BEA
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BEA eLink for Mainframe TCP

CICS User Guide

BEA® eLink™ for Mainframe TCP for CICS User Guide

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Preface

BEA eLink for Mainframe TCP for CICS (hereafter referenced as eLink TCP for CICS) is a gateway connectivity feature that enables OLTP application programs on BEA TUXEDO systems to perform various non-transactional tasks with application programs that reside on CICS.

Purpose of This Document

This document describes the eLink TCP for CICS product and gives instructions for using the tools for building eLink TCP for CICS applications. This document also explains how to configure and administer eLink TCP for CICS.

Who Should Read This Document

This document is primarily for CICS system administrators who configure and administer eLink TCP. In addition, programmers can find useful pointers for developing client programs and service routines that send data through to the remote BEA eLink gateway.

Programmers who work with eLink TCP should be familiar with CICS applications development.

System administrators who work with eLink TCP should be familiar with the following concepts, tools, and procedures:

♦   TCP/IP networking

♦   IBM CICS Sockets Interface

♦ Defining new resources to CICS

♦ Standard CICS monitoring tools

How This Document Is Organized

The *BEA eLink TCP for CICS User Guide* is organized as follows:

♦ *Introducing BEA eLink TCP for CICS* introduces eLink TCP, explains how eLink TCP fits into the BEA TUXEDO configuration, and lists MVS software requirements.

♦ *Understanding How BEA eLink TCP for CICS Works* explains how eLink TCP is started, how it processes services requests, and how it is terminated.

♦ *Configuring the eLink TCP Security* provides background information to configure security for eLink TCP.

♦ *Configuring and Administering BEA eLink TCP for CICS* provides background information to configure eLink TCP.

♦ *Programming BEA eLink TCP for CICS* provides information that helps programmers develop service routines that send data to the remote eLink TCP gateway.

♦ *Error and Informational Messages* provides a detailed list of the messages eLink TCP generates both for the local CICS log and the remote BEA TUXEDO ULOG.

How to Use This Document

The *BEA eLink TCP for CICS User Guide* is designed primarily as an online, hypertext document. If you are reading this as a paper publication, note that to get full use from this document you should install and access it as an online document via a Web browser.

The following sections explain how to view this document online, and how to print a copy of this document.

Opening the Document in a Web Browser

To access the online version of this document, open the following HTML file in a Web browser.

```
http://(directory path to eLink TCP HTML files)/index.htm
```

Note: The online documentation requires a Web browser that supports HTML 3.0. Netscape Navigator 4.0 or higher or Microsoft Internet Explorer 4.0 or higher are recommended.

Printing from a Web Browser

You can print a copy of this document, one file at a time, from the Web browser. Before you print, make sure that the topic you want is displayed and *selected* in your browser. (To select a major topic, click anywhere inside the topic you want to print. If your browser offers a Print Preview feature, you can use the feature to verify which topic you are about to print.)

The BEA eLink TCP Online Documentation CD also includes Adobe Acrobat PDF files of all of the online documents. You can use the Adobe Acrobat Reader to print all or a portion of each document.

Document Conventions

The following documentation conventions are used throughout this document.

Convention	Item
Ctrl+Tab	Indicates that you must press two or more keys sequentially.
italics	Indicates emphasis, major topic titles, or book titles. Italic text also represents variable names you must supply or output information that can change. They are intended to be replaced by actual names. Variable names are displayed in italics and can include hyphens but not underscores.

Convention	Item

`monospace text`	Indicates code samples, commands and their options, data structures and their members, data types, directories, and file names and their extensions. Monospace text also indicates text that you must enter from the keyboard.
	
	Examples:
	
	`#include <iostream.h> void main ( ) the pointer psz`
	`chmod u+w *`
	`\tux\data\ap`
	`.doc`
	`tux.doc`
	`BITMAP`
	`float`

`monospace boldface text`	Identifies significant words in code. *Example*: `void `**`commit`**` ( )`
`monospace italic text`	Identifies variables in code. *Example*: `String `*`expr`*
UPPERCASE TEXT	Indicates device names, environment variables, and logical operators. COBOL function or subprogram names are displayed in uppercase type without underscores or hyphens, as follows. ROUTINENAME() C symbolic constants are displayed in uppercase type and can include underscores, as follows. CONSTANT_NAME COBOL symbolic constants are displayed in uppercase type and can include hyphens, as follows. CONSTANT-NAME
{ }	Indicates a set of choices in a syntax line. The braces themselves should never be typed.

Convention	Item

[ ]	Indicates optional items in a syntax line. The brackets themselves should never be typed.
	
	Example:
	
	`buildobjclient [-v] [-o name ] [-f file-list]...`
	`[-l file-list]...`

|	Separates mutually exclusive choices in a syntax line. The symbol itself should never be typed.

...	Indicates one of the following in a command line:
	
	♦ That an argument can be repeated several times in a command line
	
	♦ That the statement omits additional optional arguments
	
	♦ That you can enter additional parameters, values, or other information
	
	The ellipsis itself should never be typed.
	
	Example:
	
	`buildobjclient [-v] [-o name ] [-f file-list]...`
	`[-l file-list]...`

. . .	Indicates the omission of items from a code example or from a syntax line. The vertical ellipsis itself should never be typed.

Related Documentation

The following sections list the documentation provided with the eLink TCP for CICS software, and other publications related to OLTP technology.

BEA eLink TCP Documentation

The eLink TCP documentation consists of the following items:

♦ *BEA eLink TCP for CICS User Guide*

- *BEA eLink TCP for IMS User Guide*

- *BEA eLink TCP for TUXEDO User Guide*

- *BEA eLink TCP Installation Guide*

- *BEA eLink TCP Release Notes*

Note: The BEA eLink TCP Online Documentation CD also includes Adobe Acrobat PDF files of all of the online documents. You can use the Adobe Acrobat Reader to print all or a portion of each document.

BEA Publications

The following BEA publications are also available:

- *TUXEDO System 6 Reference Manual*

- *TUXEDO System 6 Programmer's Guide, Volumes 1 and 2*

Other Publications

For more information about online transaction processing (OLTP) technology, refer to the following books:

- *The TUXEDO System* (Andrade, Carges, Dywer, Felts)

- *TUXEDO: An Open Approach to OLTP* (Primatesta)

- *Building Client/Server Applications Using TUXEDO* (Hall)

Contact Information

The following sections provide information about how to obtain support for the documentation and software.

Documentation Support

If you have questions or comments on the documentation, you can contact the BEA Information Engineering Group by e-mail at **docsupport@beasys.com**. (For information on how to contact Customer Support, refer to the following section.)

Customer Support

If you have any questions about this version of eLink TCP for CICS, or if you have problems installing and running eLink TCP for CICS, contact BEA Customer Support through BEA WebSupport at `www.beasys.com`. You can also contact Customer Support by using the contact information provided on the Customer Support Card, which is included in the product package.

When contacting Customer Support, be prepared to provide the following information:

♦ Your name, e-mail address, phone number, and fax number

♦ Your company name and company address

♦ Your machine type and authorization codes

♦ The name and version of the product you are using

♦ A description of the problem and the content of pertinent error messages

1 Introducing BEA eLink TCP for CICS

BEA eLink for Mainframe TCP for CICS (hereafter referenced as eLink TCP for CICS) is a gateway connectivity feature that makes it possible for non-transactional tasks within BEA TUXEDO regions to access services provided by CICS application programs and vice-versa. A BEA TUXEDO region, or administrative domain, is a single computer or network of computers that shares a single BEA TUXEDO configuration.

The eLink TCP for CICS software is designed to provide transparent CICS program access from within a BEA TUXEDO domain and BEA TUXEDO access from within a CICS region.

The following information introduces the eLink TCP for CICS product:

♦ BEA eLink TCP for CICS Architecture

♦ BEA eLink TCP Functionality

♦ BEA eLink TCP for CICS Components

♦ Processing Scenarios

♦ Getting Started with eLink TCP for CICS

BEA eLink TCP for CICS Architecture

BEA eLink TCP for CICS is composed of four CICS programs (Handler, Application Handler, Pre-requester, and Requester) running within the CICS region. It uses the Sockets Interface and Sockets for CICS Listener that is shipped with the IBM TCP/IP for CICS/ESA Sockets Interface. There are two different processing scenarios to consider:

♦ Requests that originate in a remote BEA TUXEDO domain and request services offered by CICS

♦ Requests that originate in a CICS region and request services offered by a remote BEA TUXEDO domain

BEA eLink TCP Functionality

The following functionality is available in the eLink TCP product.

Domains-based Gateway Connectivity

The eLink TCP product has a domains-based architecture supporting bidirectional communications, request/response support, and concurrent support for the CICS interface.

Security

The eLink TCP product grants access to TUXEDO services based on a user name that the remote gateway supplies.

The eLink TCP for CICS product can start transactions or link to programs. BEA TUXEDO provides the USERID to the eLink TCP product to check for appropriate security prior to initiating the transactions.

Domain Name Server Support

The eLink TCP product supports domain name server (DNS) resolution of IP addresses. This support allows you to change the IP address at the Domain Name Server to implement address changes without reconfiguring the eLink TCP gateway.

Note: DNS is not supported with Interlink.

Dynamic Configuration

The eLink TCP product supports dynamic configuration updates for some of the eLink TCP configuration parameters. You can modify the configuration without shutting down and restarting the eLink TCP product. For more information about dynamic configuration, refer to "Dynamically Configuring eLink TCP for CICS."

BEA eLink TCP for CICS Components

There are four programs (Handler, Application Handler, Pre-requester, and Requester) used in processing remotely and locally initiated requests. Additionally, there is an online CICS administrative tool for configuring and maintaining the eLink TCP for CICS gateway.

The eLink TCP for CICS Handler

An eLink TCP Handler is a CICS program that communicates with the eLink TCP for TUXEDO Requester over TCP/IP; specifically, the Handler communicates BEA TUXEDO requests to a CICS region. A Handler is started automatically within a CICS region when a Requester within BEA TUXEDO issues the first service request destined for that CICS region.

The Handler is responsible for accepting a connection request, taking control of the socket connection, and continuing communication with the Requester in the BEA TUXEDO domain for the life of the socket connection. The Handler interfaces as necessary with the Application Handler to process service requests originating from the eLink TCP for TUXEDO Requester. If multiplexing or security is enabled, the Handler starts the Application Handler and waits for the next service request. The Handler periodically checks for completed requests. When a request has been completed, the Handler retrieves the response data from the Application Handler and transmits that data back to the Requester. The Handler also periodically checks to ensure that no active service requests have timed out.

If the multiplex count is 1 and security is disabled, or if the service request originated from a version of eLink TCP for TUXEDO prior to Version 3.0, the Handler executes the target user application, waits for the application to return data, transmits that data back to the Requester, then waits for the Requester to send another service request.

The eLink TCP for CICS Application Handler

The Application Handler is started by and receives request information from the Handler. The Application Handler executes the target user application, waits for the application to return data, and returns the data to the Handler.

The eLink TCP for CICS Pre-requester

The Pre-Requestor program is used as an interface between your CICS client program and the eLink TCP for CICS Requester. The CICS Requester, which is described in the next section, is the program that talks with the remote BEA TUXEDO region. From your CICS client program you call the Pre-requester by issuing an EXEC CICS LINK.

The eLink TCP for CICS Requester

The Requester program is responsible for making and maintaining the sockets connection with the remote BEA TUXEDO region. After receiving request information from the Pre-requester, the Requester sends that information to BEA TUXEDO. The Requester then receives any response data returned by BEA TUXEDO and sends it back to the Pre-requester, which in turn gives the information back to the client program that had called it.

IBM TCP/IP Sockets Interface

The sockets interface must be enabled before eLink TCP for CICS can communicate over TCP/IP. This is true for any CICS program which uses the sockets API. The IBM TCP/IP Sockets Interface is not supplied by BEA Systems, Inc. You can purchase it directly from IBM. The supplied transaction that accompanies the IBM TCP/IP Sockets for CICS product is used to enable the sockets interface under CICS. Complete documentation is provided with the product.

Using Other Supported TCP/IP Sockets Products

This document refers to the IBM TCP/IP sockets interface product. If you are using another supported TCP/IP product (such as Interlink TCPaccess) consult that product's documentation for equivalent components.

IBM User Maintained Tables (UMT)

The Connection file, BEAVCON, defaults to a user maintained table (UMT). If you choose to change this file to a VSAM file you must add the transaction BDWN to PLTSI for CICS. This transaction's primary function is to shut down all the active Requesters, but one of its secondary functions is to remove all the entries from the Connection file. The Connection file must be empty before initializing activity.

IBM TCP/IP Sockets for CICS Supplied Listener

The IBM TCP/IP Sockets for CICS Supplied Listener is responsible for capturing the initial connection request and passing that request along to the eLink TCP for CICS Handler. It is a piece of the IBM TCP/IP Sockets for CICS product which you must purchase directly from IBM. The listener should be installed and configured as outlined in the manual shipped with the product.

Processing Scenarios

This section describes the eLink TCP for CICS processing scenarios.

Requests from within a BEA TUXEDO Domain

Because of the way BEA TUXEDO maps services to servers, service requests from remote BEA TUXEDO regions to eLink TCP are transparent to the user, the BEA TUXEDO developer, and the CICS programmer.

As Figure 1-1 shows, eLink TCP for CICS extends this transparent access by routing BEA TUXEDO's requests for CICS program services through TCP/IP network software.

Figure 1-1   BEA TUXEDO to eLink TCP for CICS Routing
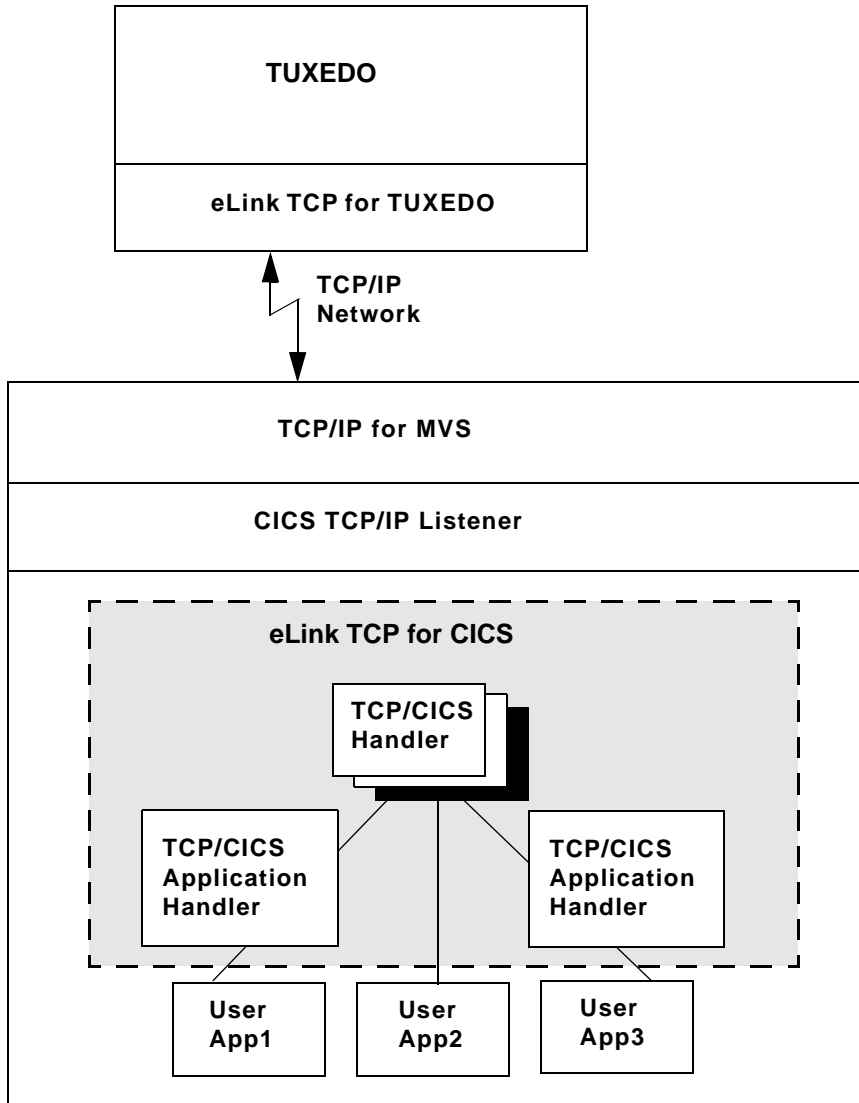
As Figure 1-1 shows, eLink TCP for CICS fits between the CICS user application and TCP/IP.

When BEA TUXEDO client programs send requests to remote systems (in this case, CICS) eLink TCP for TUXEDO transforms those requests into messages formatted appropriately for transmission to the remote system. Also, when remote systems respond, eLink TCP for TUXEDO transforms these responses into replies that local client programs can process.

The eLink TCP for CICS software is implemented as an ordinary CICS program which communicates with the Sockets Interface. It accepts connection requests from eLink TCP and returns standard replies.

Simultaneous socket connections can exist between one eLink TCP for CICS gateway (a set of eLink Handlers within a single CICS region) and all remote eLink TCP for TUXEDO Requesters. Each socket connection is established automatically when a new eLink TCP for TUXEDO Requester in the BEA TUXEDO domain establishes communication with the eLink TCP for CICS gateway.

Requests from within CICS

The mechanism used to send requests initiated from a CICS program to a remote BEA TUXEDO domain is invisible to the user and significantly abstracted from the CICS programmer. Your company's CICS program issues an EXEC CICS LINK command to the BEA eLink gateway. In the data passed with the EXEC CICS LINK command, the programmer supplies the name of the service and the data to be used as input to that service. When the EXEC CICS LINK command returns, the reply to the request is placed in that same data area. If there was a problem satisfying the service request, meaningful return codes are sent back.

Figure 1-2   BEA eLink Client Gateway Configuration
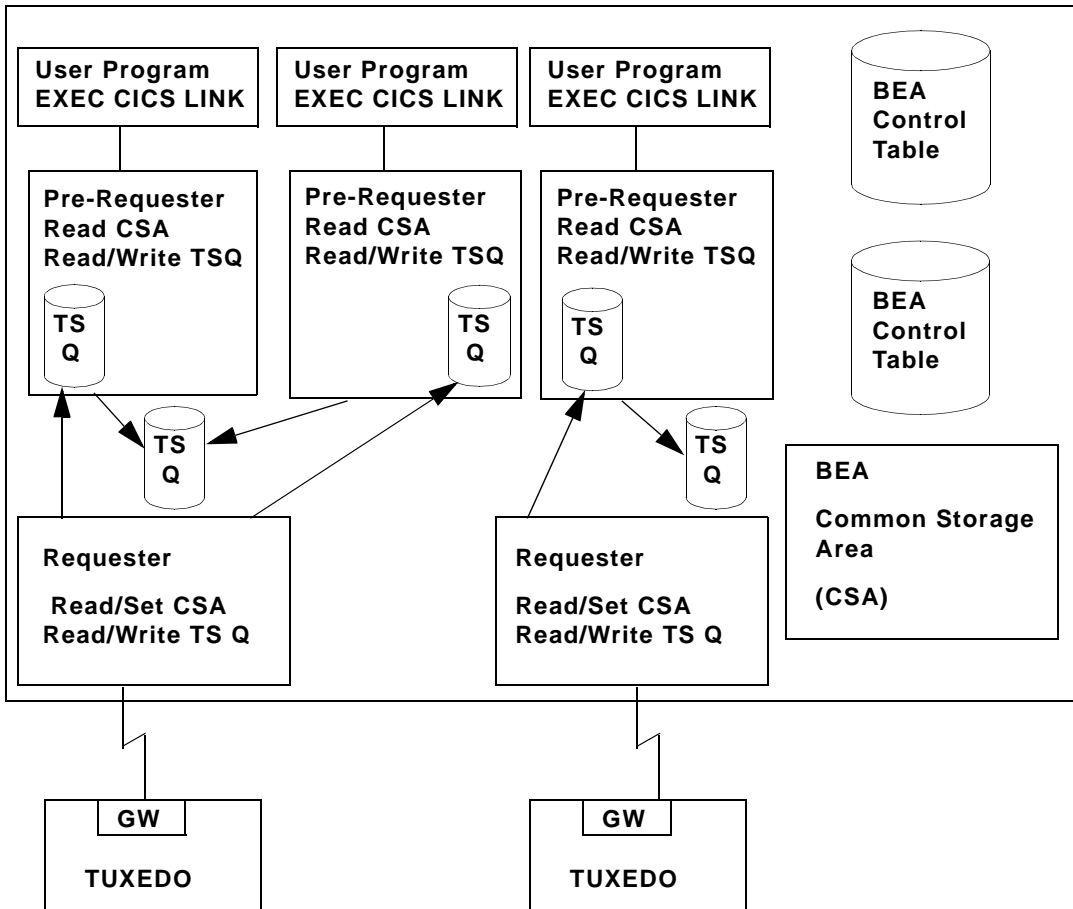
Figure 1-2 shows the configuration of the BEA eLink client gateway. A client program (your CICS program) issues an EXEC CICS LINK command to the Pre-requester. The Pre-requester verifies that the service name is valid and identifies the Requester to which it should it should pass the request. The Pre-requester starts a different Requester for each configured remote endpoint. The Requester then sends the request to the remote BEA TUXEDO domain and waits for a response. Once the response is returned, the Requester notifies the Pre-requester and hands the response to the Pre-requester, which then returns the response to the client program.

Getting Started with eLink TCP for CICS

The following list describes all the tasks you must perform before you can begin using eLink TCP for CICS.

♦ Ensure that MVS TCP/IP is installed and configured.

♦ Ensure that the Sockets for CICS interface and supplied listener are installed and configured. The listener product comes with the Sockets for CICS interface.

♦ From the MVS TCP/IP administrator, find out at which port and address your supplied listener should listen. Give this information to the BEA TUXEDO administrator so that the remote eLink TCP for TUXEDO component knows where to find the CICS TCP/IP listener.

♦ Find out on which ports eLink TCP for TUXEDO is listening. This information is necessary when you begin setting up services.

♦ Follow the installation instructions for eLink TCP given in the *BEA eLink TCP Installation Guide*.

♦ Using the administration tool (described in "Configuring and Administering BEA eLink TCP for CICS") define the services and remote endpoints for use by eLink TCP. The best way to approach this is to talk to the BEA TUXEDO administrator and choose one service only. Attempting to set up all the services at once would be a complex task, but after you learn how to set up one service, you should have no difficulty setting up the others.

♦ Add an EXEC LINK statement to one of your CICS programs and set up the data area as described in "Understanding How BEA eLink TCP for CICS Works."

♦ Consult your BEA TUXEDO administrator about service names (what to call a service and what BEA TUXEDO names it) and the layout of data each service expects. This ensures there are no consistency problems.

2 Understanding How BEA eLink TCP for CICS Works

To understand how the BEA eLink for Mainframe TCP for CICS (hereafter referenced as eLink TCP for CICS) product works, you should know how the product performs the following functions:

♦ Starting the Listener Program

♦ Running BEA eLink TCP for CICS

♦ How eLink TCP for TUXEDO Translates Data

Each of these operations is described in the following subsections. Additionally, this document describes some programming considerations that may be useful when you develop or change programs that interoperate with eLink TCP for CICS.

Starting the Listener Program

The Listener program is supplied by IBM and is part of the Sockets for CICS software product which must be purchased from IBM.

Note: Before you can use eLink TCP for CICS, you must install and configure both IBM TCP/IP and the Sockets for CICS product as outlined in the documentation that accompanies those products.

The Listener's job is to wait for connection requests at a particular network address and port of your choosing. When the Listener receives a connection request it invokes the appropriate CICS program automatically, based on the name supplied as part of the Listener's connection protocol buffer. For example, if the Listener receives a connection request from eLink TCP for TUXEDO running on a remote BEA TUXEDO node, it processes the connection and invokes the eLink TCP Handler.

Running BEA eLink TCP for CICS

The eLink TCP Handler is invoked automatically by the Listener process. Once invoked, the Handler takes control of the socket connection and retains control until either the Handler is shut down or until there is a network problem that affects the socket connection. The Handler processes service requests up to the configured multiplex count. To process more service requests than the configured multiplex count, eLink TCP for TUXEDO starts more than one Handler. For limitations of the IBM Sockets for CICS Listener, refer to the appropriate IBM product documentation.

Initializing the Handler

The very first service request that is sent from the eLink TCP for TUXEDO gateway running on a remote BEA TUXEDO node causes the following to occur.

1. CICS Sockets Listener starts the eLink TCP for CICS Handler

2. Listener issues a givesocket() function call

3. Handler issues a takesocket() function call

4. Listener resumes listening for new connection requests

5. Handler communicates directly with the remote eLink TCP for TUXEDO gateway using TCP/IP

Processing Remote Service Requests

1. The eLink TCP Handler receives the request from the remote eLink TCP for TUXEDO gateway (in the BEA TUXEDO region) over TCP/IP. If necessary, the data is translated and/or converted into the proper data format or layout.

2. If the multiplex count is 1 and security is disabled, or if the service request came from a version of eLink TCP for TUXEDO prior to Version 3.0, then the following tasks occur.

   a. The Handler issues a CICS LINK command to execute the program specified in the eLink TCP protocol header. With the LINK command it also passes along any request data provided by the client application that made the original BEA TUXEDO service request.

   b. The Handler waits for the CICS program to finish and receives any returned data from the CICS program.

   c. The Handler transmits the response to the remote eLink TCP for TUXEDO gateway.

   d. The Handler stays connected to the remote gateway awaiting another service request.

3. If the multiplex count is greater than 1 or security is enabled, then the following tasks occur.

   a. The Handler issues a CICS START TRANS call with the transaction specified in the Inbound Service File for the service specified in the eLink TCP protocol header. The transaction should be the same as the Application Handler program.

   Note: If security is enabled, the CICS START TRANS call uses the USERID=*userid* specified in the eLink TCP protocol header.

   b. For any completed service requests, the Handler retrieves the response data from the Application Handler.

   c. The Handler transmits the response to the remote eLink TCP for TUXEDO gateway.

   d. The connection between the Handler and the gateway remains and the Handler waits for another service request.

For tpacall/TPNOREPLY requests, the remote program is invoked by a CICS START TRAN command and no data is returned to the original caller. In this case, a unique transaction must be defined for the service. Use the Inbound Service Information screen to enter this unique transaction name rather than using the transaction name that starts the Application Handler.

Shutting Down the Handler

When the network connection is lost, the Handler process automatically shuts down. The next service request sent causes the Listener to automatically start a new Handler, if necessary.

Use the supplied shutdown transaction BDWN. Depending on the options specified, this causes *all* Handlers to shut down gracefully. The name of the BDWN transaction may have been changed at your site during installation, so verify the name.

Using BDWN to Shut Down the Handler

You can use the BDWN transaction in a CICS region with the following parameters to shut down Handlers in various ways. The command line syntax for BDWN is as follows.

Listing 2-1   BDWN Command Line Syntax for Handlers

```
BDWN [ALL | CLEANUP | HANDLER I | HANDLER]
```

BDWN

shuts down all Handlers or all Requesters or both. It also frees shared memory that was allocated by a Handler that has abended without freeing the shared memory that it allocated. You can specify optional parameters with the BDWN transaction to shut down Handlers immediately or after the processing of all requests has completed. The default is ALL.

ALL

shuts down all Handlers and Requesters gracefully allowing them to complete all processing of all requests that were received before the

execution of the BDWN transaction. Specifying ALL also frees any shared memory.

This is the default for BDWN.

CLEANUP

frees any shared memory of Handlers that have abended. CLEANUP does *not* shut down any Handlers or Requesters.

HANDLER I

shuts down all Handlers immediately and frees any shared memory of Handlers that have abended. This parameter does *not* shut down any Requesters.

HANDLER

shuts down all Handlers gracefully allowing them to complete all processing off all requests that were received before the execution of the BDWN transaction. This parameter also frees any shared memory of Handlers that have abended. It does *not* shut down any Requesters.

Starting the Requester Program

The Requester is started automatically when the first service request for it is made by a CICS client program. At that point, the Requester establishes a connection with its remote endpoint and updates its control tables with run-time information for use by subsequent requests. If the connection with the remote endpoint is lost for any reason, the Requester attempts to re-establish the connection automatically. After a configured number of unsuccessful connection attempts, the Requester marks itself disabled.

If the gateway receives additional service requests, they are accommodated as long as the maximum multiplex count for the existing connection is not exceeded. Also, additional connections are opened, as necessary, until the configured maximum connection count is reached or all requests are accommodated.

Processing eLink TCP for CICS Originated Service Requests

1. The CICS client program (your program) issues an EXEC CICS LINK command to the eLink TCP for CICS Pre-requester.

2. The Pre-requester verifies that the request is valid, and then determines whether a Requester has been started for the specific endpoint for which this request is destined. If a Requester is not already running, the Pre-requester starts one.

3. The request is then handed over to the Requester.

4. The Requester transmits the request information to the remote BEA TUXEDO region.

5. If the request is a type that needs a response, the Requester receives that response back from BEA TUXEDO, and hands the data over to the Pre-requester.

6. The Pre-requester issues an EXEC CICS RETURN command to the client program (your program). The client receives its response in the commarea.

Shutting Down the Requester

There are two ways to shut down the Requester:

♦ Use the administrative tool (described in "Configuring and Administering BEA eLink TCP for CICS") to disable the Requester. This causes the selected Requester to clean up its tables and shut down gracefully. It also prohibits any service requests invoking it. When you are ready, use the administrative tool to enable the Requester.

♦ Use the supplied shutdown transaction BDWN. This causes ALL Requesters to shut down gracefully. The name of the BDWN transaction may have been changed at your site during installation. Check with the person who installed eLink TCP for CICS at your site.

Using BDWN to Shut Down the Requester

You can use the BDWN transaction in a CICS region with the following parameters to shut down Requesters in various ways. The command line syntax for BDWN is as follows.

Listing 2-2   BDWN Command Line Syntax for Requesters

```
BDWN [ALL | REQUESTER I | REQUESTER]
```

BDWN

>   shuts down all Handlers or all Requesters or both. It also frees shared memory used by the Requesters associated with each LMID. You can specify optional parameters with the BDWN transaction to shut down Handlers or Requesters immediately or after processing of all requests has completed. The default is ALL.

>   ALL

>>   shuts down all Handlers and Requesters gracefully allowing them to complete all processing of all requests that were received before the execution of the BDWN transaction. Specifying ALL also frees any shared memory.

>>   This is the default for BDWN.

>   REQUESTER I

>>   shuts down all Requesters immediately and frees memory associated with each LMID. This parameter does *not* shut down any Handlers.

>   REQUESTER

>>   shuts down all Requesters gracefully allowing them to complete all processing off all requests that were received before the execution of the BDWN transaction. It also frees memory associated with each LMID. This parameter does *not* shut down any Handlers.

How eLink TCP for TUXEDO Translates Data

Due to the way eLink TCP for TUXEDO translates and converts data on the remote BEA TUXEDO system, the CICS programmer does not need to do anything to prepare data that is destined for the remote BEA TUXEDO system.

The key to this high degree of transparency is the eLink TCP for TUXEDO configuration. It is through this mechanism that environmental differences, such as naming conventions and data formats, are concealed from programmers and programs.

Although all data is converted and translated automatically by the remote eLink TCP for TUXEDO gateway, the rules implemented are outlined in the following subsections to assist the CICS programmer in understanding how the data is manipulated. It is important for the CICS programmer to remember that this information is written from the point of view of the BEA TUXEDO environment.

When a client program on the remote BEA TUXEDO system sends data to (or receives data from) a service routine on a different model of computer, eLink TCP for TUXEDO automatically translates data as required. Translation involves changing the representation of intrinsic data types by changing attributes such as word length and byte order.

The following subsections describe the basic rules that eLink TCP for TUXEDO follows when it translates data and provide detailed information about how eLink TCP for TUXEDO handles string and numeric data.

BEA TUXEDO Terminology

The following are some commonly used BEA TUXEDO terms for buffer types.

STRING   A buffer of character data that is terminated by the first null character in the buffer. Typically, character string buffers undergo translation when sent to a system that is different from the sending system.

CARRAY   A CARRAY is a buffer of raw data that contains no terminating character and that undergoes no conversion or translation; the

data is sent from one system to another without modification. A CARRAY is an exemplary buffer type for a graphics file.

VIEW   A VIEW buffer is a collection of field definitions that can be treated as a single entity. It is comparable to a record layout in COBOL or a structure in C.

FML   FML (Fielded Manipulation Language) buffers are variable length, dynamic, self-describing buffers. Each field in the buffer has its own descriptive header. In BEA TUXEDO, FML buffers can be tied closely to VIEW buffers so that conversion from one to the other is direct.

Data Translation Rules

The following table lists the data translation rules that eLink TCP for TUXEDO follows.

Field Type	Translation Rules
CARRAY	Passed untranslated as sequences of bytes
STRING and CHAR	Translated from ASCII to EBCDIC (if needed)
SHORT	Translated to S9(4) COMP
LONG	Translated to S9(9) COMP
FLOAT	Translated to COMP-1
DOUBLE	Translated to COMP-2

Note: BEA TUXEDO provides a field type named dec_t that supports decimal values within VIEWs. The eLink TCP for TUXEDO product translates these fields into machine independent representations of packed decimals. For example, dec_t(m,n) becomes S9(2*m-(n+1))V9(n) COMP-3. Therefore, a decimal field with a size of 8,5 corresponds to S9(10)V9(5) COMP-3.

The following table summarizes the translation rules between C and IBM/310 data types.

Remote Data Type	Description	View Field Type/Length
PIC X(n)	Alpha-numeric Characters	string / n
PIC X	Single Alpha-numeric Character	char
PIC X(n)	Raw Bytes	carray / n
PIC X	Single Numeric Byte	carray / 1
PIC S9(4) COMP	16-bit Integer	short
PIC S9(9) COMP	32-bit Integer	long
COMP-1	Single-precision Floating Point	float
COMP-2	Double-precision Floating Point	double
PIC S9((m+(n+1))/2)V9(n) COMP-3	Packed Decimal	dec_t / m,n

Strings and Numeric Data: A Closer Look

This subsection provides suggestions that help you develop VIEW definitions for input and output buffers and records. It also explains how string data and numeric data are treated in the eLink TCP for TUXEDO environment.

Including NULL Characters in String Length Calculations

When you create VIEW definitions for input and output records that are used by CICS applications, do not specify an extra position for the terminating NULL characters that are used in string fields.

For example, when a CICS application program expects 10 characters in an input record, specify *10* for that field, not 10 plus 1.

Note: Although eLink TCP for TUXEDO does not require strings to be NULL-terminated, it respects NULL termination. Therefore, when eLink TCP for TUXEDO detects a NULL (zero) character within a string, it does not process any subsequent characters. To pass full 8-bit data that contains embedded NULL values, use a CARRAY type field or buffer.

The character set translations performed by eLink TCP for TUXEDO can be fully localized, in accordance with the X/Open XPG Portability Guides. ASCII and EBCDIC translations are loadable from message files. The eLink TCP for TUXEDO software contains default behaviors which should meet the requirements of most English-language applications. However, you may find it necessary to customize tables. See the *BEA eLink TCP for TUXEDO User Guide* for complete instructions.

Converting Numeric Data

You can convert numeric data into different data types easily, provided that you have enough range in the intermediate and destination types to handle the maximum value you need to represent.

For example, you can convert an FML field of double into a packed decimal field on the remote target system by specifying an appropriate dec_t type VIEW element.

In addition, you can convert numeric values into strings (and the reverse). For example, while FML buffers do not directly support the dec_t type, you can place decimal values in string fields and map these to dec_t fields within VIEW definitions.

3 Configuring the eLink TCP Security

The eLink TCP product supports a security feature that allows a requester from BEA TUXEDO services to pass a USERID requirement through the CICS server interfaces for verification through a third-party security package. The following topics explain the how to set up security:

♦ Service Request Processing with Security

  ♦ Security Checking from UNIX to Mainframe

  ♦ Security Checking from Mainframe to UNIX

♦ Setting Up Security for eLink TCP for CICS

  ♦ Securing User Connections

  ♦ Securing Inbound Services

  ♦ Securing Outbound Connections from CICS to UNIX

  ♦ Securing Outbound Connections from CICS to CICS

  ♦ Securing Outbound Connections from CICS to IMS

  ♦ Securing Outbound Services

Service Request Processing with Security

The following sections describe the process flow for security verification of a service request.

Security Checking from UNIX to Mainframe

Figure 3-1 depicts the process flow for security verifications from eLink for Mainframe TCP for CICS on UNIX to a mainframe.

Figure 3-1   Security Checking for UNIX to Mainframe Transactions
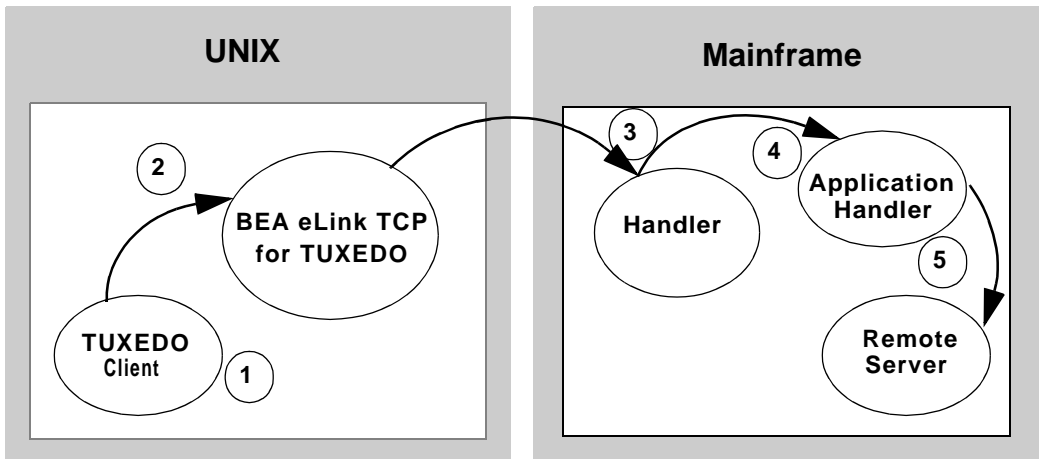
1. When the eLink TCP for TUXEDO client program performs a `tpinit()`, the user's TUXEDO identity is validated against the `tpusr` file.

2. When the client program issues a `tpcall()` or `tpacall()`, TUXEDO verifies (against the `tpacl` file) the user is authorized to invoke the gateway service.

3. When the gateway establishes the initial connection, connection security information (specified as RMTNAME and PASSWORD in the GWICONFIG file) is passed from the eLink TCP for TUXEDO gateway to the remote gateway. If the RMTNAME and PASSWORD values match the values configured on the remote gateway, the connection is established.

   With each request, the eLink TCP for TUXEDO gateway passes the user's TUXEDO identity to the remote eLink TCP for CICS gateway (to the Handler).

   Note: To pass authority checking, the user's TUXEDO identity must match the mainframe userid exactly.

4. The remote eLink TCP for CICS gateway Handler initiates an Application Handler to act on behalf of the specified userid.

5. The Application Handler calls the specified service using system security to check authorization.

Security Checking from Mainframe to UNIX

Figure 3-2 depicts the process flow for security verifications from a mainframe to eLink for Mainframe TCP for CICS on UNIX.

Figure 3-2   Security Checking for Mainframe to UNIX Transactions
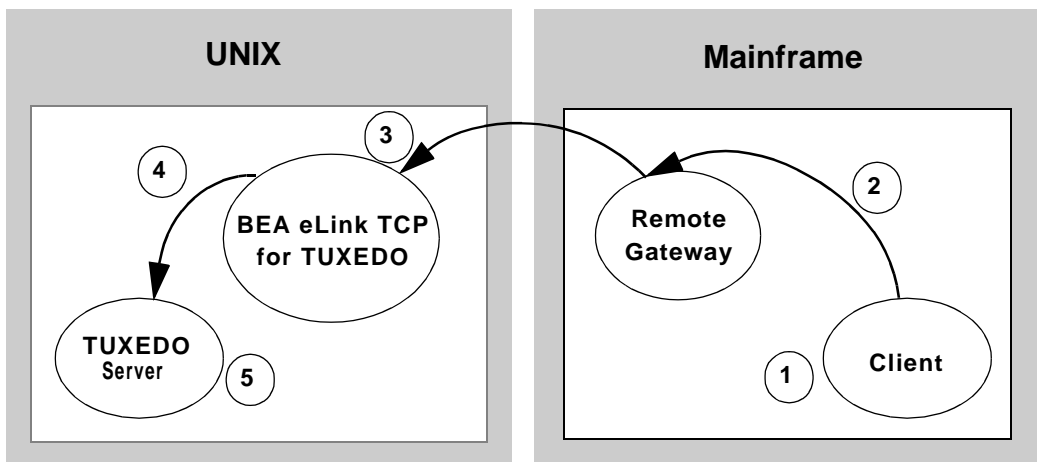
1. The userid, established at mainframe log in, is checked by system security to verify that the user has permission to start a client transaction.

2. The userid is checked by system security to verify that the user has permission to send a request to the gateway.

3. With each request, the gateway passes the userid to the TUXEDO gateway.

   Note: To pass authority checking, the user's TUXEDO identity must match the mainframe userid exactly.

4. The eLink TCP for CICS gateway maps the mainframe userid to a TUXEDO userid and issues the service request on behalf of that user.

5. The TUXEDO server performs access checks (based on the tpacl file) to verify that the user has access to the requested service.

Setting Up Security for eLink TCP for CICS

The eLink TCP for CICS product supports enhanced security. This interface allows a requester from BEA TUXEDO services to pass a USERID through the CICS server interface for authorization through your security package. For field definitions, refer to the "Configuring and Administering BEA eLink TCP for CICS."

Securing User Connections

Complete the following tasks to enable the security feature for each connection.

1. Specify SECURITY=Y in the Handler Configuration screen.

2. Enter values for the ACCOUNT and PASSWORD fields in the User Connection Account screen.

   When SECURITY=Y, eLink TCP for CICS verifies the ACCOUNT and PASSWORD values from the User Connection Account match the RMTACCT and PASSWORD values in the eLink TCP for TUXEDO GWICONFIG file *FOREIGN section. If these values do not match and SECURITY=Y, a security error occurs.

If SECURITY=N, the gateway allows a connection without any verification.

Securing Inbound Services

Complete the following tasks to enable the security feature for each inbound service.

1. Set up transaction security through the mainframe with the security administrator.

2. Specify SECURITY=Y in the Inbound Services screen for each service you want to secure. When SECURITY=Y, the gateway attempts to start user programs with the username that initiated the request as reported by the remote system.

   If SECURITY=N, the gateway starts user programs as the same user the gateway is running (as controlled by the socket listener).

Securing Outbound Connections from CICS to UNIX

Complete the following tasks to enable the security feature for each outbound connection.

1. Specify SECURITY=Y on the appropriate Requester screen.

2. Enter ACCOUNT and PASSWORD values on the appropriate Requester screen.

   Verify that the parameter values for ACCOUNT and PASSWORD in the Requester screen match the RMTACCT and PASSWORD values in the *FOREIGN section of the eLink TCP for TUXEDO GWICONFIG file.

   When SECURITY=Y, the requester program sends the ACCOUNT and PASSWORD to the remote UNIX system on connection initiation. When SECURITY=N, the gateway attempts to make a connection without any verification.

Securing Outbound Connections from CICS to CICS

Complete the following tasks to enable the security feature for each outbound connection.

1. Specify SECURITY=Y on the appropriate Requester screen.

2. Enter ACCOUNT and PASSWORD values on the appropriate Requester screen.

   Verify that the parameter values for ACCOUNT and PASSWORD in the Requester screen match the ACCOUNT and PASSWORD values in the User Connection Account screen.

   When SECURITY=Y, the requester program sends the ACCOUNT and PASSWORD to the remote CICS system on connection initiation. When SECURITY=N, the gateway attempts to make a connection without any verification.

Securing Outbound Connections from CICS to IMS

Complete the following tasks to enable the security feature for each outbound connection.

1. Specify SECURITY=Y on the appropriate Requester screen.

2. Enter ACCOUNT and PASSWORD values on the appropriate Requester screen.

   Verify that the parameter values for ACCOUNT and PASSWORD in the Requester screen match the ACCOUNT and PASSWORD values in the GATEWAY TYPE=REMOTE statement.

   When SECURITY=Y, the requester program sends the ACCOUNT and PASSWORD to the remote IMS system on connection initiation. When SECURITY=N, the gateway attempts to make a connection without any verification.

Securing Outbound Services

Complete the following tasks to enable the security feature for each outbound service.

1. Enable security for the corresponding outbound connection.

2. Specify SECURITY=Y on the appropriate Outbound Service screen.

3. Set up security for the appropriate users on the target system.

4 Configuring and Administering BEA eLink TCP for CICS

It is the responsibility of the BEA TUXEDO administrator to set up the configuration file, but close coordination with the BEA TUXEDO application developer and the CICS programmer is necessary.

The following subsections describe the BEA eLink for Mainframe TCP for CICS (hereafter referenced as eLink TCP for CICS) Maintenance System. The BEA eLink TCP for CICS Maintenance System is an online CICS application for use in configuring, maintaining, and administering the eLink TCP for CICS gateway. The following topics explain the Maintenance System:

♦ Menu Navigation

♦ The Main Menu

♦ The Connection Screens

♦ The Requester Screens

♦ The Outbound Service Information Screens

♦ The User Connection Account Screens

♦ The Inbound Service Information Screens

♦ The Handler Configuration Screens

♦ Dynamically Configuring eLink TCP for CICS

♦ Administering the Gateways

To start the administration system, enter the transaction code as defined to CICS in the installation procedure. If the name was not changed during installation, the name of the transaction is BEAM.

Menu Navigation

You can access any of the following six groups of menus for maintaining connections, requesters, outbound services, the user connection account, inbound services, and Handler configuration. The following table describes how you can use each group of menus.

Menu Type	Use
Connection	To monitor and control configured and active connections
Requester	To configure and maintain remote endpoints
Outbound Service Information	To configure each remote service and specify which Requester to use for each service
User Connection Account	To create and maintain user accounts
Inbound Service Information	To configure services residing locally that are accessed remotely
Handler Configuration	To configure and maintain the local endpoint

Each of these topics is discussed in more detail in the following sections.

The Main Menu

The Main menu (BEAM) gives you access to all the maintenance screens.

```
BEAPMNU                   BEA ELINK TCP FOR CICS                  BEAM M1

                             SELECTION SCREEN


         TABLE                                    OPERATION
    ----------------                             ----------

    C - CONNECTION                               1 - INSERT
    R - REQUESTER                                2 - UPDATE
    S - OUTBOUND SERVICE INFORMATION             3 - INQUIRE
    U - USER CONNECTION ACCOUNT                  4 - DELETE
    I - INBOUND SERVICE INFORMATION              5 - BROWSE
    H - HANDLER CONFIGURATION



                      SELECTION:  __            (e.g. R3)



  ENTER: PROCESS, PF3: EXIT
```

Usage

Use the Main menu to access the screens that make up the maintenance system. To move from the Main menu to a sub-menu, enter the appropriate two-character code. The first character in the code denotes the area in which you want to operate; the second character denotes the operation you want to perform on that area.

The following are the codes for the areas of operation:

♦ C - Connections

♦ R - Requesters

♦ S - Outbound Service Information

♦ U- User Connection Account

♦ I - Inbound Service Information

♦ H - Handler Configuration

The following are the codes for the allowable operations:

♦ 1 - Insert

♦ 2 - Update

♦ 3 - Inquire

♦ 4 - Delete

♦ 5 - Browse

Because some operations are not available in all three areas, the following table lists the valid combinations.

Enter This Code	To Access This Screen
C2	Update Connection
C3	Inquire Connection
C5	Browse Connection
R1	Insert Requester
R2	Update Requester
R3	Inquire Requester
R4	Delete Requester
R5	Browse Requester
S1	Insert Outbound Service Information
S2	Update Outbound Service Information
S3	Inquire Outbound Service Information
S4	Delete Outbound Service Information
S5	Browse Outbound Service Information
U1	Insert User Connection Account
U2	Update User Connection Account

Enter This Code	To Access This Screen
U3	Inquire User Connection Account
U4	Delete User Connection Account
U5	Browse User Connection Account
I1	Insert Inbound Service Information
I2	Update Inbound Service Information
I3	Inquire Inbound Service information
I4	Delete Inbound Service Information
I5	Browse Inbound Service Information
H2	Update Handler Configuration
H3	Inquire Handler Configuration

You can use the maintenance system screens to view and alter a connection, but not to insert (create) or delete a connection. Connections are created and deleted by eLink TCP for CICS in its normal operation.

The maintenance system checks the two-character selection code that you enter and displays the appropriate screen if the code is valid. If the code you enter is not valid, you receive an error message.

The Connection Screens

The three screens available for maintaining connection instances are labeled Update, Inquiry and Browse. The respective screens allow you to make an inquiry concerning a specific connection, to browse a list of all connections, or to disable/enable a connection.

A connection instance is an established TCP/IP connection between a remote endpoint and a Requester or a Handler. For the purposes of eLink TCP for CICS, a remote endpoint is an eLink TCP for TUXEDO Handler or Requester executing within a remote BEA TUXEDO domain.

PF Keys

The following function keys are available on various connection screens.

ENTER	Process the selection code entered
PF3	Transfer to Main Menu
PF5	Transfer to Connections Browse screen
PF7	Display the previous page of records
PF8	Display the next page of records

Note: If you enter data and press PF3 or PF5 before pressing ENTER, the current operation process is aborted and the new screen is displayed.

Update Connection Screen (C2)

Use the UPDATE CONNECTION screen to update a record from the Connection file. When the screen initially displays, the LOGICAL MACHINE NAME and TYPE fields are unprotected. Enter a valid LOGICAL MACHINE NAME (gateway ID) and TYPE and press ENTER. The screen redisplays showing the data from the record you specified and the STATUS field is unprotected. The message RECORD READY FOR UPDATE displays. You can now make changes to the record.

```
BEAPCON                      BEA ELINK TCP FOR CICS                BEAM C2

                              UPDATE   CONNECTION


                LOGICAL MACHINE NAME:      _____

                TYPE:                      _

                STATUS:

                MAX MSG SIZE:

                REQUESTER TASK NUMBER:
                NUMBER REQUESTS:
                NUMBER SUCCESS REQS:
                NUMBER RECONNECTS:
                NUMBER OPEN SOCKETS:
                NUMBER SESSIONS ACTIVE:


     ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Logical Machine Name	This is the gateway ID. Give it a unique name up to 16 characters.Example: (bankmach1)
	For Requesters, this is the LMID associated with the service that the Requester is requesting.
	For a Handler, this is BEAH followed by the task number. The task number of the Handler is given in the BEALOG.
Type	The type of connection. Specify I for incoming connections or O for outgoing connections.

Status	The status of the connection. Specify E to enable the connection. Specify D for normal shutdown which allows initiated tasks to complete prior to disconnecting. Specify A for immediate shutdown which aborts all initiated tasks and disconnects.
Max Msg Size	The largest message allowed to be sent across this connection. The maximum is 32000. Example: (31000)
Requester Task Number	The task number of the Requester that is currently associated with the Logical Machine Name. If there is not an active Requester, the task number is for the Requester most recently associated with that LMID. For a Handler, this field is blank; the task number is part of the LMID.
Number Requests	The number of service requests made during this connection.
Number Success Reqs	The number of successful communications.
Number Reconnects	The number of successful connections.
Number Open Sockets	The number of sockets that are currently opened by the Requester.
Number Sessions Active	The number of active sessions on this connection.

Inquire Connection Screen (C3)

Use this screen to inquire about a record from the Connection file. When the screen is initially displayed, the LOGICAL MACHINE NAME and TYPE fields are unprotected. Enter a valid LOGICAL MACHINE NAME (gateway ID) and TYPE and press ENTER. The screen is redisplayed with the data from the record you specified and the LOGICAL MACHINE NAME and TYPE fields are unprotected.

```
BEAPCON                    BEA ELINK TCP FOR CICS                  BEAM C3

                              INQUIRE CONNECTION


                LOGICAL MACHINE NAME:      _____

                TYPE:                      _

                STATUS:

                MAX MSG SIZE:

                REQUESTER TASK NUMBER:
                NUMBER REQUESTS:
                NUMBER SUCCESS REQS:
                NUMBER RECONNECTS:
                NUMBER OPEN SOCKETS:
                NUMBER SESSIONS ACTIVE:


     ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Logical Machine Name	This is the gateway ID. Specify a unique name up to 16 characters. Example: (bankmach1)
	For Requesters, this is the LMID associated with the service that the Requester is requesting.
	For a Handler, this is BEAH followed by the task number. The task number of the Handler is given in the BEALOG.
Type	The type of connection. I represents incoming connections or O represents outgoing connections.

Status	The status of the connection. E means the connection is enabled. D means the connection is designated for a normal shutdown, which allows initiated tasks to complete prior to disconnecting. A means the connection shuts down immediately, aborts all initiated tasks, and disconnects.
Max Msg Size	The largest message allowed to be sent across this connection. The maximum is 32000. Example: (31000)
Requester Task Number	The task number of the Requester that is currently associated with the Logical Machine Name. If there is not an active Requester, the task number is for the Requester most recently associated with that LMID. For a Handler, this field is blank; the task number is part of the LMID.
Number Requests	The number of service requests made during this connection.
Number Success Reqs	The number of successful communications.
Number Reconnects	The number of successful connections.
Number Open Sockets	The number of sockets that are currently opened by the Requester.
Number Sessions Active	The number of active sessions on this connection.

Browse Connection Screen (C5)

Use this screen to browse records in the Connection file and to select individual records for further processing. If you access this screen from the Main menu, the first record on file is displayed at the top of the screen. If you access this screen from the Connection Update screen or the Inquire screen, the list starts with the key received from that screen.

To select a record for processing enter a valid selection code in the SEL CDE field. For example, to make an inquiry about a record, enter "3". If you enter more than one selection code, the first one is used and all others are ignored. After the selection code is validated and processed, the screen for that process is displayed, and the record key appears in the LOGICAL MACHINE NAME field.

```
BEAPCON                    BEA ELINK TCP FOR CICS                  BEAM C5

                           BROWSE  CONNECTION


SEL  LOGICAL MACHINE  STA MAXMSG NUMBER NUMBER NUMBER SOCK SESS ACT
CDE       NAME        TUS  SIZE   REQS  SUCREQ RECONS ETS  IONS IVE TYPE
---  ---------------- --- ------ ------ ------ ------ ---- ---- --- ----


 _   _____  _  _____  _____  _____  _____   __   __   _   _
 _   _____  _  _____  _____  _____  _____   __   __   _   _
 _   _____  _  _____  _____  _____  _____   __   __   _   _
 _   _____  _  _____  _____  _____  _____   __   __   _   _
 _   _____  _  _____  _____  _____  _____   __   __   _   _
 _   _____  _  _____  _____  _____  _____   __   __   _   _
 _   _____  _  _____  _____  _____  _____   __   __   _   _
 _   _____  _  _____  _____  _____  _____   __   __   _   _
 _   _____  _  _____  _____  _____  _____   __   __   _   _


 * SELCDE = (2: UPD, 3: INQ)
    ENTER: PROCESS, PF3: MENU, PF7: PREV, PF8: NEXT
BEG/END OF FILE
```

The Requester Screens

A Requester is responsible for collecting request information to be sent to the remote BEA TUXEDO domain. The Requester establishes network connectivity, transmits data to BEA TUXEDO, and receives data from BEA TUXEDO. Each Requester is responsible for one and only one remote endpoint (or one TCP/IP address/port combination). You can configure multiple Requesters to point to the same endpoint, but each Requester can have only one endpoint.

On the following maintenance screens, each instance of the Requester is given a logical machine ID (LMID). You can give a Requester any unique LMID that is meaningful to you. Every service name is associated with one LMID. That is how the Requester knows which remote machine is responsible for a particular service.

PF Keys

The following function keys are available on various requester screens.

ENTER	Process the selection code entered
PF3	Transfer to Main menu
PF5	Transfer to Requester Browse screen
PF7	Display the previous page of records
PF8	Display the next page of records

Note: If you enter data and press PF3 or PF5 before pressing ENTER, the operation process is aborted and the appropriate screen is displayed.

Insert Requester Screen (R1)

Use this screen to configure a new Requester by inserting a new record into the Requester file.

When the screen is first displayed, all the fields are unprotected. Type the required data, then press ENTER. After the data is validated and processed, the screen is redisplayed and all the fields are unprotected.

```
BEAPREQ                    BEA ELINK TCP FOR CICS                BEAM R1

                            INSERT  REQUESTER

   LMID:            _____    MULTIPLEX_CNT:  __
   DNS: _____
   HOST ADDRESS:      _____
   PORT NUMBER:       _____
                                         MIN TIME (MILLISEC):     _____
   SECURITY(Y/N):   _                    MAX TIME (MILLISEC):     _____
   ACCOUNT ID:        _____          DELTA TIME (MILLISEC):   _____
   PASSWORD:                             IDLE TIME (SECONDS):     _____
                                         REQ IDLE TIME (SECONDS): _____
   MAX QUEUE SIZE:   _____              LATENCY TIME (SECONDS):    __
   MAX MSG SIZE:     _____              MAX CONNS:         __
   RETRY LIMIT:      _____              IBM TCP(Y/N):      _

   LMID TYPE:       _                    QUEUE NAME 1:    _____
   START TRAN-ID:   _____                QUEUE NAME 2:    _____
   CICS DATA:       ___

   ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
LMID	This is the logical machine name or gateway ID. Give it a unique name up to 16 characters. Example: (bankmach1)
DNS	The host name that the domain name service recognizes.
Host Address	The TCP/IP dot address. Example: (199.99.99.99)
Port Number	The TCP/IP port. Check with the TCP/IP administrator for available ports. Example: (1234)

Security	The status of security. Y specifies that security is on and N denotes that security is off.
	Note: For additional security information, refer to "Configuring the eLink TCP Security."
Account ID	An eight-character ID. This must be the same ID that is used on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Password field. Example: (CICS001A)
Password	An eight-character password. This must be the same as on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Account ID field. Example: (LETMEIN2)
Max Queue Size	Specifies the size of the local queue where requests are stored for servicing. A typical setting is 200.
Max Msg Size	The largest message allowed to be sent across this connection. The maximum is 32000. Example: (4096)
Retry Limit	If the connection fails, this number determines how many attempts the system makes to reestablish the connection before marking the connection disabled. Example: (5).
LMID Type	The type of gateway the remote system is running (C for CICS, I for IMS, T for TUXEDO, L for InterLink)
Start TranID	The ID of the transaction to be started if the remote system type is CICS.
CICS Data	A string to be passed to the IBM TCP/IP Listener for use with the eLink TCP for CICS gateway. The default is " ".
Multiplex Cnt	The number of concurrent requests for each connection.
Min Time	The minimum length of time (in milliseconds) for a socket read to wait for data to be processed.
	Note: The recommended value for running with Interlink CPT is 400. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.

Max Time	The maximum length of time (in milliseconds) for a socket read to wait for data to be processed.
	Note: If you are running Interlink CPT, this value is rounded up to the nearest second. The recommended value for running with Interlink CPT is less than or equal to 3000. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Delta Time	The time increase (in milliseconds) from Min Time to Max Time.
	Note: The recommended value for running with Interlink CPT is greater than 50. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Idle Time	The amount of time in seconds that a connection is idle before it is closed. Idle Time should be a smaller amount of time than Req Idle Time. A typical setting is 30 seconds.
Req Idle Time	The amount of time in seconds that a Requester is idle before it terminates. A typical setting is 120 seconds.
Latency Time	Network time and system processing time added to give a true system wait time (in seconds).
Max Conns	The maximum number of connections the Requester opens. The maximum value is 50 for IBM TCP/IP. The maximum value is 1 for InterLink.
IBM TCP	The TCP/IP stack being used. Specify Y if the IBM TCP/IP stack is being used or N if the Interlink stack is being used.
Queue Name 1	The unique name of a TS Q that is used for communications between the Pre-requester and the Requester.
Queue Name 2	The unique name of a TS Q that is used for communications between the Pre-requester and the Requester.

Update Requester Screen (R2)

Use this screen to update a record from the Requester file. The fields are the same as the ones on the Requester Insert screen, but on this screen you can change the values.

When the screen is first displayed, the LMID field is unprotected. Enter a logical machine name and press ENTER. The screen is redisplayed showing the data from the requested record. The HOST ADDRESS, PORT NUMBER, ACCOUNT ID, PASSWORD, MAX MSG SIZE, and CONNECT RETRY LIMIT fields are unprotected. The following message is displayed: RECORD READY FOR UPDATE.

After the changes you entered are validated and processed, the screen is redisplayed and the LMID field is unprotected.

```
BEAPREQ                     BEA ELINK TCP FOR CICS                   BEAM R2

                              UPDATE   REQUESTER

   LMID:              _____     MULTIPLEX_CNT:  __
   DNS:  _____
   HOST ADDRESS:      _____
   PORT NUMBER:       _____
                                             MIN TIME (MILLISEC):     _____
   SECURITY(Y/N):    _                       MAX TIME (MILLISEC):     _____
   ACCOUNT ID:       _____               DELTA TIME (MILLISEC):   _____
   PASSWORD:                                 IDLE TIME (SECONDS):     _____
                                             REQ IDLE TIME (SECONDS): _____
   MAX QUEUE SIZE:   _____                  LATENCY TIME (SECONDS):    __
   MAX MSG SIZE:     _____                  MAX CONNS:        __
   RETRY LIMIT:      _____                  IBM TCP(Y/N):     _

   LMID TYPE:        _                       QUEUE NAME 1:     _____
   START TRAN-ID:    ____                    QUEUE NAME 2:     _____
   CICS DATA:        ___

   ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
LMID	This is the logical machine name or gateway ID. Give it a unique name up to 16 characters. Example: (bankmach1)
DNS	The host name that the domain Name Service recognizes.
Host Address	The TCP/IP dot address. Example: (199.99.99.99)
Port Number	The TCP/IP port. Check with the TCP/IP administrator for available ports. Example: (1234)
Security	The status of security. Y specifies that security is on and N denotes that security is off. **Note:** For additional security information, refer to "Configuring the eLink TCP Security."
Account ID	An eight-character ID. This must be the same ID that is used on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Password field. Example: (CICS001A)
Password	An eight-character password. This must be the same as on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Account ID field. Example: (LETMEIN1)
Max Queue Size	Specifies the size of the local queue where requests are stored for servicing. A typical setting is 200.
Max Msg Size	The largest message allowed to be sent across this connection. The maximum is 32000. Example: (4096)
Retry Limit	If the connection fails, this number determines how many attempts the system makes to reestablish the connection before marking the connection disabled. Example: (5)
LMID Type	The type of gateway the remote system is running (C for CICS, I for IMS, T for TUXEDO, L for InterLink)
Start TranID	The ID of the transaction to be started if the remote system type is CICS.

CICS Data	A string to be passed to the IBM TCP/IP Listener for use with the eLink TCP for CICS gateway. The default is " ".
Multiplex Cnt	The number of concurrent requests for each connection.
Min Time	The minimum length of time (in milliseconds) for a socket read to wait for data to be processed. **Note:** The recommended value for running with Interlink CPT is 400. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Max Time	The maximum length of time (in milliseconds) for a socket read to wait for data to be processed. **Note:** If you are running Interlink CPT, this value is rounded up to the nearest second. The recommended value for running with Interlink CPT is less than or equal to 3000. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Delta Time	The time increase (in milliseconds) from Min Time to Max Time. **Note:** The recommended value for running with Interlink CPT is greater than 50. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Idle Time	The amount of time in seconds that a connection is idle before it is closed. Idle Time should be a smaller amount of time than Req Idle Time. A typical setting is 30 seconds.
Req Idle Time	The amount of time in seconds that a Requester is idle before it terminates. A typical setting is 120 seconds.
Latency Time	Network time and system processing time added to give a true system wait time (in seconds).
Max Conns	The maximum number of connections the Requester opens. The maximum value is 50 for IBM TCP/IP. The maximum value is 1 for InterLink.
IBM TCP	The TCP/IP stack being used. Specify Y if the IBM TCP/IP stack is being used or N if the Interlink stack is being used.

Queue Name 1	The unique name of a TS Q that is used for communications between the Pre-requester and the Requester.
Queue Name 2	The unique name of a TS Q that is used for communications between the Pre-requester and the Requester.

Inquire Requester Screen (R3)

Use this screen to make an inquiry about a record from the Requester file. The screen is initially displayed with the LOGICAL MACHINE NAME field unprotected. Enter the logical machine name and press ENTER. The screen is redisplayed with the data from the requested record and the LOGICAL MACHINE NAME field is unprotected.

```
BEAPREQ                    BEA ELINK TCP FOR CICS                 BEAM R3

                              INQUIRE REQUESTER

   LMID:                  _____    MULTIPLEX_CNT:  __
   DNS:  _____
   HOST ADDRESS:          _____
   PORT NUMBER:           _____
                                               MIN TIME (MILLISEC):      _____
   SECURITY(Y/N):    _                         MAX TIME (MILLISEC):      _____
   ACCOUNT ID:       _____                 DELTA TIME (MILLISEC):    _____
   PASSWORD:                                   IDLE TIME (SECONDS):      _____
                                               REQ IDLE TIME (SECONDS): _____
   MAX QUEUE SIZE:   _____                    LATENCY TIME (SECONDS):     __
   MAX MSG SIZE:     _____                    MAX CONNS:        __
   RETRY LIMIT:      _____                    IBM TCP(Y/N):   _

   LMID TYPE:        _                         QUEUE NAME 1:   _____
   START TRAN-ID:    _____                     QUEUE NAME 2:   _____
   CICS DATA:        ____

   ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
LMID	This is the logical machine name or gateway ID. This is a unique name up to 16 characters. Example: (bankmach1)
DNS	The host name that the domain Name Service recognizes.
Host Address	The TCP/IP dot address. Example: (199.99.99.99)
Port Number	The TCP/IP port. Check with the TCP/IP administrator for available ports. Example: (1234)
Security	The status of security. Y specifies that security is on and N denotes that security is off. **Note:** For additional security information, refer to "Configuring the eLink TCP Security."
Account ID	An eight-character ID. This must be the same ID that is used on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Password field. Example: (CICS001A)
Password	An eight-character password. This must be the same as on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Account ID field. Example: (LETMEIN1)
Max Queue Size	Specifies the size of the local queue where requests are stored for servicing. A typical setting is 200.
Max Msg Size	The largest message allowed to be sent across this connection. The maximum is 32000. Example: (4096)
Retry Limit	If the connection fails, this number determines how many attempts the system makes to reestablish the connection before marking the connection disabled. Example: (5).
LMID Type	The type of gateway the remote system is running (C for CICS, I for IMS, T for TUXEDO, L for InterLink)
Start TranID	The ID of the transaction to be started if the remote system type is CICS.

CICS Data	A string to be passed to the IBM TCP/IP Listener for use with the eLink TCP for CICS gateway. The default is " ".
Multiplex Cnt	The number of concurrent requests for each connection.
Min Time	The minimum length of time (in milliseconds) for a socket read to wait for data to be processed.
	Note: The recommended value for running with Interlink CPT is 400. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Max Time	The maximum length of time (in milliseconds) for a socket read to wait for data to be processed.
	Note: If you are running Interlink CPT, this value is rounded up to the nearest second. The recommended value for running with Interlink CPT is less than or equal to 3000. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Delta Time	The time increase (in milliseconds) from Min Time to Max Time.
	Note: The recommended value for running with Interlink CPT is greater than 50. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Idle Time	The amount of time in seconds that a connection is idle before it is closed. Idle Time should be a smaller amount of time than Req Idle Time. A typical setting is 30 seconds.
Req Idle Time	The amount of time in seconds that a Requester is idle before it terminates. A typical setting is 120 seconds.
Latency Time	Network time and system processing time added to give a true system wait time (in seconds).
Max Conns	The maximum number of connections the Requester opens. The maximum value is 50 for IBM TCP/IP. The maximum value is 1 for InterLink.
IBM TCP	The TCP/IP stack being used. Specify Y if the IBM TCP/IP stack is being used or N if the Interlink stack is being used.

Queue Name 1	The unique name of a TS Q that is used for communications between the Pre-requester and the Requester.
Queue Name 2	The unique name of a TS Q that is used for communications between the Pre-requester and the Requester.

Delete Requester Screen (R4)

Use this screen to delete a record from the Requester file.

Warning: Deleting a Requester record can have serious ramifications. Think carefully before performing this operation. If there are any Service records that point to this GWID, any client calls to those services are rejected because BEA eLink does not know to which remote machine the request should go.

The screen is initially displayed with the LOGICAL MACHINE NAME field unprotected. Enter the logical machine name and press ENTER. The screen is then redisplayed with the data from the requested record and the LOGICAL MACHINE NAME field is protected. The following message is displayed: TO CONFIRM DELETE, PRESS ENTER AGAIN.

```
BEAPREQ                    BEA ELINK TCP FOR CICS                   BEAM R4

                            DELETE  REQUESTER

    LMID:            _____     MULTIPLEX_CNT:  __
    DNS: _____
    HOST ADDRESS:    _____
    PORT NUMBER:     _____
                                          MIN TIME (MILLISEC):     _____
    SECURITY(Y/N):   _                    MAX TIME (MILLISEC):     _____
    ACCOUNT ID:      _____            DELTA TIME (MILLISEC):   _____
    PASSWORD:                             IDLE TIME (SECONDS):     _____
                                          REQ IDLE TIME (SECONDS): _____
    MAX QUEUE SIZE:  _____               LATENCY TIME (SECONDS):    __
    MAX MSG SIZE:    _____               MAX CONNS:        __
    RETRY LIMIT:     _____               IBM TCP(Y/N):   _

    LMID TYPE:       _                    QUEUE NAME 1:    _____
    START TRAN-ID:   ____                 QUEUE NAME 2:    _____
    CICS DATA:       ___

   ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
LMID	This is the logical machine name or gateway ID. This is a unique name up to 16 characters. Example: (bankmach1)
DNS	The host name that the domain Name Service recognizes.
Host Address	The TCP/IP dot address. Example: (199.99.99.99)
Port Number	The TCP/IP port. Check with the TCP/IP administrator for available ports. Example: (1234)

Security	The status of security. Y specifies that security is on and N denotes that security is off. **Note:** For additional security information, refer to "Configuring the eLink TCP Security."
Account ID	An eight-character ID. This must be the same ID that is used on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Password field. Example: (CICS001A)
Password	An eight-character password. This must be the same as on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Account ID field. Example: (LETMEIN1)
Max Queue Size	Specifies the size of the local queue where requests are stored for servicing. A typical setting is 200.
Max Msg Size	The largest message allowed to be sent across this connection. The maximum is 32000. Example: (4096)
Retry Limit	If the connection fails, this number determines how many attempts the system makes to reestablish the connection before marking the connection disabled. Example: (5).
LMID Type	The type of gateway the remote system is running (C for CICS, I for IMS, T for TUXEDO, L for InterLink)
Start TranID	The ID of the transaction to be started if the remote system type is CICS.
CICS Data	A string to be passed to the IBM TCP/IP Listener for use with the eLink TCP for CICS gateway. The default is " ".
Multiplex Cnt	The number of concurrent requests for each connection.
Min Time	The minimum length of time (in milliseconds) for a socket read to wait for data to be processed. **Note:** The recommended value for running with Interlink CPT is 400. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.

Max Time	The maximum length of time (in milliseconds) for a socket read to wait for data to be processed.
	Note: If you are running Interlink CPT, this value is rounded up to the nearest second. The recommended value for running with Interlink CPT is less than or equal to 3000. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Delta Time	The time increase (in milliseconds) from Min Time to Max Time.
	Note: The recommended value for running with Interlink CPT is greater than 50. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Idle Time	The amount of time in seconds that a connection is idle before it is closed. Idle Time should be a smaller amount of time than Req Idle Time. A typical setting is 30 seconds.
Req Idle Time	The amount of time in seconds that a Requester is idle before it terminates. A typical setting is 120 seconds.
Latency Time	Network time and system processing time added to give a true system wait time (in seconds).
Max Conns	The maximum number of connections the Requester opens. The maximum value is 50 for IBM TCP/IP. The maximum value is 1 for InterLink.
IBM TCP	The TCP/IP stack being used. Specify Y if the IBM TCP/IP stack is being used or N if the Interlink stack is being used.
Queue Name 1	The unique name of a TS Q that is used for communications between the Pre-requester and the Requester.
Queue Name 2	The unique name of a TS Q that is used for communications between the Pre-requester and the Requester.

Browse Requester Screen (R5)

Use this screen to browse a list of the records in the Requester file. Additionally, you can select a record for further processing by entering a valid selection code in the first column of that record's row.

If you access this screen from the Main menu, the first record on file is displayed at the top of the screen. If you access this screen from the Insert, Update, Inquire, or Delete screens, the key received from that screen determines which records are displayed.

To choose a record, enter a valid selection code in the SEL CDE field next to that record. For example, to make an inquiry about a record, enter "3". If you enter more than one selection code, the first one is used and the others are ignored.

After the entry in the SEL CDE field is validated and processed, the screen for that process is displayed and the record key appears in the LOGICAL MACHINE NAME field.

```
 BEAPREQ                    BEA ELINK TCP FOR CICS                 BEAM R5

                             BROWSE   REQUESTER


 SEL   LOGICAL MACHINE          HOST        PORT  MAXM  CONN  LMID START
 CDE       NAME               ADDRESS       NUM   SIZE  R-LIM TYPE TRNID
 ---   ----------------   ----------------  ----- ----- ----- ---- -----


  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____
  _   _____   _____  _____ _____ _____  _   ____

  * SELCDE = (1: INS, 2: UPD, 3: INQ, 4: DEL)
    ENTER: PROCESS, PF3: MENU, PF7: PREV, PF8: NEXT
 RECORD NOT FOUND
```

The Outbound Service Information Screens

A service is a name associated with some component of work. That component of work might be a banking transaction, an airline flight reservation, or an order for a dozen widgets. In BEA TUXEDO, a client program that needs work done makes a "service request." A process called a server performs the work described in the service request on behalf of the client, then returns the results of its efforts back to the client. In MVS this would be referred to as a call to a "black box."

In a CICS application that uses eLink TCP for CICS, a service name is passed in the data area in an EXEC CICS LINK command and the results are returned in that same area. The service screens use the terms "service name" and "remote service name." The service name (e.g., CIC01XXYYZZ) is what the service is known as to your CICS environment and the remote service name (e.g., WITHDRAWL) is what the service is known as to BEA TUXEDO. For simplicity, you can make both names the same, but if naming conventions differ, you can use different names.

PF Keys

The following function keys are available on various outbound service screens.

ENTER	Process the selection code entered
PF3	Transfer to Main menu
PF5	Transfer to Browse screen
PF7	Display the previous page of records
PF8	Display the next page of records

Note: If you enter data and press PF3 or PF5 before pressing ENTER, the operation process is aborted and the appropriate screen is displayed.

Insert Outbound Service Information Screen (S1)

Use this screen to insert a record into the service name file. The screen is first displayed with all fields unprotected. Enter the required data in the appropriate fields and press ENTER. After the data is validated and processed, the screen is redisplayed and all the fields are unprotected.

```
BEAPSVC                    BEA ELINK TCP FOR CICS                 BEAM S1

                    INSERT   OUTBOUND SERVICE INFORMATION



                  SERVICE NAME:              _____

                  LOGICAL MACHINE NAME:      _____

                  REMOTE SERVICE NAME:       _____

                  SERVICE TIMEOUT(SEC):      _____

                  SECURITY(Y/N):             _




      ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Service Name	The service name as it is known to the CICS programmer.
Logical Machine Name	This is a symbolic name as it was defined on the Requester Insert screen. It denotes the remote machine on which this service should be processed.

Remote Service Name	The name as it is known in the remote BEA TUXEDO domain.
Service Timeout	The number of seconds to wait for timing out this service request.
Security	The status of security. Y specifies that security is on and N denotes that security is off.

Update Outbound Service Information Screen (S2)

Use this screen to update a record from the service name file. When the screen is first displayed, the SERVICE NAME field is unprotected. Enter the service name and press ENTER. The screen is then redisplayed with the data from the requested record and the LOGICAL MACHINE NAME, REMOTE SERVICE NAME, SERVICE TIMEOUT(SEC), and SECURITY fields are unprotected. The following message is displayed: RECORD READY FOR UPDATE.

After the changes are validated and processed, the screen is redisplayed and the SERVICE NAME field is unprotected.

```
BEAPSVC                    BEA ELINK TCP FOR CICS                  BEAM S2

                    UPDATE   OUTBOUND SERVICE INFORMATION



                    SERVICE NAME:              _____

                    LOGICAL MACHINE NAME:      _____

                    REMOTE SERVICE NAME:       _____

                    SERVICE TIMEOUT(SEC):      _____

                    SECURITY(Y/N):             _




        ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Service Name	The service name as it is known to the CICS programmer.
Logical Machine Name	This is a symbolic name as it was defined on the Update Outbound Service Information screen. It denotes the remote machine on which this service should be processed.
Remote Service Name	The name as it is known in the remote BEA TUXEDO domain.
Service Timeout	The number of seconds to wait for timing out this service request.
Security	The status of security. Y specifies that security is on and N denotes that security is off.

Inquire Outbound Service Information Screen (S3)

Use this screen to make an inquiry about a record from the Service Name file. The screen is initially displayed with the SERVICE NAME field unprotected. Enter the service name and press ENTER. The screen is redisplayed with the data from the requested record and the SERVICE NAME field is unprotected.

```
BEAPSVC                  BEA ELINK TCP FOR CICS                  BEAM S3

                    INQUIRE OUTBOUND SERVICE INFORMATION


              SERVICE NAME:            _____

              LOGICAL MACHINE NAME:    _____

              REMOTE SERVICE NAME:     _____

              SERVICE TIMEOUT(SEC):    _____

              SECURITY(Y/N):           _




     ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Service Name	The service name as it is known to the CICS programmer.
Logical Machine Name	This is a symbolic name as it was defined on the Inquire Outbound Service Information screen. It denotes the remote machine on which this service should be processed.

Remote Service Name	The name as it is known in the remote BEA TUXEDO domain.
Service Timeout	The number of seconds to wait for timing out this service request.
Security	The status of security. Y specifies that security is on and N denotes that security is off.

Delete Outbound Service Information Screen (S4)

Use this screen to delete records from the service name file. The screen is initially displayed with the SERVICE NAME field unprotected. Type the service name and press ENTER. The screen is redisplayed with the data from the record requested and all the fields protected.

The following message is displayed: TO CONFIRM DELETE, PRESS ENTER: AGAIN. After you press enter to confirm the deletion, the screen is redisplayed and the SERVICE NAME field is unprotected.

```
BEAPSVC                      BEA ELINK TCP FOR CICS                   BEAM S4

                     DELETE   OUTBOUND SERVICE INFORMATION



              SERVICE NAME:              _____

              LOGICAL MACHINE NAME:      _____

              REMOTE SERVICE NAME:       _____

              SERVICE TIMEOUT(SEC):      _____

              SECURITY(Y/N):             _




     ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Service Name	The service name as it is known to the CICS programmer.
Logical Machine Name	This is a symbolic name as it was defined on the Delete Outbound Service Information screen. It denotes the remote machine on which this service should be processed.
Remote Service Name	The name as it is known in the remote BEA TUXEDO domain.
Service Timeout	The number of seconds to wait for timing out this service request.
Security	The status of security. Y specifies that security is on and N denotes that security is off.

Browse Outbound Service Information Screen (S5)

Use this screen to browse the records in the service name file. If you access this screen from the Main menu the first record on file is displayed at the top of the screen. If you access this screen from the Insert, Update, Inquire, or Delete screens, the list starts with the record key received from that screen.

To select a record for processing, enter a valid selection code. For example, to make an inquiry about a record, enter "3". If you enter more than one selection code, the first one is used, and the others are ignored. After the selection code is validated and processed, the screen for that process is displayed and the record key appears in the SERVICE NAME field.

```
BEAPSVC                    BEA ELINK TCP FOR CICS              BEAM S5

                             BROWSE   SERVICE NAME


 SEL       SERVICE       LOGICAL MACHINE      REMOTE SERVICE   SERVICE
 CDE        NAME              NAME                 NAME         TIMEOUT    SEC
 ---   ----------------  ----------------    ----------------  -------    ---

  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _
  _    _____  _____    _____   _____      _

  * SELCDE = (1 -INS, 2 -UPD, 3 -INQ, 4 -DEL)
     ENTER: PROCESS, PF3: MENU, PF7: PREV, PF8: NEXT
 RECORD NOT FOUND
```

The User Connection Account Screens

A Handler is responsible for receiving service requests from the remote BEA
TUXEDO domain. The User Connection Account screens allow for dynamic
manipulation of accounts allowed to connect with a Handler when a Handler is
configured with security enabled.

PF Keys

The following function keys are available on various user account screens.

ENTER   Process the data entered

PF3	Transfer to Main menu
PF5	Transfer to Browse screen
PF7	Display the previous page of records
PF8	Display the next page of records

Note: If you enter data and press PF3 or PF5 before pressing ENTER, the operation process is aborted and the appropriate screen is displayed.

Insert User Connection Account Screen (U1)

Use this screen to add a new Connection Account by inserting a new record into the user file.

When the screen is first displayed, all the fields are unprotected. Type the required data as described in the table below, then press ENTER. After the data is validated and processed, the screen is redisplayed and all the fields are unprotected.

```
BEAPUSR                    BEA ELINK TCP FOR CICS                  BEAM U1

                        INSERT USER CONNECTION ACCOUNT




                    ACCOUNT:            _____


                    PASSWORD:           _____






     ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Account	An eight-character ID. This must be the same ID that is used on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Password field. Example: (CICS001A)
Password	An eight-character password. This must be the same as on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Account ID field. Example: (LETMEIN1)

Update User Connection Account Screen (U2)

Use this screen to update a record on the account file. When the screen is first displayed, the ACCOUNT field is unprotected. Enter the account ID, and press ENTER. The screen is then redisplayed with the data from the requested record and the PASSWORD field is unprotected. The following message is displayed: RECORD READY FOR UPDATE.

After the changes are validated and processed, the screen is redisplayed and the ACCOUNT field is unprotected.

```
BEAPUSR                    BEA ELINK TCP FOR CICS                    BEAM U2

                        UPDATE USER CONNECTION ACCOUNT




                    ACCOUNT:              _____


                    PASSWORD:             _____





      ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Account	An eight-character ID. This must be the same ID that is used on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Password field. Example: (CICS001A)
Password	An eight-character password. This must be the same as on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Account ID field. Example: (LETMEIN1)

Inquire User Connection Account Screen (U3)

Use this screen to make an inquiry about a record from the account file. The screen is initially displayed with the ACCOUNT field unprotected. Enter the ACCOUNT and press ENTER. The screen is redisplayed with the data from the requested record and the ACCOUNT field is unprotected.

```
BEAPUSR                    BEA ELINK TCP FOR CICS                   BEAM U3

                       INQUIRE USER CONNECTION ACCOUNT




                  ACCOUNT:              _____


                  PASSWORD:             _____






     ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Account	An eight-character ID. This must be the same ID that is used on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Password field. Example: (CICS001A)

Password	An eight-character password. This must be the same as on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Account ID field. Example: (LETMEIN1)

Delete User Connection Account Screen (U4)

Use this screen to delete a record from the account file. The screen is initially displayed with the ACCOUNT field unprotected. Type the service name and press ENTER. The screen is redisplayed with the data from the record requested and all the fields protected.

The following message is displayed: TO CONFIRM DELETE, PRESS ENTER: AGAIN. After you press enter to confirm the deletion, the screen is redisplayed and the ACCOUNT field is unprotected.

```
BEAPUSR                 BEA ELINK TCP FOR CICS              BEAM U4

                    DELETE USER CONNECTION ACCOUNT




                  ACCOUNT:          _____


                  PASSWORD:         _____




   ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Account	An eight-character ID. This must be the same ID that is used on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Password field. Example: (CICS001A)
Password	An eight-character password. This must be the same as on the BEA TUXEDO side configuration. Coordinate with the BEA TUXEDO Administrator. Required if there is an entry in the Account ID field. Example: (LETMEIN1)

The Browse User Connection Account Screen (U5)

Use this screen to browse the records in the account file. If you access this screen from the Main menu the first record on file is displayed at the top of the screen. If you access this screen from the Insert, Update, Inquire, or Delete screens, the list starts with the record key received from that screen.

To select a record for processing, enter a valid selection code. For example, to make an inquiry about a record, enter "3". If you enter more than one selection code, the first one is used, and the others are ignored.

```
BEAPUSR                     BEA ELINK TCP FOR CICS                  BEAM U5

                         BROWSE USER CONNECTION ACCOUNTS


 SEL
 CDE        ACCOUNT
 -----      ----------


  _         _____
  _         _____
  _         _____
  _         _____
  _         _____
  _         _____
  _         _____
  _         _____
  _         _____


  * SELCDE = (1: INS, 2: UPD, 3: INQ, 4: DEL)
    ENTER: PROCESS, PF3: MENU, PF7: PREV, PF8: NEXT
 BEG/END OF FILE
```

The Inbound Service Information Screens

A service is a name associated with some component of work. That component of work can be a banking transaction, an airline flight reservation, or an order for a dozen widgets. In BEA TUXEDO, a client program that needs work done makes a service request. A server performs the work described in the service request on behalf of the client, then returns the results of its efforts back to the client. In MVS this would be referred to as a call to a "black box."

The service screens use the terms LOCAL SERVICE NAME and REMOTE SERVICE NAME. The LOCAL SERVICE NAME (e.g., CIC01XXYYZZ) is what the service is known as to your CICS environment and the REMOTE SERVICE NAME

(e.g., WITHDRAWL) is what the service is known as to BEA TUXEDO. For simplicity, you can make both names the same; however, different names can be used. Changes to the inbound service file are only picked up when the Handler is restarted.

PF Keys

The following function keys are available on various inbound service screens.

ENTER	Process the data entered
PF3	Transfer to Main menu
PF5	Transfer to Browse screen
PF7	Display the previous page of records
PF8	Display the next page of records

Note: If you enter data and press PF3 or PF5 before pressing ENTER, the operation process is aborted and the appropriate screen is displayed.

Insert Inbound Service Information Screen (I1)

Use this screen to insert a record into the service name file. The screen is first displayed with all fields unprotected. Enter the required data in the following fields and press ENTER. After the data is validated and processed, the screen is redisplayed and all the fields are unprotected.

```
BEAPISN                      BEA ELINK TCP FOR CICS                    BEAM I1

                       INSERT   INBOUND SERVICE INFORMATION



                        REMOTE SERVICE NAME:    _____

                        LOCAL SERVICE NAME:     _____

                        TRANSACTION NAME:       _____

                        MAX MESSAGE SIZE:       _____

                        SECURITY (Y/N):         _




       ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Remote Service Name	The service name as it is known in the remote BEA TUXEDO domain.
Local Service Name	The service name as it is known to the CICS programmer.

Transaction Name	The name of the CICS transaction that is started to process this service request. This is usually the transaction for the Application Handler program. For information about programming services without a reply, refer to the "Programming BEA eLink TCP for CICS."
	Warning: Services sending requests using a tpacall with the TPNOREPLY flag set must have a unique TRANSACTION NAME associated with it. Do not use the TRANSACTION NAME for the Application Handler program or an error message results.
Max Message Size	The largest message allowed to be sent across this connection. The maximum is 32000. This is the size of the actual data; eLink TCP manages additional message size through its internal headers.
Security	The status of security. Y enables security for the specified service and N disables security for the specified service.

Update Inbound Service Information Screen (I2)

Use this screen to update a record in the inbound service name file. The screen is first displayed with the REMOTE SERVICE NAME field unprotected. Enter the remote service name and press ENTER. The screen is redisplayed with the data from the requested record and the LOCAL SERVICE NAME, TRANSACTION NAME, MAX MESSAGE SIZE, and SECURITY fields unprotected. The following message displays: RECORD READY FOR UPDATE.

After the changes are validated and processed, the screen is redisplayed and the REMOTE SERVICE NAME field is unprotected.

```
BEAPISN                        BEA ELINK TCP FOR CICS               BEAM I2

                          UPDATE   INBOUND SERVICE INFORMATION



                     REMOTE SERVICE NAME:      _____

                     LOCAL SERVICE NAME:       _____

                     TRANSACTION NAME:         _____

                     MAX MESSAGE SIZE:         _____

                     SECURITY (Y/N):           _




        ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Remote Service Name	The service name as it is known in the remote BEA TUXEDO domain.
Local Service Name	The service name as it is known to the CICS programmer.

Transaction Name	The name of the CICS transaction that is started to process this service request. This is usually the transaction for the Application Handler program. For information about programming services without a reply, refer to the "Programming BEA eLink TCP for CICS."
	Warning: Services sending requests using a tpacall with the TPNOREPLY flag set must have a unique TRANSACTION NAME associated with it. Do not use the TRANSACTION NAME for the Application Handler program or an error message results.
Max Message Size	The largest message allowed to be sent across this connection. The maximum is 32000. This is the size of the actual data; eLink TCP manages additional message size through its internal headers.
Security	The status of security. Y enables security for the specified service and N disables security for the specified service.

Inquire Inbound Service Information Screen (I3)

Use this screen to inquire about a record in the inbound service name file. The screen is first displayed with the REMOTE SERVICE NAME field unprotected. Enter the remote service name and press ENTER. The screen is redisplayed with the data from the requested record and the REMOTE SERVICE NAME field unprotected.

```
BEAPISN                      BEA ELINK TCP FOR CICS                    BEAM I3

                        INQUIRE INBOUND SERVICE INFORMATION



                    REMOTE SERVICE NAME:    _____

                    LOCAL SERVICE NAME:     _____

                    TRANSACTION NAME:       ____

                    MAX MESSAGE SIZE:       _____

                    SECURITY (Y/N):         _




      ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Remote Service Name	The service name as it is known in the remote BEA TUXEDO domain.
Local Service Name	The service name as it is known to the CICS programmer.

Transaction Name	The name of the CICS transaction that is started to process this service request. This is usually the transaction for the Application Handler program. For information about programming services without a reply, refer to the "Programming BEA eLink TCP for CICS."
	Warning: Services sending requests using a tpacall with the TPNOREPLY flag set must have a unique TRANSACTION NAME associated with it. Do not use the TRANSACTION NAME for the Application Handler program or an error message results.
Max Message Size	The largest message allowed to be sent across this connection. The maximum is 32000. This is the size of the actual data; eLink TCP manages additional message size through its internal headers.
Security	The status of security. Y specifies that security is on and N denotes that security is off.

Delete Inbound Service Information Screen (I4)

Use this screen to delete a record in the inbound service name file. The screen is first displayed with the REMOTE SERVICE NAME field unprotected. Enter the remote service name and press ENTER. The screen is redisplayed with the data from the record requested and all fields protected. The following message displays: TO CONFIRM DELETE, PRESS ENTER AGAIN. After you press ENTER to confirm the deletion, the screen is redisplayed and the REMOTE SERVICE NAME field is unprotected.

```
BEAPISN                      BEA ELINK TCP FOR CICS                    BEAM I4

                         DELETE   INBOUND SERVICE INFORMATION



                 REMOTE SERVICE NAME:      _____

                 LOCAL SERVICE NAME:       _____

                 TRANSACTION NAME:         _____

                 MAX MESSAGE SIZE:         _____

                 SECURITY (Y/N):           _




      ENTER: PROCESS, PF3: MENU, PF5: BROWSE
```

Fields

Field Name	Description
Remote Service Name	The service name as it is known in the remote BEA TUXEDO domain.
Local Service Name	The service name as it is known to the CICS programmer.

Transaction Name	The name of the CICS transaction that is started to process this service request. This is usually the transaction for the Application Handler program. For information about programming services without a reply, refer to the "Programming BEA eLink TCP for CICS."
	Warning: Services sending requests using a tpacall with the TPNOREPLY flag set must have a unique TRANSACTION NAME associated with it. Do not use the TRANSACTION NAME for the Application Handler program or an error message results.
Max Message Size	The largest message allowed to be sent across this connection. The maximum is 32000. This is the size of the actual data; eLink TCP manages additional message size through its internal headers.
Security	The status of security. Y specifies that security is on and N denotes that security is off.

The Browse Inbound Service Screen (I5)

Use this screen to browse the records in the inbound service name file. If you access this screen from the Main menu, the first record on file is displayed at the top of the screen. If you access this screen from the Insert, Update, Inquire, or Delete screens, the list starts with the record key received from that screen.

To select a record for processing, enter a valid selection code. For example, to make an inquiry about a record, enter "3". If you enter more than one selection code, the first one is used, and the others are ignored. After the selection code is validated and processed, the screen for that process is displayed and the record key appears in the REMOTE SERVICE NAME field.

```
BEAPISN                 BEA ELINK TCP FOR CICS                 BEAM I5

                        BROWSE INBOUND SERVICE


SEL     REMOTE SERVICE      LOCAL SERVICE      TRAN  MAXM
CDE         NAME               NAME           NAME  SIZE   SEC
---     ----------------    ----------------   ----  -----  ---


 _      _____    _____   ____  _____   _
 _      _____    _____   ____  _____   _
 _      _____    _____   ____  _____   _
 _      _____    _____   ____  _____   _
 _      _____    _____   ____  _____   _
 _      _____    _____   ____  _____   _
 _      _____    _____   ____  _____   _
 _      _____    _____   ____  _____   _
 _      _____    _____   ____  _____   _

  * SELCDE = (1 -INS, 2 -UPD, 3 -INQ, 4 -DEL)
    ENTER: PROCESS, PF3: MENU, PF7: PREV, PF8: NEXT
RECORD NOT FOUND
```

The Handler Configuration Screens

A Handler is responsible for receiving service requests from the remote BEA TUXEDO domain. The Handler Configuration screens allow for dynamic manipulation of the configuration used by all Handler programs in the system.

Note: To apply changes that have been made to the Handler Configuration file, you must restart the Handler.

PF Keys

The following function keys are available on various user account screens.

ENTER   Process the data entered

PF3   Transfer to Main menu

Note: If you enter data and press PF3 before pressing ENTER, the operation process
is aborted and the appropriate screen is displayed.

Update Handler Configuration Screen (H2)

Use this screen to update the configuration record on the user file. If a record does not
exist, one is inserted into the user file. When the screen first displays, all fields are
unprotected. After the changes are validated and processed, the screen is redisplayed.

```
BEAPUSR                    BEA ELINK TCP FOR CICS                    BEAM H2

                         UPDATE HANDLER CONFIGURATION



                    SECURITY:                          Y

                    MULTIPLEX COUNT:                   99

                    MIN TIME (MILLISECS):              20

                    MAX TIME (MILLISECS):              30

                    DELTA TIME (MILLISECS):             5

                    IDLE TIME (SECONDS):                0




     ENTER: PROCESS, PF3: MENU
UPDATE COMPLETED
```

Fields

Field Name	Description
Security	The status of gateway security. Y denotes that security is activated and N denotes that security is not activated. If this field is set to N, the Account and Password fields are not verified prior to establishing a connection.
Multiplex Cnt	The number of concurrent incoming service requests for each Handler.
Min Time	The minimum length of time (in milliseconds) for a socket read to wait for data to be processed. **Note:** The recommended value for running with Interlink CPT is 400. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Max Time	The maximum length of time (in milliseconds) for a socket read to wait for data to be processed. **Note:** If you are running Interlink CPT, this value is rounded up to the nearest second. The recommended value for running with Interlink CPT is less than or equal to 3000. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Delta Time	The time increase (in milliseconds) from Min Time to Max Time. **Note:** The recommended value for running with Interlink CPT is greater than 50. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Idle Time	The amount of time in seconds a Handler is idle before it terminates.

Inquire Handler Configuration Screen (H3)

Use this screen to make an inquiry about the configuration record from the user file. The screen is displayed with the data from the requested record and all fields are protected.

```
BEAPUSR                    BEA ELINK TCP FOR CICS                   BEAM H3

                        INQUIRE HANDLER CONFIGURATION



            SECURITY:                        Y

            MULTIPLEX COUNT:                 99

            MIN TIME (MILLISECS):            20

            MAX TIME (MILLISECS):            30

            DELTA TIME (MILLISECS):           5

            IDLE TIME (SECONDS):              0




   ENTER: PROCESS, PF3: MENU
```

Fields

Field Name	Description
Security	The status of gateway security. Y denotes that security is activated and N denotes that security is not activated. If this field is set to N, the Account and Password fields are not verified prior to establishing a connection.

Multiplex Cnt	The number of concurrent incoming service requests for each Handler.
Min Time	The minimum length of time (in milliseconds) for a socket read to wait for data to be processed. **Note:** The recommended value for running with Interlink CPT is 400. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Max Time	The maximum length of time (in milliseconds) for a socket read to wait for data to be processed. **Note:** If you are running Interlink CPT, this value is rounded up to the nearest second. The recommended value for running with Interlink CPT is less than or equal to 3000. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Delta Time	The time increase (in milliseconds) from Min Time to Max Time. **Note:** The recommended value for running with Interlink CPT is greater than 50. For information about recommended configuration values and system behavior, refer to the *BEA eLink TCP Release Notes*.
Idle Time	The amount of time in seconds a program is idle before it terminates.

Dynamically Configuring eLink TCP for CICS

Dynamic configuration means that new configuration information affects currently running Handlers or Requesters without shutting them down. The new configuration information also affects Handlers and Requesters that are started after the information is entered. You can make the following changes to the eLink TCP for CICS gateway configuration dynamically:

♦ Modifying Outbound Services

♦ Modifying User Connection Accounts

♦ Modifying Connections

♦ Deleting Requester LMIDs

Note: All other configuration tasks are not dynamic, including Inbound Service Information and Handler Configuration. To process configuration information in these cases, the corresponding Requesters and Handlers must be shut down.

Modifying Outbound Services

You can dynamically configure outbound services by inserting a new record into the service name file, modifying an existing record in the service name file, or deleting a record in the service name file. Use the appropriate maintenance screens to accomplish the necessary task, S1 to insert, S2 to update, or S4 to delete. For field definitions, refer to the "The Outbound Service Information Screens."

Modifying User Connection Accounts

You can dynamically configure User Connection Accounts and enable accounts to connect to Handlers by inserting a new account into the user account file, modifying an existing user account, or deleting a user account. Use the appropriate maintenance screens to accomplish the necessary task, U1 to insert, U2 to update, or U4 to delete. For field definitions, refer to the "The User Connection Account Screens."

Note: Changes to the User Connection Accounts do not affect Handlers that are currently connected, but only Handlers that connect after the change is made.

Modifying Connections

You can dynamically configure the status of a connection. Using the Update Connection screen (C2), you can enable, disable, or abort the connection for a given LMID. Dynamically configuring the status of a connection has an immediate effect on the corresponding Requesters. For field definitions, refer to the "The Connection Screens."

Note: Because the data in the Update Connection screen is transient, setting the LMID status to disable does not persist after the CICS region is shut down and then restarted. The Requester file; however, is persistent.

Deleting Requester LMIDs

Each instance of the Requester is given a logical machine name (LMID). You can give a Requester any unique LMID that is meaningful to you. Every service name is associated with one or more LMIDs. That is how the Requester identifies which remote machine is responsible for a particular service. You can dynamically delete an LMID using the Update Requester screen (R2). This dynamic change only affect Pre-requesters immediately.

Note: Requesters that are currently running do not read the information in the requester file and are not affected by this dynamic change.

Administering the Gateways

BEA TUXEDO has a set of `tmadmin` and `dmadmin` commands for the administration of the eLink TCP gateways. For detailed information about these commands, refer to the *BEA TUXEDO Administrator's Guide* and the *BEA TUXEDO Domain User Guide*.

5 Programming BEA eLink TCP for CICS

The following subsections identify issues that CICS programmers should be aware of when they develop or modify application programs that operate with BEA eLink for Mainframe TCP for CICS (hereafter referenced as eLink TCP for CICS):

♦ Client Application Considerations

♦ Server Application Considerations

Client Application Considerations

A CICS application program that processes requests originating from a remote BEA TUXEDO domain is written like a CICS application program that is invoked with the CICS LINK command.

The CICS programs that work best for satisfying BEA TUXEDO requests are the ones that perform a certain operation and return information to the caller. The CICS services requested by a BEA TUXEDO client program must entail a single request/response scenario.

CICS service programs that are called from BEA TUXEDO clients must be careful if they give up control, as when performing an EXEC CICS XCTL operation. To ensure that the response data is returned to the client, chaining programs must pass the original COMMAREA during the XCTL so that it may be RETURNed to the eLink TCP for CICS Handler by the final program in the chain.

To make requests to remote BEA TUXEDO domains from CICS application programs, use the EXEC CICS LINK command. The exact layout of the request/response data area is discussed in a later section.

Buffer Layout Issues

The layout of the data buffer sent between CICS and BEA TUXEDO should be agreed upon by the CICS applications programmer, the BEA TUXEDO applications developer, and the BEA TUXEDO administrator to ensure consistency and proper configuration. There are no limitations on the CICS programmer concerning native COBOL or C data types.

Making Calls from a CICS Client Program

To make a service call from a CICS program to a remote BEA TUXEDO domain, make an EXEC CICS LINK call to the Pre-requester. The service you want to access must be configured by the BEA eLink Administrator, but from a programming point of view the LINK call is all you need. The following COBOL record is in the COBOL copybook `client.cbl`.

Listing 5-1   COBOL Record

```
01 REQUEST-RECORD.
   05   REQUEST-HEADER.
        10 DATALEN           PIC S9(08) COMP.
        10 SVCNAME[16]       PIC X(16).
        10 REQUESTCD         PIC S9(08) COMP.
        10 RETURNCD          PIC S9(08) COMP.
        10 REQRETURNCD       PIC S9(08) COMP.
   05 REQUEST-DATA.
        10 DATA-AREA          PIC X(DATALEN).
```

The layout of the structure in C that must be passed in the LINK call is shown in Listing 5-2. The following C structures is `clienth.h` in the INCLUDE file.

Listing 5-2   C Structures

```
typedef struct CLIENTHDR
{
 long DataLen;             /* THE LEN OF THE DATA FROM AND TO APPL */
 char SvcName[16];         /* THE SERVICE NAME */
 long RequestCd;           /* THE REQUEST COMMAND FROM THE APPL */
 long ReturnCd;            /* THE RETURN CODE TO THE APPL */
 long ReqReturnCd;         /* THE RETURN CODE FROM THE PREQ AND REQ */
}  CLIENTHDR;

typedef struct CMAREA
{
  CLIENTHDR CltHdr;                      /*HEADER */
  char Request_data[MAX_DATA_LENGTH];  /* REQUEST DATA */
} CMAREA;
```

The variables in the previous COBOL and C examples are defined as follows.

DataLen

The length of the data in the Request_data field.

SvcName

The service request name (ask the administrator for the names).

RequestCd

A predefined numeric value that indicates the type of call this is.

BEA_REQUEST_NORESPONSE - Value is 7. A No Reply Service Request. In this case the request is sent over to BEA TUXEDO for the service to be performed, but no response data is sent back.

BEA_REQUEST_RESPONSE - Value is 5. A Request/Response Request. A request is sent to BEA TUXEDO and a response is expected back.

Table 5-1 Request Codes

Code	Value
BEA-REQUEST-RESPONSE	+5.
BEA-REQUEST-NORESPONSE	+7.

ReturnCd

>This is the return code from the BEA TUXEDO domain.

ReqReturnCd

>This is the return code from the CICS Requester.

>For both return codes, a zero signifies a successful service call return. All other return and request codes are listed in the following tables. Some apply to one of the return code fields and some to the other. Notify the administrator if any of the return codes indicate a processing or network problem.

>**Note:** For a complete description of these codes, refer to "Codes Returned to a CICS Client Program."

Table 5-2 Response Codes

Code	Value
BEA-NORMAL	+0.
BEA-ERR-LENGTH	+1.
BEA-ERR-MISSING-SRV-NAME	+2.
BEA-ERR-REQ-CODE	+3.
BEA-ERR-SRC-NOT-FOUND	+4.
BEA-ERR-READ-UMT	+5.
BEA-ERR-SERVER	+6.
BEA-ERR-POST	+7.
BEA-ERR-CANCEL	+8.
BEA-ERR-WAIT	+9.
BEA-ERR-LMID-NOT-FOUND	+10.
BEA-ERR-START-TRANSID	+11.
BEA-ERR-DISABLE-ACQUIRING	+12.
BEA-ERR-DISABLE-NOT-FND	+13.
BEA-ERR-DISABLE-NOT-RESPOND	+14.

Table 5-2 Response Codes

Code	Value
BEA-ERR-DISABLE	+15.
BEA-ERR-ALLOC	+16.
BEA-ERR-TIMEOUT	+17.
BEA-ERR-TSQ	+18.
BEA-ERR-SOCKET-FAILURE	+19.
BEA-ERR-PROTOCOL	+20.
BEA-ERR-QUEUE-OVERFLOW	+21.

Request_data

> This is the area where request data gets placed and in which your returned data arrives. The length depends on how long this particular service is configured. Check with the administrator for each service. The maximum value is 32000.

Examples

The following sample is an example of a COBOL CICS client program.

Listing 5-3   COBOL CICS Client Program Example

```
IDENTIFICATION DIVISION.

PROGRAM-ID.    TESTCLN.
ENVIRONMENT   DIVISION.
CONFIGURATION SECTION.
SOURCE-COMPUTER. IBM-3090.
OBJECT-COMPUTER. IBM-3090.
DATA DIVISION.
WORKING-STORAGE SECTION.
01 FILLER   PIC X(32) VALUE 'SAMPLE COBOL CICS CLIENT PROGRAM'.
01 MSG-AREA.
   05 M-DATA         PIC X(42) VALUE SPACES.
   05 M-RCDE         PIC Z(05) VALUE ZEROS.
```

```
01 WS-COMMAREA.
   05  WC-DATALEN    PIC S9(9) COMP-4.
   05  WC-SVCNAME    PIC X(16).
   05  WC-REQUESTCD  PIC S9(9) COMP-4.
   05  WC-RETURNCD   PIC S9(9) COMP-4.
   05  WC-REQRETURNCD PIC S9(9) COMP-4.
   05  WC-REQDATA    PIC X(14).
LINKAGE SECTION.
01 DFHCOMMAREA      PIC X(14).
PROCEDURE DIVISION.
A100-ENTRY.
    MOVE +14             TO WC-DATALEN.
    MOVE 'TOLOWER'       TO WC-SVCNAME.
    MOVE +5              TO WC-REQUESTCD.
    MOVE 'THIS IS A TEST' TO WC-REQDATA.
    EXEC CICS LINK PROGRAM('BEAPRERQ')
            COMMAREA(WS-COMMAREA)
            LENGTH(LENGTH OF WS-COMMAREA)
    END-EXEC.
    IF RETURNCD = 0
       MOVE 'SUCCESSFUL CALL, RETURN DATA IS IN WC-DATA'
         TO MSG-DATA
    ELSE
       MOVE 'PROCESS ERROR OCCURRED, RETURN CODE EQUAL '
         TO MSG-DATA
       MOVE RETURNCD TO M-RCDE
    END-IF.
    EXEC CICS SEND TEXT FROM(MSG-AREA) LENGTH(47)
            ERASE TERMINAL FREEKB CURSOR(0)
    END-EXEC.
A200-EXIT.
    EXEC CICS RETURN END-EXEC.
```

The following is an example of a C CICS client program.

Listing 5-4   C CICS Client Program Example

```
long resp, resp2;
unsigned short int lmsg;
struct CMAREA carea;


carea.CltHdr.DataLen = strlen(sendbuf);
memcpy(carea.CltHdr.SvcName, "ECHO", 4);
```

```
carea.CltHdr.RequestCd = BEA_REQUEST_RESPONSE;
memcpy(carea.Request_data, "This is a test", 14);
lmsg=sizeof(carea);
/* Use the name defined during installation */
EXEC CICS LINK PROGRAM("PREREQ")
                        COMMAREA(&carea)
                        LENGTH(lmsg) RESP(resp) RESP2(resp2);


if(carea.CltHdr.ReturnCd || carea.CltHdr.ReqReturnCd)
        process error;
else
        successful call, returned data is in Request_data;
```

Note: C Programmers, do not include the NULL terminator on any strings. In the previous example, the memxxx calls were used instead of the strxxx calls. This is typical when using C and CICS together. For more information see your C for CICS documentation.

Error Handling

There are three types of errors you may encounter while using eLink TCP for CICS:

♦ Gateway errors (communications problems)

♦ MVS or CICS errors

♦ Application errors

The following subsections explain how eLink TCP handles these different kinds of errors.

Gateway Errors

When local or remote gateway errors occur they are logged in the BEA TUXEDO ULOG file on the remote BEA TUXEDO node and in the BEALOG file (a TD Queue defined during installation) within the CICS region. All associated service requests fail and if the eLink gateways are able to communicate with each other, error messages are communicated between them.

MVS or CICS Errors

For requests originating in the BEA TUXEDO domain, if the remote target system does not make it possible for eLink TCP for CICS to detect particular types of failure, the eLink TCP for TUXEDO (the BEA TUXEDO domain) blocking time-out parameter can be tuned to provide timely detection of problems. This configuration parameter is set in the remote eLink TCP for TUXEDO system; discuss any changes you want to make with the administrator of that system.

Problems with requests that originate in the CICS region are also logged to the BEALOG file. Additionally, time-out periods for these requests can be tuned using the eLink TCP for CICS administration tool.

For more information about the blocking time-out parameter, refer to the *BEA eLink TCP for TUXEDO User Guide*.

Application Errors

If an error occurs that makes the Handler unable to execute a certain program (i.e., the program does not exist or is disabled) the Handler sends a message back to the eLink TCP for TUXEDO gateway. If any other type of error occurs within an application program and the Handler is not notified of the problem, a time-out message is sent from the Handler back to the remote gateway.

For requests originating with CICS, BEA TUXEDO returns information about specific problems, if possible. If there are network problems that prohibit the transmission of data, the request receives a timeout error.

Server Application Considerations

The following subsections identify issues that CICS programmers should be aware of when they develop or modify application programs that interoperate with eLink TCP for CICS as a server.

Programming Services with a Response

Service programs expected to send a response to the client use the EXEC CICS LINK command to execute. The COMMAREA option contains a pointer to the raw data; therefore, no header is sent. As a result, the request data is available to the service programs in the COMMAREA.

Programming Services without a Response

Service programs that do not send replies back to the requester execute using transactions started by the EXEC CICS START command. The FROM option of this command contains a pointer to the raw data; therefore, no header is sent. As a result, such service programs must use an EXEC CICS RETRIEVE command with the SET option containing a pointer to the raw data.

Note: Define a unique transaction for each service that does not send a reply and enter the name of that transaction in the TRANSACTION NAME field of the Inbound Service Information screen for the corresponding service.

An example of a service sending no reply is one requested by a client using a tpacall with the TPNOREPLY flag set.

Modifying the Length of the Return Message

You can manage the actual size of the return message the system sends over the gateway on a per request basis. This is different than simply limiting the message size for a particular service using the MAX MESSAGE field of the Inbound Service Information screen. To limit the size of the return message per request, the service program must ADDRESS the TWA using the copybook or the include file delivered in the "YOURHLQ".BEATCPC.INCLUDE file.

Modifying Return Message Lengths for C Programs

To modify the return message length on a per request basis, specify the message length in the rtnMsgSize field in a TWA_CONNECT structure defined in the TWAINCL file.

Modifying Return Message Lengths for COBOL Programs

To modify the return message length on a per request basis, specify the message length in the RTN-MSG-SIZE field in a TWA_CONNECT record layout in the copybook TWACOPY.

A Error and Informational Messages

Most of the messages produced from BEA eLink for Mainframe TCP for CICS (hereafter referenced as eLink TCP for CICS) are sent back to the remote TUXEDO eLink TCP for TUXEDO gateway and written to the ULOG on that system. Occasionally, messages are written directly to the CICS log configured specifically for eLink TCP for CICS. For more information about configuring the CICS log, refer to "Configuring and Administering BEA eLink TCP for CICS."

The following topics describe eLink TCP for CICS messages:

♦ Messages Returned to the Remote Gateway

♦ Messages Written to the eLink TCP for CICS Log

♦ Codes Returned to a CICS Client Program

♦ Informational Process Messages

♦ Data Field Error Messages

♦ System Error Messages

Messages Returned to the Remote Gateway

Message	Description
BEA eLink TCP for CICS server process initiated.	The Handler process has been started.
Welcome to BEA eLink TCP for MVS/CICS.	The connect process has completed successfully.
Goodbye.	The disconnect process has completed successfully.
Service *svcname* not found.	The requested service was not found in the inbound service name file.
Client has already logged in.	A client process has attempted to establish a connection when a connection already existed. (The connection request protocol was resent.)
Client has not logged in.	A client process has made a request to the eLink TCP for CICS gateway but has not yet established a login connection. (The connection request protocol was never sent.)
BEA eLink TCP MVS/CICS server is active.	This message is returned to the remote TUXEDO gateway when a PING request is sent to the eLink TCP for CICS gateway from the tmadmin administration tool.
Invalid password.	The password specified in the eLink TCP for TUXEDO configuration file does not match the password specified when the CICS supplied listener was configured.
Invalid client account.	The account code specified in the eLink TCP for TUXEDO configuration file does not match the account code specified when the CICS supplied listener was configured.
Sorry-System Resource is protected by CICS.	The mode command was executed through the tmadmin tool on TUXEDO and the administrative request specified is not available in the CICS region.
Data too long, please check message header.	A message received is larger than the maximum allowable message length.

Message	Description
Data too short, please check message header.	A message was received and was smaller than the smallest expected message.
Message header is incorrect.	An invalid protocol header was received. This can occur if there was a transmission error or if a message was sent to the gateway without having gone through the eLink TCP for TUXEDO gateway on the remote TUXEDO node.
This transaction is not defined in CICS.	A CICS transaction code was mapped to a service name in the eLink TCP for TUXEDO configuration file for a transaction code that is unknown to CICS.
Application Handler abnormally terminated.	The Application Handler terminated prior to completing the service request. This message usually occurs when a service has timed out. Verify that you are not expecting a reply from a service that does not send one.
Requested Service timed out.	The requested service did not complete within the time provided in the message header from the remote TUXEDO gateway.
Unable to start another session.	The Handler is already processing the maximum number of service requests configured as the multiplex count.
Unable to start transaction.	A CICS error occurred attempting to start the transaction.
Error occurred in Application Handler.	The Application Handler encountered a CICS error.
Security error occurred in Application Handler.	The Application Handler encountered a CICS security error.

Messages Written to the eLink TCP for CICS Log

Message	Description
Goodbye.	The disconnect process has completed successfully.
Service *svcname* not found.	The requested service was not found in the inbound service name file.
Client has already logged in.	A client process has attempted to establish a connection when a connection already existed. (The connection request protocol was resent.)
Client has not logged in.	A client process has made a request to the eLink TCP for CICS gateway but has not yet established a login connection. (The connection request protocol was never sent.)
Invalid password.	The password specified in the eLink TCP for TUXEDO configuration file does not match the password specified when the CICS supplied listener was configured.
Invalid client account.	The account code specified in the eLink TCP for TUXEDO configuration file does not match the account code specified when the CICS supplied listener was configured.
Data too long, please check message header.	A message received is larger than the maximum allowable message length.
Application Handler abnormally terminated.	The Application Handler terminated prior to completing the service request. This message usually occurs when a service has timed out. Verify that you are not expecting a reply from a service that does not send one.
Requested Service timed out.	The requested service did not complete within the time provided in the message header from the remote TUXEDO gateway.
Unable to start another session.	The Handler is already processing the maximum number of service requests configured as the multiplex count.

Message	Description
`Unable to start transaction.`	A CICS error occurred attempting to start the transaction.
`Error occurred in Application Handler.`	The Application Handler encountered a CICS error.
`Security error occurred in Application Handler.`	The Application Handler encountered a CICS security error.
`DNS Lookup Failed for HOST(host) ERRNO(errno)`	The DNS lookup function failed for the given host name.
`Dotted IP address (address) malformed.`	There was an erroneous IP address passed into the ConvertAddress function.
`Invalid data pointer (pointer).`	There was an invalid data buffer pointer passed into the BufferHeader function.
`Socket CONNECT Failed. ERRNO=errno`	The Socket CONNECT function failed.
`fcntl(F_SETFL) Failed. ERRNO=errno FLAGS=hexcode`	The file control function with the F_SETFL option failed in the connect socket function.
`fcntl (F_GETFL) Failed. ERRNO=errno`	The file control function with the F_GETFL option failed in the connect socket function.
`Socket CREATE Failed. ERRNO=errno`	The Socket CREATE function failed.
`WRITE on Socket Failed. ERRNO=errno`	The Socket WRITE function failed.
`initapi Failed. ERRNO=errno`	The Socket initialization function failed.
`RETRIEVE Failed. RESP=hexcode RESP2=hexcode`	The CICS RETRIEVE command failed when it tried to access the buffer passed to the eLink TCP for TUXEDO Handler from the Sockets for CICS Listener.
`Load Control Failed. RESP=hexcode RESP2=hexcode`	A CICS LOAD PROGRAM command failed. The Handler was unable to load the control programs OTPCICS01 or OTPCICS02.
`Start Task Failed. RESP=hexcode RESP2=hexcode`	A CICS START command failed when the Handler tried to issue a START on the specified user program.

Message	Description
`Link Program Failed.` `RESP=hexcode RESP2=hexcode`	A CICS LINK command failed. The Handler was unable to LINK to the specified user program.
`GETMAIN Failed. RESP=hexcode` `RESP2=hexcode`	The CICS GETMAIN command failed.
`Take Socket Failed.` `ERRNO=errno`	The eLink TCP Handler was unable to take control of the TCP/IP socket.
`Error on Select. ERRNO=errno`	The Sockets SELECT function failed.
`Read on Socket Failed.` `ERRNO=errno`	An error was encountered while attempting to read from the active socket.
`Socket SEND Failed. RC=rc` `ERRNO=errno`	An error was encountered while issuing a send over the active socket.
`Handler connected` `successfully.`	The client request is allowed because the account and password codes are authorized to use the eLink TCP gateway.
`BEA eLink TCP Server CTOS is` `shutting down.`	The eLink TCP for TUXEDO Handler is shutting down.
`Verifying User Account.`	The Handler is verifying that the account and password codes supplied by eLink TCP for TUXEDO on the remote TUXEDO gateway are valid.
`Handler initialization` `complete.`	The eLink TCP Handler has successfully initialized.
`Normal shutdown requested, x` `requests pending.`	The eLink TCP Handler shuts down after the currently pending requests complete.
`Handler exceeded maximum idle` `time.`	The eLink TCPHandler has exceeded the configured IDLE TIME.
`BEA eLink TCP Handler is` `shutting down.`	The eLink TCP Handler is shutting down.
`Client disconnected.`	The client has been disconnected from the eLink TCP Handler.
`Read of file failed,` `resp(hexcode)`	A CICS READ command failed.

Message	Description
`Freemain did not work,` `resp(hexcode)`	A CICS FREEMAIN command failed.
`Getmain shared failed:` `resp(hexcode)`	A CICS GETMAIN(SHARED) command failed.
`Delete from file failed,` `resp(hexcode)`	A CICS DELETE command failed.
`Write to file failed,` `resp(hexcode)`	A CICS WRITE command failed.
`Rewrite of file failed,` `resp(hexcode)`	A CICS REWRITE command failed.
`Read(update) of file failed,` `resp(hexcode)`	A CICS READ(UPDATE) command failed.
`Unauthorized Client Rejected.`	The client request are not allowed because the account and/or password codes are not authorized.
`deleteq ts did not work,` `resp(hexcode)`	A CICS DELETEQ TS command failed.
`Unable to start transaction`	A CICS error occurred attempting to start the transaction.
`Security Violation: Invalid` `user for this transaction`	The userid sent with a request by the client does not match the userid set in the mainframe security for this transaction.
`The Handler is designed to run` `in the background.`	A user has attempted to start the Handler from a terminal.
`The appHandler is designed to` `run in the background.`	A user, from a terminal, has attempted to start the transaction that initiates the Application Handler.
`App Handler received corrupted` `header, exiting.`	The Application Handler is terminating on initialization because there is a problem with the header it received. This would occur, for example, if the transaction for the Application Handler was given in the Inbound Service Information screen as the transaction to start a service with no reply.
`opcode is not CONNECT on` `connection.`	The Requester has received a reply that should be the acknowledgment of a connection request; however, the message does not contain the correct opcode.

Message	Description
`Trying connection, but already connected.`	The Requester has received a reply containing an opcode indicating a response to a connection request; however, the connection already exists.
`Read on sockets failed. Connection closed by other side.`	The Handler terminated because the socket status indicated that the client side had closed the connection.

Codes Returned to a CICS Client Program

The following codes are returned to a CICS client program on return from a LINK to eLink TCP. For system level problems, please notify your CICS administrator.

Message	Description
`BEA_NORMAL`	Value 0 Successful Return From Service Call.
`BEA_ERR_LENGTH`	Value 1 There was an error regarding the length of the message sent or the length value specified.
`BEA_ERR_MISSING_SRV_NAME`	Value 2 A service request was made but no service name was provided.
`BEA_ERR_REQ_CODE`	Value 3 A service call was made with an invalid or missing request code.
`BEA_ERR_SRC_NOT_FOUND`	Value 4
`BEA_ERR_READ_UMT`	Value 5 Check the FCT entry for the CONNECTIONS dataset.
`BEA_ERR_SERVER`	Value 6 There was a problem accessing the Requester. Check that it is enabled.
`BEA_ERR_POST`	Value 7 A CICS Post error occurred in eLink TCP.

Message	Description
BEA_ERR_CANCEL	Value 8 A CICS Cancel error occurred in eLink TCP.
BEA_ERR_WAIT	Value 9 A CICS Wait error occurred in eLink TCP.
BEA_ERR_LMID_NOT_FOUND	Value 10 The service name provided specified a non-existent LMID.
BEA_ERR_START_TRANSID	Value 11 A CICS Start error occurred in eLink TCP.
BEA_ERR_DISABLE_ACQUIRING	Value 12 There was a problem getting an LMID to use for this service request.
BEA_ERR_DISABLE_NOT_FND	Value 13 The service name provided specifies an invalid LMID or is missing the LMID.
BEA_ERR_DISABLE_NOT_RESPOND	Value 14 The Requester for handling this service name is not responding.
BEA_ERR_DISABLE	Value 15 The LMID associated with the requested service is not enabled.
BEA_ERR_ALLOC	Value 16 The Pre-requester was unable to allocate the memory necessary to process a request.
BEA_ERR_TIMEOUT	Value 17 The Pre-requester has timed out the request. This could occur either during processing by the Pre-requester, before the request is sent, or because the Pre-requester did not receive a response in time.
BEA_ERR_TSQ	Value 18 The Pre-requester was unable to write the request to the appropriate TS queue.
BEA_ERR_SOCKET_FAILURE	Value 19 The Requester closed a socket because the socket was in a state inconsistent with the requested operation.
BEA_ERR_PROTOCOL	Value 20 The Requester closed a socket because the session data was corrupt.

Message	Description
BEA_ERR_QUEUE_OVERFLOW	Value 21 The Requester has aborted a request because the pending request queue for the Requester is too full.

Informational Process Messages

Message	Description	Action
"RECORD READY FOR UPDATE"	The record selected is ready to be updated.	Make the changes and press ENTER to process.
"UPDATE COMPLETED"	The changes made to the record selected for update have been processed.	Select another record to update, or press PF3 or PF5.
"TO CONFIRM DELETE, PRESS ENTER:AGAIN"	The record selected is ready to be deleted.	Press ENTER to delete the selected record of press PF3 or PF5 to abort the delete.
"DELETE COMPLETED"	The record selected for delete has been deleted.	Select another record to delete, or press PF3 or PF5.
"INQUIRE COMPLETED"	The record selected for inquiry has been processed.	Select another record to inquiry, or press PF3 or PF5.
"INSERT COMPLETED"	The record entered has been inserted into the file.	Enter another record, or press PF3 or PF5.

Data Field Error Messages

Message	Description	Action
`"INVALID FUNCTION KEY, OPTIONS=(ENTER:, PF3:)"`	The PFKey pressed is not valid in this operation.	Press a valid PFKey. See OPTIONS=.
`"INVALID FUNCTION KEY, OPTIONS=(ENTER:, PF3:, PF5:)"`	The PFKey pressed is not valid in this operation.	Press a valid PFKey. See OPTIONS=.
`"INVALID FUNCTION KEY, OPTIONS=(ENTER:, PF3:, PF7:, PF8:)"`	The PFKey pressed is not valid in this operation.	Press a valid PFKey. See OPTIONS=.
`"INVALID LOGICAL MACHINE NAME"`	The LOGICAL MACHINE NAME entered is not valid.	Enter a valid INVALID LOGICAL MACHINE NAME (i.e., LMIDNJ). Must not start with a SPACE, NULL, or Under_Score.
`"INVALID HOST ADDRESS"`	The HOST ADDRESS entered is not valid.	Enter a valid HOST ADDRESS (i.e., 1234.1234.99). Must not start with a SPACE, NULL, or Under_Score.
`"HOST ADDRESS or DNS NAME REQUIRED"`	Neither the HOST ADDRESS nor the DNS NAME have been entered.	Enter either a valid HOST ADDRESS or DNS NAME.
`"CANNOT HAVE BOTH HOST ADDRESS AND DNS NAME"`	Both HOST ADDRESS and DNS NAME have been entered.	Enter either a valid HOST ADDRESS or DNS NAME.
`"INVALID MULTIPLEX COUNT OPTIONS=(1-99)"`	The MULTIPLEX COUNT entered is not valid.	Enter a valid number for MULTIPLEX COUNT.
`"INVALID MAX CONNECTIONS OPTIONS=(1-99)"`	The MAX CONNECTIONS entered is not valid.	Enter a valid number for MAX CONNECTIONS.
`"TRAN CODE INVALID FOR LMID TYPE (L INTERLINK, I IMS, T TCP)"`	A START TRAN CODE has been entered and the LMID TYPE is not CICS.	Remove the START TRAN CODE or change the LMID TYPE to CICS.

Message	Description	Action
"QUEUE NAME REQUIRED"	The QUEUE NAME has not been entered.	Enter a valid QUEUE NAME.
"CICS DATA INVALID FOR LMID TYPE (L INTERLINK, I IMS, T TCP)"	CICS DATA has been entered and the LMID TYPE is not CICS.	Remove the CICS DATA or change the LMID TYPE to CICS.
"INVALID PORT NUMBER OPTIONS=(1 -> 65,535)"	The PORT NUMBER entered is not valid.	Enter a valid PORT NUMBER (i.e., 1234). It must not start with a SPACE, NULL, or Under_Score and must be within the range (1 -> 65,535)
"ACCOUNT ID REQUIRED"	An ACCOUNT ID is required if you entered a PASSWORD.	Enter an ACCOUNT or erase the PASSWORD.
"PASSWORD REQUIRED"	A PASSWORD is required if you entered an ACCOUNT ID.	Enter a PASWORD or erase the ACCOUNT ID.
"INVALID MAX MSG SIZE OPTIONS=(1 -> 32000)"	The MAX MSG SIZE entered is not valid.	Enter a valid MAX MSG SIZE (i.e., 4096) Must not start with a SPACE, NULL, or Under_Score and must be within the range (1 -> 32000)
"INVALID CONNECT RETRY LIMIT"	The CONNECT RETRY LIMIT entered is not valid.	Enter a valid CONNECT RETRY LIMIT (i.e., 10) Must not start with a SPACE, NULL, or Under_Score
"INVALID SELCDE, OPTIONS= (1: INS, 2: UPD, 3: INQ, 4: DEL)"	The SELCDE entered is not valid.	Enter a valid SELCDE. See OPTIONS=.
"INVALID SELCDE, OPTIONS= (2: UPD, 3: INQ)"	The SELCDE entered is not valid.	Enter a valid SELCDE. See OPTIONS=.
"INVALID SELECTION, OPTIONS=(C2-3, C5, R1-5, S1-5, U2-3, I1-5)"	The SELECTION entered is not valid.	Enter a valid SELECTION. See the list of valid options in the message.
"INVALID SERVICE NAME"	The SERVICE NAME entered is not valid.	Enter a valid SERVICE NAME. (i.e., EMPLSRV) Must not start with a space, null, or underscore.

Message	Description	Action
`"INVALID REMOTE SERVICE NAME"`	The REMOTE SERVICE NAME entered is not valid.	Enter a valid REMOTE SERVICE NAME (i.e., EMPLSRV) Must not start with a space, null, or underscore.
`"INVALID LMID TYPE OPTIONS= (C CICS, I IMS, L INTERLINK, T TCP)"`	The LMID TYPE entered is not valid.	Enter a valid LMID TYPE. See Options
`"START TRAN CODE REQUIRED FOR LMID TYPE (C CICS)"`	No START TRAN CODE has been entered and the LMID TYPE is CICS.	Enter a valid START TRAN CODE.
`"INVALID TYPE (I INCOMING, O OUTGOING)"`	The TYPE entered is not valid.	Enter a valid TYPE.
`"INVALID IBM STACK FLAG (Y/N)"`	The IBM STACK FLAG entered is not valid.	Enter a valid IBM STACK FLAG (Y or N).
`"INVALID MAX CONNECTIONS FOR STACK TYPE"`	The MAX CONNECTIONS entered is not valid for the STACK TYPE.	Enter a valid MAX CONNECTIONS. If IBM STACK FLAG=N, MAX CONNECTIONS must be 1.
`"INVALID SECURITY FLAG (Y/N)"`	The SECURITY FLAG entered is not valid.	Enter a valid SECURITY FLAG (Y or N).
`"INVALID SERVICE TIMEOUT(SEC)"`	The SERVICE TIMEOUT(SEC) entered is not valid.	Enter a valid SERVICE TIMEOUT(SEC) (i.e. 30). Must not start with a SPACE, NULL, or Under_Score.
`"INVALID STATUS OPTIONS=(E ENABLE, D DISABLE, A ABORT)"`	The STATUS entered is not valid.	Enter a valid STATUS. See OPTIONS=.
`"NO CHANGE DONE STATUS ENTERED SAME AS ON RECORD"`	The STATUS on the record is 'E' and you entered an 'E'. The STATUS on the record is 'D' and you entered a 'D'. The STATUS on the record is 'A' and you entered a 'A'.	Enter the appropriate STATUS.
`"BEA_REQ_HDR RECORD NOT FOUND"`	An error occurred within the Connection CSA.	Contact your system administrator.

System Error Messages

Message	Description	Action
`"BEG/END OF FILE"`	The end of file was detected during a browse.	None
`"DUPLICATE RECORD"`	The record being inserted is already on the file.	Use a different record key.
`"FILE NOT OPENED"`	The file is not available to CICS.	Contact your system administrator. Check the file status via CEMT.
`"DSIDERR"`	Refer to the CICS Application Reference Manual.	Contact your system administrator.
`"ILLOGIC"`	Refer to the CICS Application Reference Manual	Contact your system administrator.
`"INVREQ"`	Refer to the CICS Application Reference Manual.	Contact your system administrator.
`"IOERR"`	Refer to the CICS Application Reference Manual.	Contact your system administrator.
`"LENGERR"`	Refer to the CICS Application Reference Manual.	Contact your system administrator.
`"MAPFAIL"`	Refer to the CICS Application Reference Manual.	Contact your system administrator. Check the Mapset status via CEMT.
`"NOSPACE"`	Refer to the CICS Application Reference Manual.	Contact your system administrator.
`"NOTAUTH"`	Refer to the CICS Application Reference Manual.	Contact your system administrator.
`"PGMIDERR"`	Refer to the CICS Application Reference Manual.	Contact your system administrator. Check the Program status via CEMT.
`"RECORD NOT FOUND"`	The record selected is not in the file.	Verify the data you entered for the record key.

Message	Description	Action
`"SYSIDERR"`	Refer to the CICS Application Reference Manual.	Contact your system administrator.
`"UNKNOWN ERROR"`	Refer to the CICS Application Reference Manual.	Contact your system administrator.

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