IBM Tivoli Decision Support for OS/390 Version 1.6 (CICS)

Warehouse Enablement Pack, Version 1.2.0

Implementation Guide

for Tivoli Data Warehouse, Version 1.2

SH19-8514-00

Note:

Before using this information and the product it supports, read the information in Notices on page 34.

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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.

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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 (CICS) . This warehouse enablement pack (hereafter referred to as warehouse pack) is created for Tivoli Data Warehouse, Version 1.2.

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 IBM Tivoli Decision Support for OS/390 library:

Tivoli Decision Support for OS/390, CICS Performance Feature Guide and Reference, Version 1.6, SH19-6820

Provides information for administrators and users about collecting and reporting performance data generated by Customer Information and Control System (CICS®).

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.ibmlink.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 CICS 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.

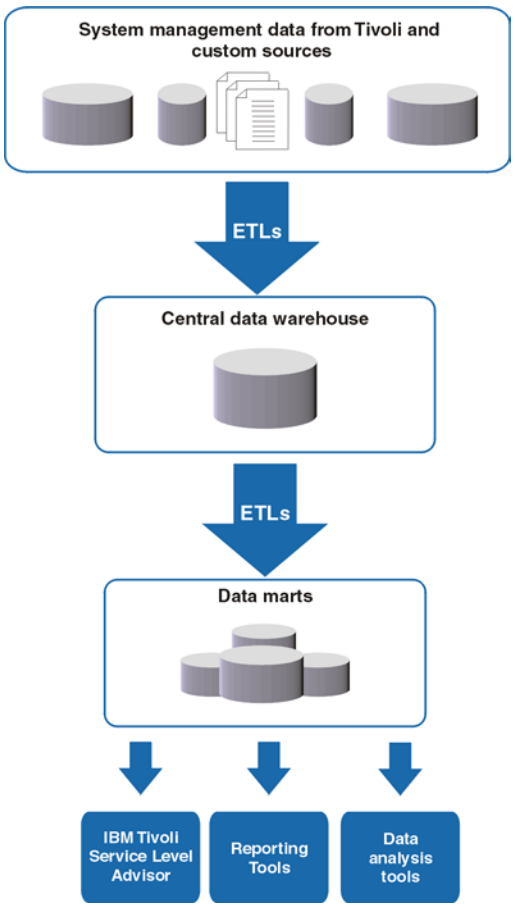

Figure 1. Tivoli Data Warehouse basic architecture

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 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 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:

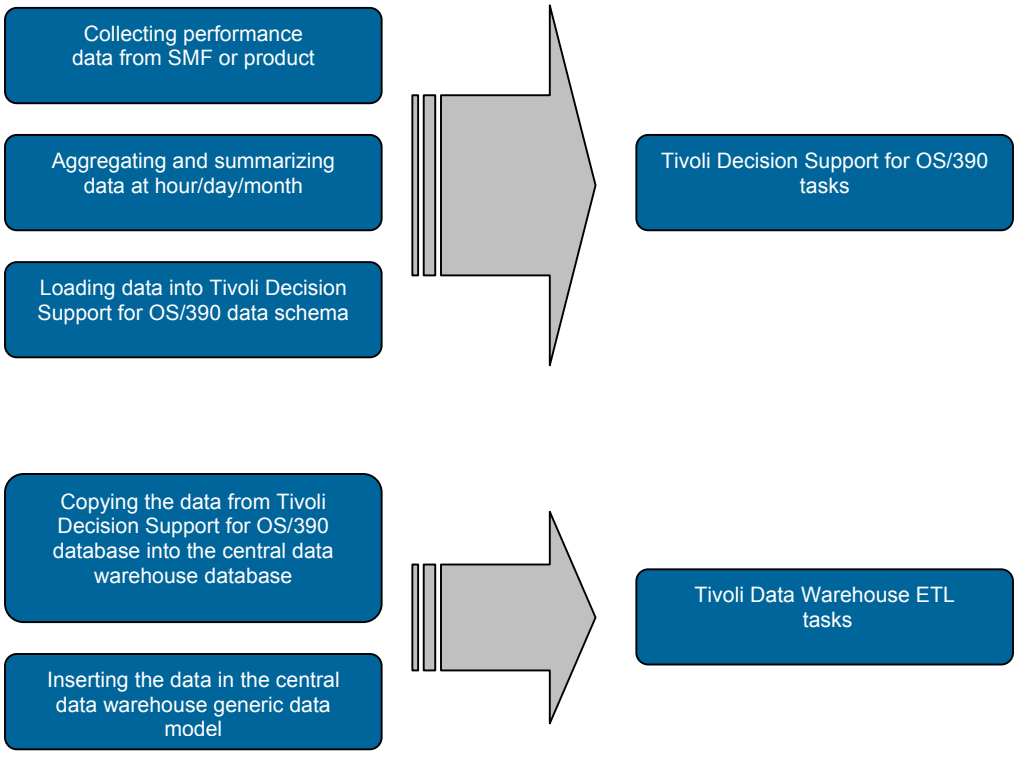

Figure 2. Overview of the warehouse pack for Tivoli Decision Support for OS/390

This figures refers only to the central data warehouse 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 (CICS)

The following tables show 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.

2.3.1 CICS Performance feature table

Tivoli Decision Support for OS/390 source Table name	**Tivoli Decision Support for OS/390 Source Field or Source formula**	**Tivoli Data Warehouse CompTyp_Cd (C) MsmtTyp_Nm (M) AttrTyp_cd (A)**
CICS_A_BASIC_H	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	APPLICATION_NAME	(C) D04_APPL
	'CICS'	(A) MVS_SUBSYS_TYPE
	RESPONSE_MIN_SEC, RESPONSE_MAX_SEC, RESPONSE_SUM_SEC / RECORDS	(M) 'CICS Response Time for All Tasks'
	DISPATCH_SEC / RECORDS	(M) 'CICS Dispatch Time'
	DISPATCH_WAIT_SEC / RECORDS	(M) 'CICS Re-Dispatch Wait Time'
	(TC_IO_WAIT_SEC + TS_IO_WAIT_SEC + TSSHWAIT_CLOCK + TD_IO_WAIT_SEC + JC_IO_WAIT_SEC + FC_IO_WAIT_SEC + RLSWAIT_CLOCK + CFDTWAIT_CLOCK + SOIOWTT_CLOCK + MRO_WAIT_SEC + LU61_IO_WAIT_SEC + LU62_IO_WAIT_SEC + FE_WAIT_SEC + DISPATCH_DELAY_SEC + ENQ_WAIT_SEC + GNQDELAY_CLOCK + ICDELAY_CLOCK + LMDELAY_CLOCK + WTEXWAIT_CLOCK + WTCEWAIT_CLOCK + GVUPWAIT_CLOCK + RMI_SUSPEND_SEC + RUNTRWTT_CLOCK + SRVSYWTT_CLOCK + SYNCDLY_CLOCK + MAXOTDLY_CLOCK + RRMSWAIT_CLOCK) / RECORDS	(M) 'CICS Dispatcher Suspended Time '
CICS_A_DBCTL_H	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	APPLICATION_NAME	(C) D04_APPL
	'CICS'	(A) MVS_SUBSYS_TYPE
	DLI_CALL_CNT	(M) CICS DBCTL Calls
CICS_A_DLI_H	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	APPLICATION_NAME	(C) D04_APPL
	'CICS'	(A) MVS_SUBSYS_TYPE

	CALL_CNT	(M) CICS DL/I Database Calls
CICS_S_DB2CONN_D	DB2_CONN_NAME	(C) D04_DB2CONN
	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	'CICS'	(A) MVS_SUBSYS_TYPE
	DB2_GMT_DISC_TIME-DB2_GMT_CONN_TIME	(M) 'CICS DB2 Connection Time'
	DB2_TCB_LIMIT	(M) 'CICS Task Control Block Limit'
	DB2_TCB_HWM	(M) 'CICS Subtask Task Control Blocks'
	DB2_COMD_CALLS	(M) 'CICS DB2 Commands '
CICS_S_DB2ENTRY_T	DB2_ENTRY_NAME	(C) D04_DB2ENTRY
	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	'CICS'	(A) MVS_SUBSYS_TYPE
	DB2_CALLS	(M) 'CICS SQL Calls'
	DB2_SIGNONS	(M) 'CICS DB2 Signons'
	DB2_THREAD_LIMIT	(M) 'CICS Threads Limit'
	DB2_THREAD_HWM	(M) 'CICS Active Threads '
	DB2_TASK_HWM	(M) 'CICS Tasks '
	DB2_TASK_TOT	(M) 'CICS Completed Tasks'
CICS_S_FILE_T	FILE_NAME	(C) D04_FILE
	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	'CICS'	(A) MVS_SUBSYS_TYPE
	GET_REQUESTS + BROWSE_REQUESTS	(M) 'CICS GET Requests'
	ADD_REQUESTS + UPDATE_REQUESTS	(M) 'CICS PUT Requests'
	DELETE_REQ_LOCAL+ DELETE_REQ_REMOTE	(M) 'CICS DELETE Requests'
	VSAM_EXCP_REQ_DATA	(M) 'CICS VSAM I/Os'
CICS_S_GLOBAL_T	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	'CICS'	(A) MVS_SUBSYS_TYPE
	LIBRARY_LOAD_REQ (Statistics_Area = 'LOADER')	(M) 'CICS MVS LOAD Requests'
	LOAD_SEC (Statistics_Area = 'LOADER')	(M) 'CICS Overall Library Load Time'
	TS_MAIN_PUTS (Statistics_Area ='TEMP_STORAGE')	(M) 'CICS Temporary Storage PUTs'
	TS_MAIN_GETS (Statistics_Area ='TEMP_STORAGE')	(M) 'CICS Temporary Storage GETs'
	TS_MAIN_PEAK_BYTES (Statistics_Area ='TEMP_STORAGE')	(M) 'CICS Temporary Storage'
	RPL_PEAK_USED (Statistics_Area ='VTAM')	(M) 'CICS VTAM Request Parameter Lists Posted'
	VTAM_SOS_COUNT (Statistics_Area ='VTAM')	(M) 'CICS VTAM Short On Storage Events'
CICS_TRAN_USR_H	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) VS_SUBSYSTEM
	TRANSACTION_ID	(C) D04_TRANS
	'CICS'	(A) MVS_SUBSYS_TYPE
	RECORDS	(M) 'CICS Transactions'
	CPU_SUM_SEC	(M) 'CICS CPU Time'
	PGM_LOAD_REQUESTS	(M) 'CICS Program_LOAD Requests'
	PGM_LOADS	(M) 'CICS Program Library Fetches'
	FC_REQUESTS_TOTAL	(M) 'CICS File Control Requests'
	EXCEPTIONS	(M) 'CICS Exceptions'
	STORAGE_PGM_TOTAL	(M) 'CICS Program Storage'
	(GETMAINS_EUDSA + GETMAINS_ECDSA) / RECORDS	(M) 'CICS GETMAINs Above 16MB'
	(GETMAINS_UDSA + GETMAINS_CDSA) / RECORDS	(M) 'CICS GETMAINs Below 16MB'
CICS_AVAIL_T	MVS_SYSTEM_ID	(C) 'MVS_SYSTEM'
	RESOURCE_NAME (where RESOURCE_TYPE='CICSSYS')	(C) 'MVS_SUBSYSTEM'
	RESOURCE_NAME (where RESOURCE_TYPE='DB2CONN')	(C) 'D04_DB2CONN'
	'CICS'	(A) MVS_SUBSYS_TYPE
	Count(Substr(INTERVAL_TYPE,1,1) = '|')	(M) 'CICS Resource Starts'
	Count(Substr(INTERVAL_TYPE,3,1) = '|')	(M) 'CICS Resource Stops'

	((DAYS(END_TIME)*60*24)+(MIDNIGHT_SECONDS(END_TIME)/60))- ((DAYS(START_TIME)*60*24)+(MIDNIGHT_SECONDS(.START_TIME)/60)) (where INTERVAL_TYPE IN ('===','==|','=|','|=='))	(M) 'Available'
	((DAYS(END_TIME)*60*24)+(MIDNIGHT_SECONDS(END_TIME)/60))- ((DAYS(START_TIME)*60*24)+(MIDNIGHT_SECONDS(.START_TIME)/60)) (where INTERVAL_TYPE = (' ') and previous recorded INTERVAL_TYPE = ('==!'))	(M) 'Unavailable'
	((DAYS(END_TIME)*60*24)+(MIDNIGHT_SECONDS(END_TIME)/60))- ((DAYS(START_TIME)*60*24)+(MIDNIGHT_SECONDS(.START_TIME)/60)) (where INTERVAL_TYPE = (' '))	(M) 'Unknown'

2.3.2 CICS Partitioning feature table

Tivoli Decision Support for OS/390 source Table name	Tivoli Decision Support for OS/390 Source Field or Source formula	Tivoli Data Warehouse CompTyp_Cd (C) MsmtTyp_Nm (M) AttrTyp_cd (A)
CICS_A_BASIC_HP	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	APPLICATION_NAME	(C) D04_APPL
	'CICS'	(A) MVS_SUBSYS_TYPE
	RESPONSE_SUM_SEC / RECORDS, RESPONSE_MIN_SEC, RESPONSE_MAX_SEC	(M) 'CICS Response Time for All Tasks'
	DISPATCH_SEC/ RECORDS	(M) 'CICS Dispatch Time'
	DISPATCH_WAIT_SEC/ RECORDS	(M) 'CICS Re-Dispatch Wait Time'
	(TC_IO_WAIT_SEC + TS_IO_WAIT_SEC + TSSHWAIT_CLOCK + TD_IO_WAIT_SEC + JC_IO_WAIT_SEC + FC_IO_WAIT_SEC + RLSWAIT_CLOCK + CFDTWAIT_CLOCK + SOIOWTT_CLOCK + MRO_WAIT_SEC + LU61_IO_WAIT_SEC + LU62_IO_WAIT_SEC + FE_WAIT_SEC + DISPATCH_DELAY_SEC + ENQ_WAIT_SEC + GNQDELAY_CLOCK + ICDELAY_CLOCK + LMDELAY_CLOCK + WTEXWAIT_CLOCK + WTCEWAIT_CLOCK + GVUPWAIT_CLOCK + RMI_SUSPEND_SEC + RUNTRWTT_CLOCK + SRVSYWTT_CLOCK + SYNCDLY_CLOCK + MAXOTDLY_CLOCK + RRMSWAIT_CLOCK) / RECORDS	(M) 'CICS Wait Time '
CICS_A_DBCTL_HP	SUSPEND_SEC/ RECORDS	(M) 'CICS Dispatcher Suspended Time '
	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	APPLICATION_NAME	(C) D04_APPL
	'CICS'	(A) MVS_SUBSYS_TYPE
	DLI_CALL_CNT	(M) 'CICS DBCTL Calls'
CICS_A_DLI_HP	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	APPLICATION_NAME	(C) D04_APPL
	'CICS'	(A) MVS_SUBSYS_TYPE
	CALL_CNT	(M) 'CICS DL/I Database Calls'
CICS_S_DB2CONN_DP	DB2_CONN_NAME	(C) D04_DB2CONN
	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	'CICS'	(A) MVS_SUBSYS_TYPE
	DB2_GMT_DISC_TIME-DB2_GMT_CONN_TIME	(M) 'CICS DB2 Connection Time'
	DB2_TCB_LIMIT	(M) 'CICS Task Control Block Limit'
	DB2_TCB_HWM	(M) 'CICS Subtask Task Control Blocks'
	DB2_COMD_CALLS	(M) 'CICS DB2 Commands '
CICS_S_DB2ENTRY_TP	DB2_ENTRY_NAME	(C) D04_DB2ENTRY

	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	'CICS'	(A) MVS_SUBSYS_TYPE
	DB2_CALLS	(M) 'CICS SQL Calls'
	DB2_SIGNONS	(M) 'CICS DB2 Signons'
	DB2_THREAD_LIMIT	(M) 'CICS Threads Limit'
	DB2_THREAD_HWM	(M) 'CICS Active Threads '
	DB2_TASK_HWM	(M) 'CICS Tasks '
	DB2_TASK_TOT	(M) 'CICS Completed Tasks'
CICS_S_FILE_TP	FILE_NAME	(C) D04_FILE
	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	'CICS'	(A) MVS_SUBSYS_TYPE
	GET_REQUESTS + BROWSE_REQUESTS	(M) 'CICS GET Requests'
	ADD_REQUESTS + UPDATE_REQUESTS	(M) 'CICS PUT Requests'
	DELETE_REQ_LOCAL+ DELETE_REQ_REMOTE	(M) 'CICS DELETE Requests'
	VSAM_EXCP_REQ_DATA	(M) 'CICS VSAM I/Os'
CICS_S_GLOBAL_TP	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	'CICS'	(A) MVS_SUBSYS_TYPE
	LIBRARY_LOAD_REQ (Statistics_Area = 'LOADER')	(M) 'CICS MVS LOAD Requests'
	LOAD_SEC (Statistics_Area = 'LOADER')	(M) 'CICS Overall Library Load Time'
	TS_MAIN_PUTS (Statistics_Area ='TEMP_STORAGE')	(M) 'CICS Temporary Storage PUTs'
	TS_MAIN_GETS (Statistics_Area ='TEMP_STORAGE')	(M) 'CICS Temporary Storage GETs'
	TS_MAIN_PEAK_BYTES (Statistics_Area ='TEMP_STORAGE')	(M) 'CICS Temporary Storage'
	RPL_PEAK_USED (Statistics_Area ='VTAM')	(M) 'CICS VTAM Request Parameter Lists Posted'
	VTAM_SOS_COUNT (Statistics_Area ='VTAM')	(M) 'CICS VTAM Short On Storage Events'
CICS_TRAN_USR_HP	MVS_SYSTEM_ID	(C) MVS_SYSTEM
	CICS_SYSTEM_ID	(C) MVS_SUBSYSTEM
	TRANSACTION_ID	(C) D04_TRANS
	'CICS'	(A) MVS_SUBSYS_TYPE
	RECORDS	(M) 'CICS Transactions'
	CPU_SUM_SEC	(M) 'CICS CPU Time'
	PGM_LOAD_REQUESTS	(M) 'CICS Program_LOAD Requests'
	PGM_LOADS	(M) 'CICS Program Library Fetches'
	FC_REQUESTS_TOTAL	(M) 'CICS File Control Requests'
	EXCEPTIONS	(M) 'CICS Exceptions'
	STORAGE_PGM_TOTAL	(M) 'CICS Program Storage'
	(GETMAINS_EUDSA + GETMAINS_ECDSA) / RECORDS	(M) 'CICS GETMAINs Above 16MB'
	(GETMAINS_UDSA + GETMAINS_CDSA) / RECORDS	(M) 'CICS GETMAINs Below 16MB'
CICS_AVAIL_TP	MVS_SYSTEM_ID	(C) 'MVS_SYSTEM'
	RESOURCE_NAME (where RESOURCE_TYPE='CICSSYS')	(C) 'MVS_SUBSYSTEM'
	RESOURCE_NAME (where RESOURCE_TYPE='DB2CONN')	(C) 'D04_DB2CONN'
	'CICS'	(A) MVS_SUBSYS_TYPE
	Count(Substr(INTERVAL_TYPE,1,1) = '|')	(M) 'CICS Resource Starts'
	Count(Substr(INTERVAL_TYPE,3,1) = '|')	(M) 'CICS Resource Stops'
	((DAYS(END_TIME)*60*24)+(MIDNIGHT_SECONDS(END_TIME)/60))- ((DAYS(START_TIME)*60*24)+(MIDNIGHT_SECONDS(.START_TIME)/60)) (where INTERVAL_TYPE IN ('===','==|','=|',' |=='))	(M) 'Available'
	((DAYS(END_TIME)*60*24)+(MIDNIGHT_SECONDS(END_TIME)/60))- ((DAYS(START_TIME)*60*24)+(MIDNIGHT_SECONDS(.START_TIME)/60)) (where INTERVAL_TYPE = (' ') and previous recorded INTERVAL_TYPE = ('==!'))	(M) 'Unavailable'

	((DAYS(END_TIME)*60*24)+(MIDNIGHT_SECONDS(END_TIME)/60))- ((DAYS(START_TIME)*60*24)+(MIDNIGHT_SECONDS(.START_TIME)/60)) (where INTERVAL_TYPE = (‘ ‘))	(M) 'Unknown'

Note: The “CICS Resource Stops “ measure is not available or loaded for MVS_SUBSYSTEM both for partitioning feature and the not partitioning one.

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 CICS component, you must install the following software:

IBM Tivoli Decision Support for OS/390 Version 1.6 CICS performance feature with one of the following feature and component:

- CICS performance feature with the following components:
  - ✓ CICS Monitoring component:

    Basic subcomponent

    DBCTL subcomponent

    DL/I subcomponent

    Basic Application Analysis subcomponent

    DBCTL Application Analysis subcomponent

    DL/I Application Analysis subcomponent

    CICS/MVS subcomponent (Global + Accounting)
  - ✓ CICS Statistics component
- CICS partitioning feature with the following components:
  - ✓ CICS Monitoring Partitioned component:

    Basic subcomponent

    DBCTL subcomponent

    DL/I subcomponent

    Basic Application Analysis subcomponent

    DBCTL Application Analysis subcomponent

    DL/I Application Analysis subcomponent

    CICS/MVS subcomponent (Global + Accounting)
  - ✓ CICS Statistics Partitioned component

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.

3.4 Pre-installation procedures

3.4.1 Configure Tivoli Decision Support for OS/390 to get availability data

To collect CICS availability data into Tivoli Decision Support for OS/390 you must configure the CICS_AVAIL_RES lookup table. The following can be used as a sample:

MVS_SYSTEM_ID	CICS_SYSTEM_ID	RESOURCE_SOURCE_NAME	RESOURCE_TYPE	RESOURCE_TARGET_NAME	RESOURCE_CHKPOINT	SCHEDULE_NAME	AVAIL_OBJ_PCT
%	%	CICS3T8X	CICSSYS		3600	STANDARD	95.0
%	%	CICS3TTS	CICSSYS		3600	STANDARD	95.0
%	%	DB23%	DB2CONN	DB23	3600	STANDARD	95.0

Where:

MVS_SYSTEM_ID: Name of your MVS system (% can be used as a wildcard).

CICS_SYSTEM_ID: The CICS Subsystem ID that the resource is associated with. (% can be used as a wildcard).

RESOURCE_SOURCE_NAME: Name of the resource you want to monitor. (% can be used as a wildcard).

RESOURCE_TYPE: In this field you must specify "CICSSYS" to collect availability data for the CICS Subsystems, or 'DB2CONN' to collect availability data for the CICS DB2 connection.

RESOURCE_TARGET_NAME: The name used as a component name in Tivoli Data Warehouse.

RESOURCE_CHKPOINT: Resource checkpoint interval in seconds.

SCHEDULE_NAME: Schedule name to use for the resource. If nothing is specified, STANDARD is used as default.

Note:

The RESOURCE_TARGET_NAME is the identifier that is used in the Data Warehouse when loading the data. In particular, for the CICSSYS resource type:

The RESOURCE_TARGET_NAME must be left blank. This means that the value of the RESOURCE_SOURCE_NAME will be used.

Inconsistencies must also be avoided between the CICS_SYSTEM_ID and the RESOURCE_SOURCE_NAME. It is recommended to leave % in the first column, and specify the CICS name in the second one.

3.5 Installation of the warehouse pack

To install this warehouse 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 central data warehouse (for example,TCDW 1)

5. Install the warehouse pack as described in *Installing and Configuring Tivoli Data Warehouse*, using the installation properties file (twh_install_props.cfg) located in the tdw_weps\d04\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 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 DRL*xxx*, you must change the following:

__TDS390_SCHEMA DRL

into:

__TDS390_SCHEMA DRL*xxx*

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.

3.6.3 How to change the default scheduled process

Tivoli Data Warehouse, during installation of the warehouse pack, schedules for execution only the Tivoli Decision Support for OS/390 CICS non-partitioning ETL process.

If you are using the Tivoli Decision Support for OS/390 CICS partitioning you need to change the scheduled process after the installation of the warehouse pack.

1. From the Data Warehouse Center, expand the object tree until you find the Subject Area D04_TDS/390-CICS_v1.6.0_Subject_Area. Expand the Processes folder and you will see the following processes:

   D04_c05_CICS_Process (process for CICS using Tivoli Decision Support for OS/390 CICS non-partitioning)

   D04_c10_CICS_Partitioning_Process (process for CICS using Tivoli Decision Support for OS/390 CICS partitioning)

2. Select the first process (D04_c05_CICS_Process). Move the first step (D04_c05_s010_processCICS) into "test mode", then go in the schedule notebook and remove its schedule.

3. Select the second process (D04_c10_CICS_Partitioning_Process). Move the first step (D04_c10_s010_processCICS) into "test mode", then go in the schedule notebook and add your preferred schedule.

4. Promote the two steps of the second process (D04_c10_CICS_Partitioning_Process) to “production mode”.

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 pack"* chapter. Before uninstalling the warehouse pack, you can delete the related data from the central data warehouse by running a specific SQL script. A sample of it can be found in the twh\apps\d04\v1200\misc directory, the name is d04_data_delete.sql. The sample deletes both 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 pack using this script you must open a DB2 Command Window and enter the following command from the twh\apps\d04\v1200\misc directory:

db2 –z <your logfile name> -tvf d04_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	D04.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**
Field in source data	MVS System id
Name of lookup table	D04.Cust_lookup table

Information for scripts	Value or location
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. It is your responsibility to 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 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 CHAR (6)	**Tmsum_Cd CHAR(1)**	**PMsmtC_Age_In_Days DECIMAL(8,0)**
D04	P	100
D04	H	100
D04	D	300
D04	W	10000
D04	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 processes

The warehouse pack has the following processes:

D04_c05_CICS _Process

D04_c10_CICS _Partitioning_Process

5.1 D04_c05_CICS _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:

D04_c05_s010_processCICS

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

D04_c05_s020_processCICS

This step populates the measurement table (Msmt table).

5.2 D04_c10_CICS_Partitioning_Process

This process is used to load Component and Measurement tables from CICS Partitioning feature source data.

The process has the following steps:

D04_c10_s010_processCICS

This step populates the Component table (Comp table), the Component Attribute table (CompAttr table) and the Component Relationship table (CompReln table).

D04_c10_s020_processCICS

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)
MVS_SYSTEM		MVS System	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	MODEL1
MVS_SUBSYSTEM		MVS Subsystem	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	MODEL1
D04_APPL		Application	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
D04_DB2CONN		DB2 Connection	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
D04_DB2ENTRY		DB2 Entry	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
D04_FILE		File	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
D04_TRANS		Transaction	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04

* 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_C d CHAR (6)	Cust_ID INTEG ER	Comp_ Corr_ID INTEG ER	Comp_Nm VARCHA R (254)	Comp_C orr_Val VARCH AR (254)	Comp_St rt_DtTm TIMEST AMP	Comp_E nd_DtTm TIMEST AMP	Comp_Ds VARCH AR (254)	MSrc_Co rr_Cd CHAR (6)

Comp_ID INTEGER	CompTyp_ Cd CHAR (17)	Centr_C d CHAR (6)	Cust_ID INTEG ER	Comp_ Corr_ID INTEG ER	Comp_Nm VARCHA R (254)	Comp_C orr_Val VARCH AR (254)	Comp_St rt_DtTm TIMEST AMP	Comp_E nd_DtTm TIMEST AMP	Comp_Ds VARCH AR (254)	MSrc_Co rr_Cd CHAR (6)
20	MVS_SYST EM	CDW	1		ESJ4		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		SHARED
21	MVS_SUBS YSTEM	CDW	1		CICS1		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		SHARED
22	MVS_SUBS YSTEM	CDW	1		CICSP		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		SHARED
23	MVS_SUBS YSTEM	CDW	1		CICSTEC		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		SHARED
24	MVS_SUBS YSTEM	CDW	1		CICSTEST		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		SHARED
25	D04_APPL	CDW	1		ACCOUNT ING		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		D04
26	D04_APPL	CDW	1		CUSTOME RS		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		D04
27	D04_APPL	CDW	1		OTHER		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		D04
28	D04_APPL	CDW	1		OTHER		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		D04
29	D04_APPL	CDW	1		PAYROLL		2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000		D04

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
MVS_SYSTEM	*mvs_system_id*	----
MVS_SUBSYSTEM	*subsystem_id*	"MVS - *mvs_system_id*"
D04_APPL	*appl_name*	"MVS - *mvs_system_id* ! CICS - *cics_subsystem_id*"
D04_DB2CONN	*db2conn_id*	"MVS - *mvs_system_id* ! CICS - *cics_subsystem_id*"
D04_DB2ENTRY	*db2entry_id*	"MVS - *mvs_system_id* ! CICS - *cics_subsystem_id*"
D04_FILE	*file_name*	"MVS - *mvs_system_id* ! CICS - *cics_subsystem_id*"
D04_TRANS	*trans_id*	"MVS - *mvs_system_id* ! CICS - *cics_subsystem_id*"

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 1to 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 CHAR (6)	RelnTyp_Nm * VARCHAR (120)	MSrc_Corr_Cd CHAR (6)
PCHILD	Parent Child Relation	MODEL1
* This column is translated.		

6.1.5 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
MVS_SYSTEM	MVS_SUBSYSTEM	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000
MVS_SUBSYSTEM	D04_APPL	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000
MVS_SUBSYSTEM	D04_DB2CONN	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000
MVS_SUBSYSTEM	D04_DB2ENTRY	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000
MVS_SUBSYSTEM	D04_FILE	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000
MVS_SUBSYSTEM	D04_TRANS	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000

6.1.6 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	MSrc_Corr_Cd CHAR (6)
1	20	21	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	SHARED
2	20	22	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	SHARED
3	20	23	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	SHARED
4	20	24	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	SHARED
5	22	25	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
6	22	26	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
7	22	27	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
8	24	28	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
9	22	29	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
10	22	30	PCHILD	2002-01-01-	9999-01-01-	D04

CompReln_ID INTEGER	Comp_Source_ID INTEGER	Comp_Target_ID INTEGER	RelnTyp_Cd CHAR (6)	CompReln_Strt_DtTm TIMESTAMP	CompReln_End_DtTm TIMESTAMP	MSrc_Corr_Cd CHAR (6)
1	20	21	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	SHARED
2	20	22	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	SHARED
3	20	23	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	SHARED
4	20	24	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	SHARED
				00.00.00.000000	00.00.00.000000	
11	24	31	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04
12	24	32	PCHILD	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	D04

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 (120)	MSrc_Corr_Cd CHAR (6)
MVS_SUBSYS_TYPE	MVS Subsystem Type	MODEL1
* This column is translated.		

6.1.9 Attribute rule (table AttrRul)

CompTyp_Cd CHAR (17)	AttrTyp_Cd CHAR (17)	AttrRul_Strt_DtTm TIMESTAMP	AttrRul_End_DtTm TIMESTAMP	AttrTyp_Multi_Val CHAR (1)	AttrRul_Dom_Ind CHAR (1)
MVS_SUBSYSTEM	MVS_SUBSYS_TYPE	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	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 INTEGER	Comp_ID INTEGER	AttrTyp_Cd CHAR (17)	CompAttr_Strt_DtTm TIMESTAMP	CompAttr_End_DtTm TIMESTAMP	CompAttr_Val VARCHAR (254)	MSrc_Corr_Cd CHAR (6)
1	21	MVS_SUBSYS_TYPE	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	CICS	SHARED

CompAttr_ID INTEGER	Comp_ID INTEGER	AttrTyp_Cd CHAR (17)	CompAttr_Strt_DtTm TIMESTAMP	CompAttr_End_DtTm TIMESTAMP	CompAttr_Val VARCHAR (254)	MSrc_Corr_Cd CHAR (6)
				00.00.00.000000		
2	22	MVS_SUBSYS_TYPE	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	CICS	SHARED
3	23	MVS_SUBSYS_TYPE	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	CICS	SHARED
4	24	MVS_SUBSYS_TYPE	2002-01-01-00.00.00.000000	9999-01-01-00.00.00.000000	CICS	SHARED

6.1.12 Component type relationship (table CTypReln)

This table is not used by this warehouse pack.

6.1.13 Component attribute type relationship (table ATypReln)

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
TRANS	State Transition Groups
* 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	NULL	Performance
UTIL	CATEG	NULL	Utilization
AVG_E	GROUP	NULL	Average Value Exists
MIN_E	GROUP	NULL	Minimum Value Exists
MAX_E	GROUP	NULL	Maximum Value Exists
TOT_E	GROUP	NULL	Total Value Exists
DRLIC1	TRANS	NULL	CICS Subsystem State Transition Measurements
DRLIC2	TRANS	NULL	CICS DB2 Connection State Transition Measurements
* This column is translated.			

6.2.3 Measurement group member (table MGrpMbr)

MGrp_Cd CHAR (6)	MGrpTyp_Cd CHAR (6)	MsmtTyp_ID INTEGER
UTIL	CATEG	1, 3, 8,9, 10-24, 26-33, 35-39
PERF	CATEG	2, 4-7, 25
DRLIC1	TRANS	40-42
DRLIC2	TRANS	40-42
AVG_E	GROUP	2-7, 36,37
MIN_E	GROUP	2, 3
MAX_E	GROUP	2, 3, 11, 12, 16
TOT_E	GROUP	1, 8,9,10, 13-15, 17-35,38-42

6.2.4 Measurement unit category (table MUnitCat)

MunitCat_Cd CHAR (6)	MunitCat_Nm * VARCHAR (120)
TM	Time Duration
QTY	Quantity
* This column is translated.	

6.2.5 Measurement unit (table MUnit)

MUnit_Cd CHAR (6)	MUnitCat_Cd CHAR (6)	Munit_Nm * VARCHAR (120)
QTY	QTY	Quantity
B	QTY	Bytes
Sec	TM	Seconds
Min	TM	Minutes
Hr	TM	Hours
* This column is translated.		

6.2.6 Measurement alias names (table MTypReln)

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
D	Daily
P	Point
* 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

MSrc_Cd CHAR (6)	MSrc_Parent_Cd CHAR (6)	MSrc_Nm VARCHAR (120)
DRL	Tivoli	Tivoli Decision Support for OS/390
D04	DRL	Tivoli Decision Support for OS/390 (CICS 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 INTEGER	MUnit_Cd CHAR (6)	MSrc_Cd CHAR (6)	MsmtTyp_Nm * VARCHAR (120)	MsmtTyp_Ds * VARCHAR (254)
1	QTY	D04	CICS DBCTL Calls	Number of DL/I calls and requests through the DBCTL interface
2	Sec	D04	CICS Response Time for All Tasks	Transaction response time for all tasks, in seconds
3	Sec	D04	CICS CPU Time	CPU time consumed by Transactions, in seconds
4	Sec	D04	CICS Dispatch Time	Transaction elapsed time for which tasks were dispatched, in seconds
5	Sec	D04	CICS Re-Dispatch Wait Time	Transaction time that tasks were waiting to be redispatched, in seconds
6	Sec	D04	CICS Wait Time	Sum of I/O and non I/O Transaction wait time
7	Sec	D04	CICS Dispatcher Suspended Time	Transaction elapsed time, in seconds, for which tasks were suspended by the dispatcher
8	QTY	D04	CICS DL/I Database Calls	Number of direct DL/I calls and requests
9	QTY	D04	CICS Transactions	Number of transaction occurrences
10	Hr	D04	CICS DB2 Connection Time	Total number of hours that CICS was connected to DB2
11	QTY	D04	CICS Task Control Block Limit	The maximum number of subtask Task Control Blocks that can be attached to service DB2 requests
12	QTY	D04	CICS Subtask Task Control Blocks	The peak number of subtasks Task Control Blocks attached to service DB2 requests
13	QTY	D04	CICS DB2 Commands	The number of DB2 commands issued using the DSNC transaction
14	QTY	D04	CICS SQL Calls	The total number of SQL calls made using this DB2ENTRY
15	QTY	D04	CICS DB2 Signons	The total number of DB2 sign-ons performed for this DB2ENTRY
16	QTY	D04	CICS Threads Limit	The current maximum number of threads allowed for the DB2ENTRY
17	QTY	D04	CICS Active Threads	The number of active threads for this DB2ENTRY

MsmtTyp_ID INTEGER	MUnit_Cd CHAR (6)	MSrc_Cd CHAR (6)	MsmtTyp_Nm * VARCHAR (120)	MsmtTyp_Ds * VARCHAR (254)
18	QTY	D04	CICS Tasks	The number of tasks for this DB2ENTRY
19	QTY	D04	CICS Completed Tasks	The total number of completed tasks that have used this DB2ENTRY
20	QTY	D04	CICS GET Requests	Number of GET requests issued
21	QTY	D04	CICS PUT Requests	Number of PUT requests issued
22	QTY	D04	CICS DELETE Requests	Number of DELETE requests issued
23	QTY	D04	CICS VSAM I/Os	Number of data I/O operations on this VSAM file
24	QTY	D04	CICS MVS LOAD Requests	Number of times the loader has issued an MVS LOAD request
25	Sec	D04	CICS Overall Library Load Time	Time taken for all the library loads, in seconds
26	QTY	D04	CICS Temporary Storage PUTs	Number of records that the application programs wrote to main temporary storage
27	QTY	D04	CICS Temporary Storage GETs	Number of records that the application programs obtained from main temporary storage
28	B	D04	CICS Temporary Storage	Virtual storage used for temporary storage
29	QTY	D04	CICS VTAM Request Parameter Lists Posted	Number of VTAM Request Parameter Lists posted
30	QTY	D04	CICS VTAM Short On Storage Events	Number of times VTAM was short on storage
31	QTY	D04	CICS Program LOAD Requests	Number of program LOAD requests
32	QTY	D04	CICS Program Library Fetches	Number of program library fetches
33	QTY	D04	CICS File Control Requests	Total number of file control requests. Incremented even if the request is function shipped
34	QTY	D04	CICS Exceptions	Number of exception conditions. This is valid for CICS V3 and later
35	B	D04	CICS Program Storage	Program storage both above and below the 16MB line, in bytes
36	QTY	D04	CICS GETMAINs Above 16MB	Average number of user storage GETMAIN requests above the 16MB line
37	QTY	D04	CICS GETMAINs Below 16MB	Average number of user storage GETMAIN requests below the 16MB line
38	QTY	D04	CICS Resource Starts	Number of times the resource started
39	QTY	D04	CICS Resource Stops	Number of times the resource stopped
40	Min	MODEL1	Available	The amount of time that the resource is available
41	Min	MODEL1	Unavailable	The amount of time that the resource is not available
42	Min	MODEL1	Unknown	The amount of time that the state of the resource is unknown

MsmtTyp_ID INTEGER	MUnit_Cd CHAR (6)	MSrc_Cd CHAR (6)	MsmtTyp_Nm * VARCHAR (120)	MsmtTyp_Ds * VARCHAR (254)
*This column is translated.				

6.2.11 Component measurement rule (table MsmtRul)

CompTyp_Cd CHAR (17)	MsmtTyp_ID INTEGER
MVS_SUBSYSTEM	9, 24-30,38,40-42
D04_APPL	1-8
D04_DB2CONN	10-13,38-42
D04_DB2ENTRY	14-19
D04_FILE	20-23
D04_TRANS	2, 3, 9, 31-37

6.2.12 Measurement (table Msmt)

Msmt_ID BIGINT	Comp_ID INTEGER	MsmtTyp_ID INTEGER	TmSum_Cd CHAR (1)	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	Msmt_stddev_Val DOUBLE	MSrc_Corr_Cd CHAR (6)
1	25	1	H	2002-02-05	08.00.00	0.34	0.44	0.39					D04
2	25	1	H	2002-02-05	16.00.00	0.33	0.47	0.43					D04
3	25	1	H	2002-02-05	18.00.00	1.3	1.3	1.3					D04
…													

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 d04.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.

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