
2. Make sure that all prerequisite product patches are applied.
3. Make sure that Tivoli Data Warehouse is installed. For instructions about installing Tivoli Data Warehouse, refer to *Installing and Configuring Tivoli Data Warehouse*.
4. Record the following information that will be used during the installation:

| ODBC source | User ID                                  | Password                                  | Database type               | Database alias  |
|-------------|--|---|-----------------------------|---|
| TDS390      | Your DB2 UDB for z/OS and OS/390 User ID | Your DB2 UDB for z/OS and OS/390 Password | DB2 UDB for z/OS and OS/390 | The ODBC data source used for CDW (for example TCDW1) |

5. Install the warehouse pack as described in *Installing and Configuring Tivoli Data Warehouse*, using the installation properties file (tw\_h\_install\_props.cfg) located in the tw\_weps\d10\v1200 directory.
6. If you want to run multiple warehouse packs on OS/390 select “Do not schedule the data extraction, transformation and loading”, when the ETL configuration window is displayed. In this way you are able to manually schedule ETLs in sequence as explained in the following *Post-installation procedures* section.
7. Perform the post-installation steps described in *Post-installation procedures*.

### 3.6 Post-installation procedures

Complete the following post-installation procedures.

#### 3.6.1 How to change the default schema name of Tivoli Decision Support for OS/390

Before running any ETL process, if this is the first Tivoli Decision Support for OS/390 warehouse enablement pack that you are installing and you have installed Tivoli Decision Support for OS/390 using a schema (Tivoli Decision Support for OS/390 table prefix) name different from DRL (which is the default name), you must customize the db2os390.translate file, as described in *Installing and Configuring Tivoli Data Warehouse*. For instance, if your schema name is DRLxxx, you must change the following:

```
__TDS390_SCHEMA DRL
```

into:

```
__TDS390_SCHEMA DRLxxx
```

### 3.6.2 How to schedule ETL processes

If you are installing this warehouse pack as the only OS/390 warehouse pack, you can schedule it using the ETL configuration window during the installation steps. On the contrary, if you are installing multiple OS/390 warehouse packs, you must ensure that their ETLs must be run in sequence. During the installation process, you selected “Do not schedule data extraction, transformation and loading”. Now you must create shortcuts in the Data Warehouse Interface to link the ETL processes in sequence. With shortcuts you specify only the first ETL process runs. All the other processes run automatically because they are linked to that process. For details see “Scheduling warehouse pack ETL processes” in *Installing and Configuring Tivoli Data Warehouse* manual.

### 3.7 Migration from a previous release of the warehouse pack

This warehouse pack has no migration from previous release.

### 3.8 Uninstallation of the warehouse pack

To uninstall the warehouse pack on your computer select **Start> Programs> Tivoli Data Warehouse> Uninstall a Warehouse Pack**. For further information see *Installing and Configuring Tivoli Data Warehouse*, “Uninstalling warehouse packs” chapter. Before uninstalling the warehouse pack, you can delete the related data from the CDW by running a specific SQL script. A sample of it can be found in the twh\apps\d10\v1200\misc directory, the name is d10\_data\_delete.sql. The sample deletes both the static data and the instances loaded in the central data warehouse by this warehouse pack. Before running this script make sure you do not need those data anymore and make sure you are connected to the central data warehouse Database on host.

To uninstall the warehouse using this script you must open a DB2 Command Window and enter the following command from the twh\apps\d10\v1200\misc directory:

```
db2 -z <your logfile name> -tvf d10_data_delete.sql
```

### 3.9 Multiple data centers

After you install the warehouse pack, you can configure Tivoli Data Warehouse to separate data for multiple data centers. To set this up, you must create SQL scripts with the following values:

| Information for scripts | Value or location      |
|-------------------------|------------------------|
| Field in source data    | MVS System ID          |
| Name of lookup table    | D10.Centr_lookup table |
| Name of center list     | TWG.Centr              |

For the procedural instructions and example of SQL statements, see the information about warehouse pack installation in the *Installing and Configuring Tivoli Data Warehouse* guide.

After the configuration for multiple data centers, you must modify the tables when data centers are added and removed.

### 3.10 Multiple customer environments

After you install the warehouse pack, you can configure Tivoli Data Warehouse to separate data for the multiple customer environments. To set this up, you must create SQL scripts with the following values:

| Information for scripts | Value or location |
|-------------------------|-------------------|
|-------------------------|-------------------|

| <b>Information for scripts</b> | <b>Value or location</b> |
|--------------------------------|--------------------------|
| Field in source data           | MVS System ID            |
| Name of lookup table           | D10.Cust_lookup table    |
| Name of customer list          | TWG.Cust                 |

For the procedural instructions and example of SQL statements, see the information about warehouse pack installation in the *Installing and Configuring Tivoli Data Warehouse* guide.

After your configuration of the multiple customer environments, you must modify the tables when customers are added and removed.

## 4 Maintenance and problem determination

This section describes maintenance tasks for the warehouse pack.

### 4.1 Backing up and restoring

Together with the procedures describing maintenance tasks in *Installing and Configuring Tivoli Data Warehouse*, it is recommended that you back up your data on a regular basis. Ensure you have sufficient backup to restore as much event data as you need to store in the Central Data Warehouse.

For further information refer to backing up and restoring in *Installing and Configuring Tivoli Data Warehouse*.

### 4.2 Deleting data in the Central Data Warehouse

To manage the high volume of measurement data, use the Prune\_Msmt\_Control table where the deletion criteria are specified. The Prune\_Msmt\_Log table keeps a history of all data deletion activity.

By default the data older than the deletion criteria specified in the Prune\_Msmt\_Control table is deleted when the CDW\_c05\_Prune\_and\_Mark\_Active process runs. This process is within the CDW\_Tivoli\_Data\_Warehouse\_v1.2.0\_Subject\_Area. By default, this process runs daily at 6:00 a.m..

#### 4.2.1 Deleting measurement data (table Prune\_Msmt\_Control)

This table provides the deletion criteria for the data in the Msmt table.

| MSrc_Cd<br>CHAR (6) | Tmsum_Cd CHAR<br>(1) | PMsmtC_Age_In_<br>Days<br>DECIMAL (8,0) |
|---------------------|----------------------|---|
| D10                 | P                    | 100                                     |
| D10                 | H                    | 100                                     |
| D10                 | D                    | 300                                     |
| D10                 | W                    | 10000                                   |
| D10                 | M                    | 10000                                   |

**Note:** PMsmtC\_Age\_In\_Days column contains the "Prune Measurement Control Age in Days". This is the age at which measurements are deleted (day duration *yyyymmdd*).

### 4.3 Maintenance of customized environments

For successful Tivoli Data Warehouse maintenance do not change the Tivoli Data Warehouse ETLs, but rather create new ETLs in another subdirectory of the apps directory. At the same time define your process in the Data Warehouse Center. Tivoli Data Warehouse provides standard maintenance of its subdirectories and processes, if not modified. Refer to *Enabling an Application* for details on how to create your ETLs.

### 4.4 Problem determination

For common problems and solutions, see the *Installing and Configuring Tivoli Data Warehouse* guide.

## 5 ETL process

The warehouse pack has the following process:

- D10\_c05\_NPM\_Process

### 5.1 D10\_c05\_NPM\_Process

This process is used to load component and measurement tables from source data into the Central Data Warehouse database.

The process has the following steps:

- D10\_c05\_s010\_processNPM

This step populates the component table (Comp table), the component attribute table (CompAttr table) and the component relationship table (CompReIn table).

- D10\_c05\_s020\_processNPM

This step populates the measurement table (Msmt table).

## 6 Central Data Warehouse information

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

This section provides an example of how information is stored in Tivoli Data Warehouse. The data values shown in the following tables come from a generic installation.

Shaded columns in the following tables are translated. These columns are also marked with an asterisk (\*) after the column name.

### 6.1 Component configuration

The following sections describe the 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 | Msrc_Corr_cd CHAR (6) |
|----------------------|-----------------------------|--------------------------------|-----------------------------|----------------------------|-----------------------|
| SNA_NETWORK          |                             | SNA Network                    | 2002-01-01-00.00.00.000000  | 9999-01-01-00.00.00.000000 | MODEL1                |
| NETWORK_APPL         |                             | Network Application            | 2002-01-01-00.00.00.000000  | 9999-01-01-00.00.00.000000 | MODEL1                |
| SNA_CCU              |                             | SNA Communication Control Unit | 2002-01-01-00.00.00.000000  | 9999-01-01-00.00.00.000000 | MODEL1                |
| SNA_LINE             |                             | SNA Line                       | 2002-01-01-00.00.00.000000  | 9999-01-01-00.00.00.000000 | MODEL1                |
| SNA_PU               |                             | SNA Physical Unit              | 2002-01-01-00.00.00.000000  | 9999-01-01-00.00.00.000000 | MODEL1                |

\* This column is translated.

#### 6.1.2 Component extension (table Comp\_ext)

This table is not used by this warehouse pack.

#### 6.1.3 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) | Msrc_Corr_Cd CHAR (6) |
|-----------------|----------------------|-------------------|-----------------|----------------------|-----------------------|-----------------------------|----------------------------|----------------------------|-----------------------|-----------------------|
| 1               | SNA_NETWORK          | CDW               | 1               |                      | NETA                  |                             | 2002-01-01-00.00.00.000000 | 9999-01-01-00.00.00.000000 |                       | SHARED                |
| 2               | NETWORK_APPL         | CDW               | 1               |                      | NPMA01                |                             | 2002-01-01-00.00.00.000000 | 9999-01-01-00.00.00.000000 |                       | SHARED                |
| 3               | SNA_CCU              | CDW               | 1               |                      | A03NCP                |                             | 2002-01-01-00.00.00.000000 | 9999-01-01-00.00.00.000000 |                       | SHARED                |

| Comp_ID<br>INTEGER | CompTyp_Cd<br>CHAR<br>(17) | Centr_Cd<br>CHAR<br>(6) | Cust_ID<br>INTEGER | Comp_Corr_ID<br>INTEGER | Comp_Nm<br>VARCHAR<br>(254) | Comp_Corr_Val<br>VARCHAR<br>(254) | Comp_Strt_DtTm<br>TIMESTAMP | Comp_End_DtTm<br>TIMESTAMP | Comp_Ds<br>VARCHAR<br>(254) | Msrc_Corr_Cd<br>CHAR<br>(6) |
|--------------------|----------------------------|-------------------------|--------------------|-------------------------|-----------------------------|-----------------------------------|-----------------------------|----------------------------|-----------------------------|-----------------------------|
| 4                  | SNA_LINE                   | CDW                     | 1                  |                         | A03C08                      |                                   | 2002-01-01-00.00.00.000000  | 9999-01-01-00.00.00.000000 |                             | SHARED                      |
| 5                  | SNA_PU                     | CDW                     | 1                  |                         | A03CP08                     |                                   | 2002-01-01-00.00.00.000000  | 9999-01-01-00.00.00.000000 |                             | SHARED                      |

**Note1:** The Comp\_Corr\_Val column is used to correlate the component instance to its parents. In the above Comp table sample this column was left empty for better readability. However in a real case, for this warehouse pack, it is built using the following structure:

| CompType_Cd  | Component instance  | Comp_Corr_Val   |
|--------------|---------------------|---|
| SNA_NETWORK  | <i>network_name</i> | ----  |
| NETWORK_APPL | <i>netappl_name</i> | "NETW - <i>network_name</i> "   |
| SNA_CCU      | <i>ccu_name</i>     | "NETW - <i>network_name</i> "   |
| SNA_LINE     | <i>line_name</i>    | "NETW - <i>network_name</i> - NCP - <i>ccu_name</i> "                           |
| SNA_PU       | <i>pu_name</i>      | "NETW - <i>network_name</i> - NCP - <i>ccu_name</i> - LINE - <i>line_name</i> " |

**Note2:** The Component Name (Comp\_Nm column) , for components of type MVS\_SYSTEM, contains the MVS System Identifier (SID) as specified in the SMFPRM00 member in the SYS1.PARMLIB. The SID is 1 to 4 characters long. Note that an alternative MVS identifier is the SYSNAME which is 1-8 characters long and could also be used in the future.

## 6.1.4 Component relationship type (table RelnTyp)

| RelnTyp_Cd<br>CHAR<br>(6) | RelnTyp_Nm *<br>VARCHAR<br>(120) | Msrc_Corr_Cd<br>CHAR<br>(6) |
|---------------------------|----------------------------------|-----------------------------|
| PCHILD                    | Parent Child Relation            | MODEL1                      |
| NETWRK                    | Network Relation                 | MODEL1                      |

\* This column is translated.

## 6.1.5 Component relationship rule (table RelnRul)

| CompTyp_Source_Cd<br>CHAR (17) | CompTyp_Target_Cd<br>CHAR (17) | RelnTyp_Cd<br>CHAR (6) | RelnRul_Strt_DtTm<br>TIMESTAMP | RelnRul_End_DtTm<br>TIMESTAMP |
|--------------------------------|--------------------------------|------------------------|--------------------------------|-------------------------------|
| SNA_NETWORK                    | NETWORK_APPL                   | PCHILD                 | 2002-01-01-00.00.00.000000     | 9999-01-01-00.00.00.000000    |
| SNA_NETWORK                    | SNA_CCU                        | PCHILD                 | 2002-01-01-00.00.00.000000     | 9999-01-01-00.00.00.000000    |
| SNA_NETWORK                    | SNA_LINE                       | PCHILD                 | 2002-01-01-00.00.00.000000     | 9999-01-01-00.00.00.000000    |
| SNA_NETWORK                    | SNA_PU                         | PCHILD                 | 2002-01-01-00.00.00.000000     | 9999-01-01-00.00.00.000000    |
| SNA_CCU                        | SNA_LINE                       | NETWRK                 | 2002-01-01-00.00.00.000000     | 9999-01-01-00.00.00.000000    |
| SNA_LINE                       | SNA_PU                         | NETWRK                 | 2002-01-01-00.00.00.000000     | 9999-01-01-00.00.00.000000    |

| CompTyp_Source_Cd<br>CHAR (17) | CompTyp_Target_Cd<br>CHAR (17) | RelnTyp_Cd<br>CHAR (6) | RelnRul_Strt_DtTm<br>TIMESTAMP | RelnRul_End_DtTm<br>TIMESTAMP  |
|--------------------------------|--------------------------------|------------------------|--------------------------------|--------------------------------|
| SNA_CCU                        | SNA_PU                         | NETWRK                 | 2002-01-01-<br>00.00.00.000000 | 9999-01-01-<br>00.00.00.000000 |

### 6.1.6 Component relationship (table CompReln)

| CompReln_ID<br>INTEGER | Comp_Source_ID<br>INTEGER | Comp_Target_ID<br>INTEGER | RelnTyp_Cd<br>CHAR (6) | CompReln_Strt_DtTm<br>TIMESTAMP | CompReln_End_DtTm<br>TIMESTAMP | MSrc_Corr_Cd<br>CHAR (6) |
|------------------------|---------------------------|---------------------------|------------------------|---------------------------------|--------------------------------|--------------------------|
| 1                      | 1                         | 2                         | PCHILD                 | 2002-01-01-<br>00.00.00.000000  | 9999-01-01-<br>00.00.00.000000 | SHARED                   |
| 2                      | 1                         | 3                         | PCHILD                 | 2002-01-01-<br>00.00.00.000000  | 9999-01-01-<br>00.00.00.000000 | SHARED                   |
| 3                      | 3                         | 4                         | PCHILD                 | 2002-01-01-<br>00.00.00.000000  | 9999-01-01-<br>00.00.00.000000 | SHARED                   |
| 4                      | 4                         | 5                         | PCHILD                 | 2002-01-01-<br>00.00.00.000000  | 9999-01-01-<br>00.00.00.000000 | SHARED                   |

### 6.1.7 Component type keyword (table CompTyp\_Keyword)

This table is not used by this warehouse pack.

### 6.1.8 Attribute type (table AttrTyp)

| AttrTyp_Cd CHAR (17)         | AttrTyp_Nm * VARCHAR<br>(120) | MSrc_Corr_Cd<br>CHAR (6) |
|------------------------------|-------------------------------|--------------------------|
| SNA_LINE_TYPE                | SNA Line Type                 | MODEL1                   |
| SNA_PU_TYPE                  | SNA Physical Unit Type        | MODEL1                   |
| * This column is translated. |                               |                          |

### 6.1.9 Attribute rule (table AttrRul)

| CompTyp_Cd<br>CHAR (17) | AttrTyp_Cd<br>CHAR (17) | AttrRul_Strt_DtTm<br>TIMESTAMP      | AttrRul_End_DtTm<br>TIMESTAMP       | AttrTyp_Multi_Val<br>CHAR (1) | AttrRul_Domain_Ind<br>CHAR (1) |
|-------------------------|-------------------------|-------------------------------------|-------------------------------------|-------------------------------|--------------------------------|
| SNA_LINE                | SNA_LINE_TYPE           | 2002-01-01-<br>00.00.00.000000<br>0 | 9999-01-01-<br>00.00.00.000000<br>0 | N                             | N                              |
| SNA_PU                  | SNA_PU_TYPE             | 2002-01-01-<br>00.00.00.000000<br>0 | 9999-01-01-<br>00.00.00.000000<br>0 | N                             | N                              |

### 6.1.10 Attribute domain (table AttrDom)

This table is not used by this warehouse pack.

### 6.1.11 Component attribute (table CompAttr)

| CompAttr_ID<br>INTEGER | Comp_ID<br>INTEGER | AttrTyp_Cd CHAR<br>(17) | CompAttr_Strt_DtTm<br>TIMESTAMP | CompAttr_End_DtTm<br>TIMESTAMP | CompAttr_Val<br>VARCHAR<br>(254) | MSrc_Corr_Cd<br>CHAR (6) |
|------------------------|--------------------|-------------------------|---------------------------------|--------------------------------|----------------------------------|--------------------------|
| 1                      | 4                  | SNA_LINE_TYPE           | 2002-01-01-<br>00.00.00.000000  | 9999-01-01-<br>00.00.00.000000 | SDLC HALF                        | SHARED                   |
| 2                      | 5                  | SNA_PU_TYPE             | 2002-01-01-<br>00.00.00.000000  | 9999-01-01-<br>00.00.00.000000 | SDLC                             | SHARED                   |

### **6.1.12 Component type relationship (table CTypReIn)**

This table is not used by this warehouse pack.

### **6.1.13 Component attribute type relationship (table ATypReIn)**

This table is not used by this warehouse pack.

## 6.2 Component measurement

The following sections describe the component measurement.

### 6.2.1 Measurement group type (table MGrpTyp)

| MGrpTyp_Cd CHAR (6)          | MGrpTyp_Nm * VARCHAR (120)         |
|------------------------------|------------------------------------|
| CATEG                        | Category                           |
| GROUP                        | Aggregate Types or Group Functions |
| * This column is translated. |                                    |

### 6.2.2 Measurement group (table MGrp)

| MGrp_Cd CHAR (6)             | MGrpTyp_Cd CHAR (6) | MGrp_Parent_Cd CHAR (6) | MGrp_Nm * VARCHAR (120) |
|------------------------------|---------------------|-------------------------|-------------------------|
| PERF                         | CATEG               |                         | Performance             |
| UTIL                         | CATEG               |                         | Utilization             |
| AVG_E                        | GROUP               |                         | Average Value Exists    |
| MIN_E                        | GROUP               |                         | Minimum Value Exists    |
| MAX_E                        | GROUP               |                         | Maximum Value Exists    |
| TOT_E                        | GROUP               |                         | Total Value Exists      |
| * This column is translated. |                     |                         |                         |

### 6.2.3 Measurement group member (table MGrpMbr)

| MGrp_Cd CHAR (6) | MGrpTyp_Cd CHAR (6) | MsmfTyp_ID INTEGER |
|------------------|---------------------|--------------------|
| UTIL             | CATEG               | 10-19              |
| PERF             | CATEG               | 1-9                |
| AVG_E            | GROUP               | 7-10,11,12-14      |
| MIN_E            | GROUP               | 7-10,12-14         |
| MAX_E            | GROUP               | 7-10,12-14         |
| TOT_E            | GROUP               | 1-6,15-19          |

### 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                        |
| * This column is translated. |                             |

### 6.2.5 Measurement unit (table MUnit)

| MUnit_Cd CHAR (6)            | MUnitCat_Cd CHAR (6) | Munit_Nm * VARCHAR (120) |
|------------------------------|----------------------|--------------------------|
| PRC                          | PRC                  | Percentage               |
| Bps                          | RT                   | Bytes per Second         |
| QTY                          | QTY                  | Quantity                 |
| B                            | QTY                  | Bytes                    |
| Sec                          | TM                   | Seconds                  |
| * This column is translated. |                      |                          |

### 6.2.6 Measurement alias names (table MTypReIn)

This table is not used by this warehouse pack.

### 6.2.7 Time summary (table TmSum)

The period over which a measurement may be summarized.

| TmSum_Cd CHAR (1)            | TmSum_Nm * VARCHAR (120) |
|------------------------------|--------------------------|
| H                            | Hourly                   |
| * This column is translated. |                          |

### 6.2.8 Measurement source (table MSrc)

| MSrc_Cd CHAR (6) | MSrc_Parent_Cd CHAR (6) | MSrc_Nm VARCHAR (120)                              |
|------------------|-------------------------|--|
| SHARED           |                         | Shared   |
| MODEL1           |                         | Tivoli Common Data Model V1                        |
| Tivoli           |                         | Tivoli Application                                 |
| DRL              | Tivoli                  | Tivoli Decision Support for OS/390                 |
| D10              | DRL                     | Tivoli Decision Support for OS/390 (NPM component) |

### 6.2.9 Measurement source history (table MSrcHistory)

This table is not used by this warehouse pack.

## 6.2.10 Measurement type (table MsmtTyp)

| MsmtTyp_ID<br>INTEGER        | MUnit_Cd<br>CHAR (6) | MSrc_Cd<br>CHAR (6) | MsmtTyp_Nm *<br>VARCHAR (120)   | MsmtTyp_Ds * VARCHAR<br>(254)   |
|------------------------------|----------------------|---------------------|---------------------------------|---|
| 1                            | Sec                  | D10                 | NPM Operator Transit Time       | Total transit time for operator transactions                                    |
| 2                            | Sec                  | D10                 | NPM Network Transit Time        | Total transit time for network transactions                                     |
| 3                            | Sec                  | D10                 | NPM Host Transit Time           | Total transit time for all host transactions (host-only plus host-with-network) |
| 4                            | QTY                  | D10                 | NPM Operator Transactions       | Number of operator transactions processed                                       |
| 5                            | QTY                  | D10                 | NPM Network Transactions        | Number of transactions sent through the network                                 |
| 6                            | QTY                  | D10                 | NPM Host Transactions           | Number of all transactions (host-only plus host-with-network) processed         |
| 7                            | Sec                  | D10                 | NPM Operator Response Time      | Response time for operator transactions   |
| 8                            | Sec                  | D10                 | NPM Network Response Time       | Response time for network transactions  |
| 9                            | Sec                  | D10                 | NPM Host Response Time          | Response time for host transactions   |
| 10                           | PRC                  | D10                 | NPM CCU Utilization             | CCU utilization, in percent   |
| 11                           | PRC                  | D10                 | NPM NCP Slowdown                | The percentage of the time the NCP was in slowdown state                        |
| 12                           | PRC                  | D10                 | NPM NCP Buffer Utilization      | NCP buffer utilization, in percent  |
| 13                           | PRC                  | D10                 | NPM Line Utilization            | Line utilization, in percent  |
| 14                           | Bps                  | D10                 | NPM Line Speed                  | Line speed in bytes per second  |
| 15                           | QTY                  | D10                 | NPM Line Outbound Queue Length  | Total outbound queue length in Path Information Units                           |
| 16                           | B                    | D10                 | NPM Line-PU Bytes Sent          | Number of bytes sent by the PU on the Line                                      |
| 17                           | B                    | D10                 | NPM Line-PU Bytes Received      | Number of bytes received by the PU from the Line                                |
| 18                           | B                    | D10                 | NPM Line-PU Bytes Retransmitted | Number of bytes retransmitted by the PU on the Line                             |
| 19                           | QTY                  | D10                 | NPM Line-PU Errors              | Total number of errors that occurred  |
| * This column is translated. |                      |                     |                                 |   |

## 6.2.11 Component measurement rule (table MsmtRul)

| CompTyp_Cd CHAR (17) | MsmtTyp_ID INTEGER |
|----------------------|--------------------|
| NETWORK_APPL         | 1-9                |
| SNA_CCU              | 10-12              |
| SNA_LINE             | 13-15              |
| SNA_PU               | 16-19              |

## 6.2.12 Measurement (table Msmt)

| Msmt_ID<br>BIGINT | Comp_ID<br>INTEGER | Msmt_Typ_ID<br>INTEGER | TmSum_Cd<br>CHAR (1) | Msmt_Strt_Date<br>DATE | Msmt_Start_Tm<br>TIME | Msmt_Min_Val<br>FLOAT | Msmt_Max_Val<br>FLOAT | Msmt_Avg_Val<br>FLOAT | Msmt_Tot_Val<br>FLOAT | Msmt_Smpl_Cnt<br>INTEGER | Msmt_Err_Cnt<br>INTEGER | Msmt_stddev_Val<br>DOUBLE | MSrc_Corr_Cd<br>CHAR (6) |
|-------------------|--------------------|------------------------|----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------------|-------------------------|---------------------------|--------------------------|
| 1                 | 2                  | 1                      | H                    | 2002-05-13             | 15.00.00              |                       |                       |                       | 0.6                   |                          |                         |                           | D10                      |
| 2                 | 2                  | 2                      | H                    | 2002-05-13             | 15.00.00              |                       |                       |                       | 0.58                  |                          |                         |                           | D10                      |
| 3                 | 2                  | 3                      | H                    | 2002-05-13             | 15.00.00              |                       |                       |                       | 0.02                  |                          |                         |                           | D10                      |
| ...               |                    |                        |                      |                        |                       |                       |                       |                       |                       |                          |                         |                           |                          |

## 6.2.13 Threshold measurement objective (table Mobj)

This table is not used by this warehouse pack.

## 6.2.14 Threshold measurement objective range (table MobjRng)

This table is not used by this warehouse pack.

## 6.2.15 Threshold severity level (table SevLvl)

This table is not used by this warehouse pack.

### **6.3 Component events**

There are no component events for this warehouse pack.

### **6.4 Helper tables**

These tables are not used by this warehouse pack.

### **6.5 Exception tables**

These tables are not used by this warehouse pack.

### **6.6 Incremental extraction**

Data extraction into Tivoli Data Warehouse is done in an incremental way.

New data from the source database is loaded into the data warehouse by checking that the existing measurements for a component are older than the new available ones.

The following columns d10.stage\_cntl table store this information:

- cntl\_comp\_id (INTEGER)
- cntl\_dttm (TIMESTAMP)

When loading measurements, this control table checks each comp\_id, and accepts only those with a newer timestamp.

After successful loading of the measurement data, this control table is updated with the last timestamp present in the twg.msmt table for each comp\_id.

## Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10504-1785  
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation  
Licensing  
2-31 Roppongi 3-chome, Minato-ku  
Tokyo 106, Japan

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licenses of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation  
2Z4A/101  
11400 Burnet Road  
Austin, TX 78758 U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

#### COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrates programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. You may copy, modify, and distribute these sample programs in any form without payment to IBM for the purposes of developing, using, marketing, or distributing application programs conforming to IBM's application programming interfaces.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

## Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM, the IBM logo, Tivoli, the Tivoli logo, AIX, DB2, DRDA, Informix, OS/2, OS/400, Tivoli Enterprise Console, NPM and TME are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both.

Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.



Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.



Printed in U.S.A.

SH19-8509-00