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GENESYS™

CIC Host Integration Solutions

Technical Reference

Abstract

CIC provides a powerful and easy-to-use solution for accessing mainframes and AS400 computers via handlers. Interaction Host Recorder assists you in creating powerful scripts. The robust Host Server establishes and maintains up to 1,000 virtual terminal emulations. The Host Interface tools enable handlers to read and write data through the Host Server.

For the latest version of this document, see the PureConnect Documentation Library at: http://help.genesys.com/cic.

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Overview

CIC includes a rich set of tools for accessing mainframe and AS400 data through terminal emulations. A standalone scripting application, Interaction Host Recorder, is included to ease the process of defining fields, screens, and screen transitions. The scripts you create with Interaction Host Recorder are called host profiles.
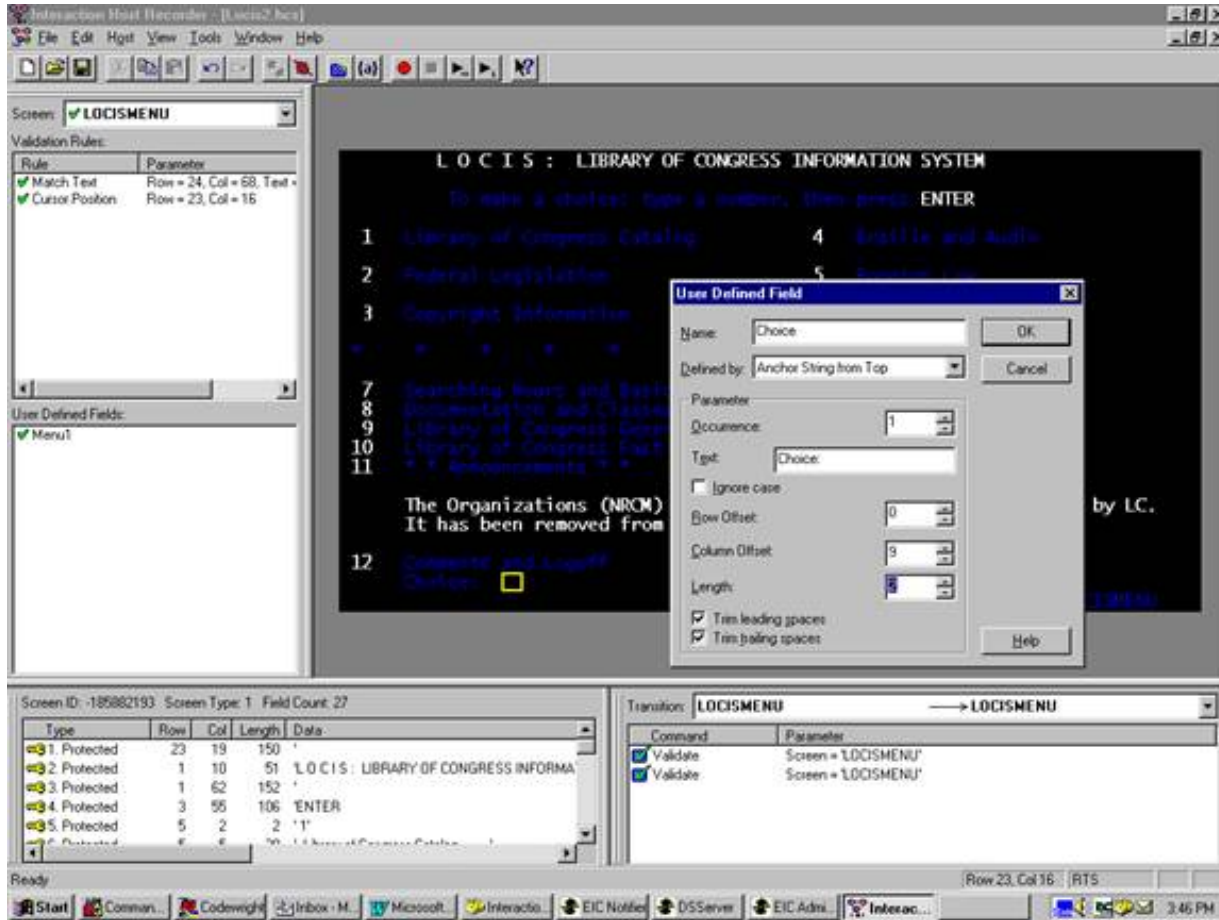
Also included are Host Interface tools for use within your host-connectivity handlers. There are two types of tools: high-level and low-level. The high-level tools perform actions prescribed in the host profiles, dealing primarily with logical fields and screens. The low-level tools operate independently of the host profiles, and provide support for lower-level operations, such as waiting for a string, sending keystrokes, and so on. Both types can be used in a single handler.

The handler shown in the following figure demonstrates how Host Interface tools are used in a handler.
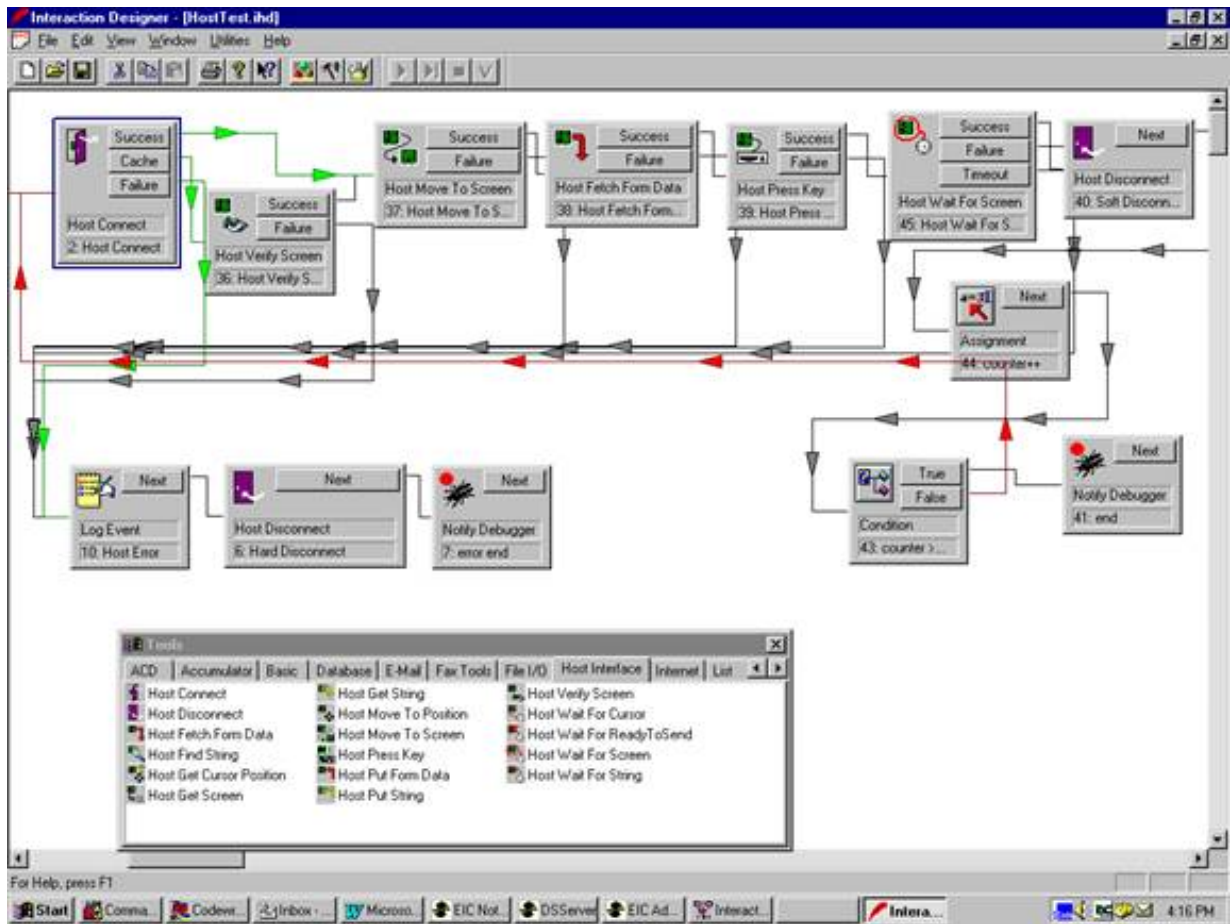
Features

The following section describes how CIC's host interface functionality is scalable, flexible, and robust.

Scalability

CIC's host tools use a multi-threaded, three-tier architecture, and were designed with scalability in mind. Scalability features include the following:

- Establishing and maintaining up to 1,000 concurrent terminal emulation sessions (physical connections).
- Caching connections to allow multiple handlers to share a single connection.
- Executing multiple field lookups or updates into a single toolstep in a handler.
- Reducing overhead. CIC's host connectivity libraries interpret the 3270 and 5250 data streams directly; the result is a significant reduction of overhead when compared with HLLAPI/EHLLAPI solutions.
- Optimizing navigation. By using dynamic recording of screen transitions, Interaction Host Recorder enables a much more optimal host navigation compared to traditional snapshot approaches that tend to make heavy use of *sleeps* to try to ensure stability. These sleeps can add a significant amount of fixed overhead to each transaction. With CIC's optimizations, your terminal emulations only sleep if the number of ready-to-send (RTS) events is different from that which was recorded during the development phase – which is rare.

Reliability

CIC uses an external process (Host Server) to service requests from the handlers and the host. This process was coded defensively from the start, making heavy use of exception handling, internal *heartbeat* checks, and redundancy. However, in the unlikely event that this process fails, no other critical CIC subsystems (like Interaction Processor) are affected. If a problem occurs, CIC's service manager detects it and automatically restarts Host Server in seconds.

Configurable Logging

Host Server has extensive logging capabilities that enable quick problem diagnosis. For example, if a *move to screen* operation fails, the exact reason it failed is logged to a file, along with a snapshot of the current screen. Internal errors and very serious host errors are also logged to the Windows event log. You can configure the level of detail that is written to the logs.

Optimal and Robust Host Navigation

CIC's host connectivity strategy offers optimal performance. However, the nature of host navigation makes it impossible to achieve optimal navigation under *all* circumstances – there will be variances in the number of RTS events, host response times, and so on. In addition, unforeseen conditions can result in unexpected (and often unknown) screens.

CIC accommodates failures on harmless anomalies (like fewer RTSs than expected), and is designed to fail gracefully and return meaningful error information when bigger problems occur (like not detecting an expected screen).

At the heart of CIC's robust strategy are the runtime screen validation rules. You can define validation rules in the Interaction Host Recorder based on the following elements:

- **Screen ID**
  An ID that is generated based on a proprietary algorithm that is designed to uniquely identify a screen under many (but not all) conditions
- **Screen Type**
  The number of unprotected fields
- **Text Match**
  Look for a particular string at a particular location
- **Cursor Position**
  Look for the cursor at a unique position

We recommend using several validation rules together to ensure that a screen is in fact the one you are expecting. All validation checks can be performed immediately, or performed with a wait timeout to allow a slow screen to finish loading. All of this is explained in the extensive Interaction Host Recorder help.

Flexible Field Definitions

Flexible Field Definitions

Screen fields are areas of a screen where you can read and write strings to and from handlers.

> **Note:**
> The fields you define do not depend on the fields programmed in the terminal screen.

Using Interaction Host Recorder you can define screen fields in many ways. The types of screen fields you can define include:

- **Absolute coordinates**
  The field begins in row X, column Y, and ends at row X1, column Y1.
- **Relative offsets from the current cursor position**
  The field begins X spaces after the current cursor position. This is very useful for repeating and tabular data.
- **Ordinal field value**
  The field begins at X spaces after the beginning of the Yth protected or unprotected field.
- **Relative to a search anchor string**
  The field begins relative to the location of a string you specify.
- **Relative to a pair of delimiting strings**
  The field is the space between the Xth occurrence of string A and the Yth occurrence of string B.

For example, to define a field relative to two delimiting search strings, you would perform the following procedure:

1. Highlight the left/top search anchor string.
2. Right-click to display a popup menu.
3. Select **Add User Defined Field**, and then select **Selection as Left Delimiter** from the menu that appears.
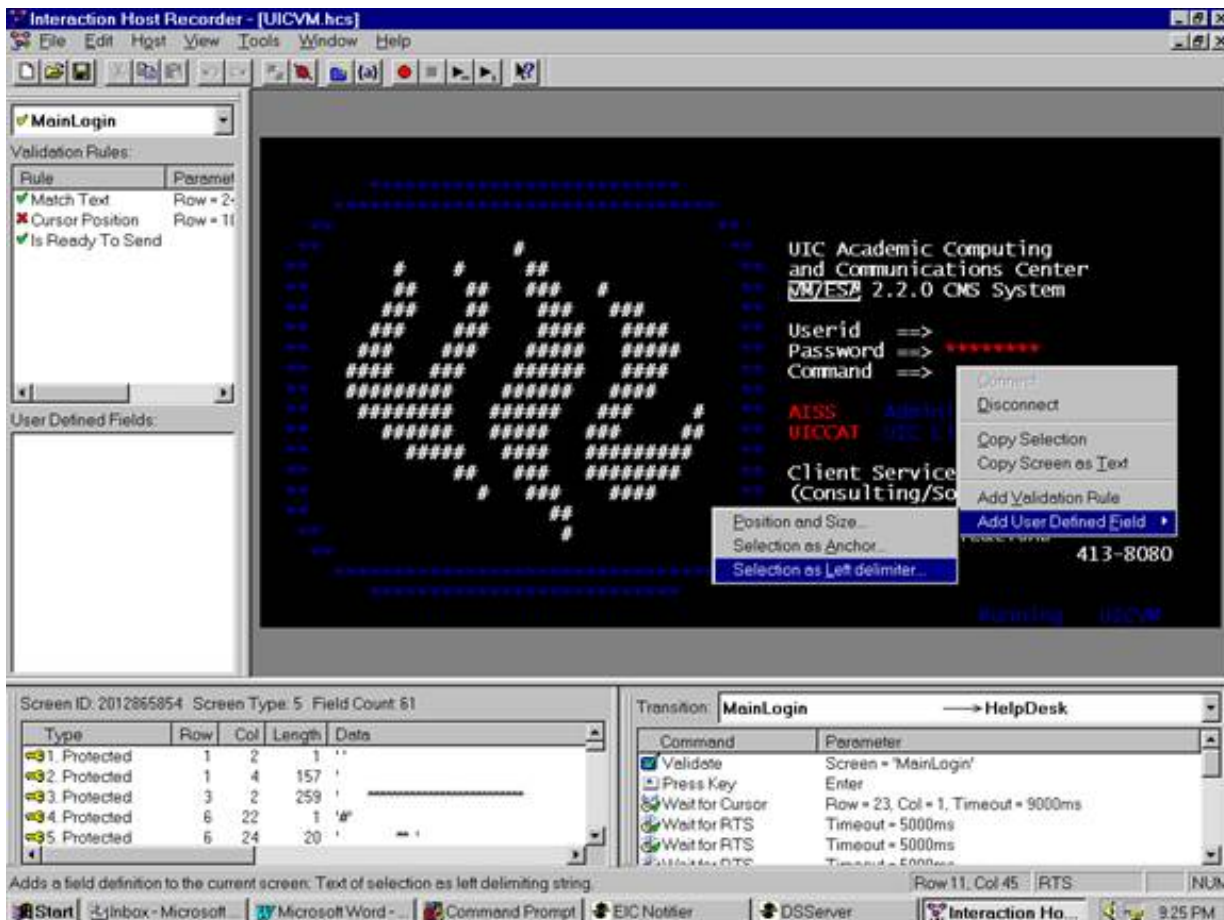
After step 3, a dialog appears allowing you to configure your definition, including specifying the right delimiting string:

Host Interface Tools

Note: Interaction Host Recorder does not natively include SSL encryption and authentication support. In CIC 3.0, you could use NetManage (now MicroFocus) OnWeb Web-to-Host to take advantage of these SSL options. MicroFocus no longer packages the required DLLs for SSL encryption and authentication support in their product line. Therefore, Interaction Host Recorder no longer supports these SSL options. CIC and PureConnect releases after CIC 4.0 do not include the Host Server license and do not support the ability to use the SSL encryption and authentication. Genesys recommends that you convert to a SOAP or REST solution instead of using Host Interface tools.

The host interface sends instructions through the host server to the host. High-level tools send commands based on the contents of the published host profile. Low-level tools can send commands directly and do not require the detailed instructions from the host profile.

High-Level Tools

The high-level host tools can read your host profile to perform the following operations. If your scripts provide enough detail, high-level tools may be all you need. The following list describes the high-level tools:

Host Connect

Establishes a connection with the host mainframe and returns a host connection handle for use by other host tools.

Host Connect Ex

Creates a connection to a host and returns a connection handle. If enabled to do so, this tool will also return a resource along with the connection handle.

Host Disconnect

Drops a connection established with a Host Connect step.

Host Disconnect Ex

Ends a connected session with the host with a connection resource.

Host Fetch Form Data

Retrieves data from a screen field you have defined.

Host Get Connection Resource

Returns a resource associated with a given host connection.

Host Get Field Attributes

Returns various field attributes for a given host connection, screen, and field.

Host Get Resource Counts

Queries the resource pool for the number of available and total resources for a given host profile.

Host Initialize Resource

Creates and initializes an instance of a resource pool for a given host profile.

Host Move To Screen

Moves from one screen to another.

Host Put Form Data

Writes data to a screen field you have defined.

Host Verify Screen

Verifies that the terminal emulation has loaded the expected screen.

Host Wait for Screen

Waits for a specific string to appear at a location on the screen.

Low-Level (Micro Control) Tools

Although using Interaction Host Recorder and its associated set of high-level tools may be all that you ever need, CIC also provides powerful low-level tools for flexible screen navigation. These tools are listed below:

Host Find String

Returns the location of a string you specify.

Host Get Cursor Position

Returns the location of the cursor's location on a screen.

Host Get Screen

Retrieves an entire screen and assigns each line as an element in a list of strings.

Host Get Screen Dimensions

This tool returns the screen dimensions for a given host connection.

Host Get String

Retrieves a string from a screen and writes it to a variable in a handler.

Host Move to Position

Move the cursor to a location on the screen.

Host Press Key

Emulates a user pressing a specific key.

Host Put String

Writes a value from a handler to a screen.

Host Wait for Cursor

Pauses the handler until the cursor appears at a specified location.

Host Wait for ReadyToSend

Pauses a handler until the host sends an RTS signal.

Host Wait for String

Pauses the handler until a specified string appears on the screen at a specified location.

Licensing for Host Interface Tools

Your organization must have a Customer Interaction Center license for the desired number of host access tool sessions, which come in bundles of 10, 24, or 50, depending on how many simultaneous connections to a mainframe or other computer you need to support. Once you have the license file containing a Host Server license key, you need to load it on the CIC server in Interaction Administrator using the **License Management** option on the **File** menu. Once loaded, you will see the I3_LICENSE_HOST_SERVER(s) entry in the **License Management** dialog, where x is the number of licenses you purchased.

Connectivity

CIC's host connectivity supports two communications protocols for accessing mainframes:
- TN3270 (or TN3270E)
- Microsoft SNA (Systems Network Architecture) Server

For the AS400, the following two protocols are supported:
- TN5250
- Microsoft SNA Server

> **Note:**
> For both Mainframe and AS400, Microsoft's SNA Server can be configured for use with the SNA Server Client, or it can be configured to act as a TN server.
>
> We recommend that any implementation be installed on a machine separate from the CIC Server.

No current VT support

There is currently no VT support with the Host Interface tools.

Connection methods (in order of preference):
- Using our Database tools with an ODBC connection to the database residing on the host
- Using our Host Interface tools with straight TN3270/5250 to the host*
- Using our Host Interface tools with straight TN3270/5250 to a separate HIS2000 server that interfaces to the host*
- Using our Host Interface tools over SNA via HIS2000** Client on the CIC box and a separate HIS2000 server that interfaces with the host*

*host = IBM mainframe or AS400 (period)
**HIS200 = Microsoft's Host Integration Server

Summary

CIC provides a powerful and easy-to-use solution for accessing mainframes and AS400 computers via handlers. A new application, Interaction Host Recorder, assists you in creating powerful scripts. The robust Host Server establishes and maintains up to 1000 virtual terminal emulations. The Host Interface tools enable handlers to read and write data through the Host Server.

Change Log

Date	Changes
30-August-2011	Updated for 4.0 GA.
04-August-2014	Updated documentation to reflect changes required in the transition from version 4.0 GA to CIC 2015 R1, such as updates to product version numbers, system requirements, installation procedures, references to Interactive Intelligence Product Information site URLs, and copyright and trademark information.
12-August-2015	Rebranded and updated Copyright page.
19-January-2017	- Added note to Host Interface Tools topic to explain SSL encryption and authentication support. - Rebranded terminology. - Conversion to HTML.