APPENDIX C

CiscoWorks Database Tables

This appendix contains information on the CiscoWorks database table structures. The following tables are described:

- AutoInstall table
- CiscoConnect table *cisco_connect_users*
- Device inventory tables *admins*, *devices*, *interfaces*, *ifaddresses*, *contacts*, *lines*, *locations*, *networks*, *people*, *phones*, *protocol types*, *vendor*
- Polling tables *attr*, *columns*, *grouptemplate*, *pollers*, *polls*, *polls_config*, *start_stop*, *plus* several sample tables
- Device configuration tables *device_config*, *history*
- Domain tables including *domains* and *domain_devices*
- Global Commands and Scheduler tables *gcmds*, *gcmds_domains*, and *crons*
- Configuration Snap-In Manager tables *pccmdset* and *pcdevset*
- Software management table *SysFiles*
- Log table *ciscolog*

Certain tables that exist in the Sybase database are not described in this appendix. These tables include the security tables and normally need not be accessed. It is highly recommended that you do not edit these tables.

Depending on your network management platform, you may not have access to certain CiscoWorks applications and therefore do not have access to those associated tables.

Caution Do not modify database table information. For Sybase-knowledgable users, refer to the schema files located in *$NMSROOT/etc*.

Reference on Database Structure

Because this release of CiscoWorks uses Sybase 10, there is a different method to access tables. For example use **dbname.username.tablename.columnname**, depending on which database you are currently in.

The two CiscoWorks databases, nmsdb and polldb, have different purposes.

Functions	nms Database	poll Database
Storage data description	Stores device inventory and configuration information including device name, community strings, and contact information.	Stores dynamic information on your network devices including polling tables created using the Device Polling application. This information was known as *transaction log information* in previous releases of CiscoWorks.
Backup strategy	Implements incremental transaction log backup when threshold is reached.	Dumps transaction log when database threshold is reached. No recovery of this information is supported. If you want to keep this dynamic information for analysis, copy the information to another storage space on your workstation.
Schema file location	*$NMSROOT/etc/cw_nms_schema*	*$NMSROOT/etc/cw_polldb_schema*
Table storage[1]	Stores tables including • AutoInstall table. • Device inventory tables: admins, devices, interfaces, ifaddresses, contacts, lines, locations, networks, people, phones, protocol types, vendor. • Device configuration tables: device_config, history. • Domain tables including domains and domain_devices. • Global Commands and Scheduler tables: gcmds, gcmds_domains, and crons. • Configuration Snap-In Manager tables: pccmdset and pcdevset. • Software management table, SysFiles.	Stores tables including • Polling tables: attr, columns, grouptemplate, pollers, polls, polls_config, sample tables, start_stop, uint4. • Log table, ciscolog.
Environment variables	*CW_NMSDB* default name is *nms*	*CW_POLLDB* default name is *$CW_NMSDB*

1. To search for database table information using Sybase commands, use the following format: *dbname.username.tablename.columnname.*

CiscoWorks Database Tables

This section provides tables depicting the relationship between the major tables in the CiscoWorks database, and lists table structure characteristics.

Table C-1 lists the conventions used in defining fields.

Table C-1 Database Field Conventions

Convention	Description
int	A whole number between 2^{31} –1 (2,147,483,647) and $–2^{31}$ (–2,147,483,648) inclusive. Storage size is 4 bytes.
uint4	A user-defined data type to store unsigned integer 2^{32} –1.
smallint	A whole number between 2^{15} –1 (32,767) and $–2^{15}$ (–32,768) inclusive. Storage size is 2 bytes.
tinyint	A whole number between 0 and 255 inclusive. Storage size is 1 byte.
NULL	A field that does not have to be filled in. The word *null* does not have to be entered; the field may be left blank if no data is entered.
varchar	A variable character defined by the number of characters in parentheses.
text	A text string.
image	A block of data.

Table-to-table links throughout the database structure are accomplished using *id* fields—for example, device_id, people_id, admin_id, and so on.

Note Sybase software is case-sensitive, so enter all database tables in lower case.

AutoInstall Database Table

The AutoInstall Manager application uses the autoinstall table to store data records on the following items. (See Table C-2.)

Table C-2 autoinstall Table File Structure

Field Name	Field Type	Field Value	Description
aim_id	int		AutoInstall ID.
aim_state	tinyint		Device state. Disabled = 0. Enabled = 1.
device_id	int		Device ID. Links to the devices table.
dev_if_name	varchar (32)	NULL	Interface name.
dev_if_addr	varchar (64)	NULL	Interface address for the device.
dev_if_subn	varchar (64)	NULL	Subnet mask for the device.
helper_addr	varchar (64)	NULL	Helper address.
config_ver	int	NULL	Configuration file version to use.
neighbor_id	int	NULL	Device ID of the neighbor device from the devices table.

Field Name	Field Type	Field Value	Description
neigh_if_id	int	NULL	Interface ID of the neighbor device used to access the if_addresses table. Links to the interfaces table.

CiscoConnect Database Table

The CiscoConnect table contains data on mapping the CiscoWorks user IDs to People IDs so that CiscoConnect can access device data such as the contact's name, address, and phone number.

Table C-3 cisco_connect_users Table File Structure

Field Name	Field Type	Field Value	Description
user_id	smallint	NULL	CiscoWorks user ID.
people_id	smallint	NULL	People ID. Links to the people table.
user_name	char(32)	NULL	Name of user.

There are also some triggers created so that any time changes are made to the users table, the appropriate changes are reflected in this table.

The following are the views (virtual tables) created:

- cw_user_info—This view prints out the user info (name, address, phone number, and so on) in a format easy to use by CiscoConnect.
- cw_devices_view—This view prints out the device name and domain name for all devices in the database of just Cisco routers.
- cw_cc_inventory—This view prints out a list of platform IDs and software versions for all Cisco routers.
- view cw_people_list—This view prints out a simple list of people_id, first and last name from the people table.

Device Inventory Database Tables

The device inventory tables consist of all the information that you can associate with a specific device, including contact, address, telephone, and vendor data.

Figure C-1 illustrates CiscoWorks database table interrelationships for device inventory.

Figure C-1 Device Inventory Database Tables Relationships

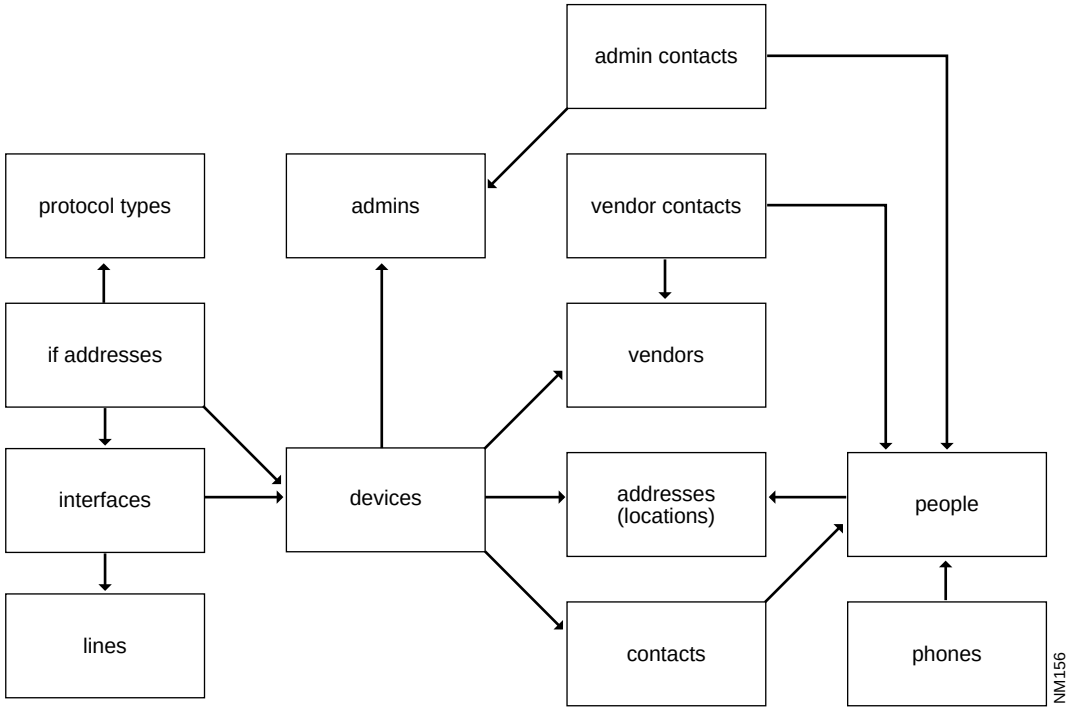


Table C-4, Table C-5, Table C-6, Table C-7, Table C-8, Table C-9, Table C-10, Table C-11, Table C-12, Table C-13, Table C-14, and Table C-15 are used for device inventory.

Table C-4 admins Table File Structure

Field Name	Field Type	Field Value	Description
admin_id	smallint		Administration ID.
admin_name	char (32)		Full name of administrator.
admin_desc	64 Character	NULL	Description of administrator duties or location.

Table C-5 devices Table File Structure

Field Name	Field Type	Field Value	Description
device_id	int		Device ID.
device_type	smallint	NULL	Specific Cisco device platform.
device_name	32 Character		Name of Cisco device.
device_domain	varchar (128)	NULL	Internet domain in which this device belongs. For example, cisco.com.
device_desc	varchar (255)	NULL	Description of Cisco device.
sysobject_id	varchar (64)	NULL	Identifies vendor and device type.
rd_community	char (32)	NULL	Read community string.
community	char (32)	NULL	Write community string.
enable_passwd	varchar (32)	NULL	Password to enable the device.

Field Name	Field Type	Field Value	Description
vty_passwd	varchar (32)	NULL	Password to allow terminal interaction with a Cisco device.
admin_id	smallint		Administration ID. Links to the admins table.
serial_number	char (32)	NULL	Identification number for the device chassis.
vendor_id	smallint		Vendor ID. Links to the vendor table.
address_id	smallint		Address ID. Links to the locations table.
software_desc	varchar (254)	NULL	Description of current software release on the device.
software_ver	char (16)	NULL	Current software release version number.
hardware_desc	char (64)	NULL	Description of device hardware.
hardware_ver	char (16)	NULL	Current hardware version number.
platform_id	int	NULL	Identification number for the Cisco device type.
has_flash	int	NULL	Flash memory capabilities.
has_env	int	NULL	Environmental card capabilities.
init_timestamp	datetime	NULL	Date and time that the device was initialized.
loaded_conf	int	NULL	The configuration file marked with the flag.
monitor_ints	char (1)	NULL	Interfaces monitored by the Device Monitor daemon.
monitor_env	char (1)	NULL	Whether the Environmental card is being monitored by the Device Monitor daemon.
monitor_events	char (1)	NULL	Whether the Device Monitor daemon is monitoring device events.
monitor_poll	int	NULL	Whether polling is occurring.

Table C-6 interfaces Table File Structure

Field Name	Field Type	Field Value	Description
interface_id	int		Interface ID.
device_id	int		Device ID. Links to the devices table.
interface_type	int	NULL	Type of interface (serial, Ethernet, and so on).
interface_speed	int	NULL	Speed of interface.
interface_name	char (32)		Name of interface.
interface_desc	char (64)	NULL	Description of the type of interface.
hardware_addr	char (64)	NULL	Description of device hardware. Links to the devices table.
hardware_ver	char (16)	NULL	Current hardware version number. Links to the devices table.
line_id	int		Line ID. Links to the lines table.

Table C-7 if_addresses Table File Structure

Field Name	Field Type	Field Value	Description
device_id	int		Device ID. Links to the devices table.
interface_id	int		Type of interface (serial, Ethernet, and so on). Links to interfaces table.
protocol_id	int		Protocol ID.
protocol_addr	char (64)		Protocol address. Links to the protocols table.
protocol_subn	char(64)		Protocol subnet mask.

Table C-8 contacts Table File Structure

Field Name	Field Type	Field Value	Description
device_id	int		Device ID. Links to the devices table.
people_id	smallint		People ID. Links to the people table.

Table C-9 lines Table File Structure

Field Name	Field Type	Field Value	Description
line_id	int		Line ID.
line_group_id	int		Line group ID.
line_type	smallint	NULL	Type of line used for this device: • 0 = No designation (default setting) • 1 = Ethernet thin wire • 2 = Ethernet thick wire • 3 = Ethernet twisted pair • 4 = Serial line
line_desc	char (16)	NULL	Description of line.

Table C-10 locations Table File Structure

Field Name	Field Type	Field Value	Description
address_id	smallint		Address ID.
location	char (64)		Location of the device.
street	char (32)	NULL	Street name.
street_two	char (32)	NULL	Second line for street name.
city	16 Character	NULL	City name.
state	char (2)	NULL	State name.
country	char (16)	NULL	Country name.
zip_code	char (16)	NULL	Zip code or country code.

Table C-11 networks Table File Structure

Field Name	Field Type	Field Value	Description
network_id	smallint		Network ID.
network_name	char (32)		Name of the network where this device is located.
admin_id	smallint		Administration ID. Links to the admins table.

Table C-12 people Table File Structure

Field Name	Field Type	Field Value	Description
people_id	smallint		People ID.
address_id	smallint		Address ID. Links to the locations table.
last_name	char (16)		Last name of device contact person.
first_name	char (16)		First name of device contact person.
middle_name	char (16)	NULL	Middle name of device contact person.
phone_number	char (16)	NULL	Telephone number of device contact person. Links to the phones table.
email_addr	char (64)	NULL	Electronic mail address of device contact person.
title	char (32)	NULL	Job title of device contact person.
nic_id	char (8)	NULL	Internet NIC ID.

Table C-13 phones Table File Structure

Field Name	Field Type	Field Value	Description
people_id	int	NULL	People ID. Links to the people table.
phone_desc	int	NULL	Description of telephone number.
phone_number	smallint	NULL	Telephone number.
phone_id	char (64)	NULL	Telephone ID.

Table C-14 protocol types Table File Structure

Field Name	Field Type	Field Value	Description
protocol_type	smallint		Type of protocol running on the device.
type_desc	char (64)		Description of the protocol type.

Table C-15 vendor Table File Structure

Field Name	Field Type	Field Value	Description
vendor_id	smallint		Vendor ID.
vendor_name	char (32)		Name of the vendor where the device was purchased.
street	char (32)	NULL	Street name of vendor.
street_two	char (32)	NULL	Second line for street name of vendor.
city	char (64)	NULL	City name for vendor.

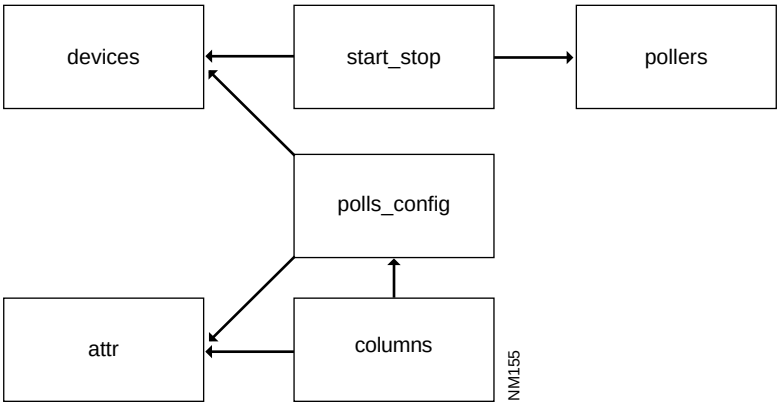
Field Name	Field Type	Field Value	Description
state	char (64)	NULL	State name for vendor.
country	char (64)	NULL	Country name for vendor.
zip_code	char (64)	NULL	Zip code or country code for vendor.

Polling Database Tables

Device polling consists of all the information that you want to gather from a device based on the way you have set up your poll groups.

Figure C-2 illustrates CiscoWorks database table interrelationships in device polling.

Figure C-2 Device Polling Database Tables Relationships



The following database tables are used during device polling. These tables are described below.

- attr
- columns
- pollers
- polls
- polls_config
- sample* tables (including sample, sample_error, sample_mix, sample_traffic, and sample_load)
- start_stop

The tables listed (Table C-16, Table C-17, Table C-18, Table C-19, Table C-20, Table C-21, Table C-22, Table C-23, Table C-24, Table C-25, and Table C-26) are used for polling.

Table C-16 attr Table File Structure

Field Name	Field Type	Field Value	Description
attr_id	int		Attribute ID.
snm_name	varchar		MIB element name in the SunNet Manager software.
ncs_name	varchar	NULL	MIB element name in the CiscoWorks software.
object_id	varchar	NULL	MIB object ID.
iftable	int	NULL	Interfaces table flag. 0 = not iftable. 1 = iftable.

Table C-17 columns Table File Structure

Field Name	Field Type	Field Value	Description
poll_id	smallint		Poll ID.
column_name	varchar		Column of record in database.
attr_id	int		Attribute ID. Links to the attr table.
datatype	smallint		Sybase database type.

Table C-18 pollers Table File Structure

Field Name	Field Type	Field Value	Description
poller_host	char (15)		Name of the workstation that nmpolld is running on.
poller_id	int		Poller ID.
pid	int		Process identification number.

Table C-19 polls Table File Structure

Field Name	Field Type	Field Value	Description
poll_id	int		Poll ID.
poll_name	varchar (80)		User-defined name for poll group.
table_name	char (30)		Table name for data repository table.
poll_rate	int	NULL	Desired polling interval (secs). Defaults are -1 for tables to be deleted; 0 for tables to be disabled.

Table C-20 polls_config Table File Structure

Field Name	Field Type	Field Value	Description
poll_id	int		Poll ID.
poller_id	varchar		Poller ID.
device_id	int		Device ID. Links to the devices table.
attr_id	int	NULL	Attribute ID. Links to the attr table.
inst	varchar	NULL	Instance ID. Links to the interface tables interface ID.

Table C-21 sample Table File Structure

Field Name	Field Type	Field Value	Description
timestamp	datetime	NULL	Date and time the device was initialized.
device_id	int	NULL	Device ID. Links to the devices table.
sysUpTime	uint4	NULL	MIB variable.
inst	varchar	NULL	Instance value.
rec_type	tinyint	NULL	Record type.
var1	uint4	NULL	ifInOctets MIB variable.
var2	uint4	NULL	ifInUcastPkts MIB variable.
var3	uint4	NULL	ifInNUcastPkts MIB variable.
var4	uint4	NULL	ifOutOctets MIB variable.
var5	uint4	NULL	ifOutUcastPkts MIB variable.
var6	uint4	NULL	ifOutNUcastPkts MIB variable.
var7	uint4	NULL	ifInErrors MIB variable.
var8	uint4	NULL	ifOutErrors MIB variable.
var9	int	NULL	ifSpeed MIB variable.
var10	int	NULL	ifAdminStatus MIB variable.
var11	int	NULL	ifOperStatus MIB variable.

Table C-22 sample_error Table File Structure

Field Name	Field Type	Field Value	Description
timestamp	datetime	NULL	Date and time the device was initialized.
device_id	int	NULL	Device ID. Links to the devices table.
sysUpTime	uint4	NULL	MIB variable.
inst	varchar	NULL	Instance value.
rec_type	tinyint	NULL	Record type.
var1	uint4	NULL	ifInUcastPkts MIB variable.
var2	uint4	NULL	ifInNUcastPkts MIB variable.
var3	uint4	NULL	ifOutUcastPkts MIB variable.
var4	uint4	NULL	ifOutNUcastPkts MIB variable.
var5	uint4	NULL	ifInDiscards MIB variable.
var6	uint4	NULL	ifInErrors MIB variable.
var7	uint4	NULL	ifOutDiscards MIB variable.
var8	uint4	NULL	ifOutErrors MIB variable.

Table C-23 sample_mix Table File Structure

Field Name	Field Type	Field Value	Description
timestamp	datetime	NULL	Date and time the device was initialized.
device_id	int	NULL	Device ID. Links to the devices table.
sysUpTime	uint4	NULL	MIB variable.
inst	varchar	NULL	Instance value.
rec_type	tinyint	NULL	Record type.
var1	uint4	NULL	ipForwDatagrams MIB variable.
var2	uint4	NULL	vinesForwarded MIB variable.
var3	uint4	NULL	novellForward MIB variable.
var4	uint4	NULL	atForward MIB variable.
var5	uint4	NULL	dnForward MIB variable.
var6	uint4	NULL	xnsForward MIB variable.

Table C-24 sample_traffic Table File Structure

Field Name	Field Type	Field Value	Description
timestamp	datetime	NULL	Date and time the device was initialized.
device_id	int	NULL	Device ID. Links to the devices table.
SysUpTime	uint4	NULL	MIB variable.
inst	varchar	NULL	Instance value.
rec_type	tinyint	NULL	Record type.
var1	uint4	NULL	ifInOctets MIB variable.
var2	uint4	NULL	ifOutOctets MIB variable.
var3	int	NULL	ifOperStatus MIB variable.
var4	int	NULL	ifAdminStatus MIB variable.
var5	uint4	NULL	ifInUcastPkts MIB variable.
var6	uint4	NULL	ifInNUcastPkts MIB variable.
var7	uint4	NULL	ifOutUcastPkts MIB variable.
var8	uint4	NULL	ifOutNUcastPkts MIB variable.

Table C-25 sample_load Table File Structure

Field Name	Field Type	Field Value	Description
timestamp	datetime	NULL	Date and time the device was initialized.
device_id	int	NULL	Device ID. Links to the devices table.
SysUpTime	uint4	NULL	MIB variable.
inst	varchar	NULL	Instance value.
rec_type	tinyint	NULL	Record type.
var1	int	NULL	freeMem MIB variable.
var2	uint4	NULL	bufferFail MIB variable.
var3	int	NULL	busyPer MIB variable.
var4	int	NULL	ifOutQLen MIB variable.

Table C-26 start_stop Table File Structure

Field Name	Field Type	Field Value	Description
table_name	char (3)		Name of polling table.
poller_id	varchar		Poller ID.
type	tinyint		Device status. 0 = start, 1 = stop, 2 = restart.
clock_time	datetime	NULL	Date and time polling stopped, started, or restarted.
device_id	int	NULL	Device ID. Links to the devices table.

Device Configuration Database Tables

Device configuration consists of all the information that you want to gather from a device during device configuration.

The tables listed in Table C-27 and Table C-28 are used for device configuration.

Table C-27 DevConfigs Table File Structure

Field Name	Field Type	Field Value	Description
conf_id	int		Configuration ID.
creator	varchar (64)		Name of person who created or loaded configuration.
time_created	int		Date and time configuration was created.
conf_stat	char (2)	NULL	Date and time configuration was started.
user_image	text	NULL	Name of the Cisco configuration file image.
machine_image	text		Name of the compiled configuration file version.
comments	text		Description of the configuration file.

Table C-28 DevConfHist Table File Structure

Field Name	Field Type	Field Value	Description
device_id	int		Device ID. Links to the devices table.
conf_id	int		Configuration ID. Links to the device_config table.
conf_ver	int		Version of the configuration file.
software_ver	varchar (16)		Software release version.

Domains Database Tables

Domains consists of all the information on the collection of routers you have created to manage your network.

The tables listed in Table C-29 and Table C-30 are used for creating domains.

Table C-29 domains Table File Structure

Field Name	Field Type	Field Value	Description
domain_id	int		Domain ID.
domain_name	char (32)		Name of the domain.

Table C-30 domain_devices Table File Structure

Field Name	Field Type	Field Value	Description
domain_id	int		Domain ID. Links to the domains table.
device_id	int		Device ID. Links to the devices table.

Global Commands Database Tables

The Global Commands and Scheduler tables include information that CiscoWorks needs to send global commands to a device set.

The tables listed (Table C-31, Table C-32, and Table C-33) are used for the Global Command Manager application and the Scheduler utility.

Table C-31 gcmds Table File Structure

Field Name	Field Type	Field Value	Description
gcmd_id	int		Global command ID.
gcmd_name	char (32)	NULL	Name of global command.
command	text	NULL	Command syntax.
user_name	char (32)	NULL	Name of user.
status	int	NULL	Status of command.

Table C-32 gcmds_domains Table File Structure

Field Name	Field Type	Field Value	Description
gcmd_id	int		Global command ID. Links to the gcmds table.
domain_id	int		Domain ID. Links to the domains table.

Table C-33 crons Table File Structure

Field Name	Field Type	Field Value	Description
cron_id	int		Cron ID.
gcmd_id	int		Global command ID. Links to the gcmds table.
cron_name	char (32)	NULL	Name of cron job in the Scheduler utility.
user_name	char (32)	NULL	Name of user.
command	text	NULL	Command syntax sent to Scheduler utility. Links to the gcmds table.
status	int		Status of command. Links to the gcmds table.
minutes	int		Time in minutes of cron.
hour	int		Time in hours of cron.
day	int		Day of cron job.
month	int		Month of cron job.
week	int		Week of cron job.

Configuration Snap-In Manager Database Tables

The configuration snap-in command tables include information that CiscoWorks needs to send snap-in commands to a device set.

The tables listed in Table C-34 and Table C-35 are used for the Configuration Snap-In Manager application.

Table C-34 pccmdset Table File Structure

Field Name	Field Type	Field Value	Description
cfgcmdset_id	int		Configuration snap-in command ID.
group_name	char (32)		Name of the set of commands.
group_type	int		Type of snap-in commands.
the_group	image	NULL	Set of snap-in commands.
domain	char (32)		Domain name. Links to the domains table.
device_set	char (32)		The set of devices to which the command will be sent.
device_set_type	int		The platform type of the device set.
description	char (255)		A description of the configuration snap-in command.

Table C-35 pcdevset Table File Structure

Field Name	Field Type	Field Value	Description
cfgdevset_id	int		Configuration snap-in device set ID.
devset_name	char (32)		Name of the set of devices to which the command will be sent.
domain	char (32)		Domain name. Links to the domains table.
the_device	image	NULL	Contains the collection of devices.
ref_count	int		Reference count of the number of the command sets that link to the a device set.
description	char (255)		A description of the device set.

Software Management Database Table

The software management tables consist of all the information required to perform the tasks for the Software Library Manager, Device Software Manager, and Software Inventory Manager applications.

Table C-36 is used for the software management tasks.

Table C-36 SysFiles Table File Structure

Field Name	Field Type	Field Value	Description
file_id	int		Software image file ID.
file_name	varchar (128)		Software image file name.
rel_version	char (32)		Software image file release version.
checksum	int		Checksum of the software image.
length	int		Size of the software image file.
platform	char (32)	NULL	Platform type.
compressed	tinyint	NULL	Whether the image file is compressed.
user_alias	char (32)	NULL	User-provided name for the software image file.
comments	text	NULL	Description or comments.
image_name	char(32)	NULL	Description of image name.
image_family	char(32)	NULL	Description of image file family.

Log Database Table

The ciscolog table stores data records on the following items. (See Table C-37.)

Table C-37 ciscolog Table File Structure

Field Name	Field Type	Field Value	Description
msgid	int		Message ID.
timestamp	datetime		Date and time of message.
appl	char (30)		CiscoWorks application that generated message.
device	char (30)	NULL	Device that generated message or that the message is about.
event	char (30)	NULL	Type of event.
netaddr	char (30)	NULL	Network IP address.
text1	varchar (255)	NULL	Together the records in text1, text2, text3, and text4 fields contain the text of the log message.
text2	varchar (255)	NULL	Together the records in text1, text2, text3, and text4 fields contain the text of the log message.
text3	varchar (255)	NULL	Together the records in text1, text2, text3, and text4 fields contain the text of the log message.
text4	varchar (255)	NULL	Together the records in text1, text2, text3, and text4 fields contain the text of the log message.