BargeEx™

CONNECTING THE WATERWAYS

BargeEx Release 3.0 Integration Guide

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Preface

How this Document is Organized

The *BargeEx Integration Guide* is divided into the following chapters:

Chapter 1 Introduction – Overview of BargeEx

Chapter 2 Web Site – Description of the BargeEx Web Site

Chapter 3 Software Development Kit – Description of the BargeEx SDK

Chapter 4 Installation – Instructions on installing the BargeEx SDK

Appendix A. Glossary of Terms and Acronyms - Glossary of terms used in this document

Appendix B. Supported CICA Documents – Details on the CICA Documents currently supported by BargeEx

Appendix C. **BargeEx .NET API Documentation** – Details on the BargeEx .NET API Class Library

Conventions Used in this Document

[ ]	Brackets are used to enclose cross-references. The document name or volume number is listed in the cross-reference only when it appears in another document.
`Text`	Monospaced text is used to indicate programming code or characters that you type. For example, they may be contained in an initialization file that you maintain or they may be examples of commands that you would type in response to a command prompt.
Additions	Additions to existing requirements are shown in blue dotted underline text.
~~Deletions~~	Deletions to existing requirements are shown in red strikethrough text.

1. Introduction

BargeEx is a flexible platform for facilitating the exchange of ANSI ASC X12 CICA Documents (i.e. electronic transactions) between marine industry trading partners (e.g. barge operations organizations and service providers). The purpose of this document is to describe and explain how to integrate a line-of-business system with BargeEx.

1.1 Why BargeEx?

The communication between barge operations organizations and their service providers is a highly labor-intensive process. Communication often involves verbal communication or batched status communication via fax or electronic mail. It is common for the originator of the information to send a custom report to the recipient and for the recipient to then re-enter the information, manually, into their line-of-business (LOB) system. The nature of this interaction leads to:

- Slow communication of status
- Inaccurate information due to manual re-keying
- Poor use of resources in clerical vs. logistical responsibilities

The purpose of BargeEx is to electronically integrate the different parties to insure:

- Timely communication of status
- Accurate information
- Better resource utilization, concentrating on logistical decision making and other value-added business activities

The following problems are inherent to implementing this type of communication:

- No standards for items such as barge numbers, location names, river mile numbering, etc.
- Most companies' LOB systems to not support the marine industry ANSI ASC X12 CICA Documents.
- Integration with multiple trading partners requires different formats for each one.

- Changes in one organization's system can break connectivity with others.

BargeEx uses a Web Service Architecture (WSA). Trading partners send and retrieve CICA Documents using web services. BargeEx also translates the data elements of a CICA Document from the source trading partner's value to the target trading partner's value.

The benefits of this architecture include the following:

- Each organization must integrate their systems with only one interface.
- The addition of a new organization does not mean the introduction of a whole new integration project for each existing organization.
- BargeEx can translate terms used by one organization into the terms used by another organization.

1.2 Trading Partners

A trading partner is any organization that interacts with BargeEx. Trading partners are assigned a Trading Partner Number (which is public), and a User Account Name and Password (both of which are private). BargeEx currently supports two types of trading partners: Service Providers and Barge Companies.

1.2.1 Service Providers

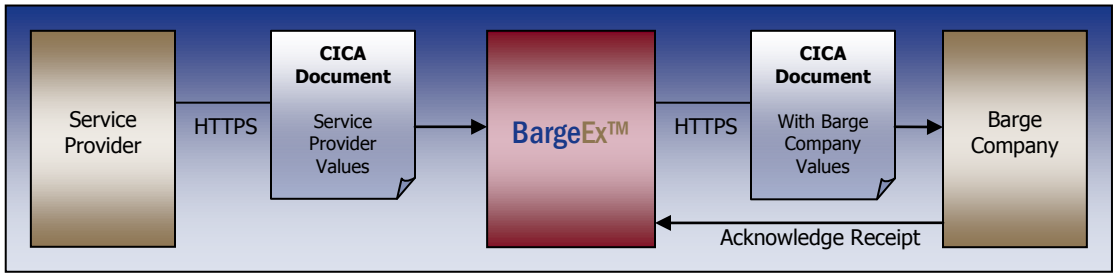
A service provider is any organization that performs services for a barge company. Examples of service providers include Fleeting Operations, Repair Facilities, Terminals, etc.

1.2.2 Barge Companies

A barge company is a company that receives services from service providers.

1.3 Architecture Overview

The following diagram demonstrates how a single CICA document is sent from a service provider to a barge company using BargeEx.



A service provider generates a CICA Document from their line-of-business system and sends it to BargeEx. BargeEx then validates the document, performs the necessary data translations, and queues the CICA Document to be retrieved by the barge company. The barge company then retrieves the CICA Document from BargeEx and acknowledges is successfully received the CICA Document. See the BargeEx website at http://www.BargeEx.com for sample CICA Document workflows.

1.3.1 Sending CICA Documents

CICA Documents can be sent to BargeEx using the following methods:

- BargeEx Web Services
- BargeEx .NET API

Each method is described in the Software Development Kit section of this document.

1.3.2 Retrieving CICA Documents

CICA Documents can be retrieved from BargeEx using the following methods:

- BargeEx Web Services
- BargeEx .NET API

Each method is described in the Software Development Kit section of this document.

1.3.3 Data Mapping

Not all trading partners use the same terminology to describe the various elements of a CICA Document. To accommodate all trading partners' terminology, BargeEx translates the source trading partner's values into the target trading partner's values before the CICA Document is delivered to the target trading partner. BargeEx supports data mapping for the following element types:

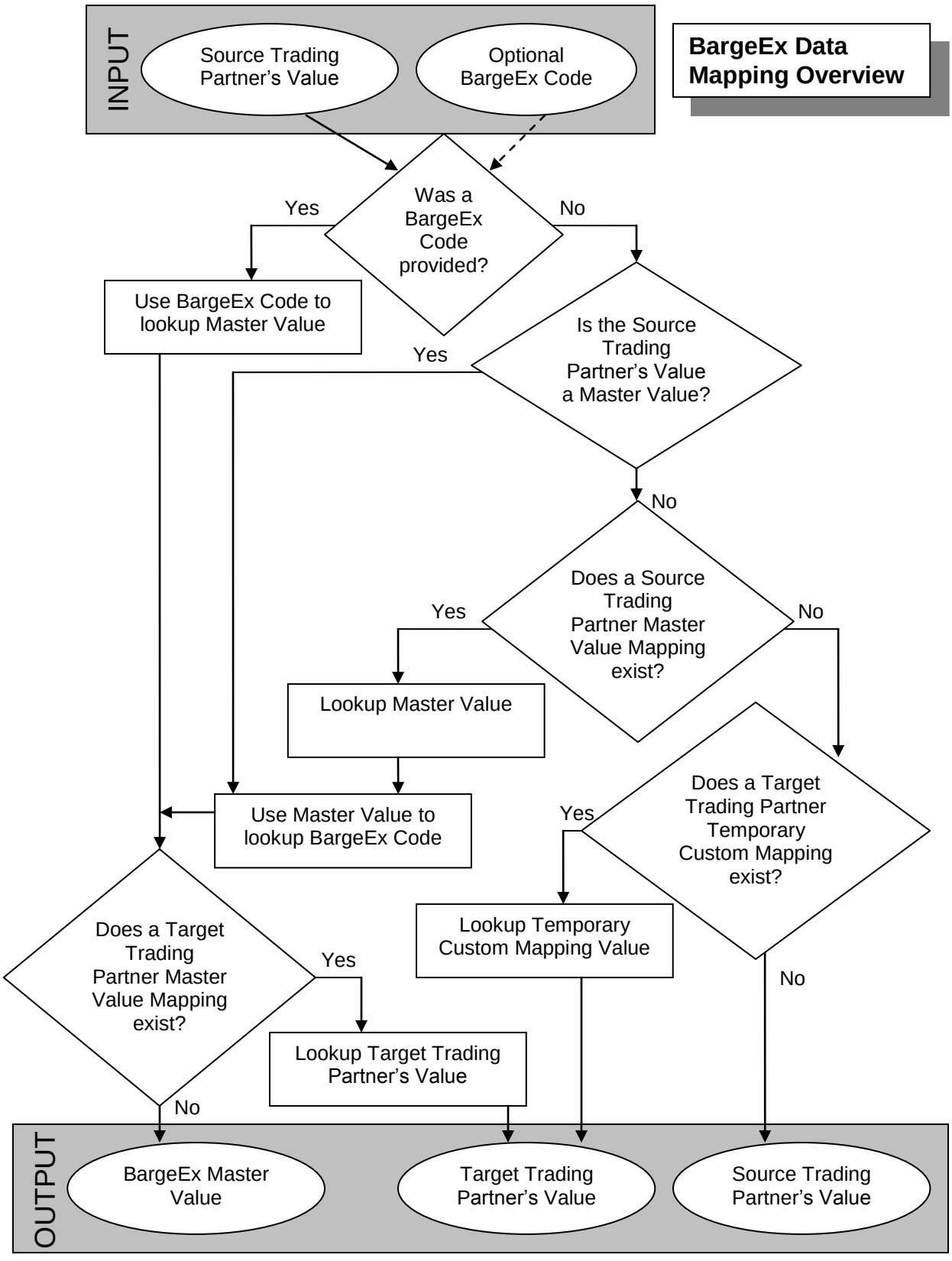
- Barge
- Boat
- Commodity
- Location
- Ship
- Waterway

BargeEx supports the following types of data mapping:

- Master Value Mapping – Mapping to and from BargeEx Master Values. When a CICA Document is received from the source trading partner, the CICA Document's element values are mapped to the BargeEx Master Values using these mappings. When a CICA Document is retrieved by the target trading partner, the CICA Document's elements are mapped from the BargeEx Master Values to the target trading partner's values using these mappings.

- Temporary Custom Mapping – Mapping from a source trading partner's value to a target trading partner's value. These mappings are only used when a Master Value Mapping cannot be found.

The diagram on the following page shows how BargeEx determines which value to send to the target trading partner.


INPUT
Source Trading Partner's Value
Optional BargeEx Code
BargeEx Data Mapping Overview
Was a BargeEx Code provided?
Yes
No
Use BargeEx Code to lookup Master Value
Is the Source Trading Partner's Value a Master Value?
Yes
No
Does a Source Trading Partner Master Value Mapping exist?
Yes
No
Lookup Master Value
Use Master Value to lookup BargeEx Code
Does a Target Trading Partner Temporary Custom Mapping exist?
Yes
No
Lookup Temporary Custom Mapping Value
Does a Target Trading Partner Master Value Mapping exist?
Yes
No
Lookup Target Trading Partner's Value
OUTPUT
BargeEx Master Value
Target Trading Partner's Value
Source Trading Partner's Value

BargeEx data mappings can be managed using the following supported interfaces:

- BargeEx Website
- BargeEx Web Services
- BargeEx .NET API

These interfaces are described in the BargeEx Web Site and the BargeEx Software Development Kit sections of this document.

1.4 SDK Interfaces Overview

Trading partners integrate their line-of-business systems with BargeEx using one of the supported application programming interfaces (API) contained in the BargeEx Software Development Kit (SDK). The actual API a trading partner chooses will depend on that trading partner's environment and their requirements. The BargeEx Software Development Kit section of this document describes each interface in detail, allowing trading partners to choose a BargeEx interface and implement a solution using that interface.

1.4.1 BargeEx Web Services

The BargeEx Web Services are a collection of web service methods that allow a trading partner to interact with BargeEx. A trading partner will typically choose this method if they have the ability to generate CICA Documents and do not wish to use the .NET Framework in their systems. This would be a good choice for trading partners with a line-of-business system that is written in Java or some other non-Microsoft platform or for trading partners that already use a 3rd party business-to-business (B2B) system.

1.4.2 BargeEx .NET API

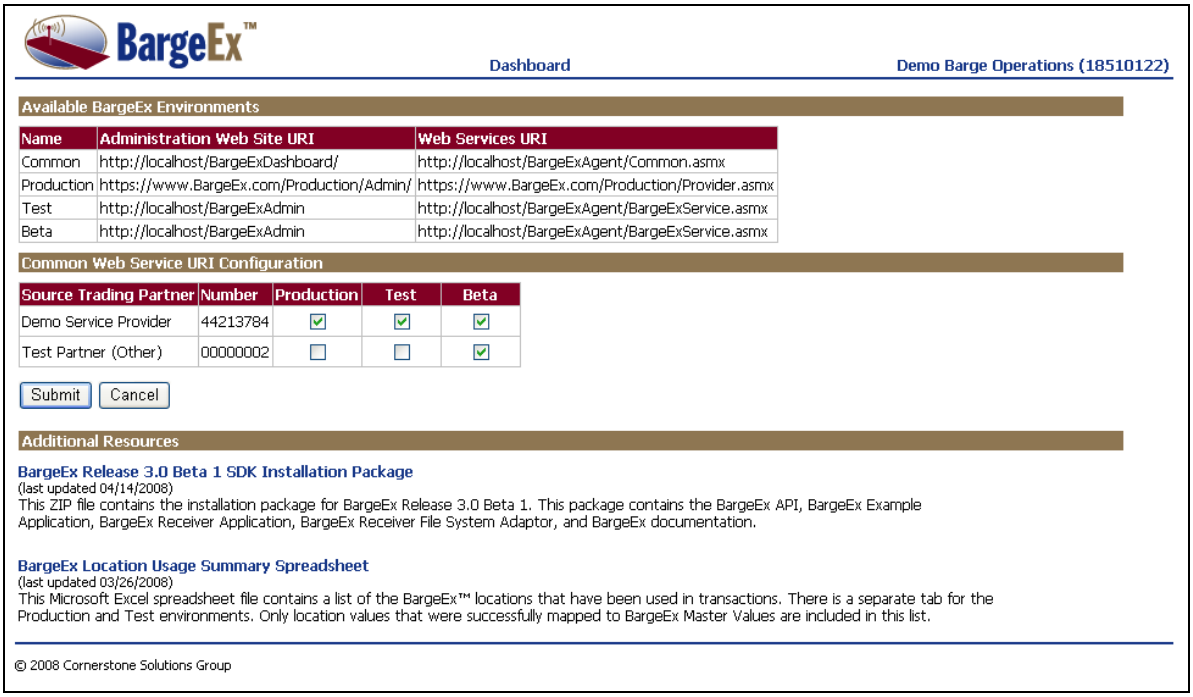
The BargeEx .NET API allows trading partners to interact with BargeEx using the .NET Framework. A trading partner will typically choose this method if they are able to use the .NET Framework but do not want to generate CICA Documents manually in their systems. This would be a good choice for service providers with a line-of-business system written in .NET.

2. BargeEx Web Site

2.1 Overview

The BargeEx website offers trading partners a convenient way to monitor and configure BargeEx.

2.2 BargeEx Dashboard



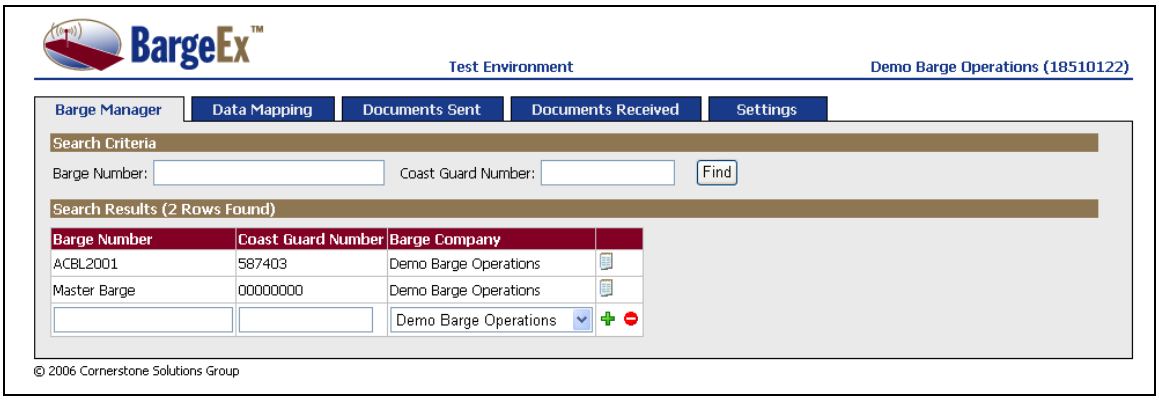
The BargeEx Dashboard lists all of the BargeEx environments available to the trading partner. It also allows a trading partner to indicate where CICA Documents sent to the Common BargeEx URI will be directed.

2.3 BargeEx Admin

2.3.1 Overview

The BargeEx Admin pages allow a trading partner to monitor and configure a particular BargeEx environment.

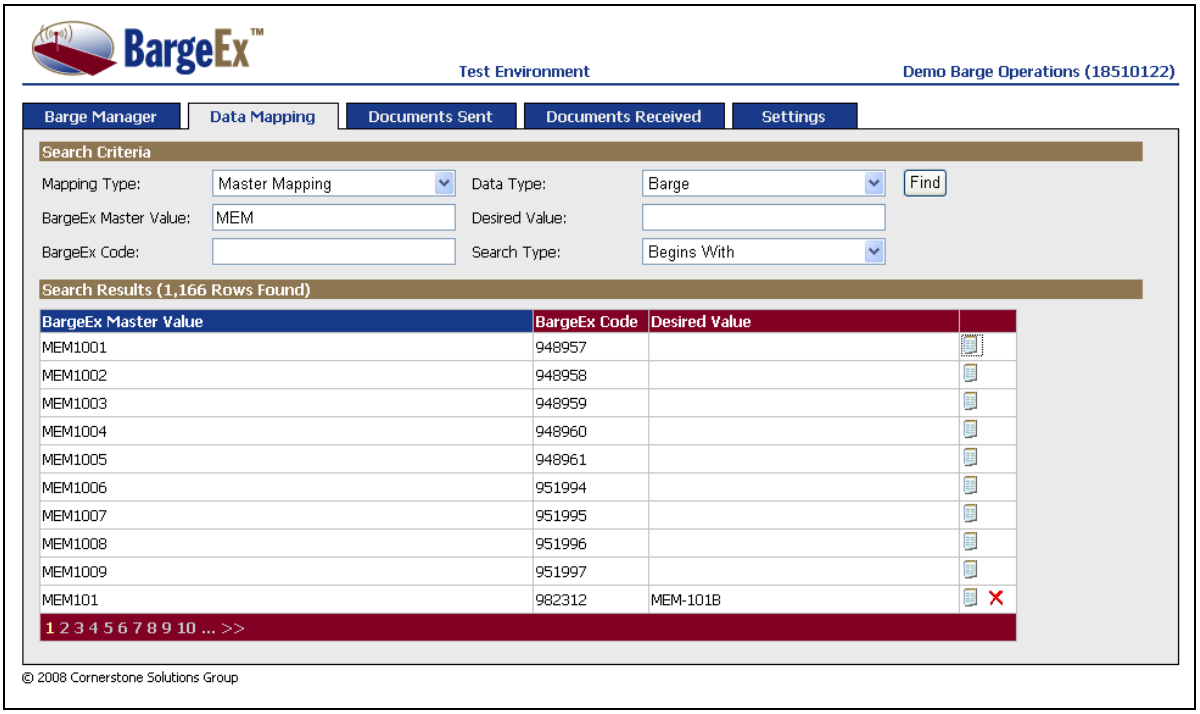
2.3.2 Barge Manager



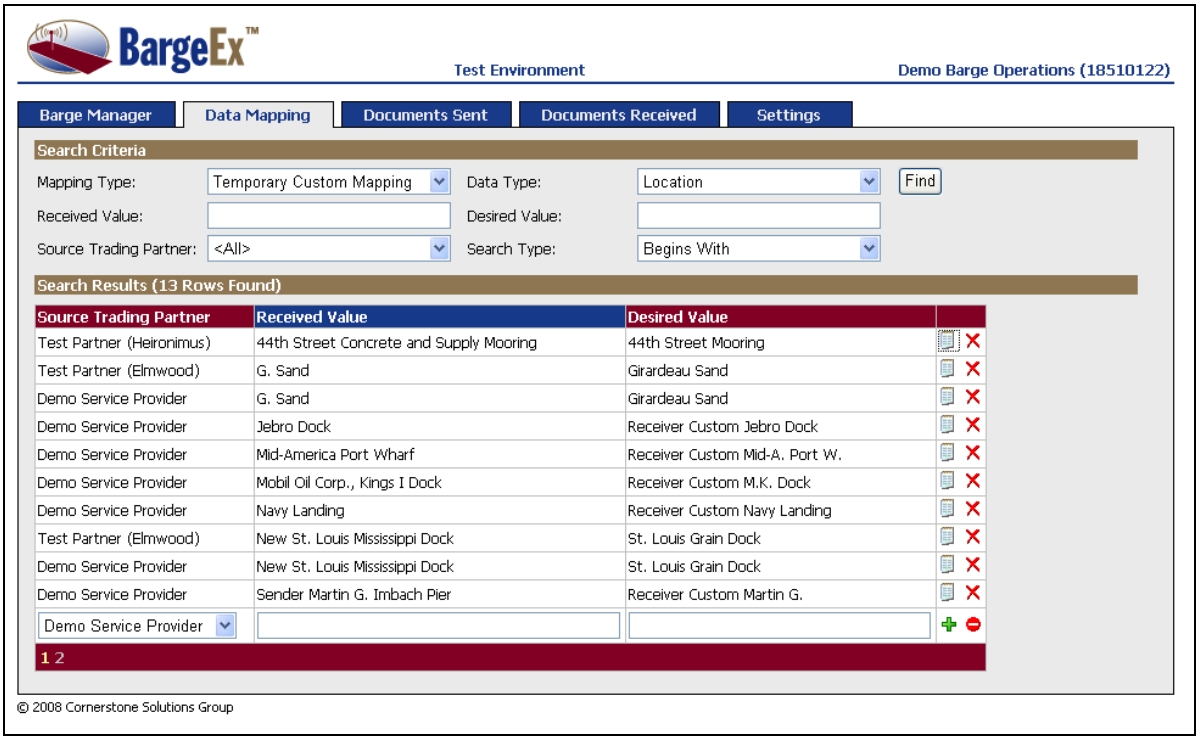
The Barge Manager page is only available to barge companies. It allows a barge company to manage all barges they own or operate. A barge company can transfer control of a barge to another barge company using this page.

2.3.3 Data Mapping

BargeEx uses two different types of data mapping: Master Mapping and Temporary Custom Mapping. Both types are managed using the Data Mapping page.

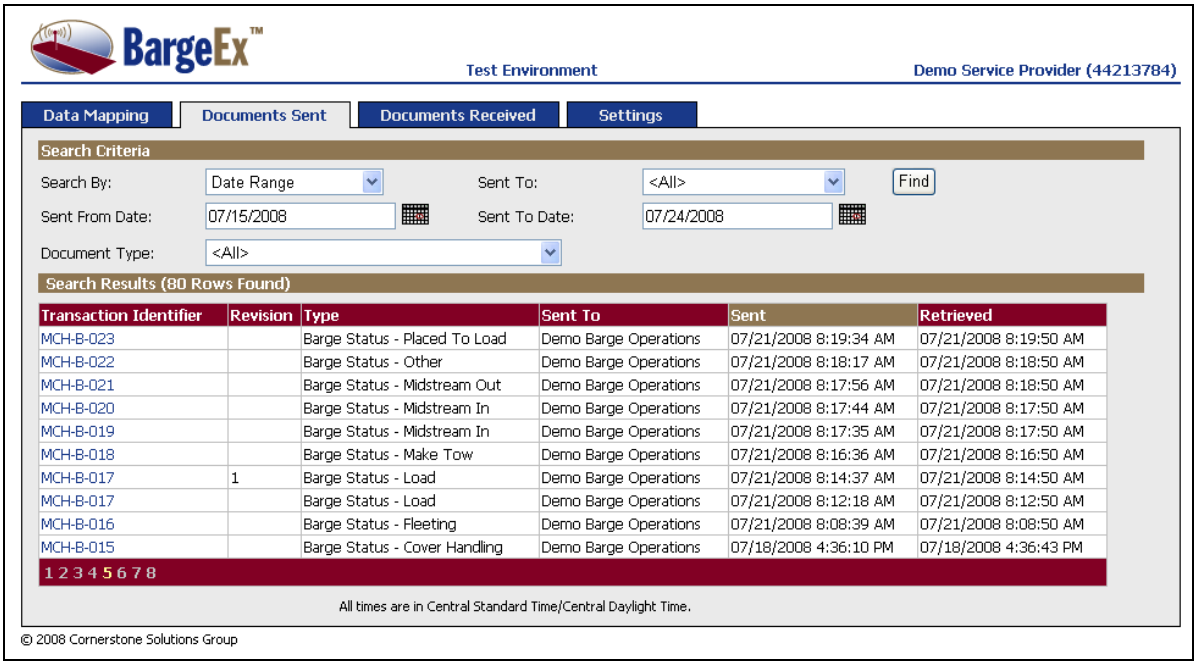


In the screenshot above the Data Mapping page is in Master Mapping mode.



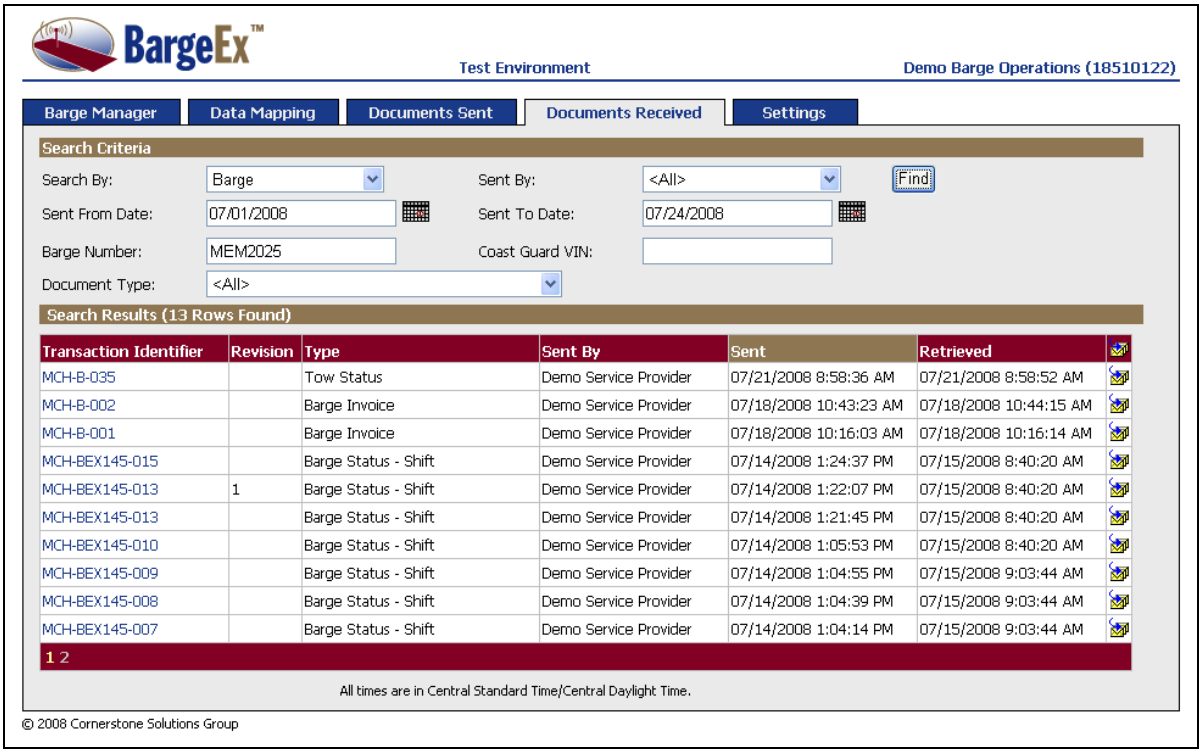
In the screenshot above the Data Mapping page is in Temporary Custom Mapping mode.

2.3.4 Documents Sent



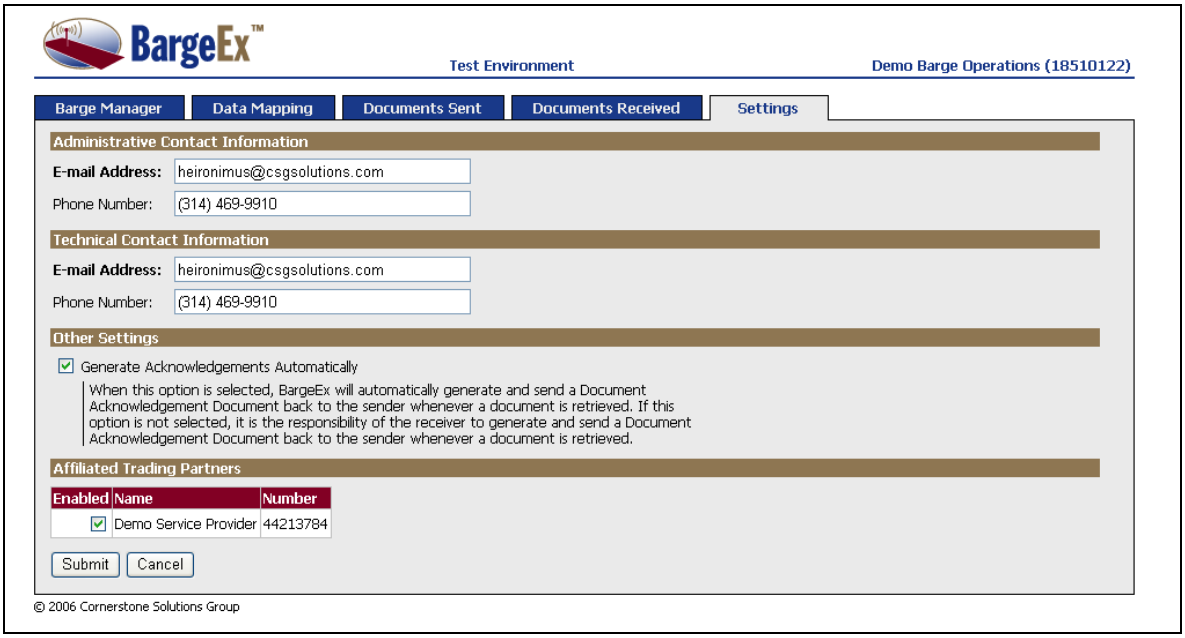
The Documents Sent page allows a trading partner to search for CICA Documents they have sent using BargeEx.

2.3.5 Documents Received



The Documents Received page allows a trading partner to search for CICA Documents they have received from BargeEx. It also allows a trading partner to re-queue a CICA Document that has already been retrieved from BargeEx.

2.3.6 Settings



The settings page allows a trading partner to configure BargeEx.

3. BargeEx Software Development Kit

3.1 Overview

Trading partners can integrate their line-of-business systems with BargeEx using one of the supported application programming interfaces (API) described in this section.

3.2 BargeEx Web Services

3.2.1 Overview

Trading partners can use BargeEx to send and receive CICA Documents using the web service methods described in this section. They can also manage their BargeEx data mappings using web service methods described in this section.

The Web Services Description Language (WSDL) file for the BargeEx Web Services can be obtained from the BargeEx website at http://www.BargeEx.com.

3.2.1.1 Authentication Header

All web service calls must contain the following soap header:

```
<soap:Header>
   <TradingPartnerCredentials xmlns="http://www.BargeEx.com/BargeExService">
      <UserName>string</UserName>
      <Password>string</Password>
      <TradingPartnerNumber>string</TradingPartnerNumber>
   </TradingPartnerCredentials>
</soap:Header>
```

Argument	Type	Description
UserName	String	The user name assigned to the trading partner.
Password	String	The password assigned to the trading partner.

Argument	Type	Description
TradingPartnerNumber	String	The BargeEx Trading Partner number assigned to the trading partner.

3.2.1.2 Return Codes

All methods return a code indicating if the method was successful. The codes listed below are common to all web service methods. Method specific codes are listed in the method's definition.

Value	Description
Success	Method was completed successfully.
FailedAuthentication	The trading partner credentials specified in the header are not valid.
UnknownProcessingError	An unexpected error occurred processing this request. If this error continues, please contact BargeEx support.

3.2.1.3 Test Method

Purpose	This method is used for testing. It verifies a trading partner can connect to BargeEx
Returns	Return codes specified in section 3.2.1.2.

Argument	Type	Direction	Description
TestValue	String	Input / Output	The web service will reverse the characters of the input string and return them.

3.2.2 Sending Documents

3.2.2.1 SendDocument Method

Purpose	This method sends a CICA Document to a trading partner via BargeEx.
Returns	Return codes specified in section 3.2.1.2 plus the following: UnauthorizedTradingPair - The sender of the CICA Document is not authorized to send documents to the recipient. FailedSchemaValidation - The data sent is not a valid XML document, does not conform to a supported CICA Document schema, or is missing a required value. UnsupportedNamespace – An unsupported CICA Document was sent. DuplicateInstanceIdentifier - The document header instance identifier or the transaction identifier for the CICA Document has already been used. Instance identifiers and transaction identifiers must be unique.

Argument	Type	Direction	Description
Document	XML	Input	The CICA Document to send. This CICA Document must conform to one of the BargeEx supported Marine Industry's CICA Document schemas.
ErrorDetails	String	Output	If the return code is FailedSchemaValidation, this output argument will contain details on why the document is invalid.

3.2.3 Retrieving Documents

3.2.3.1 GetNextDocument Method

Purpose	This method retrieves the oldest CICA Document queued for pickup from BargeEx. The trading partner's system should call this method until there are no more items in the queue (i.e. NoMoreDocuments is returned).
Returns	Return codes specified in section 3.2.1.2 plus the following: NoMoreDocuments – There are no more document available for pickup at this time.

Argument	Type	Direction	Description
Document	XML	Output	The retrieved CICA Document. This CICA Document will conform to one of the BargeEx supported Marine Industry CICA Document schemas.

3.2.3.2 AcknowledgeDocument Method

Purpose	This method is used to notify BargeEx the indicated CICA Document has been successfully retrieved by the trading partner. This method must be called following a call to GetNextDocument. If it is not, GetNextDocument will return the same CICA Document every time it is called.
Returns	Return codes specified in section 3.2.1.2.

Argument	Type	Direction	Description
SenderTradingPartnerNumber	String	Input	The trading partner number of the trading partner that sent the CICA Document.
InstanceIdentifier	String	Input	The trading partner specific instance identifier that appeared in the document header of the CICA Document being acknowledged.

3.2.4 Data Mapping

3.2.4.1 GetDataMappings Method

Purpose	This method returns the current master data mapping information for the indicated trading partner and data map type. All Master Values will be returned, even if they do not have a Custom Value defined.
Returns	Return codes specified in section 3.2.1.2.

Argument	Type	Direction	Description
DataMapType	String	Input	Indicates which type of data mapping values should be returned. Options: Barge, Boat, Commodity, Location, Ship, Waterway.
MasterValue	String	Input	Restricts the list of values returned. Only Master Values that start with this string will be returned. Use an empty string for this parameter and the CustomValue parameter to have this method return all values.
CustomValue	String	Input	Restricts the list of values returned. Only Custom Values that start with this string will be returned. Use an empty string for this parameter and the MasterValue parameter to have this method return all values.
DataMapPair()	Class	Output	An array of BargeEx master data mappings.
MasterValue	String	Output	The BargeEx master value for this mapping.
CustomValue	String	Output	The trading partner's value for this master value. If the trading partner has not mapped the master value, this will be an empty string.

3.2.4.2 UpdateDataMapping Method

Purpose	This method modifies the trading partner value that maps to a particular BargeEx Master Value or creates a temporary custom data mapping.
Returns	Return codes specified in section 3.2.1.2 plus the following: MasterValueRecordNotFound – No SenderTradingPartnerNumber was provided so ValueToMap must be a BargeEx Master Value, but ValueToMap is not a known BargeEx Master Value. ValueToMapTooLong – The ValueToMap provided is too long for the selected DataMapType. CustomValueTooLong – The CustomValue provided is too long for the selected DataMapType. DuplicateCustomValue – The CustomValue provided has already been used for this DataMapType. A CustomValue must be unique for a given DataMapType. InvalidSenderTradingPartnerNumber – The SenderTradingPartnerNumber is invalid.

Argument	Type	Direction	Description
DataMapType	String	Input	Indicates which type of data mapping value will be updated. Options: Barge, Boat, Commodity, Location, Ship, Waterway.

Argument	Type	Direction	Description
ValueToMap	String	Input	Either the BargeEx Master Value of the data mapping that is being updated or the value that was sent by the sending trading partner. If ValueToMap is a BargeEx Master Value, the standard data mapping is updated. If the ValueToMap is not a BargeEx Master Value, a temporary custom data mapping is created.
CustomValue	String	Input	The new trading partner value that should be used for the indicated ValueToMap. To reset the mapping of a trading partner value back to the BargeEx Master Value, use an empty string for this parameter.
SenderTradingPartnerNumber	String	Input	The trading partner number of the organization that sent the CICA Document containing the ValueToMap. If a SenderTradingPartnerNumber is not specified, ValueToMap must be a BargeEx Master Value.

3.3 BargeEx .NET API

3.3.1 Overview

Trading partners can use the classes available in the BargeEx .NET API to send and receive CICA Documents and manage their BargeEx data mappings.

3.3.2 Sending Documents

CICA Documents can be built using the classes provided in the BargeEx .NET API. See the BargeEx .NET API documentation for more details on the classes used to create CICA Documents.

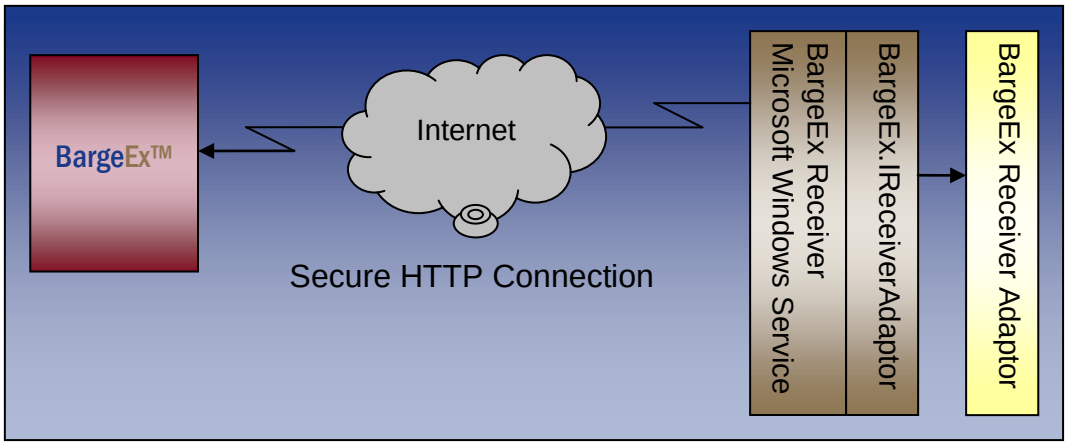
CICA Documents are sent to BargeEx using the BargeEx.BargeExService class. See the BargeEx .NET API documentation for more details on this class.

3.3.3 Retrieving Documents

3.3.3.1 Overview

The BargeEx SDK contains a Windows Service called the BargeEx Receiver. Trading partners can use this Windows Service to retrieve CICA Documents from BargeEx and process them. In order to use the BargeEx Receiver, a BargeEx Receiver Adaptor must be implemented to do any custom processing required to place the CICA Documents into the trading partner's line-of-business system.

A BargeEx Receiver Adaptor is a .NET assembly that implements the BargeEx.IReceiverAdaptor interface. It contains any custom code required to process received CICA Documents. A sample BargeEx Receiver Adaptor, the File System Adaptor, is included as part of the BargeEx SDK. A BargeEx Receiver Adaptor test application is also included in the BargeEx SDK as part of the File System Adaptor Example Project.



3.3.3.2 Configuration Settings

The BargeEx Receiver makes use of the following configuration settings. All of these settings are defined in the BargeExReceiver.My.MySettings section of the BargeExReceiver.exe.config file.

Name	Default	Description
BargeExAdaptorClass	FileSystem-Adaptor.-Connector	Name of the class in the BargeEx Receiver Adaptor the windows service should use. This class must implement the BargeEx.IReceiverAdaptor interface.
BargeExAdaptorDll	FileSystem-Adaptor.dll	Name of the BargeEx Receiver Adaptor assembly the windows service should use. This assembly must contain a class that implements the BargeEx.IReceiverAdaptor interface.
BargeExPassword		The BargeEx password for BargeEx user account. This value is provided by a BargeEx administrator.
BargeExTradingPartnerNum		The BargeEx trading partner number assigned to a company. This value is provided by a BargeEx administrator.
BargeExUri		The URI for the BargeEx Web Services. This value can be obtained from a BargeEx administrator.
BargeExUsername		The name of the BargeEx user account. This value is provided by a BargeEx administrator.
InitializeTimeout	60000	The number of milliseconds the BargeEx Receiver should wait for the service to initialize before timing out.
ProcessingInterval	30	How often the BargeEx Receiver should pull CICA Documents from BargeEx.
ProcessingIntervalUnit	minutes	The unit of time the ProcessingInterval setting is in. Values: seconds, minutes, hours.

Name	Default	Description
ProcessTimerInterval	100	This setting controls the accuracy of the internal process timer. It indicates the number of milliseconds between each timer event. This value should be kept at 100.
ProxyServerDomain		The name of the domain that the proxy server services. This is only used if UseProxyServer is True.
ProxyServerHost		The host name of the proxy server on the internal network that is used to access the internet. This is only used if UseProxyServer is True.
ProxyServerPassword		The password for the proxy authentication. This is only used if UseProxyServer is True.
ProxyServerPort	8080	The port number used by the proxy server. This is only used if UseProxyServer is True.
ProxyServerUsername		The user account name that should be used when authenticating with a proxy server. This is only used if UseProxyServer is True.
RetryAttempts	3	The number of times a BargeEx Web Services method should be tried before an error is raised.
RetryDelaySeconds	5	How long in seconds to wait between each failed BargeEx Web Services method call.
ServiceAutoLog	True	If True the BargeEx Receiver will place start and stop events onto the Windows Application Event Log.
UseProxyServer	False	Indicates if a proxy server should be used when connecting to BargeEx. This should be set to True if your network uses a proxy server.
VerboseLogging	False	If True, the BargeEx Receiver will generate logging messages to the listeners listed in the system.diagnostics section of the configuration file. Contact your BargeEx support representative for more information about this setting. Setting this value to True will negatively impact the BargeEx Receiver's performance. This should only be set to True for debugging purposes.

3.3.3.3 BargeEx.IReceiverAdaptor Interface

See the BargeEx .NET API documentation for more details on the BargeEx.IReceiverAdaptor interface.

3.3.3.4 File System Adaptor

The BargeEx SDK includes a sample BargeEx Adaptor called the BargeEx File System Adaptor (FileSystemAdaptor.dll). This adaptor will place all CICA Documents retrieved by the BargeEx Receiver into the file system directory specified in the settings file.

3.3.3.4.1 Configuration Settings

The BargeEx File System Adaptor makes use of the following configuration settings. All of these settings are defined in the FileSystemAdaptor.My.MySettings section of the BargeExReceiver.exe.config file. The BargeEx File System Adaptor does not use its own configuration file. Instead, it uses the BargeEx Receiver's configuration file.

Name	Default	Description
EmailAddress		The e-mail address all messages sent by the BargeEx File System Adaptor will be sent to.
OutputDirectory	C:\BargeEx	The directory where CICA Documents will be saved to. The user account that is executing the BargeEx Receiver windows service must have read and write privileges to this directory.

The BargeEx File System Adaptor uses SMTP to send e-mail messages. The SMTP settings are defined in the /system.net/mailSettings/ section of the BargeExReceiver.exe.config file.

Name	Default	Description
from		The e-mail address e-mail messages sent by the File System Adaptor should appear to be from.
host		The name of the SMTP server.
userName		If using Authenticated SMTP, this is the username that will be used when logging into the SMTP server.
password		If using Authenticated SMTP, this is the password that will be used when logging into the SMTP server.

The following is an example BargeExReceiver.exe.config file that uses the BargeEx File System Adaptor.

```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>
    <configSections>
        <sectionGroup name="applicationSettings"
         type="System.Configuration.ApplicationSettingsGroup, System,
Version=2.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089" >
            <section name="BargeExReceiver.My.MySettings"
             type="System.Configuration.ClientSettingsSection, System,
Version=2.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089"
             requirePermission="false" />
            <section name="FileSystemAdaptor.My.MySettings"
             type="System.Configuration.ClientSettingsSection, System,
Version=2.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089"
             requirePermission="false" />
        </sectionGroup>
    </configSections>
    <system.diagnostics>
        <sources>
            <!-- This section defines the logging configuration for
My.Application.Log -->
            <source name="DefaultSource" switchName="DefaultSwitch">
                <listeners>
                   <!-- Uncomment the below section to write to a log file -->
                   <!--<add name="FileLog"/>-->
                   <!-- Uncomment the below section to write to the
Application Event Log -->
                   <add name="EventLog"/>
                </listeners>
            </source>
        </sources>
        <switches>
```

```
            <add name="DefaultSwitch" value="Information" />
        </switches>
        <sharedListeners>
           <add name="FileLog"
            type="Microsoft.VisualBasic.Logging.FileLogTraceListener,
Microsoft.VisualBasic, Version=8.0.0.0, Culture=neutral,
PublicKeyToken=b03f5f7f11d50a3a"
            initializeData="FileLogWriter"
            traceOutputOptions="DateTime"
            logfilecreationschedule="Daily"
            location="ExecutableDirectory" />
           <add name="EventLog"
            type="System.Diagnostics.EventLogTraceListener, System,
Version=2.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089"
            initializeData="BargeEx Receiver"/>
        </sharedListeners>
    </system.diagnostics>
    <applicationSettings>
        <BargeExReceiver.My.MySettings>
            <setting name="ProcessingInterval" serializeAs="String">
                <value>30</value>
            </setting>
            <setting name="ProcessingIntervalUnit" serializeAs="String">
                <value>minutes</value>
            </setting>
            <setting name="ProcessTimerInterval" serializeAs="String">
                <value>100</value>
            </setting>
            <setting name="InitializeTimeout" serializeAs="String">
                <value>60000</value>
            </setting>
            <setting name="ServiceAutoLog" serializeAs="String">
                <value>True</value>
            </setting>
            <setting name="BargeExUri" serializeAs="String">
               <value>
https://www.BargeEx.com/Production/BargeExService.asmx</value>
            </setting>
            <setting name="BargeExTradingPartnerNum" serializeAs="String">
                <value>12345678</value>
            </setting>
            <setting name="BargeExUsername" serializeAs="String">
                <value>BexBargeCompany</value>
            </setting>
            <setting name="BargeExPassword" serializeAs="String">
                <value>MyPassword</value>
            </setting>
            <setting name="UseProxyServer" serializeAs="String">
                <value>False</value>
            </setting>
            <setting name="ProxyServerDomain" serializeAs="String">
                <value />
            </setting>
            <setting name="ProxyServerHost" serializeAs="String">
                <value />
```

```
            </setting>
            <setting name="ProxyServerPort" serializeAs="String">
                <value>8080</value>
            </setting>
            <setting name="ProxyServerUsername" serializeAs="String">
                <value />
            </setting>
            <setting name="ProxyServerPassword" serializeAs="String">
                <value />
            </setting>
            <setting name="RetryAttempts" serializeAs="String">
                <value>3</value>
            </setting>
            <setting name="RetryDelaySeconds" serializeAs="String">
                <value>5</value>
            </setting>
            <setting name="BargeExAdaptorDll" serializeAs="String">
                <value>FileSystemAdaptor.dll</value>
            </setting>
            <setting name="BargeExAdaptorClass" serializeAs="String">
                <value>FileSystemAdaptor.Connector</value>
            </setting>
            <setting name="VerboseLogging" serializeAs="String">
                <value>True</value>
            </setting>
        </BargeExReceiver.My.MySettings>
        <FileSystemAdaptor.My.MySettings>
           <setting name="EmailAddress" serializeAs="String">
              <value>bob@bargecompany.com</value>
           </setting>
           <setting name="OutputDirectory" serializeAs="String">
              <value>C:\BargeEx</value>
           </setting>
        </FileSystemAdaptor.My.MySettings>
    </applicationSettings>
    <system.net>
        <mailSettings>
            <smtp from="server@bargecompany.com">
                <network host="mail.bargecompany.com"
                 password="" userName="" />
            </smtp>
        </mailSettings>
    </system.net>
</configuration>
```

3.3.4 Data Mapping

There are methods available in the BargeEx.BargeExService class for managing BargeEx data mappings. See the BargeEx .NET API documentation for more details on this class.

4. Installation

4.1 BargeEx .NET API

4.1.1 Requirements

In order to install or use the BargeEx .NET API the following software must be installed on the machine:

- Microsoft .NET Framework 2.0 SP 1 or above

In order to develop software that makes use of the BargeEx .NET API the following additional software must be installed:

- Microsoft Visual Studio 2005 or above

4.1.2 Installation

To install the BargeEx .NET API, execute the BargeExApi.msi installation package. The following optional Visual Studio 2005 example projects are included in this installation package: BargeEx API VB.Net Example Application and BargeEx Receiver File System Adaptor.

4.1.3 Distribution Notes

Any application that makes use of the BargeEx .NET API must have the BargeEx.dll in its application directory.

4.2 BargeEx Receiver

4.2.1 Requirements

In order to install or use the BargeEx Receiver Windows Service the following software must be installed on the machine:

- Microsoft .NET Framework 2.0 SP 1 or above

4.2.2 Installation

To install the BargeEx Receiver Windows Service, execute the BargeExReceiver.msi installation package. Before you start the BargeEx Receiver Windows Service, you must do the following:

1. Configure the BargeEx Receiver Windows Service as explained in Section 3.3.3.2 Configuration Settings.

2. Install a BargeEx Receiver Adaptor.

3. Configure the BargeEx Receiver Adaptor per the instructions provided by the organization that developed the adaptor.

Appendix A. Glossary of Terms and Acronyms

ANSI	The American National Standards Institute (ANSI) coordinates the development and use of voluntary consensus standards in the United States and represents the needs and views of U.S. stakeholders in standardization forums around the globe. See http://www.ansi.org/ for more information.
API	Application Programming Interface
ASC X12	Accredited Standards Committee (ASC) X12 brings together business and industry professionals in a cross-industry forum to develop and support electronic data exchange standards and related documents for the national and international marketplace to enhance business processes, reduce costs and expand organizational reach. See http://www.x12.org/ for more details.
B2B	Business-to-Business – Electronic commerce between two businesses.
CICA	ASC X12's XML architecture, called Context Inspired Component Architecture (CICA), enables individuals to build XML business documents in a cross-industry setting and ensures organizations a significant return on investment. See http://www.disa.org/x12org/MEETINGS/pdfs/CICAOverview.pdf for more details.
HTTP	HyperText Transfer Protocol
LOB	Line-Of-Business
NDC	U.S. Army Corps of Engineers, Navigation Data Center (http://www.iwr.usace.army.mil/ndc/index.htm)
SDK	Software Development Kit
SSL	Secure Sockets Layer
TCP	Transmission Control Protocol

URI	Uniform Resource Identifier - A string that identifies a resource (like a website). For example: https://www.BargeEx.com.
WCSC	U.S. Army Corps of Engineers, Navigation Data Center, Waterborne Commerce Statistics Center
WSA	Web Services Architecture
WSDL	Web Services Description Language
XML	Extensible Markup Language - XML is a markup language for documents or transactions containing structured information. See http://www.w3.org/XML/ for more information.

Appendix B. Supported CICA Documents

BargeEx currently supports the following ASC X12 CICA Documents:

Name	Description
Document Acknowledgment Document	Provides syntax level acknowledgment of a received XML document.
Barge Invoice Document	Provides a means for a trading partner to transmit an Invoice to another trading partner for services performed by the sender. The Barge Invoice Document allows the sender to specify interested parties as well as invoice summary and invoice line items. Utilizing the Barge Invoice Document, the sender can tie invoice line items to Barge Service Order Line Items and Barge Status documents.
Barge Service Order Document	Provides a means for a trading partner to transmit an order for services to be performed on one or more barges to another trading partner.
Barge Service Order Response Document	Provides a means for a trading partner, who has received a Barge Service Order Document, to provide a response to the sender. This document supports Accepting, Partially Accepting, or Rejecting the Barge Service Order. If the Barge Service Order is partially accepted by the receiver, the receiver can accept or reject individual line items in the Barge Service Order.
Barge Status Document	Provides a means for a trading partner to transmit the status of a barge to another trading partner. Status types include Clean, Load, Unload, Shift, Midstream, Pump, Repair, etc.
Boat Status Document	Provides a means for a trading partner to transmit the status of a boat to another trading partner. Status types include the boat's position and an assist event.
Tow Status Document	Provides a means for a trading partner to transmit a barge tow configuration, including vessel details, string and cut position, and current location to another trading partner.

More details on these documents can be found on the BargeEx website at http://www.BargeEx.com.

Appendix C. BargeEx .NET API Documentation

Documentation for the BargeEx .NET API can be found on the BargeEx website (http://www.BargeEx.com). This documentation is also available in the BargeEx .NET API installation package. Please contact Cornerstone Solutions Group for instructions on obtaining the BargeEx .NET API installation package.