



IBM Tivoli Monitoring for Databases:  
Microsoft SQL Server  
Warehouse Enablement Pack  
Implementation Guide

for Tivoli Enterprise Data Warehouse, Version 1.1

**Note:**

Before using this information and the product it supports, read the information in Notices on page 49.

**First Edition (March 2003)**

This edition applies to version 1, release 1, of Tivoli® Enterprise Data Warehouse and to all subsequent releases and modifications until otherwise indicated in new editions.

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# 1 About this document

This document describes the warehouse enablement pack, Version 1.1.0 for IBM Tivoli Monitoring for Databases, Version 5.1.1: Microsoft SQL Server. It covers the following topics:

- Installing and configuring the warehouse pack
- The data structures used by the warehouse pack

Resource models are designed to monitor and report critical system metrics, such as disk utilization. This warehouse enablement pack provides a data mart ETL that is used to package metric data reported by IBM Tivoli Monitoring for Databases, Version 1.0.0: Microsoft SQL Server resource models into a database arrangement known as star schemas. Users may create historical reports of metrics, using the IBM Console. The IBM console uses data marts, which consist of one or more star schemas.

This warehouse pack relies on other IBM Tivoli products, including IBM Tivoli Monitoring, which are prerequisite to its use. The prerequisites are explained later this document.

## 1.1 Related documentation

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

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

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

- IBM Tivoli Monitoring for Databases: Microsoft SQL Server
- Tivoli Enterprise™ Data Warehouse
- IBM DB2, DB2 Data Warehouse Center, and DB2 Warehouse Manager

The following sections list and briefly describe these libraries.

### 1.1.1 IBM Tivoli Monitoring for Databases: Microsoft SQL Server

The following IBM Tivoli Monitoring for Databases: Microsoft SQL Server documents are available on the IBM Tivoli Monitoring for Databases: Microsoft SQL Server Documentation CD:

- *IBM Tivoli Monitoring for Databases Installation and Setup Guide*, GC23-4854  
Describes how to install and configure IBM Tivoli Monitoring for Databases: Microsoft SQL Server.
- *IBM Tivoli Monitoring for Databases: Microsoft SQL Server User's Guide*, SC23-4853  
Describes how to use IBM Tivoli Monitoring for Databases: Microsoft SQL Server.
- *IBM Tivoli Monitoring for Databases: Microsoft SQL Server Reference Guide*, SC23-4852  
Provides detailed information about individual tasks and resource models.
- *IBM Tivoli Monitoring for Databases Release Notes*, SC23-4851  
Describes product features and provides information about the latest changes to the installation requirements and procedures. The release notes also describe known limitations related to installation and explain how to work around each limitation.
- *IBM Tivoli Monitoring for Databases: Microsoft SQL Server Limitations and Workarounds*, SC23-4850  
Provides the latest information about known product limitations and workarounds. To ensure that the information is the latest available, this document is provided only on the Web and is updated on a regular basis. You can access the Limitations and Workarounds document through the IBM Tivoli Monitoring for Databases: Microsoft SQL Server link on the Tivoli Information Center Web site:

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

### 1.1.2 Tivoli Enterprise Data Warehouse

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

- *Tivoli Enterprise Data Warehouse Release Notes*, GI11-0857  
Provides late-breaking information about Tivoli Enterprise Data Warehouse and lists hardware requirements and software prerequisites.
- *Installing and Configuring Tivoli Enterprise Data Warehouse*, GC32-0744  
Describes how Tivoli Enterprise Data Warehouse fits into your enterprise, explains how to plan for its deployment, and gives installation and configuration instructions. It provides an introduction to the built-in program for creating and running reports, and contains maintenance procedures and troubleshooting information.
- *Enabling an Application for Tivoli Enterprise Data Warehouse*, GC32-0745  
Provides information about connecting an application to Tivoli Enterprise Data Warehouse. This book is for application programmers who use Tivoli Enterprise Data Warehouse to store and report on their application's data, data warehousing experts who import Tivoli Enterprise Data Warehouse data into business intelligence applications, and customers who use their local data in the warehouse.

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

The DB2 library contains important information about the database and data warehousing technology provided by IBM DB2, DB2 Data Warehouse Center, and DB2 Warehouse Manager. Refer to the DB2 library for help in installing, configuring, administering, and troubleshooting DB2, 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 Enterprise Data Warehouse:

- *IBM DB2 Universal Database for Windows Quick Beginnings*, GC09-2971  
Guides you through the planning, installation, migration (if necessary), and setup of a partitioned database system using the IBM DB2 product on Microsoft Windows.
- *IBM DB2 Universal Database for UNIX Quick Beginnings*, GC09-2970  
Guides you through the planning, installation, migration (if necessary), and setup of a partitioned database system using the IBM DB2 product on UNIX.
- *IBM DB2 Universal Database Administration Guide: Implementation*, SC09-2944  
Covers the details of implementing your database design. Topics include creating and altering a database, database security, database recovery, and administration using the Control Center, a DB2 graphical user interface.
- *IBM DB2 Universal Database Data Warehouse Center Administration Guide*, SC26-9993  
Provides information on how to build and maintain a data warehouse using the Data Warehouse Center.
- *IBM DB2 Warehouse Manager Installation Guide*, GC26-9998  
Provides the information to install the following Warehouse Manager components: Information Catalog Manager, warehouse agents, and warehouse transformers.
- *IBM DB2 Universal Database and DB2 Connect Installation and Configuration Supplement*, GC09-2957  
Provides advanced installation considerations and guides you through the planning, installation, migration (if necessary), and set up a platform-specific DB2 client. Once the DB2 client is installed, you then configure communications for both the client and server, using the DB2 GUI tools or the Command Line Processor. This supplement also contains

information on binding, setting up communications on the server, the DB2 GUI tools, DRDA™ AS, distributed installation, the configuration of distributed requests, and accessing heterogeneous data sources.

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

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



## 2 Overview

The following sections provide an overview of Tivoli Enterprise Data Warehouse and the IBM Tivoli for Monitoring Databases: Microsoft SQL Server warehouse pack.

### 2.1 Overview of Tivoli Enterprise Data Warehouse

Tivoli Enterprise Data Warehouse provides the infrastructure for the following:

- Extract, transform, and load (ETL) processes through the IBM DB2 Data Warehouse Center tool
- Schema generation of the central data warehouse
- Historical reporting

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

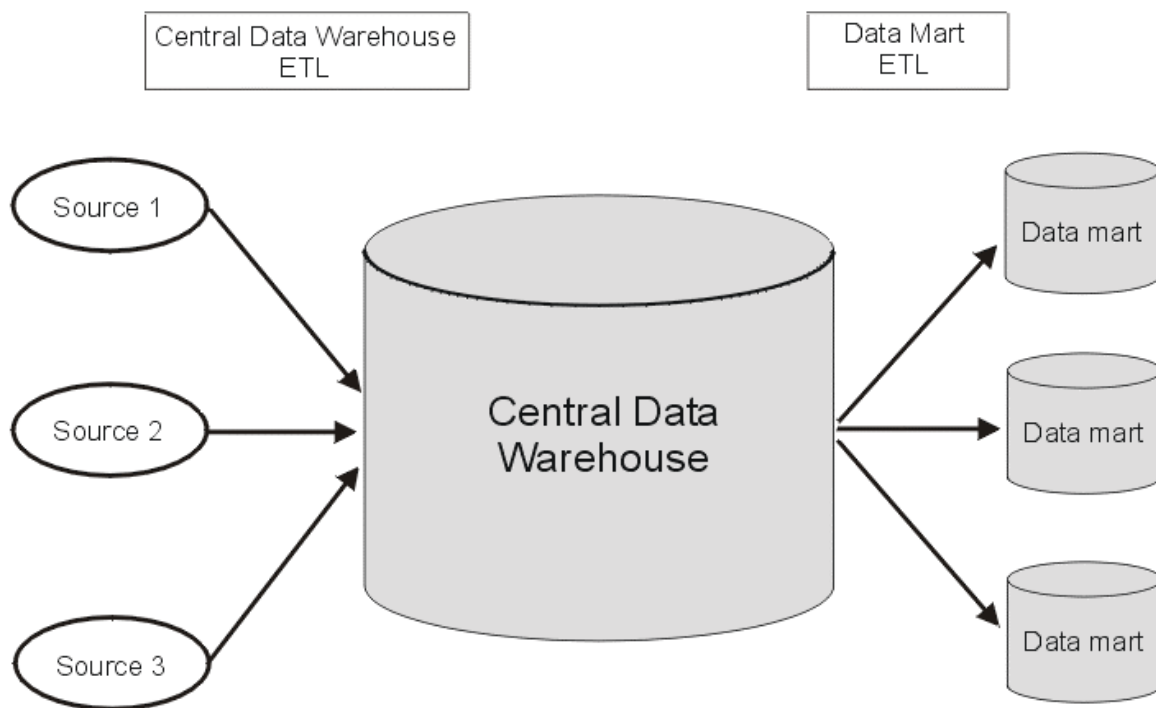


Figure 1. Tivoli Enterprise Data Warehouse overview

The *central data warehouse* uses a generic schema 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 tables or columns are added in the schema.

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

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

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

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

The ETLs are typically scheduled to run periodically, usually during non-peak hours. If an ETL encounters data that it cannot correctly transform, it creates an entry in an exception table. Exception tables are described in Exception tables on page 27.

## 2.2 Overview of Microsoft SQL Server warehouse enablement pack

The IBM Tivoli Monitoring for Databases: Microsoft SQL Server warehouse enablement pack works with the Tivoli Enterprise Data Warehouse and other IBM Tivoli software.

- The data source consists of the resource models provided by IBM Tivoli Monitoring for Databases, Version 1.0.0: Microsoft SQL Server in conjunction with IBM Tivoli Monitoring. These resource models monitor and report selected metrics of a Microsoft SQL Server database server.
- The central data warehouse ETL is the IBM Tivoli Monitoring Version 5.1.1 Warehouse enablement pack. This ETL may be used by more than one warehouse pack to insert data into the central data warehouse, for example, by IBM Tivoli Monitoring for Databases: Informix, and by IBM Tivoli Monitoring for Databases: Oracle. It is sometimes referred to as the central data warehouse generic ETL.
- The data mart ETL and a data mart is provided by the IBM Tivoli Monitoring for Databases, Version 5.1.0: Microsoft SQL Server Warehouse enablement pack.
- The central data warehouse is provided by IBM Tivoli Enterprise Data Warehouse.

You can create historical reports of metrics, using the IBM Console. The IBM console uses data marts consisting of one or more star schemas.

The warehouse pack provides the following components:

- Data mart ETL. The data mart ETL is utilized to load the Microsoft SQL Server star schemas from the Microsoft SQL Server metric data stored in the central data warehouse.
- Star schemas. Twenty-eight star schemas are defined. There are hourly, daily, weekly, and monthly star schemas for each of the seven defined Informix components. A component is a grouping of related metrics. For more information about components, see the section “Components and Metrics”.
- Data mart. One data mart is predefined for you. It is made up of the 4 hourly star schemas.
- Prepackaged reports.

You may use the IBM console to customize the prepackaged data marts and reports, or you may choose to use them as-is. You are not limited to using only prepackaged data marts and reports. You may define your own custom data marts and reports. You may even define data marts and reports that combine star schemas and metrics from other warehouse packs. This is known as *cross-application reporting*.

## 3 Installing and configuring

This section describes installation of the warehouse enablement pack. Please refer to the “Installing Tivoli Enterprise Data Warehouse and warehouse packs” chapter of the *Installing and Configuring Tivoli Enterprise Data Warehouse* manual for related information.

### 3.1 Prerequisites

Before installing the pack you should have already installed

- IBM DB2 Universal Database Enterprise Edition Version 7.2
- IBM DB2 Universal Database Enterprise Edition Version 7.2 Fixpak 6
- Tivoli Enterprise Data Warehouse required e-fixes to IBM DB2 UDB v7 FixPak 6 (1.1-TDW-0002)
- Tivoli Enterprise Data Warehouse Version 1.1
- Tivoli Enterprise Data Warehouse 1.1 Fix Pack 2 (1.1-TDW-FP02)
- IBM Tivoli Monitoring Version 5.1.1 Warehouse Enablement Pack

You can obtain the Tivoli Enterprise Data Warehouse e-fixes and fix packs from the Tivoli Enterprise Data Warehouse Web site:

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

Click the Downloads link in the Self help section.

### 3.2 Supported hardware and software

IBM Tivoli Monitoring for Databases, Version 5.1.0: Microsoft SQL Server warehouse pack Version 1.0.0 supports the versions of DB2, Informix, Microsoft SQL Server, Oracle, and Sybase database products that are documented in the “Documentation Notes” section of the *IBM Tivoli Monitoring 5.1.1 Release Notes*, GI10-5797-01.

For information about the hardware and software requirements of Tivoli Enterprise Data Warehouse, see the *Tivoli Enterprise Data Warehouse Release Notes*.

The IBM Tivoli Monitoring for Databases: Microsoft SQL Server Warehouse enablement pack is installed on the Tivoli Enterprise Data Warehouse control server in your environment.

### 3.3 Limitations

Before distributing an IBM Tivoli Monitoring profile that contains IBM Tivoli Monitoring for Databases: Microsoft SQL Server resource models, you must discover and activate the Microsoft SQL Server databases configured on the target Tivoli endpoints.

This warehouse pack must be installed using the user "db2". If that is not the user name used when installing the Tivoli Enterprise Data Warehouse core application, you must create a user temporary tablespace for use by the installation program. The user temporary tablespace that is created in each central data warehouse database and data mart database during the installation of Tivoli Enterprise Data Warehouse is accessible only to the user that performed the installation.

If you are installing the warehouse pack using the same database user that installed Tivoli Enterprise Data Warehouse, or if your database user has access to another user temporary tablespace in the target databases, no additional action is required.

If you do not know the user name that was used to install Tivoli Enterprise Data Warehouse, you can determine whether the tablespace is accessible by attempting to declare a temporary table while connected to each database as the user that will install the warehouse pack. The following commands are one way to do this:

```
db2 "connect to TWH_CDW user installing_user using password"
```

```
db2 "declare global temporary table t1 (c1 char(1))with replace on commit preserve rows not logged"
```

```
db2 "disconnect TWH_CDW"
```

```
db2 "connect to TWH_MART user installing_user using password"
db2 "declare global temporary table t1 (c1 char(1))with replace on commit preserve rows not
logged"
db2 "disconnect TWH_CDW"
```

Where:

*installing\_user* Identifies the database user that will install the warehouse pack.

*password* Specifies the password for the installing user.

If the declare command is successful, the specified database user can install the warehouse pack. No additional action is required.

If the declare command fails, run the following DB2 commands to create a new tablespace for the installation in both the central data warehouse database and data mart databases:

```
db2 "connect to TWH_CDW user installing_user using password"
db2 "create user temporary tablespace usertmp2 managed by system using (' usertmp2)"
db2 "disconnect TWH_CDW"
db2 "connect to TWH_MART user installing_user using password"
db2 "create user temporary tablespace usertmp3 managed by system using (' usertmp3')"
```

Where:

*installing\_user* Identifies the database user that will install the warehouse pack.

*password* Specifies the password for the installing user.

### 3.4 Database sizing considerations

The pack primarily uses the database TWH\_MART. You must consider the volume of data, which consists of the number of metrics and how long the star schemas should retain their data before data is pruned from them. Plan to have at least 7 Megabytes free storage space in THW\_MART for each Microsoft SQL Server per month of data.

The central data warehouse generic ETL will place Microsoft SQL Server metric data into the TWH\_CDW database. You must allocate at least 7 Megabytes storage per Microsoft SQL Server per month of data in this database.

This estimation is based on having one instance per database, and one database per host. It is also based on running the actual resource models provided by IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

Resource Model	Resource Model Interval	Number of Components	Component Space	Measurements per day
Cache/CPU	10 minutes	Number of Instances	Number of Instances $\times$ 1440	Number of Instances $\times$ 1440 $\times$ 144
Replication	10 minutes	Number of Instances	Number of Instances $\times$ 2380	Number of Instances $\times$ 2380 $\times$ 144
Availability	5 minutes	Number of Databases $\times$ Number of Instances	Number of Databases $\times$ Number of Instances $\times$ 1810	Number of Databases $\times$ Number of Instances $\times$ 1810 $\times$ 288
Replication Jobs	10 minutes	Number of Jobs $\times$	Number of Jobs $\times$	Number of Jobs $\times$

		Number of Instances	Number of Instances × 1320	Number of Instances × 1320 × 144
Space Usage	10 minutes	Number of Databases × Number of Instances	Number of Databases × Number of Instances × 4180	Number of Databases × Number of Instances × 4180 × 144
Errors	10 minutes	Number of Instances	Number of Instances × 1080	Number of Instances × 1080 × 144
Users/Transactions	10 minutes	Number of Instances	Number of Instances × 840	Number of Instances × 840 × 144
Locks	10 minutes	Number of Instances	Number of Instances × 1060	Number of Instances × 1060 × 144
Jobs	5 minutes	Number of Jobs × Number of Instances	Number of Jobs × Number of Instances × 2050	Number of Jobs × Number of Instances × 2050 × 288

### 3.5 Data sources and targets

The data source for the warehouse pack is the data in the TWH\_CDW database inserted by the central data warehouse generic ETL. The primary target for the warehouse pack is the star schemas in the TWH\_MART database. Another target is the TWH\_MD database. These are represented in the DB2 Data Warehouse Center as CTW\_TWH\_CDW\_Source, CTW\_TWH\_MART\_Target, and the CTW\_TWH\_MD\_Target, respectively.

### 3.6 Pre-installation procedures

Before installing, check that your control server has connectivity to databases TWH\_MD, TWH\_CDW, and TWH\_MART. These reside on your control server, the central data warehouse server, and the data mart server, respectively. These servers may be installed on one system in a single system installation, or distributed across two or three systems in your enterprise.

Perform the following steps to check database connectivity:

1. Open the Client Configuration Assistant by doing the following:
  - a. Click **Start** on the Windows taskbar of your control server.
  - b. Select **Programs**, then **IBM DB2**, and finally **Client Configuration Assistant**.
2. Click the **Database alias** tab.
3. Right click the database name.
4. Click the **Test** button, which is located on the right-hand side of the panel.
5. Enter the database User ID and Password.
6. Click **OK**.

### 3.7 Installation procedure

To install IBM Tivoli Monitoring for Databases: Microsoft SQL Server Warehouse enablement pack, perform the following steps:

1. Ensure that all prerequisite products are installed and prerequisite product patches are applied. See section 3.1 for a list of prerequisite products.
2. Perform the pre-installation. See section 3.6 for Pre-Installation steps.

3. Install the warehouse pack as described in the “Installing Tivoli Enterprise Data Warehouse and warehouse packs” chapter of the *Installing and Configuring Tivoli Enterprise Data Warehouse* manual.

The install image for the pack is contained in the in the tedw\_apps\_etl directory (and subdirectories) of the IBM Tivoli Monitoring for Databases, Version 5.1.1: Microsoft SQL Server CDROM. You may copy the tedw\_apps\_etl directory and all its sub-directories from the CDROM to a convenient directory on your computer for installation without the CDROM, if you would like.

The warehouse pack should be installed on the Tivoli Enterprise Data Warehouse control server in your enterprise. Use the Tivoli Enterprise Data Warehouse installation program to install the pack. Be sure to select Application Installation Only in the setup type window.

During installation you are asked for the path to the installation media for the pack. Specify the complete path to the tedw\_apps\_etl directory; for example, on Windows NT this might be R:\tedw\_apps\_etl, where R is the drive name of the CDROM in your computer.

The installation process will run for approximately 13 minutes on a typical computer system.

If an installation error occurs, review the installation log for the cause of the error. On Windows NT and Windows 2000, the application installation log is named %TWH\_TOPDIR%\apps\ctw\TWHApp.log. Occasionally, it may direct you to another log, %TEMP%\twh\_ibm\_db2\_runlog.log. Correct the source of the error and rerun the installation.

4. Perform the post-installation steps described in the next section.

### **3.8 Post-installation steps**

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

1. Make sure the control database is set to TWH\_MD.
2. Specify the properties for the CTW\_TWH\_CDW\_Source data source, CTW\_ODBC\_Source. These properties are in the Database page.
  - Set Data source name to the name of the ODBC connection for the CTW\_TWH\_CDW\_Source. The default value is TWH\_CDW.
  - Set the User ID field to the Instance name for the configuration repository. The default value is db2admin.
  - Set the Password field to the password used to access the CTW\_TWH\_CDW\_Source.
3. Specify the properties for the warehouse target CTW\_TWH\_CDW\_Target. These properties are in the Database page.
  - In the User ID field to the user ID used to access the Tivoli Enterprise Data Warehouse central data warehouse database. The default value is db2admin.
  - In the Password field, type the password used to access the central data warehouse database.
  - Do not change the value of the Data Source field. It must be TWH\_CDW.
4. Specify the following properties for the warehouse target CTW\_TWH\_MART\_Target. These properties are in the Database page.
  - In the User ID field to the user ID used to access the Tivoli Enterprise Data Warehouse data mart database. The default value is db2admin.
  - In the Password field, type the password used to access the data mart database.

- Do not change the value of the Data Source field. It must be TWH\_MART.
5. Run the initialization process CTW\_c05\_Initialize\_Process.
  6. Specify dependencies between processes and schedule processes that are to run automatically. The processes for this warehouse pack are located in the CTW\_IBM\_Tivoli\_Monitoring\_for\_Database\_Microsoft\_SQL\_Server subject area. The processes should be run in the following order:
    - CTW\_m05\_s010\_Dimension
    - CTW\_m05\_s020\_Fact
    - CTW\_m05\_s030\_Rollup
    - CTW\_m05\_s040\_Prune

## **4 Maintaining**

### ***4.1 Backing up and restoring***

There are no additional backup or restoring requirements.

### ***4.2 Pruning***

If you have established a schedule to automatically run the pack's data mart ETL process steps on a periodic basis, manually prune the logs in the directory %VWS\_LOGGING%.



## 5 ETL processes

The warehouse pack has the following process.

### 5.1 CTW\_m05\_ETL\_Process

This process moves records into the hourly fact tables. In addition, a step is included to consolidate hourly information into daily, weekly, monthly records.

This process has the following steps:

- CTW\_m05\_s010\_Dimension

This step populates the data mart dimension tables.

- CTW\_m05\_s020\_Fact

This step populates the data mart fact tables.

- CTW\_m05\_s030\_Rollup

This step consolidates the hourly fact information into daily, weekly, and monthly fact tables.

- CTW\_m05\_s040\_Prune

This step prunes data in the hourly, daily, and weekly fact tables, per the settings of the CTW\_PRUNE\_MART\_CONTROL in TWH\_MART database.

## 6 Central data warehouse information

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

Shaded columns in the following tables are translated. These columns are also marked with an asterisk (\*) in the column heading. *Installing and Configuring Tivoli Data Warehouse* contains instructions for installing support for additional languages.

### 6.1 Component configuration

#### 6.1.1 Component type (table CompTyp)

CompTyp_Cd CHAR(17)	Parent_Cd CHAR(17)	CompTyp_Nm* VARCHAR(120)	CompTyp_Strt_DtTm TIMESTAMP	CompTyp_End_DtTm TIMESTAMP
IP_HOST	NULL	IP Host	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000
CTW_HOST	NULL	Microsoft SQL Server Host	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000
CTW_INSTANCE	NULL	Microsoft SQL Server Instance	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000
CTW_DATABASE	NULL	Microsoft SQL Server Database	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000
CTW_FILEGROUP	NULL	Microsoft SQL Server Database Filegroup	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000
CTW_REPLICATION	NULL	Microsoft SQL Server Replication	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000
CTW_SERVICE	NULL	Microsoft SQL Server Service	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000
CTW_AGENT	NULL	Microsoft SQL Server Agent	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000

#### 6.1.2 Component (table Comp)

Comp_ID INTEGER	CompTyp_Cd CHAR (17)	Centr_Cd CHAR(6)	Cust_ID INTEGER	Comp_Corr_ID INTEGER	Comp_Nm* VARCHAR (254)	Comp_Corr_Val VARCHAR (254)	Comp_Strt_DtTm TIMESTAMP	Comp_End_DtTm TIMESTAMP	Comp_Ds VARCHAR (254)
1	IP_HOST	CDW	1		frankie.dirigo.com		2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	
2	CTW_HOST	CDW	1		Frankie		2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	

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_Start_DtTm TIMESTAMP	Comp_End_DtTm TIMESTAMP	Comp_Ds VARCHAR (254)
3	CTW_INSTANCE	CDW	1		pelotonsql2k a		2002-09-03- 20.35.56. 296001	9999-01-01- 00.00.00. 000000	
4	CTW_DATABASE	CDW	1		suppliers		2002-09-03- 20.35.56. 296001	9999-01-01- 00.00.00. 000000	
5	CTW_FILEGROUP	CDW	1		raid005drive e		2002-09-03- 20.35.56. 296001	9999-01-01- 00.00.00. 000000	
6	CTW_REPLICATION	CDW	1		Northwind		2002-09-03- 20.35.56. 296001	9999-01-01- 00.00.00. 000000	
7	CTW_JOBCATEGORY	CDW	1		Repl- snapshot		2002-09-03- 20.35.56. 296001	9999-01-01- 00.00.00. 000000	
8	CTW_SERVICE	CDW	1		MSSQL\$F RANKIESQ L2K		2002-09-03- 20.35.56. 296001	9999-01-01- 00.00.00. 000000	
9	CTW_AGENT	CDW	1		Snapshot Agent		2002-09-03- 20.35.56. 296001	9999-01-01- 00.00.00. 000000	

### 6.1.3 Component relationship type (table RelnTyp)

<b>RelnTyp_Cd</b> <b>CHAR(6)</b>	<b>RelnTyp_Nm *</b> <b>VARCHAR(120)</b>
PCHILD	Parent Child Relation

### 6.1.4 Component relationship rule (table RelnRul)

<b>CompTyp_Source_Cd</b> <b>CHAR(17)</b>	<b>CompTyp_Target_Cd</b> <b>CHAR(17)</b>	<b>RelnTyp_Cd</b> <b>CHAR(6)</b>	<b>RelnRul_Strt_DtTm</b> <b>TIMESTAMP</b>	<b>RelnRul_End_DtTm</b> <b>TIMESTAMP</b>
IP_HOST	CTW_INSTANCE	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
IP_INTERFACE	CTW_INSTANCE	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
CTW_HOST	CTW_INSTANCE	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
IP_HOST	CTW_SERVICE	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
IP_INTERFACE	CTW_SERVICE	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
CTW_HOST	CTW_SERVICE	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
CTW_INSTANCE	CTW_DATABASE	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
CTW_INSTANCE	CTW_JOBCATEGORY	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
CTW_INSTANCE	CTW_REPLICATION	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
CTW_DATABASE	CTW_FILEGROUP	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
CTW_INSTANCE	CTW_AGENT	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000

### 6.1.5 Component relationship (table CompReln)

<b>CompReln_ID</b> <b>INTEGER</b>	<b>Comp_Source_ID</b> <b>INTEGER</b>	<b>Comp_Target_ID</b> <b>INTEGER</b>	<b>RelnTyp_Cd</b> <b>CHAR(6)</b>	<b>CompReln_Strt_DtTm</b> <b>TIMESTAMP</b>	<b>CompReln_End_DtTm</b> <b>TIMESTAMP</b>
1	1	3	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
2	2	3	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
3	1	8	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000

<b>CompReIn_ID</b> <b>INTEGER</b>	<b>Comp_Source_ID</b> <b>INTEGER</b>	<b>Comp_Target_ID</b> <b>INTEGER</b>	<b>RelnTyp_Cd</b> <b>CHAR(6)</b>	<b>CompReIn_Strt_DtTm</b> <b>TIMESTAMP</b>	<b>CompReIn_End_DtTm</b> <b>TIMESTAMP</b>
4	2	8	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
5	3	4	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
6	3	7	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
7	3	6	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
8	4	5	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000
8	3	9	PCHILD	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000

#### 6.1.6 Attribute type (table AttrTyp)

<b>AttrTyp_Cd</b> <b>CHAR(17)</b>	<b>AttrTyp_Nm *</b> <b>VARCHAR(120)</b>
VERSION	Version number
NAME	Name
LAST_IP_ADDRESS	Last IP address
MAX_CONNECTIONS	Maximum connections to database instance
CTW_LOG_FILENAME	Database log file names
CTW_LOG_MAXSIZE	Maximum size of database log file
CTW_FILEG_MAXSIZE	Maximum size of filegroup
CTW_DB_MAXSIZE	Maximum size of database

#### 6.1.7 Attribute rule (table AttrRul)

<b>CompTyp_Cd</b> <b>CHAR(17)</b>	<b>AttrTyp_Cd</b> <b>CHAR(17)</b>	<b>AttrRul_Strt_DtTm</b> <b>TIMESTAMP</b>	<b>AttrRul_End_DtTm</b> <b>TIMESTAMP</b>	<b>AttrRul_Dom_Ind</b> <b>CHAR</b>
CTW_INSTANCE	VERSION	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000	N
CTW_INSTANCE	NAME	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000	N
CTW_HOST	AMX_EID	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000	N
CTW_HOST	AMX_GMT_OFFSET	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000	N
CTW_INSTANCE	MAX_CONNECTIONS	2002-09-03-20.35.56.296001	9999-01-01-00.00.00.000000	N

CompTyp_Cd CHAR(17)	AttrTyp_Cd CHAR(17)	AttrRul_Strt_DtTm TIMESTAMP	AttrRul_End_DtTm TIMESTAMP	AttrRul_Dom_Ind CHAR
CTW_FILEGROUP	CTW_FILEG_MAXSIZE	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	N
CTW_DATABASE	CTW_DB_MAXSIZE	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	N
CTW_DATABASE	CTW_LOG_MAXSIZE	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	N
CTW_DATABASE	CTW_LOG_FILENAME	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	N

#### 6.1.8 Attribute domain (table AttrDom)

This warehouse pack does not use the attribute domain table.

#### 6.1.9 Component attribute (table CompAttr)

CompAttr_ID INTEGER	Comp_ID INTEGER	AttrTyp_Cd CHAR(17)	CompAttr_Strt_DtTm TIMESTAMP	CompAttr_End_DtTm TIMESTAMP	CompAttr_Val VARCHAR(254)
1	3	VERSION	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	8.00.194
2	3	NAME	2002-09-03- 20.35.56.2960012002- 09-03-20.35.56.296001	9999-01-01- 00.00.00.000000	FRANKIESQL2KA
3	1	LAST_IP_ADDRESS	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	172.16.9.63
4	3	MAX_CONNECTIONS	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	325
5	4	CTW_LOG_MAXSIZE	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	120
6	4	CTW_DB_MAXSIZE	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	120
7	4	CTW_LOG_FILENAME	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	repository_Log.LDF
8	6	CTW_FILEG_MAXSIZE	2002-09-03- 20.35.56.296001	9999-01-01- 00.00.00.000000	550

## 6.2 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
STATE	State

#### 6.2.2 Measurement group (table MGrp)

<b>MGrp_Cd</b> <b>CHAR(6)</b>	<b>MGrpTyp_Cd</b> <b>CHAR(6)</b>	<b>MGrp_Parent_Cd</b> <b>CHAR(6)</b>	<b>MGrp_Nm</b> <b>VARCHAR(120)</b>
PERF	CATEG	NULL	Performance
UTIL	CATEG	NULL	Utilization
AVL	CATEG	NULL	Availability
TOT_E	GROUP	NULL	Total Value Exists
CTW_SV	STATE	NULL	Microsoft SQL Server Percent in State
CTW_DB	STATE	NULL	Microsoft SQL Server Database Percent in State

### 6.2.3 Measurement group member (table MGrpMbr)

<b>MGrp_Cd</b> <b>CHAR(6)</b>	<b>MGrpTyp_Cd</b> <b>CHAR(6)</b>	<b>MsmTyp_ID</b> <b>INTEGER</b>
CTW_SV	STATE	1-3
CTW_DB	STATE	34-35
MAX_E	GROUP	4-22, 25-26, 38-50, 52-58
MIN_E	GROUP	4-22, 25-26, 38-50, 52-58
AVG_E	GROUP	1-22, 25-26, 34-35, 38-50, 52-58
TOT_E	GROUP	23-24, 27-33, 36-37, 51, 59-78

### 6.2.4 Measurement unit category (table MUnitCat)

<b>MunitCat_Cd</b> <b>CHAR(6)</b>	<b>MunitCat_Nm *</b> <b>VARCHAR(120)</b>
TM	Time Duration
QTY	Quantity
PRC	Percentage
RT	Rate

### 6.2.5 Measurement unit (table MUnit)

<b>MUnit_Cd</b> <b>CHAR(6)</b>	<b>MUnitCat_Cd</b> <b>CHAR(6)</b>	<b>Munit_Nm *</b> <b>VARCHAR(120)</b>
PRC	PRC	Percentage
Bps	RT	Bytes per Second
MBps	RT	Megabytes per Second
KBps	RT	Kilobytes per Second
Rps	RT	Requests per Second
Qps	RT	Quantity per Second
Qpm	RT	Quantity per Minute

<b>MUnit_Cd</b> <b>CHAR(6)</b>	<b>MUnitCat_Cd</b> <b>CHAR(6)</b>	<b>Munit_Nm *</b> <b>VARCHAR(120)</b>
QTY	QTY	Quantity
GB	QTY	Gigabytes
KB	QTY	Kilobytes
MB	QTY	Megabytes
B	QTY	Bytes
MSec	TM	Milliseconds
Sec	TM	Seconds
Min	TM	Minutes
Hr	TM	Hours
Day	TM	Days
HSc	TM	Hundredths of a Second

#### 6.2.6 Time summary (table TmSum)

The period over which a measurement may be summarized.

<b>TmSum_Cd</b> <b>CHAR</b>	<b>TmSum_Nm *</b> <b>VARCHAR(120)</b>
H	Hourly
D	Daily
W	Weekly
M	Monthly
Q	Quarterly
Y	Yearly

#### 6.2.7 Measurement source (table MSrc)

<b>MSrc_Cd</b> <b>CHAR(6)</b>	<b>MSrc_Parent_Cd</b> <b>CHAR(6)</b>	<b>MSrc_Nm *</b> <b>VARCHAR(120)</b>
Tivoli	NULL	Tivoli Application
AMX	Tivoli	IBM Tivoli Monitoring
CTW	AMX	IBM Tivoli Monitoring for Databases, Version 5.1.0: Microsoft SQL Server

#### 6.2.8 Measurement type (table MsmtTyp)

When displayed in reports, the values for **MsmtTyp\_Nm** contain the space character in place of each underscore and **MSSQL** is replaced with Microsoft SQL.

<b>MsmtTyp_ID</b> <b>INTEGER</b>	<b>MUnit_Cd</b> <b>CHAR(6)</b>	<b>MSrc_Cd</b> <b>CHAR(6)</b>	<b>MsmtTyp_Nm*</b> <b>VARCHAR(120)</b>	<b>MsmtTyp_Ds</b> <b>VARCHAR(254)</b>
1	PRC	CTW	MSSQL_Service_Stopped	Microsoft SQL Server Service in stopped state



<b>MsmtTyp_ID</b> <b>INTEGER</b>	<b>MUnit_Cd</b> <b>CHAR(6)</b>	<b>MSrc_Cd</b> <b>CHAR</b> <b>(6)</b>	<b>MsmtTyp_Nm*</b> <b>VARCHAR(120)</b>	<b>MsmtTyp_Ds</b> <b>VARCHAR(254)</b>
2	PRC	CTW	MSSQL_Service_Paused	Microsoft SQL Server Service in paused state
3	PRC	CTW	MSSQL_Service_Running	Microsoft SQL Server Service in running state
4	Qps	CTW	MSSQL_Logouts	The number of logouts per second
5	Qps	CTW	MSSQL_Logins	The number of logins per second
6	QTY	CTW	MSSQL_User_Connections	The number of users logged into server
7	PRC	CTW	MSSQL_Percent_Connections_Used	Percentage of maximum connections used
8	QTY	CTW	MSSQL_Active_Transactions	The number of active transactions in server
9	Qps	CTW	MSSQL_Transactions_Rate	The transaction rate per second
10	QTY	CTW	MSSQL_Blocked_Processes	The number of processes blocked
11	PRC	CTW	MSSQL_Buffer_Cache_Hit_Ratio	Buffer requests satisfied from cache
12	PRC	CTW	MSSQL_Buffer_Extended_Memory_Cache_Hit_Ratio	Buffer requests satisfied from extended memory
13	QTY	CTW	MSSQL_Free_Buffers	Number of free buffers
14	Qps	CTW	MSSQL_Lazy_Writes	Dirty/Aged buffers written by Lazy Writer per second
15	Qps	CTW	MSSQL_Page_Writes	Number of physical writes to database per second
16	Qps	CTW	MSSQL_Page_Reads	Number of physical reads to database per second
17	Qps	CTW	MSSQL_Read_Ahead_Pages	Anticipated reads by server per second
18	QTY	CTW	MSSQL_Stolen_Page_Count	Number of pages used for server processes
19	Qps	CTW	MSSQL_Checkpoint_Writes	Number of database checkpoints per second

<b>MsmtTyp_ID</b> <b>INTEGER</b>	<b>MUnit_Cd</b> <b>CHAR(6)</b>	<b>MSrc_Cd</b> <b>CHAR</b> <b>(6)</b>	<b>MsmtTyp_Nm*</b> <b>VARCHAR(120)</b>	<b>MsmtTyp_Ds</b> <b>VARCHAR(254)</b>
20	QTY	CTW	MSSQL_Server_Memory_Used	Total memory used by server
21	PRC	CTW	MSSQL_CPU_Percent_Busy	Percent CPU has been doing Microsoft SQL Server work
22	QTY	CTW	MSSQL_Connections_High	Highest number of connections
23	QTY	CTW	MSSQL_Connections_Failed	The number of times connections failed
24	QTY	CTW	MSSQL_Errors_Logged	The number of errors logged
25	QTY	CTW	MSSQL_Full_Databases	The number of full databases discovered
26	Qps	CTW	MSSQL_Number_Deadlocks	The number of deadlocks per second
27	QTY	CTW	MSSQL_Job_Failed	Number of jobs failed
28	QTY	CTW	MSSQL_Job_Succeeded	Number of jobs succeeded
29	QTY	CTW	MSSQL_Job_Cancelled	Number of jobs cancelled
30	QTY	CTW	MSSQL_Job_Retry	Number of jobs retried
31	QTY	CTW	MSSQL_Job_In_Progress	Number of jobs running
32	QTY	CTW	MSSQL_Job_Not_Run	Number of jobs not run
33	Sec	CTW	MSSQL_Job_Duration	Number of seconds job ran
34	PRC	CTW	MSSQL_Database_Online	Percent database state is online
35	PRC	CTW	MSSQL_Database_Suspect	Percent database state is suspect
36	QTY	CTW	MSSQL_Disk_IO_Errors	The number of disk I/O errors
37	QTY	CTW	MSSQL_Space_Allocation_Failure	The number of times space allocation failed
38	Qps	CTW	MSSQL_Lock_Waits	The number of detected locks per second
39	Qps	CTW	MSSQL_Lock_Requests	The number of lock requests per second
40	Qps	CTW	MSSQL_Lock_Timeouts	Lock wait timeouts per second

<b>MsmtTyp_ID</b> <b>INTEGER</b>	<b>MUnit_Cd</b> <b>CHAR(6)</b>	<b>MSrc_Cd</b> <b>CHAR</b> <b>(6)</b>	<b>MsmtTyp_Nm*</b> <b>VARCHAR(120)</b>	<b>MsmtTyp_Ds</b> <b>VARCHAR(254)</b>
41	Qps	CTW	MSSQL_Lock_Wait_Time	Time waiting for lock in milliseconds per second
42	Qps	CTW	MSSQL_Table_Lock_Escalations	The number of locks escalated per second
43	QTY	CTW	MSSQL_Replication_Pending_Transactions	The total number of pending transactions to be run
44	Qps	CTW	MSSQL_Replication_Transaction_Rate	The total number of pending transactions per second
45	Sec	CTW	MSSQL_Delivery_Latency	The average transaction latency
46	Qps	CTW	MSSQL_Delivered_Commands	The number of commands per second
47	Qps	CTW	MSSQL_Delivered_Transactions	The number of transactions per second
48	Qps	CTW	MSSQL_Conflicts	The number of conflicts per second
49	Qps	CTW	MSSQL_Uploaded_Changes	The number of upload changes per second
50	Qps	CTW	MSSQL_Downloaded_Changes	The number of download changes per second
51	QTY	CTW	MSSQL_Allocate_Space_Failed	The number of space allocation errors.
52	MB	CTW	MSSQL_Database_Space_Used	Database space used.
53	MB	CTW	MSSQL_Log_File_Size	Size of log file
54	PRC	CTW	MSSQL_Log_Space_Percent_Used_Actual	Percent of maximum log space used
55	MB	CTW	MSSQL_Database_Size	Size of database
56	PRC	CTW	MSSQL_Database_Space_Percent_Used_Actual	Percent of maximum database used
57	PRC	CTW	MSSQL_Filegroup_Space_Percent_Used_Actual	Filegroup space percent used
58	MB	CTW	MSSQL_Filegroup_Size	Current size of filegroup
59	QTY	CTW	MSSQL_Replication_Job_Failed	Number of jobs failed

<b>MsmtTyp_ID</b> <b>INTEGER</b>	<b>MUnit_Cd</b> <b>CHAR(6)</b>	<b>MSrc_Cd</b> <b>CHAR</b> <b>(6)</b>	<b>MsmtTyp_Nm*</b> <b>VARCHAR(120)</b>	<b>MsmtTyp_Ds</b> <b>VARCHAR(254)</b>
60	QTY	CTW	MSSQL_Replication_Job_Between_Retries	Number of jobs between retries
61	QTY	CTW	MSSQL_Replication_Job_Retry	Number of jobs retried
62	QTY	CTW	MSSQL_Replication_Job_Idle	Number of jobs idle
63	QTY	CTW	MSSQL_Replication_Job_In_Progress	Number of jobs in progress
64	QTY	CTW	MSSQL_Replication_Job_Cancelled	Number of jobs cancelled
65	QTY	CTW	MSSQL_Replication_Job_Waiting_For_Thread	Number of jobs waiting for thread
66	QTY	CTW	MSSQL_Replication_Job_Succeeded	Number of jobs succeeded
67	QTY	CTW	MSSQL_Replication_Job_Executing	Number of jobs executing
68	QTY	CTW	MSSQL_Replication_Job_Suspended	Number of jobs suspended
69	QTY	CTW	MSSQL_Replication_Job_Performing_Completion_Actions	Number of jobs performing completion actions
70	QTY	CTW	MSSQL_Error_Count_Transaction_Log_Full	Number of times transaction log full message in error log
71	QTY	CTW	MSSQL_Error_Count_Disk_IO_Errors	Number of times disk I/O error message in error log
72	QTY	CTW	MSSQL_Error_Count_Connections_High	Number of times connections high message in error log
73	QTY	CTW	MSSQL_Error_Count_Connections_Failed	Number of times connection failed message in error log
74	QTY	CTW	MSSQL_Error_Count_Allocate_Space_Failed	Number of times allocate failed message in error log
75	QTY	CTW	MSSQL_Error_Count_Transaction_Log_Errors	Number of times transaction log error message in error log
76	QTY	CTW	MSSQL_Error_Count_Database_Full	Number of times database full message in error log

<b>MsmtTyp_ID</b> INTEGER	<b>MUnit_Cd</b> CHAR(6)	<b>MSrc_Cd</b> CHAR (6)	<b>MsmtTyp_Nm*</b> VARCHAR(120)	<b>MsmtTyp_Ds</b> VARCHAR(254)
77	QTY	CTW	MSSQL_Error_Count_Deadlock_Alert	Number of times deadlock alert message in error log
78	QTY	CTW	MSSQL_Error_Count_Customer_Defined	Number of times customer defined message in error log

### 6.2.9 Component measurement rule (table MsmtRul)

<b>CompTyp_Cd</b> CHAR(17)	<b>MsmtTyp_ID</b> INTEGER
CTW_SERVICE	1-3
CTW_INSTANCE	4-7, 10-26, 36-42, 71-78
CTW_JOBCATEGORY	27-33, 59-69
CTW_DATABASE	8-9, 34-35, 51-56
CTW_FILEGROUP	57-58
CTW_AGENT	45-50
CTW_REPLICATION	43-44

### 6.2.10 Measurement (table Msmt)

<b>Msmt_ID</b> BIGINT	<b>Comp_ID</b> INTEGER	<b>MsmtTyp_ID</b> INTEGER	<b>TmSum_Cd</b> CHAR	<b>Msmt_Strt_Dt</b> DATE	<b>Msmt_Strt_Tm</b> TIME	<b>Msmt_Min_Val</b> FLOAT	<b>Msmt_Max_Val</b> FLOAT	<b>Msmt_Avg_Val</b> FLOAT	<b>Msmt_Tot_Val</b> FLOAT	<b>Msmt_Smpl_Cnt</b> INTEGER	<b>Msmt_Err_Cnt</b> INTEGER
1	3	3	H	20020601	02.00.00	0	50	50			
2	3	4	H	20020601	02.00.00	3	25	14			
3	3	5	H	20020601	02.00.00	15	50	25			
4	3	18	H	20020601	02.00.00	23	80	50			
5	4	30	H	20020601	02.00.00	5	40	20			
6	4	53	H	20020601	02.00.00	98	100	99			

## 6.3 Helper tables

This warehouse pack does not generate helper tables.

## 6.4 Exception tables

This warehouse pack does not generate exception tables.

## 6.5 Incremental extraction

This warehouse pack does not include incremental extraction.

## 7 IBM Tivoli Monitoring integration

### 7.1 Metadata tables for applications that use the resource model ETL

This section defines the data in the Tivoli Enterprise Data Warehouse central data warehouse.

#### 7.1.1 Resource translation (table Resource\_Transl)

Resource	CompTyp_cd
MSSQLService	CTW_SERVICE
MSSQLDatabase	CTW_DATABASE
MSSQLServer	CTW_INSTANCE
MSSQLFilegroup	CTW_FILEGROUP
MSSQLServerReplication	CTW_AGENT
MSSQLDatabaseReplication	CTW_REPLICATION
MSSQLJobCategory	CTW_JOBCATEGORY

#### 7.1.2 Category translation (table Category\_Transl)

Category	MSrc_cd
Microsoft_SQL_Server	CTW

#### 7.1.3 Component type translation (table CompTyp\_Transl)

MSrc_Cd	ITM_Key_Property <sup>1</sup>	CompTyp_Cd	Comp_Format_Nm <sup>1</sup>
CTW	MSSQLService.MSSQLServiceName	CTW_SERVICE	MSSQLService.MSSQLServiceName
CTW	MSSQLDatabase.MSSQLDatabaseName	CTW_DATABASE	MSSQLDatabase.MSSQLDatabaseName
CTW	MSSQLFilegroup.MSSQLFilegroupName	CTW_FILEGROUP	MSSQLFilegroup.MSSQLFilegroupName
CTW	MSSQLServer.MSSQLServerName	CTW_INSTANCE	MSSQLServer.MSSQLServerName
CTW	MSSQLServerReplication.MSSQLAgentType	CTW_AGENT	MSSQLServerReplication.MSSQLAgentType
CTW	MSSQLDatabaseReplication.MSSQLDatabaseName	CTW_REPLICATION	MSSQLDatabaseReplication.MSSQLDatabaseName
CTW	MSSQLJobCategory.MSSQLJobCategory	CTW_JOBCATEGORY	MSSQLJobCategory.MSSQLJobCategory

<sup>1</sup> Use a semicolon(;) to separate values in ITM\_Key\_Property and Comp\_Format\_Nm. Do not put a semicolon after the last value.

#### 7.1.4 Attribute translation (table AttrTyp\_Transl)

MSrc_cd	ITM_Attr_Property	AttrTyp_Cd
CTW	MSSQLDatabase.MSSQLLogFileName	CTW_LOG_FILENAME
CTW	MSSQLDatabase.MSSQLLogMaximumGrowthSize	CTW_LOG_MAXSIZE
CTW	MSSQLDatabase.MSSQLDatabaseMaximumGrowthSize	CTW_DB_MAXSIZE

MSrc_cd	ITM_Attr_Property	AttrTyp_Cd
CTW	MSSQLFilegroup.MSSQLFilegroupMaximumGrowthSize	CTW_FILEG_MAXSIZE
CTW	MSSQLServer.MSSQLVersion	VERSION
CTW	MSSQLServer.MSSQLMaxConnections	MAX_CONNECTIONS

## 7.2 IBM Tivoli Monitoring resource models

The following sections contain information in the IBM Tivoli Monitoring database that is used as the operational data source for Tivoli Enterprise Data Warehouse. For more information about resource models, see the *IBM Tivoli Monitoring Workbench User's Guide*.

### 7.2.1 Resource model for MSSQL Availability - Service

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServiceName=MSSQL\$FRANKIESQL2KA;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLService
Metrics	Name VARCHAR(128)	MSSQL_Service_Running
		MSSQL_Service_Paused
		MSSQL_Service_Stopped
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.2 Resource model for MSSQL Availability - Database

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=FULLERS;MSSQLDatabaseName=Northwind;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLDatabase
Metrics	Name VARCHAR(128)	MSSQL_Database_Online
		MSSQL_Database_Suspect
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.3 Resource model for MSSQL Space Usage - Database

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=FRANKIE;MSSQLDatabaseName=Northwind;
Resources	Name VARCHAR(64)	MSSQLDatabase
Categories	Context VARCHAR(128)	MSSQLLogFileName
		MSSQLLogMaximumGrowthSize
		MSSQLDatabaseMaxGrowthSize
Metrics	Name VARCHAR(128)	MSSQL_Log_File_Size
		MSSQL_Log_Space_Percent_Used_Actual
		MSSQL_Database_Size
		MSSQL_Database_Space_Percent_Used_Actual
		MSSQL_Database_Growth_Percent_Actual

<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.

### 7.2.4 Resource model for MSSQL Space Usage - Filegroup

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=Fullers;MSSQLDatabase.MSSQLDatabaseName=Northwind; MSSQLFilegroupName=PRIMARY;
Resources	Name VARCHAR(64)	MSSQLFilegroup
Categories	Context VARCHAR(128)	MSSQLFilegroupMaximumGrowthSize
Metrics	Name VARCHAR(128)	MSSQL_Filegroup_Space_Percent_Used_Actual
		MSSQL_Filegroup_Size
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.5 Resource model for MSSQL Replication - Performance

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=flyingdog;MSSQLAgentType=logreader;



ITM Table Name	Column Name	Value
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLServerReplication
Metrics	Name VARCHAR(128)	MSSQL_Delivery_Latency
		MSSQL_Delivered_Commands
		MSSQL_Delivered_Transactions
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.6 Resource model for MSSQL Replication - Merge Performance

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=flyingdog;MSSQLAgentType;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLServerReplication
Metrics	Name VARCHAR(128)	MSSQL_Conflicts -
		MSSQL_Downloaded_Changes
		MSSQL_Uploaded_Changes
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.7 Resource model for MSSQL Replication - Database

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=peloton;MSSQLDatabaseName=Northwind;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLDatabaseReplication
Metrics	Name VARCHAR(128)	MSSQL_Replication_Pending_Transactions
		MSSQL_Replication_Transaction_Rate
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.8 Resource model for MSSQL Jobs

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=peloton;MSSQLJobCategory=DefaultCategory;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLJobCategory
Metrics	Name VARCHAR(128)	MSSQL_Job_Duration
		MSSQL_Job_Failed
		MSSQL_Job_Cancelled
		MSSQL_Job_Retry
		MSSQL_Job_Cancelled
		MSSQL_Job_Not_Run
		MSSQL_Job_Succeeded
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.9 Resource model for MSSQL Replication Jobs

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=peloton;MSSQLJobCategory=DefaultCategory;
Categories	Name VARCHAR(128)	MSSQLReplicationJobName
Resources	Context VARCHAR(64)	MSSQLJobCategory
Metrics	Name VARCHAR(128)	MSSQL_Replication_Job_Failed
		MSSQL_Replication_Job_Between_Retries
		MSSQL_Replication_Job_Retry
		MSSQL_Replication_Job_Idle
		MSSQL_Replication_Job_In_Progress
		MSSQL_Replication_Job_Cancelled

ITM Table Name	Column Name	Value
		MSSQL_Replication_Job_Waiting_For_Thread
		MSSQL_Replication_Job_Succeeded
		MSSQL_Replication_Job_Executing
		MSSQL_Replication_Job_Suspended
		MSSQL_Replication_Job_Performing_Completion_Actions
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

#### 7.2.10 Resource model for MSSQL Users/Transactions - Server

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServerName=FRANKIE;
Categories	Name VARCHAR(128)	MSSQLVersion
		MSSQLMaximumConnections
Resources	Context VARCHAR(64)	MSSQLServer
Metrics	Name VARCHAR(128)	MSSQL_Blocked_Processes
		MSSQL_Logouts
		MSSQL_User_Connections
		MSSQL_Percent_User_Connections_Used
		MSSQL_Logins
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

#### 7.2.11 Resource model for MSSQL Users/Transactions - Database

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServer.MSSQLServerName=FRANKIE;MSSQLDatabaseName=Northwind;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLDatabase

ITM Table Name	Column Name	Value
Metrics	Name VARCHAR(128)	MSSQL_Active_Transactions
		MSSQL_Transactions_Rate
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

#### 7.2.12 Resource model for MSSQL Locks – Table Lock Escalations

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServerName=peloton;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLServer
Metrics	Name VARCHAR(128)	MSSQL_Table_Lock_Escalations
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

#### 7.2.13 Resource model for MSSQL Locks – Lock Performance

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServerName=peloton;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLServer
Metrics	Name VARCHAR(128)	MSSQL_Lock_Waits
		MSSQL_Lock_Requests
		MSSQL_Lock_Timeouts
		MSSQL_Lock_Wait_Time
		MSSQL_Number_DeadLocks
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

#### 7.2.14 Resource model for MSSQL Cache/CPU - Performance

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServerName=FRANKIE;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLServer
Metrics	Name VARCHAR(128)	MSSQL_Buffer_Cache_Hit_Ratio
		MSSQL_Stolen_Page_Count_Growth
		MSSQL_Stolen_Page_Count
		MSSQL_Read_Ahead_Pages
		MSSQL_Checkpoint_Writes
		MSSQL_Page_Reads
		MSSQL_Page_Writes
		MSSQL_Lazy_Writes
		MSSQL_Free_Buffers
		MSSQL_Buffer_Extended_Memory_Cache_Hit_Ratio
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

#### 7.2.15 Resource model for MSSQL Cache/CPU - Memory

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServerName=peloton;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLServer
Metrics	Name VARCHAR(128)	MSSQL_Total_Server_Memory_Used
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.16 Resource model for MSSQL Cache/CPU - CPU

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServerName=FULLERS;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLServer
Metrics	Name VARCHAR(128)	MSSQL_CPU_Percent_Busy
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

### 7.2.17 Resource model for MSSQL Error Log

ITM Table Name	Column Name	Value
Instances <sup>1</sup>	Instance_Key VARCHAR(2096)	MSSQLServerName=FRANKIE;
Categories	Name VARCHAR(128)	
Resources	Context VARCHAR(64)	MSSQLServer
Metrics	Name VARCHAR(128)	MSSQL_Error_Count_Transaction_Log_Full
		MSSQL_Error_Count_Deadlock_Alert
		MSSQL_Error_Count_Database_Full
		MSSQL_Error_Count_Transaction_Log_Errors
		MSSQL_Error_Count_Allocate_Space_Failed
		MSSQL_Error_Count_Connections_Failed
		MSSQL_Error_Count_Connections_High
		MSSQL_Error_Count_Disk_IO_Errors
		MSSQL_Error_Count_Customer_Defined
<sup>1</sup> Use a semicolon (;) to separate values within Instances. Put a semicolon after the last value.		

## 8 Data mart schema information

The following sections contain the definition of star schemas, metric dimension tables, data marts, and reports provided with the IBM Tivoli for Monitoring Databases: Microsoft SQL Server warehouse pack.

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

### 8.1 Star schemas

Before using this section, read about the star schemas in *Enabling an Application for Tivoli Enterprise Data Warehouse*. That document defines the content of each table and explains the relationships between the tables in this document.

This warehouse pack provides the following star schemas.

#### 8.1.1 MSSQL Hourly Data File Space Used Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly filegroup space used*
Name of fact table	CTW.F_FILEGROUPSPC_HOUR
Name of metric dimension table	CTW.D_FILEGROUPSPC_METRIC
Names of other dimension tables	CTW.D_FILEGROUP
	CTW.D_INSTANCE
	CTW.D_DATABASE

##### 8.1.1.1 Fact table CTW.F\_FILEGROUPSPC\_HOUR

Metric_ID INTEGER	Datafile_id INTEGER	Database_id INTEGER	Instance_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
1	1	1	1	2002-06-04-00.00.00	20	35	28	253	

#### 8.1.2 MSSQL Hourly Database Average Percent Used Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly database average space used*
Name of fact table	CTW.F_DBAVERAGEUSED_HOUR
Name of metric dimension table	CTW.D_DBUSAGE_METRIC
Names of other dimension tables	CTW.D_INSTANCE
	CTW.D_DATABASE

#### 8.1.2.1 Fact table CTW.F DBAVERAGEUSED HOUR

Metric_ID INTEGER	Database_id INTEGER	Instance_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
2	1	1	2002-06-04-00.00.00	40	60	55		

#### 8.1.3 MSSQL Hourly Service Availability Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly reporting of server availability*
Name of fact table	CTW.F_SERVERAVAIL_HOUR
Name of metric dimension table	CTW.D_SERVERAVAIL_METRIC
Names of other dimension tables	CTW.D_SERVICE

#### 8.1.3.1 Fact table CTW.F SERVERAVAIL HOUR

Metric_ID INTEGER	Service_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
1	3	2002-06-04-00.00.00	0	0	0		
2	3	2002-06-04-00.00.00	0	100	50		
3	3	2002-06-04-00.00.00	100	100	100		

#### 8.1.4 MSSQL Hourly Replication Delivery Latency Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly reporting of database replication delivery latency*
Name of fact table	CTW.F_AGENTLATENCY_HOUR
Name of metric dimension table	CTW.D_AGENTLATENCY_METRIC
Names of other dimension tables	CTW.D_INSTANCE
	CTW.D_AGENT



#### 8.1.4.1 Fact table CTW.F AGENTLATENCY HOUR

Metric_ID INTEGER	Agent_id INTEGER	Instance_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
1	1	1	2002-06-04-00.00.00	2	25	10		

#### 8.1.5 MSSQL Hourly Server Performance Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly reporting of server performance*
Name of fact table	CTW.F_SERVERPERF_HOUR
Name of metric dimension table	CTW.D_SERVERPERF_METRIC
Names of other dimension tables	CTW.D_INSTANCE

#### 8.1.5.1 Fact table CTW.F SERVEPERFL HOUR

Metric_ID INTEGER	Instance_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
1	3	2002-06-04-00.00.00	0	0	0		
2	4	2002-06-04-00.00.00	0	100	50		
3	8	2002-06-04-00.00.00	100	100	100		

#### 8.1.6 MSSQL Hourly Replication Activity Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly reporting of database replication transaction performance*
Name of fact table	CTW.F_REPLICATION_HOUR
Name of metric dimension table	CTW.D_REPLICATION_METRIC
Names of other dimension tables	CTW.D_REPLICATION
Names of other dimension tables	CTW.D_INSTANCE

#### 8.1.6.1 Fact table CTW.F REPLICATION HOUR

Metric_ID INTEGER	Replication_id INTEGER	Instance_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
1	1	1	2002-06-04-00.00.00	2	5	5		

#### 8.1.7 MSSQL Hourly Jobs Activity Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly reporting of server job completion status*
Name of fact table	CTW.F_JOBCATEGORY_HOUR
Name of metric dimension table	CTW.D_JOBCATEGORY_METRIC
Names of other dimension tables	CTW.D_JOBCATEGORY
Names of other dimension tables	CTW.D_INSTANCE

#### 8.1.7.1 Fact table CTW.F JOBCATEGORY HOUR

Metric_ID INTEGER	Jobcategory_id INTEGER	Instance_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
1	1	1	2002-06-04-00.00.00	0	2	1		

#### 8.1.8 MSSQL Hourly Cpu Usage Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly reporting of server Cpu utilization*
Name of fact table	CTW.F_SERVERCPUUSAGE_HOUR
Name of metric dimension table	CTW.D_SERVERCPUUSAGE_METRIC
Names of other dimension tables	CTW.D_INSTANCE

#### 8.1.8.1 Fact table CTW.F SERVERCPUUSAGE HOUR

Metric_ID INTEGER	Instance_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
1	1	2002-06-04-00.00.00	2	25	10		

### 8.1.9 MSSQL Hourly Error Message Star Schema

Description of star schema (in IWH_STARSHEMA)	Microsoft SQL Server star schema for hourly reporting of server error message logging*
Name of fact table	CTW.F_ERRORLOGCOUNT_HOUR
Name of metric dimension table	CTW.D_ERRORLOGCOUNT_METRIC
Names of other dimension tables	CTW.D_INSTANCE

#### 8.1.9.1 Fact table CTW.F\_ERRORLOGCOUNT\_HOUR

Metric_ID INTEGER	Instance_id INTEGER	Meas_hour TIMESTAMP	Min_value DOUBLE	Max_value DOUBLE	Avg_value DOUBLE	Total_value DOUBLE	Sample_count DOUBLE
1	1	2002-06-04-00.00.00	2	25	10		

## 8.2 Metric dimension tables

This section describes the metric dimension tables used by the star schemas in this warehouse pack. Shaded columns indicate text that is translated. These column headings are also marked with an asterisk.

### 8.2.1 CTW.D\_FILEGROUPSPC\_METRIC

Metric_ID INTEGER	Met_category * VARCHAR(254)	Met_desc * VARCHAR(254)	Met_name * VARCHAR(254)	Met_units * VARCHAR(254)	Min_exists CHAR(1)	Max_exists CHAR(1)	Avg_exists CHAR(1)	Total_exists CHAR(1)	Msrc_nm * VARCHAR(254)
1	Not used	Filegroup space percent used	Group size	Percent	Y	Y	Y	N	Component Name <sup>2</sup>
2	Not use	Current size of Filegroup	Current size	Megabytes	Y	Y	Y	N	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

### 8.2.2 CTW.D\_DBUSAGE\_METRIC

Metric_ID INTEGER	Met_category * VARCHAR(254)	Met_desc * VARCHAR(254)	Met_name * VARCHAR(254)	Met_units * VARCHAR(254)	Min_exists CHAR(1)	Max_exists CHAR(1)	Avg_exists CHAR(1)	Total exists CHAR(1)	Msrc_nm * VARCHAR(254)
1	Not used	Active Transactions	Current count	QTY	Y	Y	Y	N	Component Name <sup>2</sup>
2	Not use	Transaction Rate	Number of active transactions	QTY	Y	Y	Y	N	Component Name <sup>2</sup>
3	Not use	Database Size	Size of database	Megabytes	Y	Y	Y	N	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

### 8.2.3 CTW.D\_SERVERAVAIL\_METRIC

Metric_ID INTEGER	Met_category * VARCHAR(254)	Met_desc * VARCHAR(254)	Met_name * VARCHAR(254)	Met_units * VARCHAR(254)	Min_exists CHAR(1)	Max_exists CHAR(1)	Avg_exists CHAR(1)	Total exists CHAR(1)	Msrc_nm * VARCHAR(254)
1	Not used	Service in stopped state	Stopped state	Percent	N	N	N	Y	Component Name <sup>2</sup>
2	Not use	Service in paused state	Paused state	Percent	N	N	N	Y	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

### 8.2.4 CTW.D\_SERVERCPUUSAGE\_METRIC

Metric_ID INTEGER	Met_category * VARCHAR(254)	Met_desc * VARCHAR(254)	Met_name * VARCHAR(254)	Met_units * VARCHAR(254)	Min_exists CHAR(1)	Max_exists CHAR(1)	Avg_exists CHAR(1)	Total exists CHAR(1)	Msrc_nm * VARCHAR(254)
1	Not used	Cpu Usage Delta	High water mark for Cpu busy	Percent	Y	Y	Y	N	Component Name <sup>2</sup>

<b>Metric_ID</b> <b>INTEGER</b>	<b>Met_category *</b> <b>VARCHAR(254)</b>	<b>Met_desc *</b> <b>VARCHAR(254)</b>	<b>Met_name *</b> <b>VARCHAR(254)</b>	<b>Met_units *</b> <b>VARCHAR(254)</b>	<b>Min_exists</b> <b>CHAR(1)</b>	<b>Max_exists</b> <b>CHAR(1)</b>	<b>Avg_exists</b> <b>CHAR(1)</b>	<b>Total exists</b> <b>CHAR(1)</b>	<b>Msrc_nm *</b> <b>VARCHAR(254)</b>
2	Not used	Cpu Percent Busy	Cpu percent busy	Percent	Y	Y	Y	N	Component Name <sup>2</sup>
3	Not used	Cpu Usage MS	Cpu milliseconds used by Microsoft SQL server	Seconds	Y	Y	Y	N	Component Name <sup>2</sup>
4	Not use	Service in running state	Running state	Percent	Y	Y	Y	N	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

#### 8.2.5 CTW.D\_SERVERPERF\_METRIC

<b>Metric_ID</b> <b>INTEGER</b>	<b>Met_category *</b> <b>VARCHAR(254)</b>	<b>Met_desc *</b> <b>VARCHAR(254)</b>	<b>Met_name *</b> <b>VARCHAR(254)</b>	<b>Met_units *</b> <b>VARCHAR(254)</b>	<b>Min_exists</b> <b>CHAR(1)</b>	<b>Max_exists</b> <b>CHAR(1)</b>	<b>Avg_exists</b> <b>CHAR(1)</b>	<b>Total exists</b> <b>CHAR(1)</b>	<b>Msrc_nm *</b> <b>VARCHAR(254)</b>
1	Not used	Logins	Number of login attempts	QTY	Y	Y	Y	N	Component Name <sup>2</sup>
2	Not used	Logouts	Number of logout attempts	QTY	Y	Y	Y	N	Component Name <sup>2</sup>
3	Not used	Buffer Cache Hit Ratio	Times data found in buffer cache	Percent	Y	Y	Y	N	Component Name <sup>2</sup>
4	Not use	Blocked Processes	Number of blocked server processes	QTY	Y	Y	Y	N	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

### 8.2.6 CTW.D\_AGENTLATENCY\_METRIC

<b>Metric_ID</b> <b>INTEGER</b>	<b>Met_category *</b> <b>VARCHAR(254)</b>	<b>Met_desc *</b> <b>VARCHAR(254)</b>	<b>Met_name *</b> <b>VARCHAR(254)</b>	<b>Met_units *</b> <b>VARCHAR(254)</b>	<b>Min_exists</b> <b>CHAR(1)</b>	<b>Max_exists</b> <b>CHAR(1)</b>	<b>Avg_exists</b> <b>CHAR(1)</b>	<b>Total exists</b> <b>CHAR(1)</b>	<b>Msrc_nm *</b> <b>VARCHAR(254)</b>
1	Not used	Agent delivery latency	Latency in seconds	Seconds	Y	Y	Y	N	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

### 8.2.7 CTW.D\_REPLICATION\_METRIC

<b>Metric_ID</b> <b>INTEGER</b>	<b>Met_category *</b> <b>VARCHAR(254)</b>	<b>Met_desc *</b> <b>VARCHAR(254)</b>	<b>Met_name *</b> <b>VARCHAR(254)</b>	<b>Met_units *</b> <b>VARCHAR(254)</b>	<b>Min_exists</b> <b>CHAR(1)</b>	<b>Max_exists</b> <b>CHAR(1)</b>	<b>Avg_exists</b> <b>CHAR(1)</b>	<b>Total exists</b> <b>CHAR(1)</b>	<b>Msrc_nm *</b> <b>VARCHAR(254)</b>
1	Not used	Transaction Rate	Replication transaction rate	QTY	Y	Y	Y	N	Component Name <sup>2</sup>
2	Not used	Pending Transactions	Pending replication transaction	QTY	Y	Y	Y	N	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

### 8.2.8 CTW.D\_JOBCATEGORY\_METRIC

<b>Metric_ID</b> <b>INTEGER</b>	<b>Met_category *</b> <b>VARCHAR(254)</b>	<b>Met_desc *</b> <b>VARCHAR(254)</b>	<b>Met_name *</b> <b>VARCHAR(254)</b>	<b>Met_units *</b> <b>VARCHAR(254)</b>	<b>Min_exists</b> <b>CHAR(1)</b>	<b>Max_exists</b> <b>CHAR(1)</b>	<b>Avg_exists</b> <b>CHAR(1)</b>	<b>Total exists</b> <b>CHAR(1)</b>	<b>Msrc_nm *</b> <b>VARCHAR(254)</b>
1	Not used	Job Failed	Server job failed	QTY	Y	Y	Y	N	Component Name <sup>2</sup>
2	Not used	Job Succeeded	Server job succeeded	QTY	Y	Y	Y	N	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

### 8.2.9 CTW.D\_ERRORLOGCOUNT\_METRIC

Metric_ID INTEGER	Met_category * VARCHAR(254)	Met_desc * VARCHAR(254)	Met_name * VARCHAR(254)	Met_units * VARCHAR(254)	Min_exists CHAR(1)	Max_exists CHAR(1)	Avg_exists CHAR(1)	Total exists CHAR(1)	Msrc_nm * VARCHAR(254)
1	Not used	Transaction Log Full	Transaction Log Full	QTY	Y	Y	Y	Y	Component Name <sup>2</sup>
2	Not used	Disk IO Errors	Disk IO Errors	QTY	Y	Y	Y	Y	Component Name <sup>2</sup>
3	Not used	Connections High	Connections High	QTY	Y	Y	Y	Y	Component Name <sup>2</sup>
4	Not used	Connection Failed	Connection Failed	QTY	Y	Y	Y	Y	Component Name <sup>2</sup>
5	Not used	Allocate Space Failed	Allocate Space Failed	QTY	Y	Y	Y	Y	Component Name <sup>2</sup>
6	Not used	Customer Defined	Customer Defined	QTY	Y	Y	Y	Y	Component Name <sup>2</sup>
7	Not used	Transaction Log Errors	Transaction Log Errors	QTY	Y	Y	Y	Y	Component Name <sup>2</sup>
8	Not used	Deadlock Alert	Deadlock Alert	QTY	Y	Y	Y	Y	Component Name <sup>2</sup>
9	Not used	Database Full	Database Full	QTY	Y	Y	Y	N	Component Name <sup>2</sup>

<sup>2</sup> The component name is IBM Tivoli Monitoring for Databases: Microsoft SQL Server.

## 8.3 Dimension tables

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

### 8.3.1 Dimension table CTW.D\_Filegroup

The following columns are used in this dimension table:

- Filegroup\_Id
- Filegroup\_Name: Microsoft SQL Server Database File Group name

### 8.3.2 Dimension table CTW.D\_Host

The following columns are used in this dimension table:

- Host\_Id
- Host\_Name: Server Host name

### 8.3.3 Dimension table CTW.D\_Database

The following columns are used in this dimension table:

- Database\_Id
- Database\_Name: Microsoft SQL Server Database name

### 8.3.4 Dimension table CTW.D\_Instance

The following columns are used in this dimension table:

- Instance\_Id
- Instance\_Name: Microsoft SQL Server Instance name

### 8.3.5 Dimension table CTW.D\_Service

The following columns are used in this dimension table:

- Service\_Id
- Service\_Name: Microsoft SQL Server Service name

### 8.3.6 Dimension table CTW.D\_JobCategory

The following columns are used in this dimension table:

- JobCategory\_Id
- JobCategory\_Name: Microsoft SQL Server Job Category

### 8.3.7 Dimension table CTW.D\_Agent

The following columns are used in this dimension table:

- Agent\_Id
- Agent\_Name: Microsoft SQL Server Replication Agent Name

### 8.3.8 Dimension table CTW.D\_Replication

The following columns are used in this dimension table:

- Replication\_Id
- Database\_Name: Microsoft SQL Server Database Name

## 8.4 Data marts and reports

This warehouse pack provides the following data marts.

### 8.4.1 Microsoft SQL Server Data mart

- MSSQL Daily Cpu Usage Star Schema
- MSSQL Daily Data File Space Used Star Schema
- MSSQL Daily Database Average Percent Used Star Schema
- MSSQL Daily Error Message Star Schema
- MSSQL Daily Jobs Activity Star Schema
- MSSQL Daily Replication Activity Star Schema
- MSSQL Daily Replication Delivery Latency Star Schema
- MSSQL Daily Server Performance Star Schema



- MSSQL Daily Service Availability Star Schema
- MSSQL Hourly Cpu Usage Star Schema
- MSSQL Hourly Data File Space Used Star Schema
- MSSQL Hourly Database Average Percent Used Star Schema
- MSSQL Hourly Error Message Star Schema
- MSSQL Hourly Jobs Activity Star Schema
- MSSQL Hourly Replication Activity Star Schema
- MSSQL Hourly Replication Delivery Latency Star Schema
- MSSQL Hourly Server Performance Star Schema
- MSSQL Hourly Service Availability Star Schema
- MSSQL Monthly Cpu Usage Star Schema
- MSSQL Monthly Data File Space Used Star Schema
- MSSQL Monthly Database Average Percent Used Star Schema
- MSSQL Monthly Error Message Star Schema
- MSSQL Monthly Jobs Activity Star Schema
- MSSQL Monthly Replication Activity Star Schema
- MSSQL Monthly Replication Delivery Latency Star Schema
- MSSQL Monthly Server Performance Star Schema
- MSSQL Monthly Service Availability Star Schema
- MSSQL Weekly Cpu Usage Star Schema
- MSSQL Weekly Data File Space Used Star Schema
- MSSQL Weekly Database Average Percent Used Star Schema
- MSSQL Weekly Error Message Star Schema
- MSSQL Weekly Jobs Activity Star Schema
- MSSQL Weekly Replication Activity Star Schema
- MSSQL Weekly Replication Delivery Latency Star Schema
- MSSQL Weekly Server Performance Star Schema
- MSSQL Weekly Service Availability Star Schema

#### **8.4.2 Reports**

This data mart provides the following prepackaged reports.

##### **8.4.2.1 Daily Filegroup Space Usage Health Check**

This health check report provides details about the size of the various databases (at the FileGroup level) on the server at a particular date and time or per a specific range of dates and times. This report helps to determine the change in the database sizes due to the higher volume of the data flow.

##### **8.4.2.2 Daily Database Space Used (Filegroup) Summary**

This summary report provides the maximum size of the various databases filegroups. This report helps to determine the change in the database sizes due to the higher volume of the data flow.

#### **8.4.2.3 Daily Server Availability Extreme Case**

This extreme case report provides the percentage of time that the Microsoft SQL server is available.

#### **8.4.2.4 Daily Replication Agent Latency Health Check**

This health check report provides the latency of delivery for replication. This report helps to determine whether the replication process was slowing down.

#### **8.4.2.5 Daily Server Cpu Usage Extreme Case**

This extreme case report provides the maximum CPU cycles used for a given Microsoft SQL Server.

#### **8.4.2.6 Daily Server Error Message Count Summary**

This summary provides the number of times a Microsoft SQL Server error message was logged within a time period.

#### **8.4.2.7 Daily Database Usage Health Check**

This health check report provides maximum percent of space used by a database.

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