IBM

IBM i Access Client Solutions
Linux Application Package

Installation and usage guide

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Introduction

IBM i Access Client Solutions is the newest member of the IBM i Access family. The Linux Application Package is an optional download that provides an ODBC driver for accessing the DB2 for i database from a Linux client.

ODBC features for the IBM i Access Linux Application Package include:

- TCP/IP connectivity to DB2® for i using ODBC

- 32 and 64-bit drivers for connecting to IBM i release 6.1 and later

- Full support for 64-bit ODBC data types

- 128-byte schema names, XML data type, Concurrent Access Resolution, multi-row UPDATE, DELETE, MERGE statements, Extended Dynamic Remote SQL (EDRS), and more.

For additional functions for the Linux platform like 5250 emulation, Data Transfer, 5250 Console, and displaying spool files, see IBM i Access Client Solutions.

Requirements

Recommended Linux Distributions:

- SUSE LINUX Enterprise Server 11 and later

- Red Hat Enterprise Linux 6 and later

- Ubuntu 12.04 and later

- Debian 7 and later

Linux requirements:

- GNU C Library (GLibc 2.11)

- Red Hat package manager (RPM 4.4)

- unixODBC driver manager version 2.2.14 or later must be installed on the client. See the unixODBC Project web site for more information.

IBM i requirements:

- Connections to IBM i 6.1 and later are supported. Unexpected results are produced when using the product with earlier releases.

- The QUSER user profile must be enabled (DSPUSRPRF, CHGUSRPRF)

- The IBM i host servers must be started (STRHOSTSVR).

- TCP/IP must be installed (IBM i licensed program 5770-TC1) on the system and running

Installation

Installing the Linux Application Package

1. Download the Linux Application Package: IBMiAccess_v1r1_LinuxAP.zip

2. Unzip the file. This can be accomplished using the unzip command or one of the many GUI tools available.

3. Choose the package to install based on your platform.
    32-bit and 64-bit packages are available for i386, x86, and PowerPC architectures
    Both rpm and deb packages are provided for i386 and x86.
    Also available are 32-bit compatibility packages for 64-bit architectures.

4. On rpm-based distributions, use:
    rpm -ivh   (e.g. rpm -ivh ibm-iaccess-1.1.0-1.0.i386.rpm)
    Note: Due to changes in unixODBC package on some distributions, you may need to force install the rpm with the --nodeps option

    On Debian-based distributions, use:
    dpkg -i   (e.g. dpkg -i ibm-iaccess-1.1.0-1.0.amd64.deb)
    Note: During the installation, the ODBC driver will automatically be registered with the unixODBC driver manager.

Updating the Linux Application Package

1. Download the updated Linux Application Package: IBMiAccess_v1r1_LinuxAP.zip
    Note: The updates will be available in the same location as your original download with updated version numbers.

2. Unzip the file. This can be accomplished using the unzip command or one of the many GUI tools available.

3. Choose the package to install based on your platform.
    32-bit and 64-bit packages are available for i386, x86, and PowerPC architectures
    Both rpm and deb packages are provided for i386 and x86.
    Also available are 32-bit compatibility packages for 64-bit architectures.

4. On rpm-based distributions, use:
    rpm -Uvh   (e.g. rpm -Uvh ibm-iaccess-1.1.0-1.0.i386.rpm)
    Note: Due to changes in unixODBC package on some distributions, you may need to force install the rpm with the --nodeps option

    On Debian-based distributions, use:
    dpkg -i   (e.g. dpkg -i ibm-iaccess-1.1.0-1.0.amd64.deb)
    Note: During the upgrade, the ODBC driver will automatically be re-registered with the unixODBC driver manager.

Uninstalling the Linux Application Package

For rpm-based distributions, use:
rpm -e   (e.g. rpm -e ibm-iaccess-1.1.0-1.0.i386.rpm)

For Debian-based distributions, use:
dpkg -r   (e.g. dpkg -r ibm-iaccess-1.1.0-1.0.amd64.deb)
Note: the /opt/ibm/iSeriesAccess/conv_tables directory might not be removed during uninstall because of downloaded conversion tables. The directory will then need to be removed manually.

Security

Kerberos

IBM i Access Client Solutions - Linux Application Package supports authenticating to IBM i via Kerberos. To install and configure IBM i for Kerberos, see the [IBM i Information Center](#), under the Security > Single sign-on topic. To install and configure Kerberos for Linux, consult information appropriate for your distribution (often readily available online)

Note: Most Linux distributions have at least one (Heimdal and MIT) version of the Kerberos 5 included with them. However, some distributions do not create a symlink for the Kerberos shared library (Heimdal /usr/lib/libgssapi.so, MIT /usr/lib/libgssapi_krb5.so). Linux Application Package dynamically loads the Kerberos shared library by that name and if a symlink to that name is not available, you will get the following error: CWBSY1015 - Kerberos not available on this version of the operating system.

To use Kerberos with Linux Application Package, you must first authenticate to your Kerberos domain using the "kinit" command or set up your initial Linux login to do it with PAM (Pluggable Authentication Module) Kerberos plug-in. After a successful "kinit", you should be able to do a "klist -f" to see the status of your Kerberos tickets.

To configure the ODBC driver to use kerberos, simply specify "*KERBEROS" as the user name when configuring your data source or calling the connection API.

The Kerberos principal name will be based upon the fully qualified TCP/IP name received from the reverse look-up of the TCP/IP address. If you use hosts file to resolve TCP/IP addresses, be sure to include the fully qualified TCP/IP system name. For example: 1.2.3.4 MyiSseries.MyDomain.com MyiSeries

Other Security Solutions

For other security solutions including OpenSSH and stunnel, see Securing Communications with [OpenSSH on IBM i5/OS (PDF, 1.54MB)](#)

Debugging problems

Communications

Use the cwbping program to verify the connection between the Linux workstations and the IBM i server, and to verify the host servers are started.

Tracing and logging

Once you verify your connection to the server, there are four basic trace files for problem determination:

- SQL log - The unixODBC sql.log will show the input and output parameters for ODBC API calls made. The sql.log is activated using the unixODBC ODBCConfig program. From the Advanced tab, you can enable sql tracing and configure the location of the log file.

- History log - The history log will show high-level communication, security and data conversion error messages. The History log is activated using the cwbtrc program.

- Detail trace - The detail trace will show low-level driver information and is intended for use in reporting problems to IBM. Detail trace is activated using the cwbtrc program.

For additional help on error messages, refer to the "Error Message" sections in the ODBC FAQs.

Technical support

IBM i Access Client Solutions - Linux Application Package is Licensed Program 5733-XJ1.

Refer to one of these sources for known problems:

- In this Installation and Usage Guide, refer to...
  ODBC FAQs

- IBM i APARs and Information APARs

- Support Line Knowledge Base

FAQs

ODBC frequently asked questions

- [Error messages](#)

- [National language considerations](#)

- [Differences between the ODBC Driver in IBM i Access Linux Application Package and the ODBC Driver in IBM i Access for Windows](#)

- [Restrictions when using the ODBC Driver in IBM i Access Linux Application Package](#)

- [Known problems](#)

Error messages

When an error occurs, the ODBC Driver in IBM i Access returns the SQLSTATE (an ODBC error code) and an error message. The driver obtains this information both from errors that are detected by the driver and from errors that are returned by the IBM i.

For errors that occur in the data source, the ODBC Driver in IBM i Access maps the returned native error to the appropriate SQLSTATE. When both the driver and the driver manager detect an error, they generate the appropriate SQLSTATE. The ODBC Driver in IBM i Access returns an error message based on the message returned by the IBM i.

For errors that are detected within the ODBC Driver, the driver returns an error message based on the text associated with the SQLSTATE. These error messages are translated messages. [Help text](#) for error messages found in the underlying components of the IBM i Access product is also shipped in the /opt/ibm/iSeriesAccess/doc directory.

Error message format

Error messages have the following format:

> [vendor][ODBC-component][data-source]
> error-message

The prefixes in brackets ([ ]) identify the source of the error. The following table shows the values of these prefixes returned by the IBM i Access ODBC Driver.

When the error occurs in the data source, the [vendor] and [ODBC-component] prefixes identify the vendor and name of the ODBC component that received the error from the data source.

Error Source	Value
Driver Manager	[unixODBC] [Driver Manager]
ODBC Driver in IBM i Access	[unixODBC] [IBM] [IBM i Access ODBC Driver]
NLS messages	[unixODBC] [IBM] [IBM i Access ODBC Driver] Column #: NLS error message number NLS error message text See the message prefix table below to find second level help text.
Communication and security	[unixODBC] [IBM] [IBM i Access ODBC Driver] Communications link failure. comm rc=xxxx - (message text) xxxx is the error number in decimal, not hexadecimal, format. Message text describing the nature of your error appears with the error number. See the message prefix table below to find second level help text.
DB2 for i	[unixODBC] [IBM] [IBM i Access ODBC Driver] [DB2 UDB] Server error message To view error message text for DB2 for i errors: <table><tr><td>**For errors that begin with:**</td><td>**Use this OS/400 command**</td></tr><tr><td>SQL</td><td>DSPMSGD RANGE(SQLxxxx) MSGF(QSQLMSG)</td></tr><tr><td>IWS or PWS</td><td>DSPMSGD RANGE(ZZZxxxx) MSGF(QIWS/QIWSMSG) ZZZ is either IWS or PWS</td></tr></table>

Some other prefixes that may be seen through the ODBC Driver in IBM i Access include:

Message Prefix		
Message Prefix	**Message File**	**Description**
CWB####	cwber.html	Base error messages
CWBCO####	cwbcoer.html	Communication error messages
CWBNL####	cwbnler.html	Conversion error messages
CWBSY####	cwbsyer.html	Security error messages
CWBRC####	cwbrcer.html	Remote Command error messages
CWBLM####	cwblmer.html	License error messages

National language considerations when using IBM i Access Linux Application Package

The ODBC Driver in IBM i Access handles many types of data conversions. The character code page conversions involve using conversion tables and the iconv interfaces. Some of the conversion tables are shipped with the driver, others will be automatically downloaded from the IBM i when needed. Iconv is a library shipped with Linux that also handles character data conversions.

Coded Character Set Identifiers (CCSID)

The ODBC Driver in IBM i Access uses a pair (to and from) of Coded Character Set Identifiers (CCSID) to convert character data. The conversion will either use a conversion table or the iconv interfaces.

Conversion tables

Conversion tables are stored in **/opt/ibm/iSeriesAccess/conv_tables** and use the following naming convention:

<4 digit hex number of FROM CCSID><4 digit hex number of TO CCSID>.tbl

For example, the conversation table for 819 to 500 would be **033301f4.tbl**.

Many conversion tables are shipped with the IBM i Access ODBC Driver. Additional conversion tables will be downloaded automatically from the IBM i when they are needed. You can also download conversion tables using the CWBNLTBL utility.

ODBC application character set

The ODBC application character set is defined by the current locale's character set.

To find out the current locale, use the following command:\

locale

To find out the current mapping between the current locale's character set and the CCSID that will be used, use the following command:

> **/opt/ibm/iSeriesAccess/bin/cwbnltbl**

Overriding the character set to/from CCSID mappings

If you wish to change or add character set to/from CCSID mapping, add the following lines to the **$HOME/.iSeriesAccess/cwb_userprefs.ini** configuration file.

[CWB_CURRUSER\Software\IBM\Client Access Express\CurrentVersion\NLS]
CCSID-CODESET=attr_str:939,IBM939,819,IBM819

The above lines will create mappings for CCSID 939 to character set "IBM939" and for CCSID 819 to character set "IBM819".

List of available locales

To list the available locales, use the following command:

> **locale -a**

List of available Iconv character sets

To list the available iconv character sets, use the following command:

> **iconv -l**

How to investigate conversion problems

Most conversion problems are logged in the History Log. To turn on history logging, use the following command:

> **/opt/ibm/iSeriesAccess/bin/cwbtrc /hl:1**

(Refer to CWBTRC for more about the trace utility.)

The history log output will be in **$HOME/.iSeriesAccess/cwbhistory--.csv**. Use either a text editor or a spread sheet to view the contents of the history log.

Differences between the ODBC Driver in IBM i Access Linux Application Package and the ODBC Driver in IBM i Access for Windows

Linux ODBC	Windows ODBC
The driver is an ODBC 3.5 ANSI driver with the ability to store and process Unicode data. An ANSI driver does not support Unicode strings passed as arguments to the APIs. Applications passing Unicode strings on APIs will work because the unixODBC driver manager maps calls these calls to the ANSI driver's narrow interfaces.	The driver is an ODBC 3.5 Unicode driver. A Unicode driver accepts Unicode strings as arguments to the APIs.
To sign on you must specify a user ID and password (or specify *KERBEROS as the user ID) when calling the connection API or have the user ID and password entered into the DSN. The ODBC driver will not prompt for iSeries user IDs or passwords. User ID and password updates must be done through a telnet session with the iSeries.	The user has sign on options that control which user ID and password to use when connecting. When connecting, cached passwords might be used. If a user's password has expired a dialog is displayed to allow a user to change it.
When binding a parameter or a column with SQL_C_WCHAR as the C type, wchar_t buffers should **not** be passed in. The driver manager and driver both handle the SQL_C_WCHAR data type as a 2 byte UCS-2 string.	When binding a parameter or a column with SQL_C_WCHAR as the C type, wchar_t buffers should be passed in. The driver manager and driver both handle the SQL_C_WCHAR data type as a 2 byte UCS-2 string.

Restrictions when using the ODBC Driver in IBM i Access Linux Application Package

Restriction	Reason
MTS is not supported.	This depends on Microsoft Windows-specific components which are not available on Linux.
APIs that display a graphical user interface are not supported.	The API call will still complete but will behave as if displaying the GUI failed.
Translation DLLs	Translation DLLs are not currently supported. Any attempt to use them will be ignored.
DSN connection option for user ID /password prompting via a sign-on dialog is not supported.	Graphical user interfaces are not being ported to Linux.
DSN option for customizing package settings for an application is not supported.	Only the simple implementation of package settings is being ported to Linux.
See Unsupported Connection String Keywords for other DSN options that are not supported in Linux.	These keywords correspond with options we aren't supporting.

Restriction	Reason
Secure Sockets Layer (SSL) component	The SSL component is not needed or shipped with the Linux driver. Use a common SSL tunnel or Socks server instead.
Connection Timeout	The connection timeout option is not supported with the Linux driver.

Known problems

There are several known problems that have been discovered with the unixODBC Driver Manager and with applications that use the ODBC Driver in IBM i Access. This list is by no means a complete list, but contains a list of problems that we've noticed

unixODBC Driver Manager:

Refer to the unixODBC web site (link resides outside of ibm.com) for a list of known problems that are fixed in each release.

Utilities

The following utilities are included with IBM i Access Client Solutions - Linux Application Package and are shipped in **/opt/ibm/iSeriesAccess/bin**.

CWBPING - Test the connection to the server

Use this command from a console prompt to determine if a connection can be successfully made to an IBM i system, or to help determine the cause of a connection failure.

CWBPING checks of the status of the host servers on the IBM i system. The name of the communications provider is shown, as well as the result of connecting to each of the host socket servers. To see detailed messages, use the (/v) verbose option.

Syntax

> cwbping system [/v] [/pl:#] [/al:#] [/serv:name] [/port:#] [/user:userid] [/password:password] [/all]

Parameters

- system = name of the server

- /v = verbose output

- /pl:# = port mode (0 = Server services file, 1 = Local services file, 2 = Standard port)
  Note: If the /port:# is specified, the port mode is ignored.

- /al:# = address mode
  0 = Always use gethostbyname
  1 = Lookup after 1 hour
  2 = Lookup after 1 day
  3 = Lookup after 1 week
  4 = Never use gethostbyname, use configured IP address
  5 = Lookup once after each PC restart
  Note: If the system name is specified in IP Address form (x.x.x.x) the address mode will be ignored.

- /serv:name = name of the service to connect to (i.e. /serv:telnet or /serv:ftp)
  Note: Any TCP/IP service name can be used. For example, see CWBCO1003 or you local services file.

- /port:# = port number to connect to in decimal (i.e. /port:23 or /port:21)
  Note: Any TCP/IP port number can be used. For example, see CWBCO1003 or your local services file.

- /user:userid = IBM i user ID to use only if the server requires security on startup

- /password:password = iSeries password to use only if the server requires security on startup

- /all = verify all possible servers, by default only common servers are verified.

Examples

To check the status of the host servers on the IBM i system named System1 with address 9.12.103.14:

> cwbping System1
>
> or
>
> cwbping 9.12.103.14 /v

CWBTRC - Trace IBM i Access Linux Application Package

Use this command from a console prompt to configure tracing.

Syntax

> cwbtrc [/DT:0-1] [/DPATH:path] [/DWRAP:0-4000] [/DFLTR:0-1] [/DTICK:0-1]
> [/DFRMT:0-1] [/HL:0-1] [/HPATH:path] [/HWRAP:0-4000] [/HFLTR:0-1] [/HTICK:0-1]

Parameters

Note: Defaults shown in bold.

- /DT:0-1 = turn detail trace **off**/on

- /DPATH:path = detail trace path, default is $HOME/.iSeriesODBC

- /DWRAP:0-4000 = detail trace wrap size (MB), default is 1. An "<eof>" symbol will be placed after the last record.

- /DFLTR:0-1 = detail trace filter **off**/on

- /DTICK:0-1 = **timestamp** or tick count in trace entries

- /DFRMT:0-1 = limit tcp hex data **off**/on

- /HL:0-1 = turn history log **off**/on

- /HPATH:path = history log path, default is $HOME/.iSeriesODBC

- /HWRAP:0-4000 = history log wrap size (MB), default is 1. An "<eof>" symbol will be placed after the last record.

- /HFLTR:0-1 = history log filter **off**/on

- /HTICK:0-1 = **timestamp** or tick count in traces entries

Running CWBTRC without any parameters will show the command syntax and the current status of each parameter.

The output from CWBTRC will have the following naming convention:

cwbdetail--pid.csv

cwbhistory--pid.csv

The output files will be in semi-colon separated record format, suitable for input into spreadsheets for viewing.

Examples

The following command will turn on detail trace and allow it to grow to a 10 meg file before wrapping. It will also turn on history logging.

cwbtrc /dt:1 /dwrap:10 /hl:1

The following command will turn on history log and change the path to /usr/traces

cwbtrc /hl:1 /hpath:/usr/traces

CWBNLTBL - Download conversion tables

Use this command from a console prompt to download conversion tables.

Syntax

cwbnltbl [source-code-page] [target-code-page] [system] [userid] [password]

Parameters

- source-code-page = source code page for the table

- target-code-page = target code page for the table

- system = IBM i system to download the table from. Note that if a connection to the IBM i is necessary, the user ID and password must also be specified.

- userid = IBM i user ID

- password = IBM i password

The tables share a common location on the workstation /opt/ibm/iSeriesODBC/conv_tables. Many conversions tables are already shipped with the product. The product also uses iconv conversion where necessary. Use the History Log to look for conversion information.

Examples

- To download the 819 to 13488 conversion table from the iSeries if necessary, run cwbnltbl 819 13488 myiSeriesSystem myiSeriesuserid myiSeriesPwd

- To show the current locale charset and its code-page mapping, run cwbnltbl

CWBCOPWR - Change advanced communications settings

Use this command to change the advanced communications settings of IBM i Access Linux Application Package.

Examples

PHP - ODBC

See how the Apache Software Foundation's web server, PHP, and the ODBC Driver in IBM i Access Linux Application Package can work together to access database data on an IBM i.

Instructions for setting up PHP and Apache are in the Redbook [Linux Integration with IBM i5/OS](#), (SG24-6551).

Read section 3.4.2, "PHP for three-tier applications".

Error messages

CWBCO1001

Cause

iSeries Access could not start or could not access the TCP/IP communications provider on your personal computer. Either the communications provider is not installed, or is no longer in a usable state.

Recovery

The provider must be BSD sockets compatible.
Install or re-install the TCP/IP communications provider and verify that it is working correctly.

CWBCO1002

Cause

The level of communications provider found is not supported by or compatible with iSeries Access.

Recovery

Use a communications provider that is supported for use with iSeries Access. The provider must be BSD sockets compatible.

CWBCO1003

Cause

An error occurred during communications. The name of the function that failed, if available, and its error code are specified.

Recovery

Check the list below for the error code specified in the message and take the action specified. If the function and/or error code in the message are not listed here, they may be listed in Informational APAR II10598 along with cause and recovery information.

Error codes (for all functions)

8405 - The connection was initially established, but was disconnected by the server application before communications were completed. See message CWBCO1047 for additional information.

8411 - The connection attempt did not complete before the user configured timeout expired. The timeout can occur while querying the IP address or making the initial connection attempt to the server. See Server Connection Properties for information on configuring the connection to the server. See message CWBCO1051 for additional information.

8413 - A user configurable time-out occurred during a send or receive attempt. See message CWBCO1054.

11001, 11002, 11003 - The server name was not found during TCP/IP address lookup. Verify the server name entered is correct. Verify the TCP/IP settings are correct for resolving addresses. See message CWBCO1004 for additional help. See Server Connection Properties for information on changing the IP address and mode.

11004 - The iSeries service name was not found in the local SERVICES file. Verify the required iSeries service names are correctly entered in the local SERVICES file.

Port numbers for host servers and server mapper:

Service Name	Description	Port Number	Subsystem	Daemon	Server
as-central	Central server	8470	QSYSWRK	QZSCSRVSD	QZDASOINIT and QZSCSRVS
as-database	Database server	8471	QSERVER	QZDASRVSD	QZDASOINIT and QTFPJTCP
as-dtaq	Data queue server	8472	QSYSWRK	QZHQSRVD	QZHQSSRV
as-file	File server	8473	QSERVER	QPWFSERVSD	QNPSERVS and QIWVPPJT
as-netprt	Network print server	8474	QSYSWRK	QNPSERVD	QNPSERVS and QIWVPPJT
as-rmtcmd	Remote command / Program call server	8475	QSYSWRK	QZRCSRVSD	QZRCSRVS
as-signon	Signon server	8476	QSYSWRK	QZSOSGND	QZSOSIGN
as-svrmap	Server mapper	449	QSYSWRK	QZSOSMAPD	n/a
drda	DDM	446	QSYSWRK	QRWTLSTN	QRWTSRVR
as-usf	Ultimedia Facilities	8480	QSYSWRK	QUMBDMN	QUMBPJTC
as-admin-http	HTTP Administration	2001	QHTTPSVR	n/a	all within QHTTPSVR subsystem
as-mtgtctrl	Management Central	5555	QSYSWRK	n/a	QYPSSRV
telnet	Telnet server	23	QSYSWRK	n/a	QTVTELNET and QTVDEVICE

See Server Connection Properties for information on changing the port mode.

10014, 10022 - The TCP/IP provider has detected an invalid argument. This can happen when the connection terminates and invalidates its resources before notifying the calling application. Try re-connecting to the server, then try the action again.

10050, 10051 - The network is down or unreachable. Check your local and remote network settings.

10048 - The local socket address and port are already in use. Restart the application and try again.

10050, 10051, 10064, 10065 - No route to the server was found. Check your TCP/IP address and configuration. There may also be a network problem.

10052 - The server you were connected to somehow lost the knowledge of the connection, possibly due to a network failure or a "keep-alive" activity timeout. Try re-connecting to the server, then try the action again.

10053 - The connection was established, but was broken by the client TCP/IP communications provider. Try re-connecting to the server, then try the action again.

10054 - See 8405 above.

10055, 10067 - The TCP/IP provider has run out of resources to process your request. Your PC system may be too low on available memory, or you may have too many programs that use TCP/IP running. End any unnecessary programs and try the action again. If this error still occurs, shutdown and re-start your pc, and try the action again with as few other programs active as possible.

10057, 10058 - A request to send or receive failed because the socket had already been closed.

10060, 10064 - The address used for the server was found, but the connection to the server timed out. See CWBCO1048 for additional information.

10061 - The server was contacted, but refused the connection request. See CWBCO1049 for additional information.

10107 - The TCP/IP provider received a failure from an operating system call that should never fail. Check to make sure you have the latest operating system service pack installed.

Any other
Ask your systems administrator to verify that the host servers are running on the iSeries server, and look for messages logged on the server that might indicate a network or other problem. If there are routers in the network between your personal computer and the server, the problem may be related to router configuration or operation. Check for general network problems.

CWBCO1004

Cause
iSeries Access could not determine the IP address for the server.

Recovery
If you use a Domain Name Server (DNS), contact your network administrator to verify that the DNS is operational. You can determine if your PC can communicate with the DNS by using the 'ping' utility that comes with the TCP/IP communications support you installed on your PC.

If you rely on the file on your PC called 'HOSTS' for IP address resolution, verify that an entry exists in that file for the server you are trying to connect to. For example, if the server name is SYSA and its IP address is 4.5.6.7, for address resolution using the HOSTS file to work, the following entry must exist in the HOSTS file:
4.5.6.7 SYSA

If an entry for the server exists in the HOSTS file, but the ping utility fails to contact the server and tells you the system name you entered is an invalid IP address, the cause of failure may be invalid characters in the system name. Which characters are valid in a system name may vary from one TCP/IP implementation to another. Try using a system name containing only letters ('a'-'z' and 'A'-'Z'), numbers ('0'-'9'), dashes ('-') and periods ('.'). Add a new entry to the HOSTS file using the new system name, and if the ping program can contact the server using that system name, iSeries Access should no longer fail with this message.

If you are not using either DNS or a HOSTS file for IP address resolution, but do have a connection to the server configured in iSeries Access, verify that the IP address field in the Properties for that system's connection is correct. Also, verify that the IP Address lookup mode is **NEVER**.

See Server Connection Properties for information on changing the IP address and mode.

CWBCO1006

Cause
Connecting to the Service Mapper on the server failed.

Recovery
Ensure that the TCP/IP host servers on the iSeries server are started and see help for previous communications-related messages.
For information on starting host servers, see How to Start OS/400Host Socket Servers.

CWBCO1007

Cause

The Service Mapper on the server was found and contacted. However, the port number to use for connecting to the specified host server was not successfully retrieved from the Service Mapper.

Recovery

Notify your system administrator of this message. The existence of an entry for the server application in the service table on the server must be verified. If this entry is missing, it can be re-entered, or Option 12 (Host Servers) can be re-installed on the server.

CWBCO1008

Cause

The Service Mapper was successfully contacted on the server, but connecting to the specified application server on that server failed, probably because the host server is not running. The error code is specified.

Recovery

Verify that the host server is ready to receive connections by doing the following on the server:

1. Enter the NETSTAT command.

2. Select option 3, Work with TCP/IP connection status.

3. Search for an entry for which the Local Port is the name of the server application specified in the message. This name may be truncated for display in NETSTAT.

4. Press F14 (Display port numbers) and note what port number that server is using; also note what the state of the server is.

* If the entry exists but the port number shown is different from the one listed in the CWBCO1022 message text, then either the iSeries Access configuration for the system specifies to lookup the remote port on the PC, or the services table on the server is incorrect. Have your systems administrator verify that the entry for the specified host server is correct. See Server Connection Properties for information on configuring the connection to the server.

* If there is no such entry, or if the State listed for the entry is not Listen, the server application is not ready to accept connections; see How to Start OS/400 Host Socket Servers. You may have to stop and restart the host socket servers.

* If the entry exists and the state is Listen, there may be a problem related to one or more routers in your network not allowing connections to be made through them. Contact your system administrator for assistance.

See CWBCO1003 for details on the error code specified.

CWBCO1009

Cause

This message displays the name of the TCP/IP provider in use on your PC.

Recovery

If you expected a different TCP/IP provider, contact whoever is responsible for installing and configuring software on your PC for assistance.

CWBCO1010

Cause
The server's IP address could not be resolved.

Recovery
See message CWBCO1004 for recovery methods to solve this problem.
Check previous messages for details.

CWBCO1011

Cause
The remote server port could not be resolved

Recovery
See Server Connection Properties for information on changing the remote server port.
Check previous messages for details.

CWBCO1014

Cause
The attempt to connect to the specified host server application on the specified server failed. Since this host server application is not necessary to complete a iSeries Access connection, this failure is a warning only. Although a iSeries Access connection does not require that the specified host server application be running, some iSeries Access functions do; those functions will not work until connecting to the host server application succeeds.
For example, if the host server application as-database cannot be connected to, iSeries Access data transfer and ODBC functions will not work.

Recovery
See How to Start OS/400 Host Socket Servers
See previous messages for recovery information.

CWBCO1015

Cause
At least one failure occurred when trying to connect to a host server application on the server. A connection may be established, but some iSeries Access functions will not work.

Recovery
See earlier messages related to the connection failures for recovery information.

CWBCO1016

Cause
At least one failure occurred during the connection verification that will prevent an iSeries Access connection from succeeding.

Recovery
See earlier messages for recovery information.

CWBCO1017

Cause

The connection verification was canceled, either by the user or by the PC operating system, before it completed. No determination was made of whether a iSeries Access connection to server will succeed.

Recovery

To verify the connection, retry the operation without canceling. If the connection verification seemed to take much too long to complete (and so was canceled), it is likely that there is a configuration problem. Have your network administrator help you determine if communications are correctly configured on your PC system and on the server, and whether or not there are any network problems.

CWBCO1018

Cause

The server you are verifying a connection to is running an OS/400 release older than V4R2M0. Most functions of iSeries Access will not work correctly or at all when running to such a server.

Recovery

Connect to a server running OS/400 release V4R2M0 or later, or upgrade the level of OS/400 on server you were trying to verify the connection to.

CWBCO1019

Cause

The specified communications provider is not ready for use.

Recovery

Verify that the communications provider is installed and configured properly, and that basic functions, such as 'ping', are working properly. Contact your network administrator to make sure there are no problems with the network or its configuration.

CWBCO1020

Cause

The Signon transaction program is not functioning properly or there is a network problem between your personal computer and the server.

Recovery

Have your system administrator verify that the latest service level for the Signon transaction program has been installed on the server, and retry the operation.

CWBCO1021

Cause
The connection to the server is not configured correctly.

Recovery
Verify that the properties of that connection are correct, and that the communication provider shown for that connection is what you expected.

See Server Connection Properties for information on configuring the connection to the server.

CWBCO1022

Cause
Informational message - The remote port that will be used for this connection is shown.

Recovery
If the connections fails, verify this is the correct remote port.

See Server Connection Properties for information on configuring the connection to the server.
See help for message CWBCO1008.

CWBCO1023

Cause
Informational message - The local port that will be used for this connection is shown.

Recovery
See Server Connection Properties for information on configuring the connection to the server.

CWBCO1024

Cause
A condition exists that has prevented the cancel mechanism from working properly. The connection verification will continue, but if you try to cancel it, it may not end, or unpredictable results could occur. This could be the result of low PC system resources.

Recovery
Try freeing PC system resources by ending unnecessary programs (especially those that communicate with other systems) and deleting unnecessary files from your hard disk, and try the connection verification again. If the problem persists, shutdown and restart your pc, and try again.

CWBCO1039

Cause
Informational message - The remote TCP/IP address lookup mode that was used for this connection

Recovery
Verify the correct mode has been configured for this server.

See Server Connection Properties for information on configuring the connection to the server.

CWBCO1040

Cause
Informational message - The remote port lookup mode that was used for this connection
Server - Always connect to the Service Mapper to determine the port number for this service
Local - Always look in the local services file for the port number
Standard - Always use the pre-defined port number

Recovery
Verify the correct mode has been configured for this server.

See Server Connection Properties for information on configuring the connection to the server.

CWBCO1041

Cause
Informational message - The TCP/IP gethostbyname() function will be used to resolve the TCP/IP address.

Recovery
If this is not desired, or if the time interval at which this happens needs to be changed, these settings can be changed.

See Server Connection Properties for information on configuring the connection to the server.

CWBCO1042

Cause
The server configuration parameter is not correct for the reason code specified.

Recovery
Verify that the configuration for this server is correct. The reason codes can be found in the header files in the Programmer's Toolkit.

CWBCO1043

Cause
The server object instance could not be created for the reason code specified.

Recovery
Verify that the configuration for this server is correct. The reason codes can be found in the header files in the Programmer's Toolkit.

CWBCO1044

Cause
Informational message - The remote TCP/IP address that will be used for this connection attempt.

Recovery
See Server Connection Properties for information on configuring the connection to the server.
You may need to refer to this message if the connection attempt fails.

CWBCO1045

Cause
Informational message - The local TCP/IP address that was used for this connection

Recovery
You may need to refer to this message if the connection attempt fails.

CWBCO1047

Cause
The connection was initially established, but was disconnected by the server or server application before communications were completed.

Recovery
Try the operation again. If the problem persists, have your systems administrator check the server to verify that TCP/IP and the host servers are running, and your connection is not restricted by an IP filter. See How to Start OS/400 Host Socket Servers.

Have your system administrator check the server application job logs and server subsystems. See message CWBCO1003 for the names of the server jobs and the default names of the subsystems.

This can also result from incorrectly configured routing on the server when multiple routes to and from the server are possible. The result in this case is that packets sent to the server are discarded because they are too large. When this happens, TCP/IP on the PC assumes that the connection has been ended by the server since it is not responding to the packets sent from the PC, and reports error 10054 or 8405. Have your systems administrator analyze the configuration of TCP/IP and associated routing, as well as the maximum frame size configured for each TCP/IP interface that may be reachable from the PC, and correct any inconsistencies or problems with the configuration, then try the operation again.

CWBCO1048

Cause
The address used for the server was found, but the connection to the server timed out.

Recovery
Make sure TCP/IP has been started on that server, and that the host servers have been started. If this does not fix the problem, verify that the IP address used to attempt the connection is correct for the server. This address is logged in a previous message.

Verify TCP/IP address servers (Domain Name Servers) are configured correctly on this PC and have the correct address for this server. If the address is correct, check the HOSTS file on your computer for errors. If the IP address specified in the HOSTS file is incorrect for the server, correct it and try the operation again.

If a TCP/IP router of some kind exists on the network between the PC and the server, make sure the router is configured to allow connections to the iSeries Access host servers and to the Server Mapper on the server.

CWBCO1049

Cause
The server was contacted, but refused the connection request.

Recovery
Make sure the host servers have been started on the server; see How to Start OS/400 Host Socket Servers.

If a TCP/IP router, firewall or gateway of some kind exists on the network between the PC and the server, make sure the router is configured to allow connections to the iSeries Access host servers and to the Server Mapper on the server. If message CWBCO1022 was logged as well, this message indicates the port number that must be allowed through the router to perform the iSeries Access function being attempted.

CWBCO1051

Cause
A user specified timeout occurred trying to connect to the server. A timeout can occur while querying the IP address or making the initial connection attempt the server.

Recovery
Check the current configured timeout value for this server. If your Domain Name Server is on another network, you might want to consider changing your IP address lookup mode to be less frequent. See Server Connection Properties for information on changing the IP address and mode.

CWBCO1054

Cause
A user configurable time-out occurred during a send or receive attempt.

Recovery
Check the network for possible configuration or routing errors. Adjust the time-out period.

CWBCO1099

Cause
An internal error occurred in iSeries Access communications. This may be due to low PC system resources or may be a programming error.

Recovery
Free some PC system resources by ending any unnecessary programs and by deleting any unnecessary files from your hard drive, then try the operation again. If the problem persists, shutdown and restart your pc. If the problem remains, contact IBM Support.

Server Connection Properties

AS/400 connection properties default values for your AS/400 connections are maintained through the user's INI file. You can view and change default values that will be used by your applications when connecting to the specified AS/400 system. Unique default values for each AS/400 system can be set, however these values may be overridden at the application level.

Values can be set for:
AS/400 signon information - specifies what default user ID to use
Performance - specifies the properties of the PC to AS/400 connection for the PC that can affect performance.

How to start iSeries Access servers

To start all of the host socket servers on the AS/400 system, type the following command at the AS/400 command prompt:
STRHOSTSVR SERVER(*ALL)

To start just the signon server on the AS/400 system, type:
STRHOSTSVR SERVER(*SIGNON *SVRMAP)

To use the socket servers, the QUSER profile on the AS/400 system must be enabled and the password must not be expired. One way to make sure that the QUSER profile is always enabled is to set the password with no expiration time value. To do this, type the following command at the AS/400 prompt:
CHGUSRPRF USRPRF(QUSER) PASSWORD(*NONE) PWDEXP(*NO) STATUS(*ENABLED) PWDEXPITV(*NOMAX)

If you are having trouble starting the host socket servers, try the following:

1. Type STRHOSTSVR SERVER(*ALL) at the AS/400 command prompt.

2. If step 1 does not work, type ENDHOSTSVR SERVER(*ALL) to end the host socket servers, then try step 1 again.

3. If step 2 does not work, type NETSTAT at the AS/400 command prompt. Then select option 3. Work with TCP/IP connection status. Look for any jobs with TCP addresses beside them. End those jobs with option 4, then try step 1 again.

The various servers on the AS/400 system have different timeout values that come into play when the PC goes down before the connection is disconnected. For example, in the case where your PC goes into a hang condition before you can disconnect all of your host server connections and data queues, you will have server jobs active on the AS/400 system until they timeout. This timeout could be minutes, hours, or days, depending on the server.

Ending the host servers does not clean up the jobs running on the AS/400 when the ENDHOSTSVR command is run on the AS/400. The good thing about not cleaning up jobs is that your host server connections and data queues will continue to work after the ENDHOSTSVR command is run. The downside to not cleaning up server jobs on the AS/400 is that jobs that are still active prevent the server from starting when the STRHOSTSVR command is run on the AS/400.

When ending and restarting host servers on the AS/400, you should use the CWBPING command from a Client Access Express workstation to make sure the host servers actually start back up. If they do not start back up, use the NETSTAT command and end any active jobs with TCP/IP addresses next to them.

Reference links

- IBM i Access ODBC

This link provides information about implementation issues, restrictions, performance information, and programming examples.

- DB2 SQL Reference (PDF, 6.29MB)

- Securing Communications with OpenSSH on IBM i5/OS (PDF, 1.55MB)

- Linux Integration with IBM i5/OS (Redbook)

- unixODBC Driver Manager (link resides outside of ibm.com)

- IBM Redbooks

- IBM i Information Center

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