

SeeBeyond ICAN Suite

Implementing the SeeBeyond Match Engine with eIndex

Release 5.0



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Contents

List of Tables	8
<hr/>	
Chapter 1	
Introduction	10
Document Purpose and Scope	10
Intended Audience	10
Document Organization	11
Writing Conventions	11
Supporting Documents	12
Online Documents	12
SeeBeyond Web Site	12
<hr/>	
Chapter 2	
The SeeBeyond Match Engine	13
About the Matching Algorithm	13
Standardization and Matching	13
Data Types	14
How it Works	14
Matching Weight Formulation	15
Matching and Unmatching Probabilities	15
Agreement and Disagreement Weights	15
<hr/>	
Chapter 3	
Standardization Configuration Files	17
About Standardization Configuration Files	17
Standardization Configuration File Types	17
<hr/>	
Chapter 4	
Matching Configuration Files	19
About Matching Configuration Files	19

The Match Configuration File	19
Match Configuration File Format	20
Probability Type	20
Matching Rules	20
Matching Comparison Functions	22
The Match Constants File	24

Chapter 5

eIndex and the SeeBeyond Match Engine	25
SeeBeyond Match Engine and eIndex	25
Searching and Matching in eIndex	25
The Standardization and Matching Process	26
The Match String	26
Field Identifiers	26
Match and Standardization Types	28
Customizing SeeBeyond Match Engine Configuration Files	30
Matching Service Configuration	31
Standardization Configuration	31
Normalization Structures	31
Standardization Structures (Parsing and Normalization)	32
Phonetic Encoding Structures	33
Matching Configuration	33
Configuring the Match and Standardization Engines	34

Chapter 6

Person Data Type Configuration	35
Person Matching Overview	35
Person Data Processing Fields	35
Match String Fields	35
Standardized Fields	36
The Object Structure	36
Match Configuration for Person Data	36
Standardization Configuration for Person Data	37
personConstants.cfg	37
personConjonUS.dat	38
personFirstNameDash.dat	38
personFirstNameUS.dat	39
personGenSuffixUS.dat	40
personLastNamePrefixUS.dat	41
personNamePatt.dat	41
personOccupSuffixUS.dat	41
personRemoveSpecChars.dat	41
personThreeUS.dat	42
personTitleUS.dat	42
personTwoUS.dat	43

businessOrRelated.dat	43
Customizing Person Data Configuration Files	43
Configuring the eIndex Match Service	44
Configuring StandardizationConfig	44
Step 1: Configure the System Object	44
Step 2: Configure the Normalization Structures	45
Step 3: Configure Fields to Phonetically Encode	47
Configuring the Match String	48
Configuring the Match and Standardization Engines	50

Chapter 7

Address Data Type Configuration	51
Address Matching Overview	51
Address Data Processing Fields	51
Match String Fields	52
Standardized Fields	52
The Object Structure	52
Match Configuration for Address Data	53
Standardization Configuration for Address Data	53
addressConstants.cfg	53
addressClueAbbrevUS.dat	54
addressMasterCluesUS.dat	55
addressPatternsUS.dat	57
Modifying Address Data Configuration Files	61
Configuring the eIndex Match Service	61
Configuring StandardizationConfig	62
Step 1: Configure the System Object	62
Step 2: Configure Fields to Parse and Normalize	62
Step 3: Configure Fields to Phonetically Encode	64
Configuring the Match String	65
Configuring the Match and Standardization Engines	67

Chapter 8

Business Names Data Type Configuration	68
Business Name Matching Overview	68
Business Name Processing Fields	68
Match String Fields	68
Standardized Fields	69
The Object Structure	69
Match Configuration for Business Names	69
Standardization Configuration for Business Names	70
bizConstants.cfg	70
bizAdjectivesTypeKeys.dat	71

bizAliasTypeKeys.dat	71
bizAssociationTypeKeys.dat	72
bizBusinessGeneralTerms.dat	73
bizCityorStateTypeKeys.dat	73
bizCompanyFormerNames.dat	74
bizCompanyMergerNames.dat	74
bizCompanyPrimaryNames.dat	75
bizConnectorTokens.dat	75
bizCountryTypeKeys.dat	76
bizIndustryCategoryCode.dat	76
bizIndustryTypeKeys.dat	77
bizOrganizationTypeKeys.dat	78
bizPatterns.dat	78
Business Name Tokens	79
bizRemoveSpecChars.dat	81
Modifying Business Name Configuration Files	81
Configuring the eIndex Match Service	82
Configuring StandardizationConfig	82
Step 1: Configure the System Object	82
Step 2: Configure Fields to Parse and Normalize	83
Step 3: Configure Fields to Phonetically Encode	85
Configuring the Match String	86
Configuring the Match and Standardization Engines	87

Appendix A

Fine-tuning Weights and Thresholds	88
Overview	88
Customizing the Match Configuration and Thresholds	88
Determine the Match Fields	88
Customize the Match Configuration	89
Probabilities or Agreement Weights	89
Defining Relative Value	89
Determining the Weight Range	89
Comparison Functions	91
Define the Weight Thresholds	91
Weight Threshold Overview	91
Specifying the Weight Thresholds	92
Fine-tuning the Thresholds	93

Appendix B

Match Configuration Comparison Functions	95
Comparison Functions	95
Bigram Comparison Functions	95
Uncertainty Comparison Functions	96
Exact Comparison Function (c)	97
Numeric Comparison Functions	98

Contents

Date Comparison Functions	100
Prorated Comparison Function (p)	102
Comparison Function Options	104
Glossary	105
Index	109

List of Tables

Table 1	Special Notation Conventions	11
Table 2	Match Configuration File Columns	20
Table 3	Comparison Functions	22
Table 4	Standardization Field Identifiers	27
Table 5	Standardization Types	29
Table 6	Match Types	29
Table 7	Person Constants File Parameters	37
Table 8	Hyphenated Name Category File	39
Table 9	First Name Category File	39
Table 10	Generational Suffix Category File	40
Table 11	Person Title Category File	42
Table 12	Person Information structures-to-normalize Elements	46
Table 13	Person Domain phoneticize-fields Elements	48
Table 14	Person Domain match-column Elements	49
Table 15	Address Constants File Parameters	54
Table 16	Address Clues File Columns	55
Table 17	Address Master Clue File Columns	56
Table 18	Address Patterns File	57
Table 19	Input Address Pattern Type Tokens	58
Table 20	Output Address Pattern Tokens	59
Table 21	Address free-form-text-to-standardize Elements	64
Table 22	Address phoneticize-fields Elements	65
Table 23	Address match-column Elements	66
Table 24	Business Constants File Parameters	70
Table 25	Alias Key Type File	72
Table 26	Association Type Key Table	72
Table 27	City or State Key Type File	73
Table 28	Business Former Name Reference File	74
Table 29	Business Merger Name Category File	74
Table 30	Business Primary Name Reference File	75
Table 31	Country Key Type Files	76
Table 32	Industry Sector Reference File	77

List of Tables

Table 33	Industry Key Type File	77
Table 34	Organization Key Type File	78
Table 35	Business Patterns File Components	79
Table 36	Business Name Input Pattern Tokens	80
Table 37	Business Name Output Pattern Tokens	81
Table 38	Business Name Domain free-form-text-to-standardize Elements	84
Table 39	Business Name Data Type phoneticize-fields Elements	85
Table 40	Business Name Data Type match-column Elements	86
Table 41	Sample Agreement and Disagreement Weights	90
Table 42	Sample m-probabilities and u-probabilities	90
Table 43	n, nI, and nR Comparison Function Parameters	99
Table 44	nS Comparison Function Parameters	99
Table 45	Date Comparison Function Parameters	101
Table 46	Prorated Comparison Function Parameters	103

Introduction

This guide provides comprehensive information on working with the components of the SeeBeyond® Match Engine, and implementing the match engine with eIndex Global Identifier. As a component of SeeBeyond's Integrated Composite Application Network (ICAN) Suite, eIndex helps you integrate information from disparate systems throughout your organization, using a matching algorithm to identify data.

This guide includes complete descriptions of the components of the SeeBeyond Match Engine along with information about customizing each component. It also describes how to customize the eIndex configuration files to define standardization and matching fields for the SeeBeyond Match Engine. This guide is designed to be used in conjunction with the *eIndex Global Identifier User's Guide* and the *eIndex Global Identifier Configuration Guide*.

This chapter provides an overview of this guide and the conventions used throughout, as well as a list of supporting documents and information about using this guide.

1.1 Document Purpose and Scope

This guide provides background information and instructions for implementing the SeeBeyond Match Engine with eIndex. It includes descriptions of all components and the default configuration, and also provides instructions for customizing the eIndex configuration files for the match engine.

This guide does not include information or instructions for installing or configuring eIndex. These topics are covered in the appropriate user guide (for more information, see [“Supporting Documents” on page 12](#)).

1.1.1. Intended Audience

Any user who configures the eIndex Match Service (that is, the Match Field file), or who creates or customizes the match engine configuration files, should read this book. A thorough knowledge of eIndex is not needed to understand this guide, but familiarity with the eIndex configuration files (especially the Match Field file) is recommended. A general understanding of basic standardization and matching logic is helpful. It is presumed that the reader of this guide is familiar with the type of data being stored in eIndex and the processing requirements for that data.

1.1.2. Document Organization

This guide is divided into eight chapters and two appendixes that cover the topics shown below.

- **Chapter 1 “Introduction”** gives a general preview of this document—its purpose, scope, and organization—and provides sources of additional information.
- **Chapter 2 “The SeeBeyond Match Engine”** gives an overview of the SeeBeyond Match Engine, the underlying matching algorithm, and the components of the match engine.
- **Chapter 3 “Standardization Configuration Files”** gives an overview of the standardization configuration files and their purpose.
- **Chapter 4 “Matching Configuration Files”** describes the matching configuration files and gives a reference of the comparison functions for matching.
- **Chapter 5 “eIndex and the SeeBeyond Match Engine”** describes how the SeeBeyond Match Engine works with eIndex.
- **Chapter 6 “Person Data Type Configuration”** gives information and instructions for customizing the standardization and matching configuration files for person data, and gives instructions for customizing the Match Field file.
- **Chapter 7 “Address Data Type Configuration”** gives information and instructions for customizing the standardization and matching configuration files for address fields, and gives instructions for customizing the Match Field file.
- **Chapter 8 “Business Names Data Type Configuration”** gives information and instructions for customizing the standardization and matching configuration files for business name fields, and gives instructions for customizing the Match Field file.
- **Appendix A “Fine-tuning Weights and Thresholds”** describes the process of fine-tuning the matching logic and weight thresholds.
- **Appendix B “Match Configuration Comparison Functions”** lists and describes the comparison functions you can use with the SeeBeyond Match Engine.

1.2 Writing Conventions

Before you start using this guide, it is important to understand the conventions observed throughout this document. Table 1 lists these conventions.

Table 1 Special Notation Conventions

Text	Convention	Example
Titles of publications	Title caps in <i>italic</i> font	<i>eIndex Global Identifier Configuration Guide</i>
Button, Icon, Command, Function, and Menu Names	Bold text	<ul style="list-style-type: none"> ▪ Click OK to save and close. ▪ From the File menu, select Exit.

Table 1 Special Notation Conventions (Continued)

Text	Convention	Example
Parameter, Variable, and Method Names	Bold text	<ul style="list-style-type: none"> Use the executeMatch() method. Enter the field-type value.
Command Line Code and Code Samples	Courier font (variables are shown in bold italic)	<ul style="list-style-type: none"> bootstrap -p password <tag>Person</tag>
Hypertext Links	Blue text	For more information, see “Writing Conventions” on page 11.
File Names and Paths	Bold text	The matchConfigFile.cfg file contains the matching rules for each field.
Notes	Bold Italic text	<i>Note: If a toolbar button is dimmed, you cannot use it with the selected component.</i>

1.3 Supporting Documents

SeeBeyond has developed a suite of user's guides and related publications that are distributed in an electronic library. The following documents may provide information useful in implementing the SeeBeyond Match Engine.

- *eIndex Global Identifier User's Guide*
- *eIndex Global Identifier Configuration Guide*
- *eIndex Global Identifier Reference Guide*

1.4 Online Documents

The documentation for the SeeBeyond ICAN Suite is distributed as a collection of online documents. These documents are viewable with the Acrobat Reader application from Adobe Systems. Acrobat Reader can be downloaded from:

<http://www.adobe.com>

1.5 SeeBeyond Web Site

The SeeBeyond Web site is your best source for up-to-the-minute product news and technical support information. The site's URL is:

<http://www.SeeBeyond.com>

The SeeBeyond Match Engine

The SeeBeyond Match Engine is the standard match engine for eIndex. It is highly configurable in the eIndex environment and can be used to match on various types of data.

This chapter provides information about the configurable components of the match engine, and how the SeeBeyond Match Engine standardizes and matches data.

2.1 About the Matching Algorithm

The SeeBeyond Matching Engine compares records containing similar data types by calculating how closely the records match. The resulting comparison weight is either a positive or negative numeric value that represents the degree to which the two sets of data are similar. The match engine relies on probabilistic algorithms to compare data of a given type using a comparison function specific to the type of data being compared. The comparison functions for each matching field are defined in a match configuration file that you configure specifically for the type of data you are indexing. The formula used to determine the matching weight is based on either matching and unmatching probabilities or on specific agreement and disagreement weights.

The SeeBeyond Match Engine is also designed to standardize freeform text fields, such as street address fields or business names. This allows the match engine to generate a more accurate weight for freeform data.

2.1.1. Standardization and Matching

The matching algorithm in the SeeBeyond Match Engine uses a proven methodology to process and weight records in the eIndex database. By providing both standardization and matching capabilities, the match engine allows you to condition data prior to matching. You can also use these capabilities to review legacy data prior to loading it into the database. This review helps you determine data anomalies, invalid or default values, and missing fields.

Both matching and standardization occur when two records are analyzed for matching probability. Before matching, certain fields are standardized and converted into their phonetic values if necessary. The match fields are analyzed and weighted according to the rules defined in a match configuration file. The weights for each field are combined to determine the overall matching weight for the two records. After the match engine has performed these steps, survivorship is determined by eIndex, based on how the

overall matching weight compares to the duplicate and match thresholds set for eIndex. These thresholds are configured for the eIndex Manager Service in the Threshold file.

2.1.2. Data Types

You can standardize and match on different types of data with the SeeBeyond Match Engine. In its default implementation with eIndex, the match engine supports data standardization and matching on the three primary types of data listed below.

- Person Information
- Street Addresses
- Business Names

In addition, the SeeBeyond Match Engine provides comparison functions for matching on various types of fields contained within the primary data types, such as numbers, dates, Social Security Numbers, single characters, and so on.

When processing person information, the match engine assumes that each match field is stored in a separate field. For street address and business name processing, eIndex is configured to parse free-form fields for searching and matching. Each data type requires specific customizations to the Match Field file in the eIndex Project. The required customizations for each type are described in chapters 6 through 8 of this guide.

2.1.3. How it Works

The SeeBeyond Match Engine compares two records and returns a match weight indicating the likelihood of a match between the two records. There are three primary components of the match engine.

- **Configuration Files**
The SeeBeyond Match Engines includes a set of files that define standardization and matching logic for all supported data types. You can customize these files to adapt the standardization and matching logic to your specific needs.
- **Standardization Engine**
Standardization involves converting non-standard data into a standardized form so it is more accurate and efficient to process. Standardization consists of any one or more of the following actions:
 - ♦ **Parsing** — separating a free-text field into its individual components, such as street address information or a business name.
 - ♦ **Normalization** — changing the value of a field to a standard version, such as changing a nickname to a common name.
 - ♦ **Phonetic Encoding** — changing the value of a field to its phonetic version. The field to be converted can be the original field, a parsed field, a normalized field, or a parsed and normalized field.

Using the person data type, for example, first names such as “Bill” and “Will” are normalized to “William”, which is then phonetically converted using Soundex. Using the street address data type, street addresses are parsed into their component

parts, such as house numbers, street names, and so on. The street name is then phonetically converted. Standardization logic is defined in the configuration files and in the **StandardizationConfig** section of the eIndex Match Field file, and is carried out prior to assigning match weights.

- **Match Engine**

Matching involves comparing two standardized records and returning a weight that indicates the likelihood of a match between the two records. A higher weight indicates a greater likelihood of a match. Matching criteria and logic are defined in the match engine configuration files. The data fields that are sent to the SeeBeyond Match Engine for matching, known as the *match string*, are defined in the **MatchingConfig** module of the eIndex Match Field file. The match engine configuration files define how the match string is standardized and which matching rules to use to process each match field.

2.1.4. Matching Weight Formulation

The SeeBeyond Match Engine determines the matching weight between two records by comparing the match string fields using the rules defined in the match configuration file and by taking into account the matching logic specified for each field. The SeeBeyond Match Engine can use either matching (m) and unmatching (u) conditional probabilities or agreement and disagreement weights to fine tune the match process. It uses the underlying algorithm to arrive at a match weight for each match string field. A weight is generated for each field in the match string indicating the level of match between each field. The weights assigned to each field are then summed together for a total, composite matching weight. Agreement weights and m and u-probabilities are defined in the match configuration file.

Matching and Unmatching Probabilities

When m and u conditional probabilities are used, the match engine uses a logarithmic formula to determine match weights between fields. These probabilities allow you to specify which fields provide the most reliable matching information and which provide the least. For example, in person matching, the gender field is not as reliable as the SSN field for determining a match since a person's SSN is more specific. Therefore, the SSN field should have a higher m-probability than the gender field. The more reliable the field, the greater the m-probability for that field should be.

If a field matches between two records, an agreement weight, determined by the logarithmic formula using the m-probabilities and u-probabilities, is added to the composite match weight for the record. If the fields disagree, a disagreement weight is subtracted from the composite match weight. m-probabilities and u-probabilities are expressed as decimals between one and zero (excluding one and zero).

Agreement and Disagreement Weights

Agreement and disagreement weights are a more direct way to implement m-probabilities and u-probabilities. Like probabilities, agreement and disagreement weights allow you to define the relative reliability of each field; however, the match

weight has a more linear relationship with the agreement and disagreement weights. When you use agreement and disagreement weights to determine the match weight, you define a maximum weight for each field when they are in complete agreement and a minimum weight for when they are in complete disagreement. The SeeBeyond Match Engine assigns a matching weight to each field that falls between the agreement and disagreement weights specified for the field. This provides a more convenient and intuitive representation of conditional probabilities.

Using the SSN and gender field example above, the SSN field would be assigned a higher agreement weight and a lower disagreement weight than the gender field because it is more reliable. If you assign an agreement weight of "10" and two SSNs match, the match weight for that field is "10". If you assign a disagreement weight of "-10" and two SSNs are in complete disagreement, the match weight for that field is "-10".

Standardization Configuration Files

The standardization configuration files for the SeeBeyond Match Engine must follow certain rules for formatting and interdependencies. This chapter provides an overview of the types of configuration files provided for standardization, the architecture of those files, and formatting descriptions.

3.1 About Standardization Configuration Files

The standardization configuration files define additional logic used by the SeeBeyond Match Engine to standardize specific data types. This logic helps define how fields in incoming records are parsed, standardized, and classified for processing. Standardization files include data patterns files, category files, clues value tables, type key tables, and constants files. Reference files define special characters that are stripped from the initial data string to aid in standardization or that are used to join different parts of an address or business name.

The standardization configuration files are stored in the eIndex Project, and appear as nodes in the **Standardization Engine** node of the Project.

3.1.1. Standardization Configuration File Types

Several different types of configuration files are included with the SeeBeyond Match Engine, each providing specific information to help the engine standardize and match data according to requirements.

- **Category Files**—The SeeBeyond Match Engine uses category files when processing person or business names. These files list common values for certain types of data, such as titles, suffixes, and nicknames for person names or industries and organizations for business names. Category files also define standardized versions of each term or classify the terms into different categories, and some files perform both functions. When processing address files, category files named “clues files” are used.
- **Clues Files**—The SeeBeyond Match Engine uses clues files when processing address data types. These files list general terms used in street address fields, define standardized versions of each term, and classify the terms into various component types using predefined address tokens. These files are used by the standardization engine to determine how to parse a street address into its various components.

Clues files provide clues in the form of tokens to help the engine recognize the component type of certain values in the input fields.

- **Constants Files**—The SeeBeyond Match Engine refers to constants files for information about the standardization files, such as the maximum length of the files. For the address data type, the constants file also describes input and output field lengths.
- **Patterns Files**
The patterns files specify how incoming data should be interpreted for standardization based on the format, or pattern, of the data. These files are used only for processing data contained in freeform text fields that must be parsed prior to matching (such as street address fields or business names). Patterns files list possible input data patterns, which are encoded in the form of tokens. Each token signifies a specific component of the freeform text field. For example, in a street address field, the house number is identified by one token, the street name by another, and so on. Patterns files also define the format of the output fields for each input pattern.
- **Key Type Files**
For business name processing, the SeeBeyond Match Engine refers to a number of key type files for processing information. These files generally define standard versions of terms commonly found in business names and some classify these terms into various components or industries. These files are used by the standardization engine to determine how to parse a business name into its different components and to recognize the component type of certain values in the input fields.
- **Reference Files**
Reference files define general terms that appear in input fields for each data type. Some reference files define terms to ignore, and some define terms that indicate the business name is continuing. For example, in business name processing “and” is defined as a joining term. This helps the standardization engine to recognize that the primary business name in “Martin and Sons, Inc.” is “Martin and Sons” instead of just “Martin”. Reference files can also define characters to be ignored by the standardization engine.

Matching Configuration Files

The matching configuration files for the SeeBeyond Match Engine must follow certain rules for formatting and interdependencies. This chapter provides an overview of the two matching configuration files provided, the architecture of those files, and formatting descriptions. It also provides a reference of comparison functions for use in the match configuration file.

4.1 About Matching Configuration Files

The matching configuration files define how the SeeBeyond Match Engine processes records to assign matching probability weights, allowing eIndex to identify matches, potential duplicates, and non-matches. These files consist of two configurable files, the match configuration file and the match constants file. Together these files define additional logic for the SeeBeyond Match Engine to use when determining the matching probability between two records. A third file, the internal match constants file, is read-only and used internally by the match engine. It defines each comparison function and the comparison options.

The matching configuration files are very flexible, allowing you to customize the matching logic according to the type of data stored in eIndex and for the record matching requirements of your business. The matching configuration files are stored in the eIndex Project, and appear as nodes in the **Match Engine** node of the Project. The SeeBeyond Engine standardizes the data prior to matching, so the match process is performed against the standardized data.

4.2 The Match Configuration File

The match configuration file, **matchConfigFile.cfg**, contains the matching logic for each field on which matching is performed. This file handles the matching logic for the three primary data types (person names, business names, and addresses), and can also handle generic data types, such as dates, numbers, social security numbers, and characters.

The match configuration file defines matching logic for each field on which matching is performed. The SeeBeyond Match Engine provides several comparison functions that you can call in this file to fine-tune the match process. Comparison functions contain

the logic to compare different types of fields between records in very specific ways in order to arrive at a match weight for each field. These functions allow you to define how matching is performed for different data types, and can be used in conjunction with either matching and unmatching probabilities or agreement and disagreement weights for each field. This file also defines how to handle missing fields.

4.2.1. Match Configuration File Format

The match configuration file is divided into two sections. The first section consists of one line that indicates the matching probability type. The second section consists of the matching rules to use for each match field.

Probability Type

The first line of the match configuration file defines the probability type to use for matching. Specify “0” (zero) to use m-probabilities and u-probabilities to determine a field’s match weight; specify “1” (one) to use agreement and disagreement weights to determine a field’s match weight. If the probability type is set to use agreement and disagreement weights, the **m-prob** and **u-prob** columns in the matching rules section are ignored. If the probability type is set to use m-probabilities and u-probabilities, the **agreement-weight** and **disagreement-weight** columns in the matching rules section are ignored. The default is to use agreement and disagreement weights because they are more intuitive.

Matching Rules

The section after the first line of the match configuration file contains match field rows, which define how each field will be matched. The syntax for this section is:

```
match-type maximum-length null-field function m-prob u-prob
agreement-weight disagreement-weight parameters
```

Table 2 describes each element in a match field row.

Table 2 Match Configuration File Columns

Column Number	Column Name	Description
1	match-type	A value that indicates to the SeeBeyond Match Engine how each field should be weighted. Each field specified for matching in the MatchingConfig section of the Match Field file must have a match type corresponding to a value in this column.
2	size	The maximum length of the fields specified for the corresponding match type.

Table 2 Match Configuration File Columns

Column Number	Column Name	Description
3	null-field	<p>An index that specifies how to calculate the total weight for null fields or fields that only contain spaces. You can specify any of the following values:</p> <ul style="list-style-type: none"> ▪ 0 — (zero) If one or both fields are empty, the weight used for the field is 0 (zero). ▪ 1 — If both fields are empty, the agreement weight is used; if only one field is empty, the disagreement weight is used. ▪ a# — An “a” followed by a number (for example, “a4”) specifies that if both fields are empty, the agreement weight is used. The agreement weight is divided by the number following the “a” to obtain the match weight for that field. If no number is specified, the default is “2”. You can specify any number from 1 through 10. ▪ d# — A “d” followed by a number (for example, “d6”) specifies that if only one field is empty, the disagreement weight is used. The disagreement weight is divided by the number following the “d” to obtain the disagreement weight for the field. If no number is specified, the default is “2”. You can specify any number from 1 through 10.
4	function	The type of comparison to perform when weighting the field. For information about the available comparison functions, see Appendix B .
5	m-prob	The initial probability that the specified field in two records will match if the records match. The probability is on a scale from 0 to 1.
6	u-prob	The initial probability that the specified field in two records will match if the records do not match. The probability is on a scale from 0 to 1.
7	agreement-weight	The matching weight to be assigned to a field given that the fields match between two records. This number can be between 0 and 100.
8	disagreement-weight	The matching weight to be assigned to a field given that the fields do not match between two records. This number can be between 0 and -100.
9	parameters	The parameters correspond to the comparison function. Some comparison functions do not take any parameters, and some take multiple parameters. For additional information about parameters, see Appendix B .

4.2.2. Matching Comparison Functions

Match field comparison functions compare the values of a field in two records to determine whether the fields match. The fields are then assigned a matching weight based on the results of the comparison function. You can use several different types of comparison functions in the match configuration file to define how the SeeBeyond Match Engine should match two records. The SeeBeyond Match Engine also provides several options to use with each function. Table 3 summarizes each comparison function. A complete reference of the comparison functions and options is included in [Appendix B](#).

Table 3 Comparison Functions

Comparison Function	Description
b1	Based on the <i>Bigram</i> algorithm, this function compares two strings using all combinations of two consecutive characters and returns the total number of combinations that are the same.
b2	Similar to the standard Bigram comparison function (b1), but allows for character transpositions.
u	Based on the <i>Jaro</i> algorithm, this function compares two strings taking into account uncertainty factors, such as string length, transpositions, and characters in common.
ua	Based on the <i>Jaro</i> algorithm with variants of Winkler/Lynch and McLaughlin, this function is similar to the basic uncertainty comparison function (u), but increases the agreement weight if the initial characters of each string are exact matches. This comparison function takes into account key punch and visual memory errors.
uf	Based on the simplex uncertainty comparison function (u), this function is designed to specifically weight first name values. The string is analyzed and the weight adjusted based on statistical data.
ul	Based on the simplex uncertainty comparison function (u), this function is designed to specifically weight last name values. The string is analyzed and the weight adjusted based on statistical data.
un	Based on the simplex uncertainty comparison function (u), this function is designed to specifically weight house number values. The string is analyzed and the weight adjusted based on statistical data.
us	A custom uncertainty comparison function that compares two strings taking into account such uncertainty factors as string length, transpositions, key punch errors, and visual memory errors. Unlike the uncertainty comparison function ("u"), this function handles diacritical marks. This function also improves processing speed.

Table 3 Comparison Functions

Comparison Function	Description
c	Compares string fields character by character. Each character must match in order for an agreement weight to be assigned.
n	Compares numeric fields using a relative distance value to determine the match weight. As the difference between the two fields increases, the match weight decreases. Once the difference is beyond the relative distance, a disagreement weight is assigned.
nl	Compares integer fields using a relative distance comparison. This comparison function is based on the standard numeric comparison function (n).
nR	Compares fields containing real numbers using a relative distance comparison. This comparison function is based on the standard numeric comparison function (n).
nS	Compares social security numbers, taking into account any of these options: <ul style="list-style-type: none"> ▪ Field length ▪ Character types ▪ Invalid values
dY	Compares year values using relative distance values prior to and following the given year to determine the match weight. As the difference between the two fields increases, the match weight decreases. Once the difference is beyond the relative distance, a disagreement weight is assigned. The date comparison functions handle Gregorian years.
dM	Compares the month and year using a relative distance, as described above for the year comparison function (dY).
dD	Compares the day, month, and year using a relative distance, as described above for the year comparison function (dY).
dH	Compares the hour, day, month, and year using a relative distance, as described above for the year comparison function (dY).
dm	Compares the minute, hour, day, month, and year using a relative distance, as described above for the year comparison function (dY).
ds	Compares the second, minute, hour, day, month, and year using a relative distance, as described above for the year comparison function (dY).
p	Prorates the disagreement weight for a date or numeric field based on values you specify. Differences greater than the amount you specify receive the full disagreement weight.

4.3 The Match Constants File

The match constants file, **matchConstants.txt**, defines certain configurable constants used by the match engine. This file includes four parameters, but currently only the first parameter, **nFields**, is used. This parameter defines the maximum number of fields being used for matching. This must be equal to or greater than the number of fields defined in the **match-columns** element of the eIndex Match Field file. The match constants file defines the following constants for the match engine.

nFields

This constant defines the maximum number of different matching fields. You can enter any integer, but this number must be equal to or greater than the number of fields defined in the match-columns elements in the eIndex Match Field file.

maxFreqTableSize

This constant is only used when frequency tables are used. This is not currently available, and this constant is ignored.

maxNumberTables

This constant is only used when frequency tables are used. This is not currently available, and this constant is ignored.

mcls

This constant is only used when the generic-type frequency tables are used. This is not currently available, and this constant is ignored.

eIndex and the SeeBeyond Match Engine

Implementing the SeeBeyond Match Engine for eIndex requires certain configurations to the Match Field file in the eIndex Project. You can also customize the SeeBeyond Match Engine configuration files to better suit your data standardization and matching requirements.

This chapter provides information about the required configurations, and how the Match Field file corresponds to the configuration files.

5.1 SeeBeyond Match Engine and eIndex

eIndex uses the SeeBeyond Match Engine specifically for standardization and probabilistic weighting, while eIndex determines survivorship. This process relies on the logic specified in the configuration files of the eIndex Project and of the SeeBeyond Match Engine.

5.1.1. Searching and Matching in eIndex

When a new record is passed to the eIndex database, the index selects a subset of possible matches from the database. eIndex then uses the SeeBeyond Match Engine's matching algorithm to assign a matching probability weight for each record in this subset (known as the *candidate selection pool*). To create the candidate selection pool, eIndex makes series of query passes of the existing data, searching for matches on specific combinations of data. These combinations are defined by the blocking query that is defined in the Candidate Select file and specified in the Threshold file.

Matching is performed on the data elements included in the match string in the Match Field file. Each data element is assigned a matching weight. The weights for each data element are summed to determine the matching probability weight for the entire record. Before matching on certain fields, such as the first name, the index may standardize that field based on information in certain standardization files. You can customize how each data element is weighted in the match configuration file.

5.1.2. The Standardization and Matching Process

The standardization and matching processes use logic that is defined by a combination of SeeBeyond Match Engine configuration files and eIndex configuration files. During the standardization and match processes, the following occurs.

- 1 The SeeBeyond Match Engine receives the match string from an incoming record, as defined by the **match-columns** elements of the **MatchingConfig** section of the Match Field file.
- 2 The SeeBeyond Match Engine standardizes the fields specified for parsing, normalization, and phonetic encoding. These fields are defined in the **StandardizationConfig** section of the Match Field file, and the rules for standardization are defined in the SeeBeyond Match Engine standardization configuration files.
- 3 eIndex queries the database for records that are possible matches using the specified blocking query. If the blocking query uses standardized or phonetic fields, the criteria values are obtained from the database.
- 4 For each possible match, eIndex creates a match string (based on the match columns in **MatchingConfig**) and sends the string to the SeeBeyond Match Engine.
- 5 The SeeBeyond Match Engine matches the incoming record against each possible match, producing a matching weight. Matching is performed using the weighting rules defined in the match configuration file.

5.1.3. The Match String

The data string that is passed to the SeeBeyond Match Engine for match processing is called the *match string*, and is defined in the **MatchingConfig** section of the Match Field file. The SeeBeyond Match Engine configuration files, the blocking query, and the matching configuration are closely linked in the search and matching processes. The blocking query defines the select statements for creating the candidate selection pool during the matching process. The matching configuration defines the match string that is passed to the SeeBeyond Match Engine. Finally, the SeeBeyond Match Engine configuration files define how the match string is processed.

The SeeBeyond Match Engine configuration files are dependent upon the match string, and it is very important when you modify the match string to ensure that the match type you specify corresponds to the correct row in the match configuration file (**matchConfigFile.cfg**). For example, if you are using person matching and add “MaritalStatus” as a match field, you need to specify a match type for the MaritalStatus field that is listed in the first column of the match configuration file. You must also make sure that the matching logic defined in the corresponding row of the match configuration file is defined appropriately for matching on the MaritalStatus field.

5.1.4. Field Identifiers

The SeeBeyond Match Engine uses field identifiers (field IDs) to determine how to process fields that are defined for normalization or parsing. The IDs are defined

internally in the match engine, and are referenced in the Match Field file. The field IDs for business names specify which business type key file to use for standardization.

You can only specify the predefined field IDs that are listed in Table 4.

Table 4 Standardization Field Identifiers

Use this field ID ...	for these fields ...
Person Name Standardization Field Identifiers	
FirstName	Any first name field.
MiddleName	Any middle name field.
LastName	Any last name field.
Address Standardization Field Identifiers	
HouseNumber	The parsed house number field, which stores the house, rural route, and PO box numbers.
RuralRouteIdentif	The parsed house number field, which stores the house, rural route, and PO box numbers.
BoxIdentif	The parsed house number field, which stores the house, rural route, and PO box numbers.
OrigStreetName	The parsed street name field, which stores the street name, rural route descriptor, or PO box type.
RuralRouteDescript	The parsed street name field, which stores the street name, rural route descriptor, or PO box type.
BoxDescript	The parsed street name field, which stores the street name, rural route descriptor, or PO box type.
PropDesPrefDirection	The parsed address field containing the standardized street direction. This field ID handles cases where the direction is a prefix to the property description.
PropDesSufDirection	The parsed address field containing the standardized street direction. This field ID handles cases where the direction is a suffix to the property description.
StreetNamePrefDirection	The parsed address field containing the standardized street direction. This field ID handles cases where the direction is a prefix to the street name.
StreetNameSufDirection	The parsed address field containing the standardized street direction. This field ID handles cases where the direction is a suffix to the street name.
StreetNameSufType	The parsed address field containing the standardized street type. This field ID handles cases where the street type is a suffix to the street name.

Table 4 Standardization Field Identifiers

Use this field ID ...	for these fields ...
StreetNamePrefType	The parsed address field containing the standardized street type. This field ID handles cases where the street type is a prefix to the street name.
PropDesSufType	The parsed address field containing the standardized street type. This field ID handles cases where the street type is a suffix to the property description.
PropDesPrefType	The parsed address field containing the standardized street type. This field ID handles cases where the street type is a prefix to the property description.
Business Name Standardization Field Identifiers	
PrimaryName	The field containing the parsed name in a freeform text business name field.
OrgTypeKeyword	The field containing the parsed organization type in a freeform text business name field.
AssocTypeKeyword	The field containing the parsed association type in a freeform text business name field.
IndustrySectorList	The field containing the parsed industry sector in a freeform text business name field.
IndustryTypeKeyword	The field containing the parsed industry type in a freeform text business name field.
AliasList	The field containing the parsed alias in a freeform text business name field.
Url	The field containing the parsed URL in a freeform text business name field.

5.1.5. Match and Standardization Types

The Match Field file in the eIndex Project uses indicators to reference the type of matching and standardization to perform on each field. You must specify one of these indicators, called *match types* and *standardization types*, for the fields you define for standardization or matching. The match types correspond to the match types listed in the first column of the match configuration file (**matchConfigFile.cfg**). The standardization types are defined internally in the match engine. The types let the SeeBeyond Match Engine know how to process each field.

Table 5 lists the default standardization types; Table 6 lists the default match types. You can modify the match type names, but not the standardization type names. For more

information about match and standardization types, see “Match and Standardization Types” in Appendix B of the *eIndex Global Identifier User’s Guide*.

Table 5 Standardization Types

This indicator ...	processes this data type ...
Address	Free-form street address fields.
PersonName	Pre-parsed name fields (including any first, middle, last, or alias names).
BusinessName	Free-form business names.

The standardization types listed above correspond to the match types listed below. You can also specify miscellaneous match types, which do not correspond to any standardization types.

Table 6 Match Types

This indicator ...	processes this type of data
Business Name Match Types	
PrimaryName	The parsed name field of a business name.
OrgTypeKeyword	The parsed organization type field of a business name.
AssocTypeKeyword	The parsed association type field of a business name.
AliasList	The parsed alias type field of a business name.
IndustrySectorList	The parsed location type field of a business name.
IndustryTypeKeyword	The parsed industry type field of a business name.
Url	The parsed URL field of a business name.
Address Match Types	
StreetName	The parsed street name field of a street address.
HouseNumber	The parsed house number field of a street address.
StreetDir	The parsed street direction field of a street address.
StreetType	The parsed street type field of a street address.
Person Name Match Types	
FirstName	A first name field, including middle name, alias first name, and alias middle name fields.
LastName	A last name field, including alias last name fields.
Date Match Types	

Table 6 Match Types

This indicator ...	processes this type of data
DateDays	The day, month, and year of a date field.
DateMonths	The month and year of a date field.
DateHours	The hour, day, month, and year of a date field.
DateMinutes	The minute, hour, day, month, and year of a date field.
DateSeconds	The seconds, minute, hour, day, month, and year of a date field.
Miscellaneous Match Types	
String	A generic string field.
Numeric	A numeric field.
Integer	A field containing integers.
Real	A field containing real numbers.
SSN	A field containing a social security number.
Char	A field containing a single character.
pro	Any field on which you want the SeeBeyond Match Engine to use prorated weights.
Exac	Any field you want the SeeBeyond Match Engine to match character for character.

5.1.6. Customizing SeeBeyond Match Engine Configuration Files

The SeeBeyond Match Engine configuration files are designed to perform very specific functions in the standardization and match processes. These files should only be modified by personnel with an understanding of the SeeBeyond Match Engine and an understanding of the data integrity requirements of your organization. SeeBeyond recommends that any modifications to both the eIndex configuration files and the SeeBeyond Match Engine configuration files be made while eIndex is in the pre-production stages. Modifying the files after eIndex has moved into production may cause variances in matching weights and data processing.

The most common modifications to the SeeBeyond Match Engine configuration files are generally in the match configuration file, where you can fine-tune the weighting process. This file defines probabilities used by the algorithm to determine a matching probability weight for each match field. You can use the match comparison functions provided by the SeeBeyond Match Engine to fine-tune the matching logic in this file. Another common modification is inserting additional names or terms into category files, such as the first name category file (**personFirstNameUS.dat**).

Depending on your data requirements, you might need to modify additional standardization files. Some of the patterns files (most notably the address patterns file) are very complex, and should only be modified by personnel who thoroughly understand the defined patterns and tokens.

5.2 Matching Service Configuration

To configure eIndex for specific data types and the SeeBeyond Match Engine, you must customize the Matching Service by modifying the Match Field file in the eIndex Project. The Match Field file has three sections to customize: standardization configuration, match field configuration, and match and standardization engine configuration.

5.2.1. Standardization Configuration

The **StandardizationConfig** section of the Match Field file determines which fields are normalized, parsed, or phonetically encoded. This section of the file includes the following structures.

- **Normalization Structures** on page 31
- **Standardization Structures (Parsing and Normalization)** on page 32
- **Phonetic Encoding Structures** on page 33

This section defines fields that will be normalized, fields that will be parsed and normalized, and fields that will be phonetically encoded. The standardization types you specify in this section correspond to the match configuration file; the field IDs you can specify are listed in [Table 4 on page 27](#).

Normalization Structures

The normalization structure defines fields that are already parsed, but need to be normalized. It also tells the SeeBeyond Match Engine where to place the normalized data in the object structure. Matching on any of these fields is determined by the match string and the logic is defined in the match configuration file.

Of the three data types processed by the SeeBeyond Match Engine, it only expects the person name data type to provide information in parsed fields; that is, the first, last, and middle names appear in separate fields, as do the suffix, title, and so on. The person standardization files define logic for normalizing person name fields. By default, only person first, last, and middle names and the alias first, last, and middle names are defined for normalization. You can specify additional name fields for normalization, such as maiden name, spouse's name, and so on.

Defining new Fields for Normalization

The fields you define for normalization in the Match Field file can include any name fields. If you define normalization for fields that are not currently defined for normalization in the Match Field file, you must make the following modifications to the remaining configuration files.

- 1 Define the normalization structure, using the appropriate standardization type (PersonName) and field IDs (FirstName, MiddleName, or LastName).
- 2 Add the new fields that will store the normalized version of the original field value to the appropriate objects in the eIndex Object Definition file.

- 3 If any the normalized fields are to be used for blocking, modify the Candidate Select file by adding the new fields to the blocking query being used.
- 4 Regenerate the eIndex application in Enterprise Designer to include the new fields in the database creation script, the outbound Object Type Definition (OTD), and the method OTD.

Defining new Normalized Fields for Matching

If you want to match on the new fields storing the normalized data, you must perform the following steps.

- 1 Determine the match type or the match comparison function you want to use to match the normalized data, and modify the match configuration file (**matchConfigFile.cfg**) if needed.
- 2 Add the new normalized field to the **match-columns** element of the **MatchingConfig** section of the Match Field file, making sure to use the appropriate match type from the match configuration file.

Standardization Structures (Parsing and Normalization)

The fields that must be parsed, and possibly normalized, are defined in a standardization structure in **StandardizationConfig**. The standardization structure tells the SeeBeyond Match Engine where to place the standardized information extracted from the fields that are parsed. The target fields you specify for standardization facilitate searching by the parsed fields. Matching on any of these fields is determined by the match string and the logic is defined in the match configuration file.

The SeeBeyond Match Engine expects business names and street address information in freeform text fields that must be parsed and normalized prior to matching. The logic for parsing and normalizing street address information is contained in the address standardization files; the logic for parsing and normalizing business names is contained in the business standardization files. You can customize the standardization of these data types by modifying the appropriate patterns file.

Defining new Fields for Standardization

The fields you define for standardization in the Match Field file can include any street address field or fields containing business names. Perform the following tasks if you need to define one of these field types for standardization.

- 1 If necessary, modify the patterns file (you can define new input and output patterns or modify existing ones).
- 2 Define the standardization structure, using the appropriate standardization type (BusinessName or Address) and field IDs (described in [Table 4 on page 27](#)).
- 3 Add the new fields that will store the parsed or normalized data to the appropriate objects in the Object Definition file.
- 4 If any the parsed or normalized fields are to be used for blocking, modify the Candidate Select file by adding the new fields to the blocking query being used.

- 5 Regenerate the eIndex application in Enterprise Designer to include the new fields in the database creation script, the outbound Object Type Definition (OTD), and the method OTD.

Defining new Standardized Fields for Matching

If you want to match on the new fields storing standardized data, you must perform the following steps.

- 1 Determine the match type or the match comparison function you want to use to match the parsed data, and modify the match configuration file (**matchConfigFile.cfg**) if needed.
- 2 Add the new standardized field to the **match-columns** element of the **MatchingConfig** section of the Match Field file, making sure to use the appropriate match type from the match configuration file.

Phonetic Encoding Structures

The fields that must be phonetically encoded are defined in a phonetic encoding structure in **StandardizationConfig**. The phonetic encoding structure tells the SeeBeyond Match Engine where to place the phonetic data created from the fields that are encoded. You can define any field in the object structure for phonetic encoding.

Defining new Fields for Phonetic Encoding

The fields you define for phonetic encoding in the Match Field file can include any field.

- 1 Determine the type of phonetic encoder to use to convert the field. You can use either Soundex or NYSIIS encoding.
- 2 Define the phonetic encoding structure, as described in chapters 6 through 8.
- 3 Add the new fields that will store the phonetic version of the original field value to the appropriate objects in the Object Definition file.
- 4 If any the phonetic fields are to be used for blocking, modify the Candidate Select file by adding the new fields to the blocking query being used.
- 5 Regenerate the eIndex application in Enterprise Designer to include the new fields in the database creation script, the outbound OTD, and the method OTD.

5.2.2. Matching Configuration

The **MatchingConfig** section determines which fields are passed to the SeeBeyond Match Engine for matching (the match string). If you are matching on fields parsed from a freeform text field, define each individual parsed field you want to use for matching. The default fields listed in **MatchingConfig** are FirstName, LastName, DOB, Gender, and SSN.

The match types you can use for each field in this section are defined in the first column of the match configuration file. Make sure the match type you specify has the correct matching logic defined in the match configuration file.

5.2.3. Configuring the Match and Standardization Engines

To configure eIndex to use the SeeBeyond Match Engine for standardization and matching, you must specify the SeeBeyond Match Engine in the **MEFAConfig** section of the Match Field file. This includes modifying the **standardizer-api**, **standardizer-config**, **matcher-api**, and **matcher-config** elements in **MEFAConfig**. For more information, see “MEFA Configuration” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

Following is a sample illustrating the four elements that define the match and standardization engines.

```
<MEFAConfig module-name="MEFA"
  parser-class="com.stc.eindex.configurator.impl.MEFAConfiguration">
  ...
    <standardizer-api>
      <class-name>com.stc.eindex.matching.adapter.SbmeStandardizerAdapter
    </class-name>
    </standardizer-api>
    <standardizer-config>
      <class-name>com.stc.eindex.matching.adapter.SbmeStandardizerAdapterConfig
    </class-name>
    </standardizer-config>
    <matcher-api>
      <class-name>com.stc.eindex.matching.adapter.SbmeMatcherAdapter
    </class-name>
    </matcher-api>
    <matcher-config>
      <class-name>com.stc.eindex.matching.adapter.SbmeMatcherAdapterConfig
    </class-name>
    </matcher-config>
  </MEFAConfig>
```

To Specify the Standardization Engine

To specify the SeeBeyond Match Engine as the standardization engine, you must specify the API and configuration classes for the engine.

- 1 Open the Match Field file in the eIndex Project.
- 2 Scroll to the **MEFAConfig** section of the file.
- 3 In the **standardizer-api** element, enter **com.stc.eindex.matching.adapter.SbmeStandardizerAdapter**.
- 4 In the **standardizer-config** element, enter **com.stc.eindex.matching.adapter.SbmeStandardizerAdapter Config**.
- 5 Save and close the file.

To Specify the Match Engine

To specify the SeeBeyond Match Engine as the match engine, you must specify the API and configuration classes for the engine.

- 1 Open the Match Field file in the eIndex Project.
- 2 Scroll to the **MEFAConfig** section of the file.
- 3 In the **matcher-api** element, enter **com.stc.eindex.matching.adapter.SbmeMatcherAdapter**.
- 4 In the **matcher-config** element, enter **com.stc.eindex.matching.adapter.SbmeMatcherAdapter Config**.
- 5 Save and close the file.

Person Data Type Configuration

Processing person data involves normalizing and phonetically encoding certain fields prior to matching. This chapter describes the configuration files that define person processing logic, and provides instructions for modifying the Match Field file for processing person data.

6.1 Person Matching Overview

Matching on the person data type includes standardizing and matching on demographic information about a person. The SeeBeyond Match Engine can create normalized and phonetic values for person data. Several configuration files designed specifically to handle person data are included to provide additional logic for the standardization and phonetic encoding process. These include files referenced by the standardization engine for information about how to standardize different types of person data. The SeeBeyond Match Engine can phonetically encode any field you specify, with some modification to the standardization files. It can also match on any field, as long as the match type for the field is defined in the match specifications file (**matchConfigFile.cfg**).

In addition, when storing person information, you might want to standardize addresses to enable searching against address information. This requires working with the address configuration files, described in [Chapter 7, “Address Data Type Configuration”](#).

6.1.1. Person Data Processing Fields

When matching on person data, not all fields in a record need to be processed by the SeeBeyond Match Engine. The match engine only needs to process fields that must be parsed, normalized, or phonetically converted, and the fields against which matching is performed. These fields are defined in the Match Field file, and processing logic for each field is defined in the standardization and matching configuration files.

Match String Fields

The match string processed by the SeeBeyond Match Engine is defined by the match fields specified in the Match Field file. The match engine can process any combination of fields you specify for matching. By default, the match configuration file includes rows specifically for matching on first name, last name, social security number, and

date of birth (this is the default match string). It also includes a row for matching a single character, such as might be the case in a gender field. You can use any of the existing rows for matching, or you can create new rows for the fields you want to match.

Standardized Fields

The SeeBeyond Match Engine expects person data to be provided in separate fields within a single record, meaning that no parsing is required of the name fields prior to normalization. The match engine is designed to normalize only first and last name fields in person data. Finally, the match engine can phonetically convert any field you choose using either the NYSIIS or Soundex phonetic encoder.

The Object Structure

In the default configuration, several fields are added to the object structure and database creation script to store phonetic or standardized person names. The following fields store phonetic or standardized data for the different name fields in the object structure.

- StdFirstName
- StdLastName
- StdMiddleName
- FnamePhoneticCode
- LnamePhoneticCode
- MnamePhoneticCode
- MotherMNPhoneticCode
- MaidenPhoneticCode
- MotherPhoneticCode
- FatherPhoneticCode
- SpousePhoneticCode

If you define additional fields to be standardized or phonetically encoded, be sure to add the fields that will store the modified values to the object structure and to the database creation script.

6.2 Match Configuration for Person Data

The default match configuration file, `matchConfigFile.cfg`, defines several match types for the kinds of data typically included in a person master index. You can customize the

existing match types or create new match types for the data being processed. The following match types are typical for matching on person data

- FirstName
- MiddleName
- LastName
- String
- Date
- Numeric
- Integer
- Real
- SSN
- Char
- pro
- Exac

This file appears under the **Match Engine** node of the eIndex Project. For more information about the comparison functions used for each match type and how the weights are tuned, see [“The Match Configuration File” on page 19](#) and [Appendix B](#).

6.3 Standardization Configuration for Person Data

Several configuration files are used to define processing logic for the SeeBeyond Match Engine. You can customize any of the configuration files described in this section to fit your data processing and standardization requirements. These files appear under the **Standardization Engine** node of the eIndex Project.

6.3.1. personConstants.cfg

The person constants file defines certain information about the standardization files used for processing person data, primarily the number of lines contained in each file. The number of lines specified here must be equal to or greater than the number of lines actually contained in each file.

Table 7 lists and describes each parameter in the constants file. The files referenced by these parameters are described on the following pages.

Table 7 Person Constants File Parameters

Parameter	Description
words	The maximum number of words in a given freeform text field containing a person name. This parameter is not currently used. Default: 11
conjdex	The maximum number of lines in the person conjunctions reference file (personConjonUS.dat). Default: 25
jrsrcdex	The maximum number of lines in the generational suffix category file (personGenSuffixUS.dat). Default: 25

Table 7 Person Constants File Parameters

Parameter	Description
nickdex	The maximum number of lines in the first name category file (personFirstNameUS.dat). Default: 3900
predex	The maximum number of lines in the last name prefix category file (personLastNamePrefixUS.dat). Default: 30
titldex	The maximum number of lines in the title category file (personTitleUS.dat). Default: 46
sufdex	The maximum number of lines in the occupational suffix category file (personOccupSuffix.dat). Default: 25
skpdex	The maximum number of lines in the business name reference file (businessOrRelated.dat). Default: 1200
ptrndex1	The maximum number of lines in the person patterns file (personNamePatt.dat). Default: 900
twodex	The maximum number of lines in the two-character reference file for occupational suffixes (personTwoUS.dat). Default: 16
thredex	The maximum number of lines in the three-character reference file for occupational suffixes (personTwoUS.dat). Default: 16
blnkdex	The maximum number of lines in the special characters reference file (personRemoveSpecChars.dat). Default: 16
dashSize	The maximum number of lines in the hyphenated name category file (personFirstNameDash.dat). Default: 20

6.3.2. personConjonUS.dat

The conjunction reference file is not used in version 5.0, but is designed to work with the person name patterns file during standardization.

6.3.3. personFirstNameDash.dat

The hyphenated name category file defines first names that include hyphens (such as Anne-Marie) to help the SeeBeyond Match Engine recognize and process these values as first names. The file also classifies each name into a gender category.

The syntax of this file is:

```
name gender-class
```

You can modify or add entries in this table as needed. Table 8 describes the columns in the `personFirstNameDash.dat` file.

Table 8 Hyphenated Name Category File

Column	Description
name	A hyphenated first name.
gender-class	An indicator of the gender with which the first name corresponds. The possible values are: <ul style="list-style-type: none"> ▪ N—the title is neutral, and can be applied to male or female first names. ▪ F—the title is used for females. ▪ M—the title is used for males.

Following is an excerpt from the `personFirstNameDash.dat` file.

```
ANNE-MARIE      F
JEAN-NOEL       M
JEAN-MARIE      M
JEAN-BAPTISTE   M
JEAN-PIERRE     M
JEAN-YVES       M
```

6.3.4. `personFirstNameUS.dat`

The first name category file defines standardized versions of first names, and defines a gender classification for each name. This file is used to standardize first names when comparing person names. The gender classification helps to further clarify the match. The SeeBeyond Match Engine uses this file when a first name field is defined for normalization or standardization in the Match Field file.

Note: By default, the names listed in this file are based on US names. You can customize this file to add names of other types, including those containing diacritical marks.

The syntax of this file is:

```
original-value standardized-form gender-class
```

You can modify or add entries in this table as needed. Table 9 describes the columns in the `personFirstNameUS.dat` file.

Table 9 First Name Category File

Column	Description
original-value	The original value of the first name.
standardized-form	The standardized version of the original value. A zero (0) in this field indicates that the original value is already in its standardized form.

Table 9 First Name Category File

Column	Description
gender-class	An indicator of the gender with which the first name corresponds. The possible values are: <ul style="list-style-type: none"> ▪ N—the title is neutral, and can be applied to male or female first names. ▪ F—the title is used for females. ▪ M—the title is used for males.

Following is an excerpt from the **personFirstNameUS.dat** file. Certain rows contain a zero (0) for the standardized form, indicating that the name is already standard (Alonzo, Amanda, and Ann, for example).

```
STEPHEN          0          M
STEPHENIE       STEPHANIE  F
STEPHIE         STEPHANIE  F
STEPHINE        STEPHANIE  F
STEPHNIE        STEPHANIE  F
STERLING        0          M
STEVE           STEPHEN    M
STEVEN          STEPHEN    M
STEVIE          STEPHEN    N
STEW            STUART     M
STEWART        STUART     M
STU             STUART     M
STUART          0          M
SU              SUSAN      F
SUE             SUSAN      F
SUHANTO         0          M
SULLIVAN        0          F
SULLY           SULLIVAN   F
SUMMER          0          F
```

6.3.5. personGenSuffixUS.dat

The generational suffix category file defines standardized versions of generational suffixes (such as Jr., III, and so on). This file is used to compare standard versions of the suffix field. You can define additional suffixes and their standardized form, following the syntax below.

```
field-value standard-form
```

Note: *By default, the suffixes listed in this file are based on US names. You can customize this file to add suffixes of other types, including those containing diacritical marks.*

Table 10 describes each column of the **personGenSuffixUS.dat** file.

Table 10 Generational Suffix Category File

Column	Description
field-value	The original value of the generational suffix in the record being processed.

Table 10 Generational Suffix Category File

Column	Description
standard-form	The standard form of the generational suffix. A zero ('0') in this column indicates that the value listed in column one is already in its standardized form.

An excerpt from the **personGenSuffixUS.dat** file appears below. In this excerpt, certain suffixes, such as 2ND, 3RD and JR, are already in their standardized form.

```

11          2ND
111         3RD
1V          4TH
2ND         0
3RD         0
4TH         0
FOURTH     4TH
II          2ND
III         3RD
IV          4TH
JR          0
JUNIOR     JR
SECOND     2ND
SENIOR     SR
SR         0

```

6.3.6. **personLastNamePrefixUS.dat**

The last name prefix category file is not used in version 5.0, but is designed to work with the person name patterns file during standardization.

6.3.7. **personNamePatt.dat**

The person name patterns file is not used in version 5.0, but is designed to standardize freeform text name fields.

6.3.8. **personOccupSuffixUS.dat**

The occupational suffix category file is not used in version 5.0, but is designed to work with the person name patterns file during standardization.

6.3.9. **personRemoveSpecChars.dat**

The special characters reference file lists characters that may appear in person data, but that should be ignored. The SeeBeyond Match Engine removes these characters from a field before making any comparisons or before normalizing data. You can define additional characters to remove from person data by simply adding the character to the list.

An excerpt from the **personRemoveSpecChars.dat** file appears below.

```
[
]
{
}
<
>
/
?
*
^
#
!
```

6.3.10. personThreeUS.dat

This reference file is not used in version 5.0, but is designed to work with the person name patterns file during standardization.

6.3.11. personTitleUS.dat

The title category file defines standard forms for titles and classifies each title into a gender category. For example, “Mister” is standardized to “MR” and is classified as male; “Doctor” is standardized to “DR.” and is classified as gender neutral. You can add, modify, or delete entries in this file as needed. Use the following syntax.

```
original-value standardized-form gender-class
```

Note: *By default, the titles listed in this file are based on US names. You can customize this file to add titles of other types, including those containing diacritical marks.*

Table 11 describes each column of the **personTitleUS.dat** file.

Table 11 Person Title Category File

Column	Description
original-value	The original value of the title in the person name field.
standardized-form	The standardized version of the original value. A zero (0) in this field indicates that the original value is already in its standardized form.
gender-class	An indicator of the gender with which the title corresponds. The default values are: <ul style="list-style-type: none"> ▪ N—the title is neither male nor female. ▪ F—the title is used for females. ▪ M—the title is used for males.

An excerpt from the **personTitleUS.dat** file appears below. In this excerpt, certain titles, such as DR, GEN, and MISS, are already in their standardized form.

CTO	0	N
DEAN	0	N
DIR	DIRECTOR	N
DIRECTOR	0	N
DOC	DR	N
DOCTOR	DR	N
DR	0	N
DRS	0	N
EMERITUS	0	N
FOUNDER	0	N
GEN	0	N
GENERAL	GEN	N
MANAGER	0	N
MGR	MANAGER	N
MISS	0	F
MISSUS	MRS	F

6.3.12. personTwoUS.dat

This reference file is not used in version 5.0, but is designed to work with the person name patterns file during standardization.

6.3.13. businessOrRelated.dat

The business-related category file is used to identify business terms in person name information. Examples of when this could occur would be when indexing both person and business names, or when business information is included within a person object structure. The SeeBeyond Match Engine removes these terms for person matching. This file contains a list of common business terms that might be found in person data. You can modify this file by adding, changing, or deleting terms.

An excerpt from the **businessOrRelated.dat** file appears below.

```
ACCOUNTANT
ACCT
ACDY
ACRE
ACREAGE
ACRES
ACS
ACT
AD
ADATU
ADM
ADMIN
ADMINISTRATIO
ADMINISTRATION
ADMINISTRATOR
```

6.4 Customizing Person Data Configuration Files

To customize the SeeBeyond Match Engine configuration files for processing person data, you can modify any of the files described in this chapter using the text editor provided in the Enterprise Designer. Before modifying the match configuration file,

review the information provided in [Chapter 4](#) and [Appendix B](#) of this guide. Make sure a thorough data analysis has been performed to determine the best fields for matching, and the best comparison functions to use for each field.

Updating most standardization files is a straight-forward process. Make sure to follow the syntax guidelines provided in [“Standardization Configuration for Person Data” on page 37](#). If you add any lines to any of the standardization configuration files, be sure to adjust the corresponding parameter in the person constants file (`personConstants.cfg`).

6.5 Configuring the eIndex Match Service

To ensure eIndex uses the SeeBeyond Match Engine to process person information, you must customize the eIndex Match Service. This includes modifying the Match Field file to support the fields on which you want to match, to standardize the appropriate fields, and to specify the SeeBeyond Match Engine as the match and standardization engine. Perform the following tasks to configure the eIndex Match Service.

- [Configuring StandardizationConfig](#) on page 44
- [Configuring the Match String](#) on page 48
- [Configuring the Match and Standardization Engines](#) on page 50

When configuring the eIndex Match Service, keep in mind the information presented in [“Matching Service Configuration” on page 31](#).

6.5.1. Configuring StandardizationConfig

The `StandardizationConfig` section of the Match Field file is described in detail in Chapter 6 of the *eIndex Global Identifier Configuration Guide*. Perform the following steps to configure the required fields for standardization and phonetic encoding.

- [Step 1: Configure the System Object](#) on page 44
- [Step 2: Configure the Normalization Structures](#) on page 45
- [Step 3: Configure Fields to Phonetically Encode](#) on page 47

Note: *In the current configuration, the rules defined for the person data type assume the incoming data to be parsed prior to processing. Therefore, you do not need to configure fields to parse and normalize unless you want to search on address information. In that case, you must configure address fields to parse and normalize, as described in [“Step 2: Configure Fields to Parse and Normalize” on page 62](#).*

Step 1: Configure the System Object

The system object defined for standardization must be the parent object of the object structure (typically, this is “Person” for a person database, but it can be whatever you defined).

To configure the system object

- 1 In the Project Explorer pane of the Enterprise Designer, double-click the **Match Field** node in the **Configuration** folder of the Project you want to modify.
- 2 Scroll to the **standardize-system-object** element.
- 3 Make sure the value of the **system-object-name** element is the name of the parent object in the object structure (as defined in the Object Definition file).

A sample is shown below.

```
<standardize-system-object>
  <system-object-name>Person</system-object-name>
  ...
</standardize-system-object>
```

- 4 Save your changes to the file.

Step 2: Configure the Normalization Structures

The fields defined for normalization for the person data type can include any name fields. By default this includes first, middle, and last name fields. The fields are identified by the field identifiers specified for names in [Table 4 on page 27](#).

A sample normalization structure for person data is shown below. This sample specifies that the PersonName standardization type is used to normalize the first name, alias first name, last name, and alias last name fields.

```
<structures-to-normalize>
  <group standardization-type="PersonName">
    <unnormalized-source-fields>
      <source-mapping>
        <unnormalized-source-field-name>Person.FirstName
        </unnormalized-source-field-name>
        <standardized-object-field-id>FirstName
        </standardized-object-field-id>
      </source-mapping>
    </unnormalized-source-fields>
    <normalization-targets>
      <target-mapping>
        <standardized-object-field-id>FirstName
        </standardized-object-field-id>
        <standardized-target-field-name>Person.StdFirstName
        </standardized-target-field-name>
      </target-mapping>
    </normalization-targets>
  </group>
  <group standardization-type="LastName">
    <unnormalized-source-fields>
      <source-mapping>
        <unnormalized-source-field-name>Person.LastName
        </unnormalized-source-field-name>
        <standardized-object-field-id>LastName
        </standardized-object-field-id>
      </source-mapping>
    </unnormalized-source-fields>
    <normalization-targets>
      <target-mapping>
        <standardized-object-field-id>LastName
        </standardized-object-field-id>
        <standardized-target-field-name>Person.StdLastName
        </standardized-target-field-name>
      </target-mapping>
    </normalization-targets>
  </group>
```

```

<group standardization-type="PersonName">
  <unnormalized-source-fields>
    <source-mapping>
      <unnormalized-source-field-name>Person.Alias[*].FirstName
      </unnormalized-source-field-name>
      <standardized-object-field-id>FirstName
      </standardized-object-field-id>
    </source-mapping>
  </unnormalized-source-fields>
  <normalization-targets>
    <target-mapping>
      <standardized-object-field-id>FirstName
      </standardized-object-field-id>
      <standardized-target-field-name>Person.Alias[*].StdFirstName
      </standardized-target-field-name>
    </target-mapping>
  </normalization-targets>
</group>
<group standardization-type="LastName">
  <unnormalized-source-fields>
    <source-mapping>
      <unnormalized-source-field-name>Person.Alias[*].LastName
      </unnormalized-source-field-name>
      <standardized-object-field-id>LastName
      </standardized-object-field-id>
    </source-mapping>
  </unnormalized-source-fields>
  <normalization-targets>
    <target-mapping>
      <standardized-object-field-id>LastName
      </standardized-object-field-id>
      <standardized-target-field-name>Person.Alias[*].StdLastName
      </standardized-target-field-name>
    </target-mapping>
  </normalization-targets>
</group>
</structures-to-normalize>

```

To configure the normalization structures

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **structures-to-normalize** element.
- 3 Add, modify, or delete source or target fields for standardization using the instructions under “Defining Normalization” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 12 for guidelines on how to populate the normalization elements for person matching.

- 4 Save and close the Match Field file.

Table 12 Person Information structures-to-normalize Elements

Element	Description
standardization-type	For name fields, enter “PersonName”. For additional information, see “Standardization and Match Types” on page 33 .
unnormalized-source-fields elements	
source-mapping	Defines a source field to be normalized.

Table 12 Person Information structures-to-normalize Elements

Element	Description
unnormalized-source-field-name	The ePath of a field in the input record to be normalized. For example, if the parent object is “Person”, and you want to specify the alias last name, the value would be similar to Person.Alias[*].LastName .
standardized-object-field-id	The SeeBeyond Match Engine field ID of the field defined by unnormalized-source-field-name (for more information, see Table 4 on page 27).
normalization-targets elements	
target-mapping	Defines a target field for the corresponding source-mapping element.
standardized-object-field-id	The match configuration field ID of the field defined by the standardized-target-field-name element. This is the same value as the standardized-object-field-id element in the unnormalized-source-field element.
standardized-target-field-name	The name of the field that stores the standardized version of the field specified by unnormalized-source-field-name . As with unnormalized-source-field-name , this value must be the ePath of the field.

Step 3: Configure Fields to Phonetically Encode

Certain fields are defined for phonetic encoding by default. You can define additional names, such as maiden names or alias names, for phonetic encoding as well. A sample of fields defined for phonetic encoding is shown below. This sample converts name and alias name fields, as well as the street name.

```
<phoneticize-fields>
  <phoneticize-field>
    <unphoneticized-source-field-name>Person.StdFirstName
    </unphoneticized-source-field-name>
    <phoneticized-target-field-name>Person.FnamePhoneticCode
    </phoneticized-target-field-name>
    <encoding-type>Soundex</encoding-type>
  </phoneticize-field>
  <phoneticize-field>
    <unphoneticized-source-field-name>Person.StdLastName
    </unphoneticized-source-field-name>
    <phoneticized-target-field-name>Person.LnamePhoneticCode
    </phoneticized-target-field-name>
    <encoding-type>NYSIIS</encoding-type>
  </phoneticize-field>
  <phoneticize-field>
    <unphoneticized-source-field-name>Person.Alias[*].StdFirstName
    </unphoneticized-source-field-name>
    <phoneticized-target-field-name>Person.FnamePhoneticCode
    </phoneticized-target-field-name>
    <encoding-type>Soundex</encoding-type>
  </phoneticize-field>
  <phoneticize-field>
    <unphoneticized-source-field-name>Person.Alias[*].StdLastName
    </unphoneticized-source-field-name>
    <phoneticized-target-field-name>Person.LnamePhoneticCode
    </phoneticized-target-field-name>
    <encoding-type>NYSIIS</encoding-type>
  </phoneticize-field>
</phoneticize-fields>
```

```
<phoneticize-field>
  <unphoneticized-source-field-name>
    Person.Address[*].StreetName
  </unphoneticized-source-field-name>
  <phoneticized-target-field-name>
    Person.Address[*].StNamePhoneticCode
  </phoneticized-target-field-name>
  <encoding-type>NYSIIS</encoding-type>
</phoneticize-field></phoneticize-fields>
```

To configure fields to phonetically encode

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **phoneticize-fields** element.
- 3 Add, modify, or delete fields for phonetic conversion using the instructions under “Defining Phonetic Conversion” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 13 for guidelines on how to populate the phonetic elements for person matching.

- 4 Save and close the Match Field file.

Table 13 Person Domain phoneticize-fields Elements

Element	Description
unphoneticized-source-field-name	The ePath of a field in the input record to convert to its phonetic version. For example, if the parent object is “Person” and you want to specify the first name of an alias name, the value would be similar to Person.Alias[*].FirstName .
phoneticized-object-field-id	This element is not used by the SeeBeyond Match Engine and can be omitted.
phoneticized-target-field-name	The name of the field that stores the phonetic version of the field. As with the unphoneticized-source-field-name element, this value must be the ePath of the field.
encoding-type	The type of encoding to use for the phonetic conversion. Specify “NYSIIS” or “Soundex”.

6.5.2. Configuring the Match String

You can include any fields on which you want to match in the match string. The match string is defined by the **match-column** elements in the **MatchingConfig** section of the Match Field file. The default match fields are FirstName, LastName, SSN, DOB, and Gender.

A sample match string for person matching is shown below. This sample matches on first and last names, date of birth, social security number, gender, and the street name of the address.

```
<match-system-object>
  <object-name>Person</object-name>
  <match-columns>
    <match-column>
      <column-name>
```



```

        Enterprise.SystemSBR.Person.StdFirstName
    </column-name>
    <match-type>FirstName</match-type>
</match-column>
<match-column>
    <column-name>Enterprise.SystemSBR.Person.StdLastName
    </column-name>
    <match-type>LastName</match-type>
</match-column>
<match-column>
    <column-name>Enterprise.SystemSBR.Person.SSN
    </column-name>
    <match-type>SSN</match-type>
</match-column>
<match-column>
    <column-name>Enterprise.SystemSBR.Person.DOB
    </column-name>
    <match-type>DateDays</match-type>
</match-column>
<match-column>
    <column-name>Enterprise.SystemSBR.Person.Gender
    </column-name>
    <match-type>Char</match-type>
</match-column>
<match-column>
    <column-name>Enterprise.SystemSBR.Person.Address.StreetName
    </column-name>
    <match-type>StreetName</match-type>
</match-column>
</match-columns>
</match-system-object>

```

To configure the match string for person matching

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **MatchingConfig** module.
- 3 Add, modify, or delete fields in the match string using the instructions under “Configuring the Match String” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 14 for guidelines on how to populate the **column-name** and **match-type** elements for person matching.

- 4 Save and close the Match Field file.

Table 14 Person Domain match-column Elements

Element	Description
column-name	The fully qualified field name of the field in the SBR to be included in the match string, with “Enterprise” as the root object. For example, to specify a person’s maiden name, the column-name would be similar to Enterprise.SystemSBR.Person.Maiden .
match-type	For the SeeBeyond Match Engine, each data type has a different match type. The FirstName, MiddleName, and LastName match types are specific to person matching. You can specify any of the other match types defined in the match configuration file, as well. For more information, see “Match and Standardization Types” on page 28 .

6.5.3. Configuring the Match and Standardization Engines

The **MEFAConfig** section of the Match Field file defines which standardization and match engines to use based on the adapter and API Java classes specified. Make sure this section is configured for the SeeBeyond Match Engine. Instructions are provided in [“Configuring the Match and Standardization Engines” on page 34](#).

For more information, see “MEFA Configuration” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

Address Data Type Configuration

Processing street addresses involves parsing, normalizing, and phonetically encoding certain fields prior to matching. This chapter describes the configuration files that define address processing logic, and provides instructions for modifying the Match Field file for processing address fields.

7.1 Address Matching Overview

Matching on the address data type includes standardizing and matching on address information in the master index. You can implement street address standardization to enable address searching in eIndex, and you can include address fields in the match string. For example, standardizing address information allows you to include address fields in Enterprise Data Manager search criteria, even though matching might not be performed against these fields.

The SeeBeyond Match Engine can create standardized and phonetic values for United States street address information. Several configuration files designed specifically to handle address data are included to define additional logic for the standardization and phonetic encoding process. These include address clues files, a patterns file, and a constants file. The address standardization engine is based on the work performed at the US Census Bureau. The clues files, in particular, are based on census bureau statistics.

The SeeBeyond Match Engine can match on any field, as long as the match type for the field is defined in the match specifications file (**matchConfigFile.cfg**).

7.1.1. Address Data Processing Fields

When matching on address data, not all fields in a record need to be processed by the SeeBeyond Match Engine. The match engine only needs to process fields that must be parsed, normalized, or phonetically converted, and the fields against which matching is performed. These fields are defined in the Match Field file, and processing logic for each field is defined in the standardization and matching configuration files.

Match String Fields

The match string processed by the SeeBeyond Match Engine is defined by the match fields specified in the Match Field file. By default, no address fields are included in the match string, but you can add any of the parsed address fields to the match string.

The match engine can process any combination of fields you specify for matching. By default, the match specifications file includes rows specifically for matching on the fields that are parsed from the street address fields, such as the street number, street direction, and so on. The file also defines several generic match types. You can use any of the existing rows for matching, or you can create new rows for the fields you want to match.

Standardized Fields

The SeeBeyond Match Engine expects that street address data will be provided in a freeform text field containing several components that must be parsed. The match engine is designed to parse these components, and to normalize and phonetically encode the street name. You can specify additional fields for phonetic encoding.

To parse address fields, a standardization structure for street addresses is defined in the Match Field file. The fields listed below under **“The Object Structure”** are defined as the target fields. Each of these fields has several entries in the standardization structure. This is because different parsed components can be stored in the same field. For example, the house number, post office box number, and rural route identifier are all stored in the house number field.

The Object Structure

In the default configuration, several fields are added to the object structure and database creation script to store phonetic or standardized address information. The following fields store phonetic or standardized data for the street address fields in the object structure.

- HouseNumber
- StreetName
- StreetDir
- StreetNamePhoneticCode
- StreetType

If you define additional fields to be standardized or phonetically encoded, be sure to add the fields that will store the modified values to the object structure and to the database creation script.

7.2 Match Configuration for Address Data

The default match configuration file, **matchConfigFile.cfg**, defines several match types for the kinds of address data typically included for matching on address fields. You can customize the existing match types or create new match types for the data being processed. The following match types are typical for matching on address data.

- StreetNumber
- StreetDir
- HouseNumber
- StreetType

In addition, you can use any of these generic match types for matching on address data.

- String
- Date
- Numeric
- Integer
- Real
- SSN
- Char
- pro
- Exac

This file appears under the **Match Engine** node of the eIndex Project. For more information about the comparison functions used for each match type and how the weights are tuned, see [“The Match Configuration File” on page 19](#) and [Appendix B](#).

7.3 Standardization Configuration for Address Data

Several configuration files are used to define certain processing logic for the SeeBeyond Match Engine. You can customize any of the configuration files described in this section to fit your data processing and standardization requirements. In addition to the files described here, one additional file, **addressInternalConstants.cfg**, is included. This file is used internally and should not be modified. These files appear under the **Standardization Engine** node of the eIndex Project.

7.3.1. addressConstants.cfg

The address constants file defines certain information about the standardization files used for processing address data, primarily the number of lines contained in each file. The number of lines specified here must be equal to or greater than the number of lines actually contained in each file.

Table 15 lists and describes each parameter in the constants file. The files referenced by these parameters are described on the following pages.

Table 15 Address Constants File Parameters

Parameter	Description
maxWords	The maximum number of words in a given address field. Default: 15
clueArraySize	The maximum number of lines in the address clues file (addressClueAbbrevUS.dat). Default: 2000
patternArraySize	The maximum number of lines in the patterns file (addressPatternsUS.dat). Default: 1100
maxPattSize	The maximum length (in characters) of any pattern in the address patterns file. Default: 35
imageSize	The maximum length of an input address field. Default: 25
nameOutputFieldSize	The maximum output length of a street or property name. Default: 25
numberOutputFieldSize	The maximum output length of a house number or rural route number within the structure identifier or post office box fields. Default: 15
directionOutputFieldSize	The maximum output length of a directional field (prefix or suffix). Default: 15
typeOutputFieldSize	The maximum output length of a street type field (prefix or suffix). Default: 25
prefixOutputFieldSize	The maximum length of a number prefix fields. Default: 10
suffixOutputFieldSize	The maximum length of a number suffix fields. Default: 10
extensionOutputFieldSize	The maximum output length of any extension field. Default: 10
extrainfoOutputFieldSize	The maximum output length of any miscellaneous information that is not recognized as a known type. Default: 30

7.3.2. addressClueAbbrevUS.dat

The address clues file lists common terms in street addresses, specifies a normalized value for each common term, and categorizes the terms into street address component types. A term can be categorized into multiple component types. The relevance value

specifies which of the component types the term is most likely to be. For example, the term “Junction” is standardized as “Jct”, and is classified as a street type, building unit, and generic term (giving relevance in that order).

This file helps the SeeBeyond Match Engine recognize common terms in street addresses, and to parse and normalize the values correctly. The syntax of this file is:

```
common-term normalized-term ID-number/type-token
```

You can modify or add entries in this table as needed. Table 16 describes the columns in the **addressClueAbbrevUS.dat** file.

Table 16 Address Clues File Columns

Column	Description
common-term	A term commonly found in street addresses.
normalized-term	The normalized version of the common term.
ID-number/type-token	An ID number and a token indicating the type of address component represented by the common term. The ID number corresponds to an ID number in the address master clues file, and the type token corresponds to the type specified for that ID number in the address master clues file.

Following is an excerpt from the **addressClueAbbrevUS.dat** file.

```

TRLR VILLAGE      Trpk      59BU
TRLR VLG          Trpk      59BU
TRPK              Trpk      59BU
TRPRK            Trpk      59BU
VILLA            Vlla     305TY    60BU
VLLA             Vlla     305TY    60BU
VILLAS           Vlla     60BU
VILL             Vlg      317TY    61BU    364AU
VILLAG          Vlg      317TY    61BU    364AU
VLG             Vlg      317TY    61BU    364AU
VILLAGE         Vlg      317TY    61BU    364AU
VILLG           Vlg      317TY    61BU    364AU
VILLIAGE        Vlg      317TY    61BU    364AU
VLGE            Vlg      317TY    61BU    364AU
VIVI            Vivi     62BU
VIVIENDA        Vivi     62BU
COLLEGE         Coll     64BU          0AU
CLG             Coll     64BU
COTTAGE         Cott     65BU    65BP    0AU

```

7.3.3. addressMasterCluesUS.dat

The address master clues file lists common terms in street addresses, as defined by the US Postal Service. For each common term, this file specifies a normalized value, defines USPS information, and categorizes the terms into street address component types. A term can be categorized into multiple component types.

The syntax of this file is:

```
ID-number common-term normalized-term short-abbrev USPS-abbrev CFCCS
type-token usage-flag USPS-flag
```

You can modify or add entries in this table as needed. Table 17 describes the columns in the **addressMasterCluesUS.dat** file.

Table 17 Address Master Clue File Columns

Column	Description
ID-number	A unique identification number for the address common term. This number corresponds to an ID number for the same term in the address clues file.
common-term	A common address term, such as Park, Village, North, and so on.
normalized-term	The normalized version of the common term.
short-abbrev	A short abbreviation of the common term.
USPS-abbrev	The standard United States Postal Office abbreviation of the common term.
CFCCS	The census feature class code of the term (as defined in the Census Tiger® database). The following values are used: <ul style="list-style-type: none"> ▪ A—Road ▪ B—Railroad ▪ C—Miscellaneous ▪ D—Landmark ▪ E—Physical feature ▪ F—Nonvisible feature ▪ H—Hydrography ▪ X—Unclassified
type-token	The type of address component represented by the common term. Types are specified by an address token (for more information, see “Address Type Tokens” on page 58).
usage-flag	A flag indicating how the term is used (for more information, see “Pattern Class” on page 60).
USPS-flag	The United States Postal Office code for the term.

Following is an excerpt from the **addressMasterCluesUS.dat** file.

```

11Alley           Alley           Al             Aly A         TY R U
12Alternate Route Alt Rte        Alt           Alt A         TY R
15Arcade          Arcade          Arc           Arc A         TY R U
16Arroyo          Arroyo          Arryo         ArryHA        TY R
17Autopista       Atpta          Apta          AptaA        TY R
18Avenida         Avenida         Ava           Ava A         TY R
19Avenue          Avenue         Ave           Ave A         TY R U
26Boulevard       Blvd           Blvd          BlvdA        TY R U
32Bulevar         Blvr           Blv           Blv A         TY R
33Business Route  Bus Rte        BusRt         BsRtA        TY R
34Bypass          Bypass         Byp           Byp A         TY R U
36Calle           Calle           Calle         ClleA        TY R
37Calleja         Calleja        Cja           Cja A         TY R

```


38Callejon	Callej	Cjon	CjonA	TY R
39Camino	Camino	Cam	Cam A	TY R
47Carretera	Carrt	Carr	CarrA	TY R
48Causeway	Cswy	Cswy	CswyAH	TY R U
51Center	Center	Ctr	Ctr DA	TY R U

addressPatternsUS.dat

The address patterns file defines the expected input patterns of street address fields to help the SeeBeyond Match Engine recognize and process these values. Tokens are used to indicate the type of address component in the input and output fields. This file contains two rows for each pattern. The first row defines the input pattern and provides an example. The second row defines the output pattern, the pattern type, the relative importance of the pattern compared to other patterns, and usage flags (as shown below).

```
AU A1 TY          01 Oak B Street
NA NA ST          T* 75          TX
```

The relative importance determines which pattern to use in the case that the format of the input field matches more than one pattern.

The syntax of this file is:

```
input-pattern example
output-pattern pattern-class pattern-modifier priority usage-flag
exclude-flag
```

You can modify or add entries in this table as needed. Table 18 describes the columns in the **addressPatternsUS.dat** file.

Table 18 Address Patterns File

Column	Description
input-pattern	Tokens that represent a possible input pattern from the unparsed street address fields. Each token represents one component. For more information about address tokens, see “Address Type Tokens” on page 58 .
example	An example of a street address that fits the specified pattern. This file element is optional.
output-pattern	Tokens that represent the output pattern for the specified input pattern. Each token represents one component of the output of the SeeBeyond Match Engine. For more information about address tokens, see “Address Type Tokens” on page 58 .
pattern-class	An indicator of the type of address component represented by the pattern. Possible pattern types are listed in “Pattern Class” on page 60 .

Table 18 Address Patterns File

Column	Description
pattern-modifier	An indicator of whether the priority of the pattern is averaged against other patterns that match the input. Pattern modifiers are listed in “Pattern Modifiers” on page 60 .
priority	The priority weight to use for the pattern when the pattern is a sub-pattern of a larger input pattern.
usage-flag	A flag indicating how the term is used (for more information, see “Pattern Class” on page 60). This file element is optional.
exclude-flag	This file element is optional.

Following is an excerpt from the **addressPatternsUS.dat** file.

```

NU DR TY A1 AU           01  123 South Avenida B Oak
HN PD PT NA NA         H* 70

NU DR TY NU DR          01  123 South Avenida 1 West
HN PD PT NA SD         H* 70

NU A1 TY AU TY          01  123 C circle hill drive
HN HS NA NA ST         H* 70

NU A1 AM A1 TY          01  123 M & M road
HN NA NA NA ST         H* 65

NU TY AU A1             01  123 Avenida Oak B
HN PT NA NA            H* 60

NU TY NU A1             01  123 Avenida 1 B
HN PT NA NA            H* 60

```

Address Type Tokens

The address pattern and clues files use tokens to denote different components in a street address, such as street type, house number, street names, and so on. These files use one set of tokens for input fields and another set for output fields. You can use only the predefined tokens to represent address components; the SeeBeyond Match Engine does not recognize custom tokens.

Table 19 lists and describes each input token; Table 20 lists and describes each output token.

Table 19 Input Address Pattern Type Tokens

Token	Description
A1	Alphabetic value, one character in length
AM	Ampersand
AU	Generic word
BP	Building property
BU	Building unit

Table 19 Input Address Pattern Type Tokens

Token	Description
BX	Post office box
DA	Dash (as a starting character)
DR	Street direction
EI	Extra information
EX	Extension
FC	Numeric fraction
HR	Highway route
MP	Mile posts
NL	Common words, such as "of", "the", and so on
NU	Numeric value
OT	Ordinal type
PT	Prefix type
RR	Rural route
SA	State abbreviations
TY	Street type
WD	Descriptor within the structure
WI	Identifier within the structure

Table 20 Output Address Pattern Tokens

Token	Description
1P	Building number prefix
2P	Second building number prefix
BD	Property or building directional suffix
BI	Structure (building) identifier
BN	Property or building name
BS	Building number suffix
BT	Property or building type suffix
BX	Post office box descriptor
BY	Structure (building) descriptor
DB	Property or building directional prefix
EI	Extra information
EX	Extension index
H1	First house number (the actual number)
H2	Second house number (house number suffix)

Table 20 Output Address Pattern Tokens

Token	Description
HN	House number
HS	House number suffix
NA	Street name
NB	Building number
NL	Conjunctions that connect words or phrases in one component type (usually the street name)
P1	House number prefix
P2	Second house number prefix
PD	Directional prefix to the street name
PT	Street type prefix to the street name
RR	Rural route descriptor
RN	Rural route identifier
ST	Street type suffix to the street name
SD	Directional suffix to the street name
TB	Property or building type prefix
WI	Identifier within the structure
WD	Descriptor within the structure
XN	Post office box identifier

Pattern Class

Each pattern defined in the address patterns file must have an associated pattern class. The pattern class indicates a portion of the input pattern or the type of address data that is represented by the pattern. You can specify any of the following pattern classes.

- **H**—the address pattern represents a house.
- **B**—the address pattern represents a building.
- **W**—the address pattern represents a unit within a structure, such as an apartment or suite number.
- **T**—the address pattern represents a street type or direction.
- **R**—the address pattern represents a rural route.
- **P**—the address pattern represents a Post Office box.
- **N**—the address pattern is mostly numeric.

These classes are also specified as usage flags in the patterns file and the master clues file.

Pattern Modifiers

Each pattern type must be followed by a pattern modifier that indicates how to handle cases where one or more defined patterns is found to be a sub-pattern of a larger input

pattern. In this case, the SeeBeyond Match Engine must know how to prioritize each defined pattern that is a part of the larger pattern. The pattern modifiers are:

- *—An asterisk indicates that the priority weight for the matching pattern is averaged down equally with the other matching sub-patterns.
- +—A plus sign indicates that the priority weight for the matching pattern is not averaged down equally with the other matching sub-patterns.

Priority Indicators

The priority indicator is a numeric value following the pattern modifier that indicates the priority weight of the pattern. These values work best when defined as a multiple of five between and including 35 and 95. If a pattern is assigned a priority of 90 or 95 and the pattern matches, or is a sub-pattern of, the input pattern, the match engine stops searching for additional matching patterns and uses the high-priority matching pattern.

7.4 Modifying Address Data Configuration Files

To customize the SeeBeyond Match Engine configuration files for processing street address data, you can modify any of the files described in this chapter using the text editor provided in the Enterprise Designer. Before modifying the match configuration file, review the information provided in [Chapter 4](#) and [Appendix B](#) of this guide. Make sure a thorough data analysis has been performed to determine the best fields for matching, and the best comparison functions to use for each field.

Updating most standardization files is a straight-forward process. Make sure to follow the syntax guidelines provided in [“Standardization Configuration for Address Data” on page 53](#). If you add rows to any of the standardization files, make sure to adjust the corresponding parameter in the address constants file (`addressConstants.cfg`).

Modifying the patterns file is a more complex task. Only modify this file once you fully understand pattern tokens, types, relevance, and flags.

7.5 Configuring the eIndex Match Service

To ensure eIndex uses the SeeBeyond Match Engine to process address information, you must customize the eIndex Match Service. This includes modifying the Match Field file to support the fields on which you want to match, to standardize the appropriate fields, and to specify the SeeBeyond Match Engine as the match and standardization engine. Perform the following tasks to configure the eIndex Match Service.

- [Configuring StandardizationConfig](#) on page 62
- [Configuring the Match String](#) on page 65
- [Configuring the Match and Standardization Engines](#) on page 67

When configuring the eIndex Match Service, keep in mind the information presented in [“Matching Service Configuration” on page 31](#).

7.5.1. Configuring StandardizationConfig

The **StandardizationConfig** section of the Match Field file is described in detail in Chapter 6 of the *eIndex Global Identifier Configuration Guide*. Perform the following steps to configure the required fields for standardization and phonetic encoding.

- **Step 1: Configure the System Object** on page 62
- **Step 2: Configure Fields to Parse and Normalize** on page 62
- **Step 3: Configure Fields to Phonetically Encode** on page 64

Note: *In the default configuration, the rules defined for the address data type assume that all input fields must be parsed as well as normalized. Thus, this section does not describe the process of configuring fields only for normalization.*

Step 1: Configure the System Object

The system object defined for standardization must be the parent object of the object structure.

To configure the system object

- 1 In the Project Explorer pane of the Enterprise Designer, double-click the **Match Field** node in the **Configuration** folder of the Project you want to modify.
- 2 Scroll to the **standardize-system-object** element.
- 3 Make sure the value of the **system-object-name** element is the name of the parent object in the object structure (as defined in the Object Definition file).

A sample is shown below.

```
<standardize-system-object>
  <system-object-name>Person</system-object-name>
  ...
</standardize-system-object>
```

- 4 Save your changes to the file.

Step 2: Configure Fields to Parse and Normalize

For address fields, the source fields in the standardization structure must include the fields predefined for parsing and normalization. This includes any fields containing street address information, which are parsed into the street address fields listed in **“The Object Structure” on page 52** (except the phonetic street name field). The target fields can include any of these parsed fields.

A sample standardization structure for address data is shown below. This structure parses the first two lines of street address into the standard street address fields.

```
<free-form-texts-to-standardize>
  <group standardization-type="ADDRESS">
    <unstandardized-source-fields>
      <unstandardized-source-field-name>Person.Address[*].Address1
      </unstandardized-source-field-name>
      <unstandardized-source-field-name>Person.Address[*].Address2
      </unstandardized-source-field-name>
    </unstandardized-source-fields>
```

```
<standardization-targets>
  <target-mapping>
    <standardized-object-field-id>HN
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].HouseNumber
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>RV
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].HouseNumber
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>BV
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].HouseNumber
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>SN
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].StreetName
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>RT
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].StreetName
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>BT
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].StreetName
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>PD
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].StreetDir
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>SD
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].StreetDir
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>ST
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].StreetType
    </standardized-target-field-name>
  </target-mapping>
  <target-mapping>
    <standardized-object-field-id>PT
    </standardized-object-field-id>
    <standardized-target-field-name>Person.Address[*].StreetType
    </standardized-target-field-name>
  </target-mapping>
</standardization-targets>
</group>
</free-form-texts-to-standardize>
```

To configure fields to parse and normalize

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **free-form-text-to-standardize** element.

- 3 Add, modify, or delete source or target fields for parsing and normalization using the instructions under “Defining Standardization” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 21 for guidelines on how to populate the standardization elements for address matching.

- 4 Save and close the Match Field file.

Table 21 Address free-form-text-to-standardize Elements

Element	Description
standardization-type	Specifies the type of standardization for the SeeBeyond Match Engine to use for the fields defined in the unstandardized-source-field-name elements of the group. For parsing street address fields, the value of this element must be “ADDRESS”. For more information, see “Standardization and Match Types” on page 33 .
unstandardized-source-fields elements	
unstandardized-source-field-name	The ePath of a field in the input record containing the freeform text to be standardized. You can have more than one source field (such as AddressLine1 and AddressLine2). The source fields you specify in a group are concatenated to determine the target values for the group. For example, if the parent object is “Business” and you want to specify the first line of the street address, the value would be similar to Business.Address[*].AddressLine1 .
standardized-targets elements	
target-mapping	Defines a target field for the corresponding unstandardized-source-fields element. You can have multiple target-mapping elements for one unstandardized-source-field element.
standardized-object-field-id	The match configuration field ID of the field defined by the standardized-target-field-name element (for more information, see Table 4 on page 27)
standardized-target-field-name	The name of the fields that store the standardized version of the input fields. As with the unstandardized-source-field-name element, this value must be the ePath of the field.

Step 3: Configure Fields to Phonetically Encode

When you match or stanardize on street address fields, the street name should be specified for phonetic conversion. A sample of the **phoneticize-fields** element is shown below. This sample only converts the address street name. You can define additional fields for phonetic encoding.


```
<phoneticize-fields>
  <phoneticize-field>
    <unphoneticized-source-field-name>Person.Address[*].StreetName
  </unphoneticized-source-field-name>
  <phoneticized-target-field-name>Person.Address[*].StreetName_Phon
  </phoneticized-target-field-name>
  <encoding-type>NYSIIS</encoding-type>
  </phoneticize-field>
</phoneticize-fields>
```

To configure fields to phonetically encode

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **phoneticize-fields** element.
- 3 Add, modify, or delete fields for phonetic conversion using the instructions under “Defining Phonetic Conversion” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 22 for guidelines on how to populate the phonetic elements for address matching.

- 4 Save and close the Match Field file.

Table 22 Address phoneticize-fields Elements

Element	Description
unphoneticized-source-field-name	The ePath of a field in the input record to convert to its phonetic version. For example, to specify the street name, the value would be similar to Person.Address[*].StreetName .
phoneticized-object-field-id	This element is not used by the SeeBeyond Match Engine and can be omitted.
phoneticized-target-field-name	The name of the field that stores the phonetic version of the field. As with the unphoneticized-source-field-name element, this value must be the ePath of the field.
encoding-type	The type of encoding to use for the phonetic conversion. You can specify “NYSIIS” or “Soundex”.

7.5.2. Configuring the Match String

For matching on street address fields, make sure the match string you specify in **MatchingConfig** contains all or a subset of the fields defined for standardization in **StandardizationConfig**. You can include additional fields for matching, such as the city name or zip code. A sample match string for address matching is shown below.

```

<match-system-object>
  <object-name>Person</object-name>
  <match-columns>
    <match-column>
      <column-name>Enterprise.SystemSBR.Person.Address.StreetName
      </column-name>
      <match-type>StreetName</match-type>
    </match-column>
    <match-column>
      <column-name>Enterprise.SystemSBR.Person.Address.HouseNumber
      </column-name>
      <match-type>HouseNumber</match-type>
    </match-column>
    <match-column>
      <column-name>Enterprise.SystemSBR.Person.Address.StreetDir
      </column-name>
      <match-type>StreetDir</match-type>
    </match-column>
    <match-column>
      <column-name>Enterprise.SystemSBR.Person.Address.StreetType
      </column-name>
      <match-type>StreetType</match-type>
    </match-column>
  </match-columns>
</match-system-object>

```

To configure the match string for address matching

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **MatchingConfig** module.
- 3 Add, modify, or delete fields in the match string using the instructions under “Configuring the Match String” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 23 for guidelines on how to populate the **column-name** and **match-type** elements for address matching.

- 4 Save and close the Match Field file.

Table 23 Address match-column Elements

Element	Description
column-name	The fully qualified field name of the field in the SBR to be included in the match string, with “Enterprise” as the root object. For example, to specify the street name of an address, this value would be similar to Enterprise.SystemSBR.Person.Address.StreetName .
match-type	Each component of a street address has a different match type. The default match types are StreetName, HouseNumber, StreetDir, and StreetType. For more information, see “Match and Standardization Types” on page 28 .

7.5.3. Configuring the Match and Standardization Engines

The **MEFAConfig** section of the Match Field file defines which standardization and match engines to use based on the adapter and API Java classes specified. Make sure this section is configured for the SeeBeyond Match Engine. Instructions are provided in [“Configuring the Match and Standardization Engines” on page 34](#).

For more information, see “MEFA Configuration” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

Business Names Data Type Configuration

Processing unparsed business name fields involves parsing, normalizing, and phonetically encoding certain fields prior to matching. This chapter describes the configuration files that define business name processing logic, and provides instructions for modifying the Match Field file for processing business names.

8.1 Business Name Matching Overview

If business names are included in your master person index, you can standardize business name fields and include the parsed fields in the match string. For example, standardizing business name fields allows you to include these fields in Enterprise Data Manager search criteria, even though matching might not be performed against these fields.

The SeeBeyond Match Engine can create standardized and phonetic values for business names. Several configuration files designed specifically to handle business names are included to define additional logic for the standardization and phonetic encoding process. These include reference files, a patterns file, and key type files. The SeeBeyond Match Engine can match on any field, as long as the match type for the field is defined in the match specifications file (`matchConfigFile.cfg`).

8.1.1. Business Name Processing Fields

When matching on freeform business names, not all fields in a record need to be processed by the SeeBeyond Match Engine. The match engine only needs to process fields that must be parsed, normalized, or phonetically converted, and the fields against which matching is performed. These fields are defined in the Match Field file, and processing logic for each field is defined in the standardization and matching configuration files.

Match String Fields

By default, no business name fields are included in the match string in the Match Field file. If you standardize a freeform business name field, you can add any of the parsed fields to the match string. By default, the SeeBeyond Match Engine parsed business names into these fields: name, organization type, association type, alias, sector, industry, and URL. The match engine can process any combination of fields you specify for matching. By default, the match specifications file includes rows specifically for

matching on the fields that are parsed from the business name fields, such as the name, industry, and so on. The file also defines several generic match types. You can use any of the existing rows for matching, or you can create new rows for the fields you want to match.

Standardized Fields

The SeeBeyond Match Engine expects that business name data will be provided in a freeform text field containing several components that must be parsed. The match engine is designed to parse these components, and to normalize and phonetically encode the business name. You can specify additional fields for phonetic encoding.

Business name standardization is defined in a standardization structure in the Match Field file. The fields you can define as the target fields are listed in the next section, “The Object Structure”.

The Object Structure

In the default configuration, no fields are included to store phonetic or standardized data for freeform business names. The following fields can be parsed out of a business name. You must add these fields to the object structure and database creation script if you define a standardization structure for business names.

- BusinessName
- NamePhon
- OrgType
- AssocType
- Industry
- Sector
- Alias
- Url

You can modify the names of these fields as needed.

8.2 Match Configuration for Business Names

The default match configuration file, **matchConfigFile.cfg**, defines several match types for the kinds of business name data typically included in the match string. You can customize the existing match types or create new match types for the data being processed. The following match types are typical for matching on business names.

- PrimaryName
- OrgTypeKeyword
- AssocTypeKeyword
- IndustrySectorList
- AliasList
- IndustryTypeKeyword
- URL

In addition, you can use any of these generic match types for matching on business names.

- String
- Date
- Numeric
- Integer
- Real
- Char
- pro
- Exac

This file appears under the **Match Engine** node of the eIndex Project. For more information about the comparison functions used for each match type and how the weights are tuned, see [“The Match Configuration File” on page 19](#) and [Appendix B](#).

8.3 Standardization Configuration for Business Names

Several configuration files are used to define certain processing logic for the SeeBeyond Match Engine. You can customize any of the configuration files described in this section to fit your data processing and standardization requirements. These files appear under the **Standardization Engine** node of the eIndex Project.

8.3.1. bizConstants.cfg

The business constants file defines certain information about the standardization files used for processing business data, primarily the number of lines contained in each file. The number of lines specified here must be equal to or greater than the number of lines actually contained in each file.

Table 24 lists and describes each parameter in the constants file. The files referenced by these parameters are described on the following pages.

Table 24 Business Constants File Parameters

Parameter	Description
cityMax	The maximum number of lines in the city or state key type file (bizCityorStateTypeKey.dat). Default: 180
primaryMax	The maximum number of lines in the primary business names reference file (bizCompanyPrimaryNames.dat). Default: 525
countryMax	The maximum number of lines in the country key type file (bizCountryTypeKeys.dat). Default: 99
industryMax	The maximum number of lines in the industry key type file (bizIndustryTypeKeys.dat). Default: 900

Table 24 Business Constants File Parameters

Parameter	Description
patternMax	The maximum number of lines in the business patterns file (bizPatterns.dat). Default: 400
mergerMax	The maximum number of lines in the merged business name category file (bizCompanyMergerNames.dat). Default: 40
adjectiveMax	The maximum number of lines in the adjective key type file (bizAdjectiveTypeKeys.dat). Default: 80
orgMax	The maximum number of lines in the organization key type file (bizOrganizationTypeKeys.dat). Default: 50
assocMax	The maximum number of lines in the association key type file (bizAssociationTypeKeys.dat). Default: 20
genTermMax	The maximum number of lines in the general terms reference file (bizBusinessGeneralTerms.dat). Default: 20
charsMax	The maximum number of lines in the special characters reference file (bizRemoveSpecChars.dat). Default: 25

8.3.2. bizAdjectivesTypeKeys.dat

The adjectives key type file defines adjectives commonly found in business names to help the SeeBeyond Match Engine recognize and process these values as a part of the business name. This file contains one column with a list of commonly used adjectives, such as General, Financial, Central, and so on.

You can modify or add entries in this file as needed. Following is an excerpt from the **bizAdjectivesTypeKeys.dat** file.

```
DIGITAL
DIRECTED
DIVERSIFIED
EDUCATIONAL
ELECTROCHEMICAL
ENGINEERED
EVOLUTIONARY
EXTENDED
FACTUAL
FEDERAL
```

8.3.3. bizAliasTypeKeys.dat

The alias key type file lists business name acronyms and abbreviations along with their standardized names. This helps the SeeBeyond Match Engine recognize and process

these values appropriately. You can add entries to the alias key type file using the following syntax.

```
alias standardized-name
```

Table 25 describes the columns in the **bizAliasTypeKeys.dat** file.

Table 25 Alias Key Type File

Column	Description
alias	An abbreviation or acronym commonly used in place of a specific business name.
standardized-name	The normalized version of the alias name.

Following is an excerpt from the **bizAliasTypeKeys.dat** file.

```
BBH          BARTLE BOGLE HEGARTY
BBH          BROWN BROTHERS HARRIMAN
IBM          INTERNATIONAL BUSINESS MACHINE
IDS          INCOMES DATA SERVICES
IDS          INSURANCE DATA SERVICES
IDS          THE INTEGRATED DECISION SUPPORT GROUP
IDS          THE INTERNET DATABASE SERVICE
CAL-TECH    CALIFORNIA INSTITUTE OF TECHNOLOGY
```

8.3.4. bizAssociationTypeKeys.dat

The association key type file lists business association types along with their standardized names. This helps the SeeBeyond Match Engine recognize and process these values appropriately. You can add entries to the association key type file using the following syntax.

```
association-type standardized-type
```

Table 26 describes the columns in the **bizAssociationTypeKeys.dat** file.

Table 26 Association Type Key Table

Column	Description
association-type	A common association type for businesses, such as Partners, Group, and so on.
standardized-type	The standardized version of the association type.

Following is an excerpt from the **bizAssociationTypeKeys.dat** file.

```
ASSOCIATES    0
BANCORP       0
BANCORPORATION BANCORP
COMPANIES     0
GP            GROUP
GROUP         0
PARTNERS      0
```


8.3.5. bizBusinessGeneralTerms.dat

The general terms reference file lists terms commonly used in business names. This file is used to identify terms that indicate a business, such as bank, supply, factory, and so on. This helps the SeeBeyond Match Engine recognize and process the business name.

This file contains one column that lists the connector tokens in the business names you process. You can add entries as needed. Below is an excerpt from the **bizBusinessGeneralTerms.dat** file.

```
BUILDING
CITY
CONSUMER
EAST
EYE
FACTORY
LATIN
NORTH
SOUTH
```

8.3.6. bizCityorStateTypeKeys.dat

The city or state key type file lists various cities and states that might be used in business names. It also classifies each entry as a city (CT) or state (ST) and indicates the country in which the city or state is located. This helps the SeeBeyond Match Engine recognize and process these values appropriately. You can add entries to the city or state key type file using the following syntax.

```
city-or-state type country
```

Table 26 describes the columns in the **bizCityorStateTypeKeys.dat** file.

Table 27 City or State Key Type File

Column	Description
city-or-state	The name of a city or state used in business names.
type	An indicator of whether the value is a city or state. "CT" indicates city and "ST" indicates state.
country	The country code of the country in which the city or state is located.

Following is an excerpt from the **bizCityorStateTypeKeys.dat** file.

```
ADELAIDE           CT  AU
ALABAMA            ST  US
ALASKA             ST  US
ALGIERS            CT  DZ
AMSTERDAM          CT  NL
ARIZONA            ST  US
ARKANSAS           ST  US
ASUNCION           CT  PY
ATHENS             CT  GR
```

8.3.7. bizCompanyFormerNames.dat

The business former name reference file provides a list of common company names along with names by which the companies were formerly known. This helps the SeeBeyond Match Engine recognize a business when a record containing their previous business name is processed. You can add entries to the business former name table using the following syntax.

```
former-name current-name
```

Table 28 describes each column in the **bizCompanyFormerNames.dat** file.

Table 28 Business Former Name Reference File

Column	Description
former-name	One of the company's previous names.
current-name	The company's current name.

Below is an excerpt from the **bizCompanyFormerNames.dat** file.

```
HELLENIC BOTTLING                COCA-COLA HBC
INTERNATIONAL PRODUCTS           THE TERLATO WINE
ORGANIC FOOD PRODUCTS           SPECTRUM ORGANIC PRODUCTS
SOFTWARE TECHNOLOGY CORPORATION SEEBEYOND TECHNOLOGY CORPORATION
SUTTER HOME WINERY              TRINCHERO FAMILY ESTATES
```

8.3.8. bizCompanyMergerNames.dat

The merged business name category file provides a list of companies whose name changed because of a merger along with the name of the company after the merge. It also classifies the business names into industry sectors and sub-sectors. This helps the SeeBeyond Match Engine recognize the current company name and to determine the sector of the business. You can add entries to the business merger name file using the following syntax.

```
former-name/merged-name sector-code
```

Table 28 describes each column in the **bizCompanyMergerNames.dat** file.

Table 29 Business Merger Name Category File

Column	Description
former-name	The name of the company whose name was not kept after the merger.
merged-name	The name of the company whose name was kept after the merger.
sector-code	The industry sector code of the business. Sector codes are listed in the bizIndustryCategoriesCode.dat file.

Below is an excerpt from the **bizCompanyMergerNames.dat** file.

```

DUKE/FLUOR DANIEL                20005
FAULTLESS STARCH/BON AMI         09004
FIND/SVP                          10013
FIRST WAVE/NEWPARK SHIPBUILDING  27005
GUNDLE/SLT                       19020
HMG/COURTLAND                   23004
J BROWN/LMC                     10014
KORN/FERRY                      10020
LINSKO/PRIVATE LEDGER           14005
    
```

8.3.9. bizCompanyPrimaryNames.dat

The primary business name reference file provides a list of companies by their primary name. It also classifies the business names into industry sectors and sub-sectors. This helps the SeeBeyond Match Engine determine the correct value of the sector field when parsing the business name. You can add entries to the primary business name file using the following syntax.

```
primary-name sector-code
```

Table 28 describes the columns in the **bizCompanyPrimaryNames.dat** file.

Table 30 Business Primary Name Reference File

Column	Description
primary-name	The primary name of the company.
sector-code	The industry sector code of the business. Sector codes are listed in the bizIndustryCategoriesCode.dat file.

Below is an excerpt from the **bizCompanyPrimaryNames.dat** file.

```

BROTHER INTERNATIONAL            12006
BRYSTOL-MYERS SQUIBB            11005
BURLINGTON COAT FACTORY         24003
BURLINGTON NORTHERN SANTA FE    27005
BV SOLUTIONS                    06012
CABLEVISION                    26001
CABOT                          04006
CADENCE                        06010
CAMPBELL                       22006
CAPITAL BLUE CROSS              17001
    
```

8.3.10. bizConnectorTokens.dat

The connector tokens reference file defines common values (typically conjunctions) that connect words in business names. For example, in the business name “Nursery of Venice”, “of” is a connector token. This helps the SeeBeyond Match Engine recognize and process the full name of a business by indicating that the token connects two parts of the full name.

This file contains one column that lists the connector tokens in the business names you process. You can add entries as needed. Below is an excerpt from the **bizConnectorTokens.dat** file.

AN
DE
DES
DOS
LA
LAS
LE
OF
THE

8.3.11.bizCountryTypeKeys.dat

The country key type file lists countries and continents, along with their abbreviations and assigned nationalities. For continents, the abbreviation is “CON” to separate them from countries. This helps the SeeBeyond Match Engine recognize and process these values as countries or continents. You can add entries to the country key type file using the following syntax.

```
country abbreviation nationality
```

Table 26 describes the columns in the **bizCountryTypeKeys.dat** file.

Table 31 Country Key Type Files

Column	Description
country	The name of a country or continent.
abbreviation	The common abbreviation for the specified country. The abbreviation for a continent is always “CON”.
nationality	The nationality assigned to a person or business originating in the specified country.

Following is an excerpt from the **bizCountryTypeKeys.dat** file.

```
AMERICA          CON  AMERICAN
AFRICA           CON  AFRICAN
EUROPE          CON  EUROPEAN
ASIA            CON  ASIAN
AFGHANISTAN     AF   AFGHAN
ALBANIA         AL   ALBANIAN
ALGERIA         DZ   ALGERIAN
```

8.3.12.bizIndustryCategoryCode.dat

The industry sector reference file lists and groups various industry sectors and sub-sectors, and includes an identification code for each type. This helps the SeeBeyond Match Engine determine and process the industry sectors for different businesses. You can add entries to the industry sector reference file using the following syntax.

```
sector-code industry-sector
```

Table 33 describes each column in the **bizIndustryCategoryCode.dat** file.

Table 32 Industry Sector Reference File

Column	Description
sector-code	The identification code of the specified sector. The first two numbers of each code identify the general industry sector; the last three number identify a sub-sector.
industry-sector	A description of the industry category. This is written in the format "<sector> - <sub-sector>", where <sector> is a general category of industry types, and <sub-sector> is a specific industry within that category.

```

02006 Automotive&Transport Equipment - Recreational Vehicles
02007 Automotive&Transport Equipment - Shipbuilding&RelatedServices
02008 Automotive&Transport Equipment - Trucks, Buses&Other Vehicles
03001 Banking - Banking
04001 Chemicals - Agricultural Chemicals
04002 Chemicals - Basic&Intermediate Chemicals&Petrochemicals
04003 Chemicals - Diversified Chemicals
04004 Chemicals - Paints, Coatings&Other Finishing Products
04005 Chemicals - Plastics&Fibers
04006 Chemicals - Specialty Chemicals
05001 Computer Hardware - Computer Peripherals
05002 Computer Hardware - Data Storage Devices
05003 Computer Hardware - Diversified Computer Products
    
```

8.3.13. bizIndustryTypeKeys.dat

The industry key type file is used to standardize the value of the Industry field into common industries to which businesses belong. This helps the SeeBeyond Match Engine recognize and process the industry types for different businesses. You can add entries to the industry key type file using the following syntax.

```
industry-type standardized-form sectors
```

Table 33 describes each column in the **bizIndustryTypeKeys.dat** file.

Table 33 Industry Key Type File

Column	Description
industry-type	The original value of the industry type in the input record.
standardized-form	The normalized version of the industry type.
sectors	The industry categories of the specified industry type. These values correspond to the sector codes listed in the industry sector file (bizIndustryCategoryCode.dat). You can list as many categories as apply for each type, but they must be entered with a space between each and no line breaks, and they must correspond to an entry in the industry sector file.

Below is an excerpt from the **bizIndustryTypeKeys.dat** file.

```

TECH                TECHNOLOGY                05001-05007
TECHNOLOGIES        TECHNOLOGY                05001-05007
TECHNOLOGY          0                        05001-05007
TECHSYSTEMS         0                        05001-05007
TELE PHONE          TELEPHONE                 16005
TELE PHONES         TELEPHONES               16005
TELEVISION          TV                       11013  21014
TELECOM             0                        16005  26006  26009  26010
TELECOMM            TELECOMMUNICATION        16005  26006  26008
TELECOMMUNICATION  0                        16005  26006  26008
    
```

8.3.14. bizOrganizationTypeKeys.dat

The organization key type file is used to standardize the value of the Organization field into common organizations to which businesses belong. This helps the SeeBeyond Match Engine recognize and process the organization types for different businesses. You can add entries to the organization key type file using the following syntax.

```
original-type standardized-form
```

Table 34 describes each column in the **bizOrganizationTypeKeys.dat** file.

Table 34 Organization Key Type File

Column	Description
original-type	The original value of the organization field in an input record.
standardized-form	The normalized version of an organization type. A zero (0) in this field indicates that the value in the first column is already in its standardized form.

Below is an excerpt from the **bizOrganizationTypeKeys.dat** file.

```

INC                INCORPORATED
INCORPORATED        0
KG                  0
KK                  0
LIMITED             0
LIMITED PARTNERSHIP 0
LLC                 0
LLP                 0
LP                  LIMITED PARTNERSHIP
LTD                 LIMITED
    
```

8.3.15. bizPatterns.dat

The business patterns file defines multiple formats expected from the business name input fields along with the standardized output of each format. The patterns and output appear in two-row pairs in this file, as shown below.

```
4 PNT AST SEP-GLC ORT
PNT AST DEL ORT
```

The first line describes the input pattern and the second line describes the output pattern. This file uses tokens to denote each component. The allowed tokens are

described in **“Business Name Tokens” on page 79**. A number at the beginning of the first line indicates the number of components in the given business name format. You can modify this file using the following syntax.

```
length input-pattern
output-pattern
```

Table 35 lists and describes the syntax components.

Table 35 Business Patterns File Components

Component	Description
length	The number of business name components in the input field.
input-pattern	Tokens that represent a possible input pattern from the unparsed business name fields. Each token represents one component. For more information about address tokens, see “Business Name Tokens” on page 79 .
output-pattern	Tokens that represent the output pattern for the specified input pattern. Each token represents one component. For more information about business name tokens, see “Business Name Tokens” on page 79 .

Below is an excerpt from the **bizPatterns.dat** file.

```
4 PNT AST SEP-GLC ORT
PNT AST DEL ORT

4 PNT IDT IDT ORT
PNT IDT ORT

4 PNT IDT-AJT IDT ORT
PNT IDT IDT ORT

4 NF IDT-AJT IDT ORT
PNT IDT IDT ORT

4 AJT IDT SEP-GLC ORT
PNT PNT DEL ORT
```

Business Name Tokens

The business patterns file uses tokens to denote different components in a business name, such as the primary name, alias type key, URL, and so on. These files use one set of tokens for input fields and another set for output fields. The tokens indicate the type key files to use to determine the appropriate values for each output field. You can use only the predefined tokens to represent business name components; the SeeBeyond Match Engine does not recognize custom tokens.

Table 36 lists and describes each input token; Table 37 lists and describes each output token.

Table 36 Business Name Input Pattern Tokens

Pattern Identifier	Description
CTT	A connector token
PNT	A primary name of a business
PN-PN	A hyphenated primary name of a business
BCT	A common business term
URL	The URL of the business' web site
ALT	A business alias type key (usually an acronym)
CNT	A country name
NAT	A nationality
CST	A city or state type key
IDT	An industry type key
IDT-AJT	Both an industry and an adjective type key
AJT	An adjective type key
AST	An association type key
ORT	An organization type key.
SEP	A separator key
NFG	Generic term, not recognized as a specific business name component, with an internal hyphen
NF	Generic term, not recognized as a specific business name component
NFC	A single character, not recognized as a specific business name component
SEP-GLC	A joining comma (a <i>glue type separator</i>)
SEP-GLD	A joining hyphen (a <i>glue type separator</i>)
AND	The text "and"
GLU	A glue type key, such as a forward slash, connecting two parts of a business name component
PN-NF	A business primary name followed by a hyphen and a generic term that is not recognized as a specific business name component
NF-PN	A generic term that is not recognized as a specific business name component, followed by a hyphen and a recognized business primary name

Table 36 Business Name Input Pattern Tokens

Pattern Identifier	Description
NF-NF	Two generic terms, not recognized as specific business name components and separated by a hyphen

Table 37 Business Name Output Pattern Tokens

Pattern Identifier	Description
PNT	The primary name of the business
URL	The URL of the business
ALT	The alias type key of the business (usually an acronym)
IDT	The industry type key of the business
AST	The association type key of the business
ORT	The organization type key of the business
NF	A generic term not recognized as a business name component

8.3.16. bizRemoveSpecChars.dat

The special characters reference file lists certain characters that should be removed from a business name prior to processing the field. These typically include punctuation marks such as exclamation points, parenthesis, and so on. This helps the SeeBeyond Match Engine recognize the business name.

This file contains one column that lists the characters to be removed from the business names you process. You can add entries as needed. Below is an excerpt from the **bizRemoveSpecChars.dat** file.

```
[
]
{
}
<
>
/
?
```

8.4 Modifying Business Name Configuration Files

To customize the SeeBeyond Match Engine configuration files for processing business names, you can modify any of the files described in this chapter using the text editor provided in the Enterprise Designer. Before modifying the match configuration file, review the information provided in [Chapter 4](#) and [Appendix B](#) of this guide. Make

sure a thorough data analysis has been performed to determine the best fields for matching, and the best comparison functions to use for each field.

Updating most standardization files is a straight-forward process. Make sure to follow the syntax guidelines provided in [“Standardization Configuration for Business Names” on page 70](#). If you add rows to any standardization files, make sure to modify the corresponding parameter in the business constants file (`bizConstants.cfg`). Before making any changes to the patterns file, make sure you understand the tokens used to represent business name field components.

8.5 Configuring the eIndex Match Service

To ensure eIndex uses the SeeBeyond Match Engine to process business names, you must customize the eIndex Match Service. This includes modifying the Match Field file to support the fields on which you want to match, to standardize the appropriate fields, and to specify the SeeBeyond Match Engine as the match and standardization engine. Perform the following tasks to configure the eIndex Match Service.

- [Configuring StandardizationConfig](#) on page 82
- [Configuring the Match String](#) on page 86
- [Configuring the Match and Standardization Engines](#) on page 87

When configuring the eIndex Match Service, keep in mind the information presented in [“Matching Service Configuration” on page 31](#).

8.5.1. Configuring StandardizationConfig

The `StandardizationConfig` section of the Match Field file is described in detail in Chapter 6 of the *eIndex Global Identifier Configuration Guide*. Perform the following steps to configure the required fields for standardization and phonetic encoding.

- [Step 1: Configure the System Object](#) on page 82
- [Step 2: Configure Fields to Parse and Normalize](#) on page 83
- [Step 3: Configure Fields to Phonetically Encode](#) on page 85

Note: *In the default configuration, the rules defined for the business data type assume that all input fields must be parsed as well as normalized. Thus, this section does not describe the process of configuring fields only for normalization.*

Step 1: Configure the System Object

The system object defined for standardization must be the parent object of the object structure.

To configure the system object

- 1 In the Project Explorer pane of the Enterprise Designer, double-click the **Match Field** node in the **Configuration** folder of the Project you want to modify.
- 2 Scroll to the **standardize-system-object** element.
- 3 Make sure the value of the **system-object-name** element is the name of the parent object in the object structure (as defined in the Object Definition file).

A sample is shown below.

```
<standardize-system-object>
  <system-object-name>Person</system-object-name>
  ...
</standardize-system-object>
```

- 4 Save your changes to the file.

Step 2: Configure Fields to Parse and Normalize

For business name fields, the source fields in the standardization structure must include the fields predefined for parsing and normalization. This includes any fields containing business name information, which are parsed into the business name fields listed in [“The Object Structure” on page 69](#) (except the phonetic business name field). The target fields can include any of these parsed fields.

A sample standardization structure for business name data is shown below. This structure parses a business name field into the standard business name fields.

```
<free-form-texts-to-standardize>
  <group standardization-type="BusinessName">
    <unstandardized-source-fields>
      <unstandardized-source-field-name>Company.Name
    </unstandardized-source-field-name>
    </unstandardized-source-fields>
    <standardization-targets>
      <target-mapping>
        <standardized-object-field-id>PrimaryName
      </standardized-object-field-id>
        <standardized-target-field-name>Person.Company.Name
      </standardized-target-field-name>
      </target-mapping>
      <target-mapping>
        <standardized-object-field-id>OrgTypekeyword
      </standardized-object-field-id>
        <standardized-target-field-name>
          Person.Company.OrganizationType
        </standardized-target-field-name>
      </target-mapping>
      <target-mapping>
        <standardized-object-field-id>AssocTypeKeyword
      </standardized-object-field-id>
        <standardized-target-field-name>Person.Company.AssociationType
      </standardized-target-field-name>
      </target-mapping>
      <target-mapping>
        <standardized-object-field-id>IndustrySectorList
      </standardized-object-field-id>
        <standardized-target-field-name>Person.Company.Sector
      </standardized-target-field-name>
      </target-mapping>
      <target-mapping>
        <standardized-object-field-id>IndustryTypeKeyword
      </standardized-object-field-id>
```

```

        <standardized-target-field-name>
            Company.Person.Company.Industry
        </standardized-target-field-name>
    </target-mapping>
    <target-mapping>
        <standardized-object-field-id>AliasList
        </standardized-object-field-id>
        <standardized-target-field-name>Company.Person.Company.Alias
        </standardized-target-field-name>
    </target-mapping>
    <target-mapping>
        <standardized-object-field-id>Url
        </standardized-object-field-id>
        <standardized-target-field-name>Company.Person.Company.URL
        </standardized-target-field-name>
    </target-mapping>
</standardization-targets>
</group>
</free-form-texts-to-standardize>

```

To configure fields to parse and normalize

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **free-form-text-to-standardize** element.
- 3 Add, modify, or delete source or target fields for parsing and normalization using the instructions under “Defining Standardization” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 38 for guidelines on how to populate the standardization elements for business name matching.

- 4 Save and close the Match Field file.

Table 38 Business Name Domain free-form-text-to-standardize Elements

Element	Description
standardization-type	Specifies the type of standardization to perform on the fields defined in the unstandardized-source-field-name elements of the group. For parsing business name fields, the value of this element must be “BusinessName”. For more information, see “Standardization and Match Types” on page 33 .
unstandardized-source-fields elements	
unstandardized-source-field-name	The ePath of a field in the input record containing the free-form text to be standardized. You can specify more than one source field. The source fields you specify in a group are concatenated to determine the target values for the group. For example, to specify the industry type, the value would be similar to Person.Industry_Type .
standardized-targets elements	
target-mapping	Defines a target field for the corresponding unstandardized-source-fields element.

Table 38 Business Name Domain free-form-text-to-standardize Elements

Element	Description
standardized-object-field-id	The match configuration field ID of the field defined by the standardized-target-field-name element (for more information, see Table 4 on page 27).
standardized-target-field-name	The name of the fields that store the standardized version of the input fields. As with the unstandardized-source-field-name element, this value must be the ePath of the field.

Step 3: Configure Fields to Phonetically Encode

When you match on business name fields, the name field should be specified for phonetic conversion. A sample of the **phoneticize-fields** element is shown below. This sample only converts the business name. You can define additional fields for phonetic encoding.

```
<phoneticize-fields>
  <phoneticize-field>
    <unphoneticized-source-field-name>Person.Company.Name
    </unphoneticized-source-field-name>
    <phoneticized-target-field-name>Person.Company.NamePhon
    </phoneticized-target-field-name>
    <encoding-type>NYSIIS</encoding-type>
  </phoneticize-field>
</phoneticize-fields>
```

To configure fields to phonetically encode

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **phoneticize-fields** element.
- 3 Add, modify, or delete fields for phonetic conversion using the instructions under “Defining Phonetic Conversion” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 39 for guidelines on how to populate the phonetic elements for business name matching.

- 4 Save and close the Match Field file.

Table 39 Business Name Data Type phoneticize-fields Elements

Element	Description
unphoneticized-source-field-name	The ePath of a field in the input record to convert to its phonetic version. For example, to specify the company name, the value would be similar to Person.Business.Company_Name .
phoneticized-object-field-id	This element is not used by the SeeBeyond Match Engine and can be omitted.
phoneticized-target-field-name	The name of the field that will store the phonetic version of the field. As with the unphoneticized-source-field-name element, this value must be the ePath of the field.

Table 39 Business Name Data Type phoneticize-fields Elements

Element	Description
encoding-type	The type of encoding to use for the phonetic conversion. You can specify "NYSIIS" or "Soundex".

8.5.2. Configuring the Match String

For matching on business name fields, make sure the match string you specify in **MatchingConfig** contains all or a subset of the fields defined for standardization in **StandardizationConfig**. You can include additional fields for matching if required. A sample match string for business name matching is shown below. This sample matches on the company name, the organization type, and the sector.

```
<match-system-object>
  <object-name>Person</object-name>
  <match-columns>
    <match-column>
      <column-name>Enterprise.SystemSBR.Person.Company.PrimaryName
      </column-name>
      <match-type>PrimaryName</match-type>
    </match-column>
    <match-column>
      <column-name>Enterprise.SystemSBR.Person.Company.OrganizationType
      </column-name>
      <match-type>OrgTypeKeyword</match-type>
    </match-column>
    <match-column>
      <column-name>Enterprise.SystemSBR.Person.Company.Sector
      </column-name>
      <match-type>IndustryTypeKeyword</match-type>
    </match-column>
  </match-columns>
</match-system-object>
```

To configure the match string for address matching

- 1 In the Project Explorer pane of the Enterprise Designer, double-click **Match Field** under the **Configuration** folder in the Project you want to modify.
- 2 Scroll to the **MatchingConfig** module.
- 3 Add, modify, or delete fields in the match string using the instructions under "Configuring the Match String" in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

See Table 40 for guidelines on how to populate the **column-name** and **match-type** elements for business name matching.

- 4 Save and close the Match Field file.

Table 40 Business Name Data Type match-column Elements

Element	Description
column-name	The fully qualified field name of the field in the SBR to be included in the match string, with "Enterprise" as the root object. For example, to specify the company name, the column-name would be similar to Enterprise.SystemSBR.Person.Company.CompanyName .

Table 40 Business Name Data Type match-column Elements

Element	Description
match-type	Each component of a business name has a different match type. The default match types are PrimaryName, OrgTypeKeyword, AssocTypeKeyword, IndustrySectorList, IndustryTypeKeyword, and Url. For more information, see “Match and Standardization Types” on page 28 .

8.5.3. Configuring the Match and Standardization Engines

The **MEFAConfig** section of the Match Field file defines which standardization and match engines to use based on the adapter and API Java classes specified. Make sure this section is configured for the SeeBeyond Match Engine. Instructions are provided in [“Configuring the Match and Standardization Engines” on page 39](#).

For more information, see “MEFA Configuration” in Chapter 6 of the *eIndex Global Identifier Configuration Guide*.

Fine-tuning Weights and Thresholds

Each eIndex implementation is unique, typically requiring extensive data analysis to determine how to best configure the structure and matching logic of eIndex. This chapter provides an overview of the process of fine-tuning the matching logic in the match configuration file and fine-tuning the match and duplicate thresholds.

1.1 Overview

A thorough analysis of the data to be shared with eIndex is a must before beginning any implementation. This analysis not only defines the types of data to include in the structure, but indicates the relative reliability of each system's data, helps determine which fields should be used for matching, and should indicate the relative reliability of each match field.

To begin the analysis, the legacy data that will be converted into the database should be extracted and analyzed. Once the initial analysis is complete, you can perform an iterative process to help fine-tune the matching and duplicate thresholds, and to determine the level of potential duplication in the existing data.

1.2 Customizing the Match Configuration and Thresholds

There are three primary steps to customizing the way records are matched in eIndex. These tasks are described on the following pages.

- [Determine the Match Fields](#) on page 88
- [Customize the Match Configuration](#) on page 89
- [Define the Weight Thresholds](#) on page 91

1.2.1. Determine the Match Fields

Before extracting data for analysis, review the types of data stored in the messages generated by each system. Use these messages to determine which fields and objects will be included in the object structure of eIndex. From this object structure, select the fields to be used for matching. When selecting these fields, keep in mind how representative each field is of a specific person. For example, in a master person index,

the social security number field, first and last name fields, and birth date are good representations. Certain address information or a home telephone number might also be considered.

1.2.2. Customize the Match Configuration

Once you've determined the fields on which matching will be performed, you need to determine how the weights will be generated for each field. The primary tasks include determining whether to use probabilities or agreement weights, and the choosing the best comparison functions to use for each match field.

Probabilities or Agreement Weights

The first step in configuring the match configuration is to decide whether to use m-probabilities and u-probabilities or agreement and disagreement weights. Both methods will give you similar results, but agreement and disagreement weights allow you to specify the precise maximum and minimum weights that can be applied to each match field, giving you control over the value of the highest and lowest matching weights that can be assigned to each record.

Defining Relative Value

For each field you will use for matching, you need to define either the m-probabilities and u-probabilities or the agreement and disagreement weights in the match configuration file. Review the information provided under "[Matching Weight Formulation](#)" on page 15 to help determine how to configure these values. Remember that a higher m-probability or agreement weight gives the field a higher weight when field values agree.

Determining the Weight Range

In order to find the initial values to set for the match and duplicate thresholds, you must determine the total range of matching weights that can be assigned to a record. This weight is the sum of all weights assigned to each match field.

Weight Ranges using Agreement Weights

For agreement and disagreement weights, determining the match weight ranges that will be generated is very straightforward. Simply total the agreement weights for each field to determine the maximum match weight, and total the disagreement weights for each field to determine the minimum match weight. Table 41 provides a sample agreement/disagreement configuration for matching on person data. As you can see, the range of match weights generated for eIndex with this configuration is from -36 to +38.

Table 41 Sample Agreement and Disagreement Weights

Field Name	Agreement Weight	Disagreement Weight
First Name	8	-8
Last Name	8	-8
Date of Birth	7	-5
Gender	5	-5
SSN	10	-10
Maximum Match Weight	38	
Minimum Match Weight		-36

Weight Ranges using Probabilities

Determining the match weight ranges when using m-probabilities and u-probabilities is a little more complicated than using agreement and disagreement weights. To determine the maximum weight that will be generated for each field, use the following formula:

$$\text{LOG}_2(m_prob/u_prob)$$

To determine the minimum match weight that will be generated for each field, use the following formula:

$$\text{LOG}_2((1-m_prob)/(1-u_prob))$$

Table 42 below illustrates a sample of m-probabilities and u-probabilities, including the corresponding agreement and disagreement weights that are generated with each combination of probabilities. As you can see, the range of match weights generated for eIndex with this configuration is from -35.93 to +38

Table 42 Sample m-probabilities and u-probabilities

Field Name	m-probability	u-probability	Agreement Weight	Disagreement Weight
First Name	.996	.004	7.96	-7.96
Last Name	.996	.004	7.96	-7.96
Date of Birth	.97	.007	7.11	-5.04
Gender	.97	.03	5.01	-5.01
SSN	.999	.001	9.96	-9.96
Maximum Match Weight			38	
Minimum Match Weight				-35.93

Comparison Functions

The match configuration file defines several match types for different types of fields. You can either modify existing rows in this file, or create new rows that define custom matching logic. To determine which comparison functions to use, review the information provided in [Appendix B “Match Configuration Comparison Functions”](#). Choose the comparison functions that best suit how you want the match fields to be processed.

1.2.3. Define the Weight Thresholds

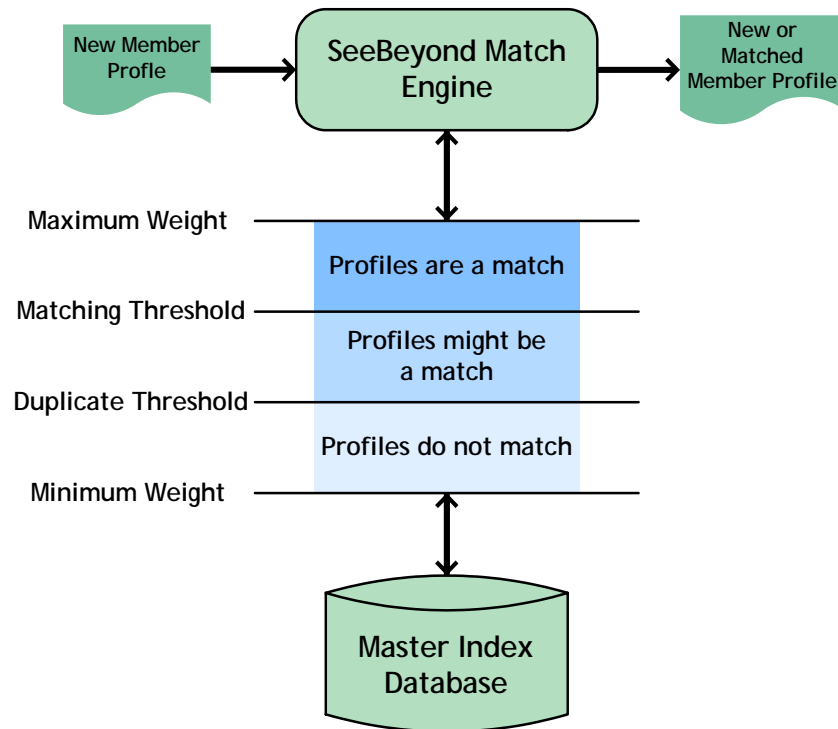
Weight Threshold Overview

Weight thresholds tell eIndex how to process incoming records based on the matching probability weights generated by the SeeBeyond Match Engine. Two parameters in the Threshold configuration file provide eIndex with the information needed to determine if records should be flagged as potential duplicates, if records should be automatically merged, or if a record is not a potential match to any existing records.

- **Match Threshold**—Specifies the weight at which two profiles are assumed to represent the same person and are automatically merged.
- **Duplicate Threshold**—Specifies the minimum weight at which two profiles are considered potential duplicates of one another. The matching threshold indicates the maximum weight for potential duplicates.

Figure 1 illustrates the match and duplicate thresholds in comparison to total composite match weights.

Figure 1 Weight Thresholds



Specifying the Weight Thresholds

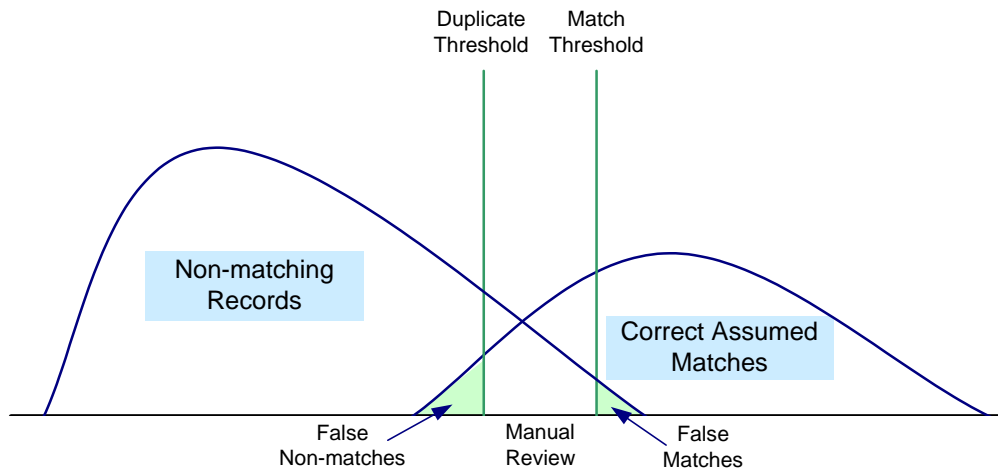
There are two techniques for determining the initial match and duplicate thresholds. The first method, the weight distribution method, is based on the calculation of the error rates of false matches and false non-matches from analyzing the distribution spectrum of all the weighted pairs. This is the standard method, and is illustrated in Figure 2. The second method, the percentage method, relies on measuring the total maximum and minimum weights of all the matched fields and then specifying a certain percentage of these values as the initial thresholds.

The weight distribution method is more thorough and powerful, but requires a large amount of data (match weights) to be statistically reliable. It does not apply well in cases where one candidate record is matched against very few reference records. The percentage method, though simple, is very reliable and precise when dealing with such situations. For both methods, defining the match threshold and the duplicate threshold is an iterative process.

Weight Distribution Method

Each record pair in eIndex can be classified into three categories: matches, non-matches, and potential matches. In general, the distribution of records is similar to the graph shown in Figure 2. Your goal is to make sure that very few records fall into the False Matches region (if any), and that as few as possible fall into the False Non-matches region. You can see how modifying the thresholds will change this distribution. Balance this against the number of records falling within the Manual Review section, as these will each need to be reviewed, researched, and resolved individually.

Figure 2 Weight Distribution Chart



Percentage Method

Using this method, you set the initial thresholds as a percentage of the maximum and minimum weights. Using the information provided under **“Weight Ranges using Agreement Weights”** or **“Weight Ranges using Probabilities”**, determine the maximum and minimum values that will be generated as a composite match weight. For the initial run, the the match threshold is set intentionally high to catch only the most probable matches. The duplicate threshold is set intentionally low to catch a large set of possible matches.

Set the match threshold at 70% of the maximum composite weight starting from zero as the neutral value. Using the weight range samples earlier, this would be 70% of 38, or 26.6. Set the duplicate threshold near the neutral value (that is, the value in the center of the maximum and minimum weight range). The value could be set between 10% of the maximum weight and 10% of the minimum weight. Using the samples above, this would be between 3.8 (10% of 38) and -3.6 (10% of -36).

Fine-tuning the Thresholds

Achieving the correct thresholds for your implementation is an iterative process. First, using the initial thresholds described earlier, process the data extracts into the eIndex database. Then analyze the assumed match and potential duplicates, paying close attention to the assumed match records with matching weights close to the match threshold, to potential duplicate records close to either threshold, and to non-matches near the duplicate threshold.

If you find that most or all of the assumed matches at the low end of the match range are not actually duplicate records, raise the match threshold accordingly. If, on the other hand, you find several potential duplicates at the high end of the duplicate range that are actual matches, decrease the match threshold accordingly. If you find that most or all of the potential duplicate records in the low end of the duplicate range should not be considered duplicate matches, consider raising the duplicate threshold. Conversely, if you find several non-matches with weight near the duplicate threshold that should be considered potential duplicates, lower the duplicate threshold.

Repeat the process of loading and analyzing data and adjusting the thresholds until you are satisfied with the results.

Match Configuration Comparison Functions

Match field comparison functions compare the values of a field in two records to determine whether the fields match or how closely they match. The fields are then assigned a matching weight based on the results of the comparison function. You can use several different types of comparison functions in the match configuration file in order to customize how the SeeBeyond Match Engine should match two records.

J.1 Comparison Functions

There are six primary types of comparison functions used by the SeeBeyond Match Engine. The following types of comparison functions are available.

- **Bigram Comparison Functions** on page 95
- **Uncertainty Comparison Functions** on page 96
- **Exact Comparison Function (c)** on page 97
- **Numeric Comparison Functions** on page 98
- **Date Comparison Functions** on page 100
- **Prorated Comparison Function (p)** on page 102

Certain comparison function types are very specific to the type of data being matched, such as the numeric functions and the date functions. Others, such as the Bigram and uncertainty functions, are more general and can be applied to various data fields.

Bigram Comparison Functions

The SeeBeyond Match Engine provides two different comparison functions based on the Bigram algorithm:

- Standard bigram (b1)
- Transposition bigram (b2)

A Bigram algorithm compares two strings using all combinations of two consecutive characters within each string. For example, the word “bigram” contains the following bigrams: “bi”, “ig”, “gr”, “ra”, and “am”. The Bigram comparison function returns a value between 0 and 1, which accounts for the total number of bigrams that are in common between the two strings divided by the average number of bigrams in the two strings. Bigrams handle minor typographical errors well.

Standard bigram (b1)

This is a standard Bigram comparison function, processing match fields as described above. This comparison function takes no parameters.

Transposition bigram (b2)

This comparison function is based on the standard Bigram comparison function, but handles transpositions of characters within a string. This comparison function takes no parameters.

Uncertainty Comparison Functions

The SeeBeyond Match Engine provides the following uncertainty comparison functions for comparing string fields. The first three comparison functions are generic, and the last three comparison functions are designed for specific types of information.

- Basic uncertainty (u)
- Advanced uncertainty (ua)
- Uncertainty, simplex (us)
 - ♦ Uncertainty, first name (uf)
 - ♦ Uncertainty, last name (ul)
 - ♦ Uncertainty, house number (un)

Basic uncertainty (u)

This is the standard uncertainty comparison function, and processes string fields as described above. As more differences are found between two fields, the agreement weight decreases non-linearly. Thus, the agreement weight can remain high for several differences, but will drop sharply at a certain point. This comparison function takes no parameters.

The uncertainty comparison function is based on the Jaro algorithm, which is a string comparison function that accounts for insertions, deletions, and transpositions by performing the following steps.

- 1 Compute the lengths of both strings to be matched.
- 2 Determine the number of common characters between the two strings. In order for characters to be considered common, they must be within one-half the length of the shorter string.
- 3 Determine the number of transpositions. A transposition means a character from the first string is out of order with the corresponding common character from the second string.

Advanced uncertainty (ua)

This comparison function is based on the standard uncertainty comparison function, **u**, with variants of Winkler/Lynch and McLaughlin. It has additional features to handle specific differences between fields, such as key punch and visual memory errors. Each feature makes use of the information made available from previous features. This comparison function takes no parameters.

These features are included in the advanced uncertainty function.

- The function determines each character in exact agreement and then assigns a value of 1.0 to each agreeing character. It then determines each disagreeing but similar character and assigns a value of 0.3 to each. Similar characters might occur because of scanning errors (for example, “1” the number versus “l” the letter) or keypunch errors (for example, “S” versus “D”).
- The function gives increased value to agreement on the beginning characters of a string. The algorithm adjusts the weighting value up by a fixed amount if the first four characters in each string agree; it adjusts the weighting value up by smaller value if the first three, two, or one characters agree.
- The function adjusts the string comparison function value if the strings are longer than six characters and more than half of the characters after the fourth character agree.

Uncertainty, simplex (us)

This comparison function is a custom SeeBeyond version of a generic string comparison function. It is similar to the basic uncertainty comparison function, **u**, but processes data in a more simple and efficient manner, improving processing speed. The agreement weights generated by this comparison function decrease in a more uniform manner for each difference found between two fields.

Like the basic uncertainty function, the simplex function takes into account such uncertainty factors as string length, transpositions, key punch errors, and visual memory errors. Unlike the uncertainty comparison function (“u”), this function handles diacritical marks. This comparison function takes no parameters.

Uncertainty, first name (uf)

This comparison function is designed specifically for matching on first name fields, and is based on the simplex uncertainty comparison function, **us**. This comparison function analyzes the string and then adjusts the weight based on statistical data. This comparison function takes no parameters.

Uncertainty, last name (ul)

This comparison function is designed specifically for matching on last name fields, and is based on the simplex uncertainty comparison function, **us**. This comparison function analyzes the string and then adjusts the weight based on statistical data. This comparison function takes no parameters.

Uncertainty, house number (un)

This comparison function is designed specifically for matching on house numbers, and is based on the simplex uncertainty comparison function, **u**. This comparison function analyzes the string and then adjusts the weight based on statistical data. This comparison function takes no parameters.

Exact Comparison Function (c)

The SeeBeyond Match Engine provides one exact-match comparison function, “c”. With this comparison function, two fields must match on each character in order to be considered a match. This comparison function takes no parameters.

Numeric Comparison Functions

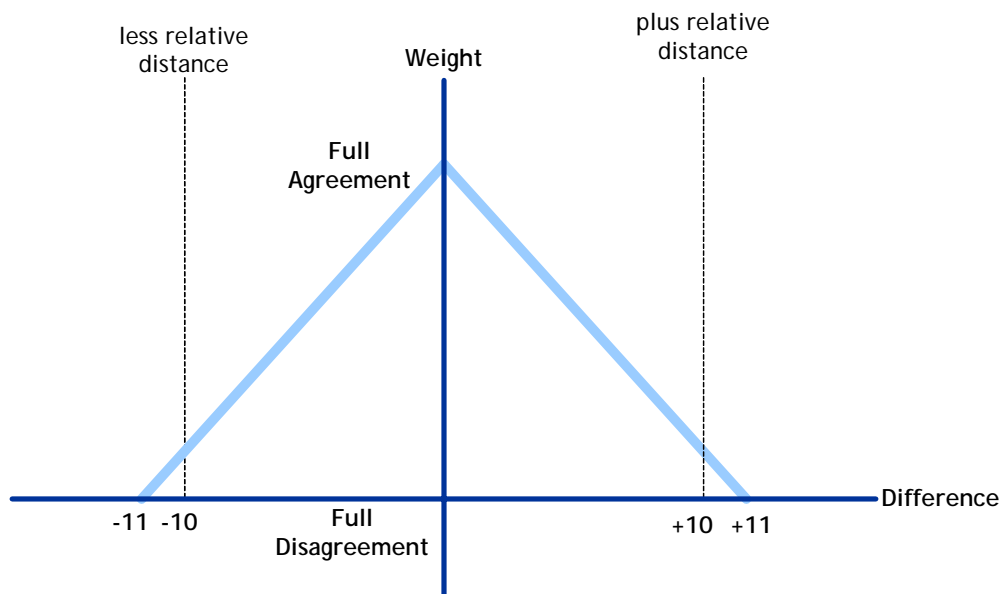
The SeeBeyond Match Engine provides several comparison functions for matching on numeric fields.

- Basic numeric (n)
- Numeric, integer (nI)
- Numeric, real (nR)
- Numeric, string (nS)

All but the nS comparison function can perform numeric string comparisons or relative distance calculations. When set for a string comparison, the functions compare numeric strings based on the advanced uncertainty comparator. When set for relative distance calculations, the matching weight between two numbers decreases as the numbers become further apart, until the relative distance plus one is reached. At this point, the numbers are considered non-matches. For example, if the relative distance is "10" and the base number for comparison is "2", a field value of 8 receives a lower matching weight than a field value of 4; but a field value of 13 is considered a complete non-match (since the distance between 2 and 13 is 11).

Figure 3 illustrates how the weight is decreased as the difference between the two compared fields reaches the relative distance. In this diagram, the relative distance is 10 and the light blue line represents the agreement weight. When the difference between two fields reaches 11 (relative distance plus one), the fields are considered a non-match and are given the full disagreement weight.

Figure 3 Numeric Relative Distance Comparison



Basic numeric (n)

This is a basic numeric comparison function, processing numeric fields as described above. It accepts the parameters listed in Table 43.

Table 43 n, nI, and nR Comparison Function Parameters

Parameter	Description
distance-or-string	Specifies whether a relative distance calculation or a direct string comparison is used. Specify "y" to use a relative distance calculation; specify "n" to use a string comparison.
relative-distance	The greatest difference between two integers at which the values could still be considered a possible match. When the difference between two numbers is greater than the relative distance, the numbers are considered a non-match (the weight becomes zero at when the actual difference is the relative distance plus one). Only use this parameter

Numeric, integer (nI)

This numeric comparison function matches specifically on integers, and accepts the parameters listed in Table 43.

Numeric, real (nR)

This numeric comparison function matches specifically on real numbers, and accepts the parameters listed in Table 43.

Numeric, string (nS)

This numeric comparison function is designed specifically for matching on numeric strings, and is very useful for matching social security numbers. This is the only numeric comparator that can compare alphanumeric values rather than just numeric values. It accepts the parameters listed in Table 44.

Table 44 nS Comparison Function Parameters

Parameter	Description
fixed-length	An optional parameter that takes the length of the field value into account. If a fixed length is specified, the match engine considers any field of a different length to be a non-match. Specify any integer.
character-type	An indicator of whether the field must be all numeric. Specify "nu" for numeric only, or specify "an" to allow alphanumeric characters. The match engine considers any fields containing characters that are not allowed to be a non-match.

Table 44 nS Comparison Function Parameters

Parameter	Description
invalid-characters	A list of invalid characters for the field. If you specify a character, the match engine considers fields that consist of only that character to be a non-match. For example, if you specify "0", then an SSN field cannot contain all zeros. Specify as many alphanumeric characters as needed, separated by a space.

Date Comparison Functions

The SeeBeyond Match Engine provides various date comparison functions. When comparing dates, the match engine compares each date component (for example, it compares the year in the first date against the year in the second date, the month against the month, and the day against the day). This allows for multiple transpositions in each date field. The date comparators use the Java date format (`java.sql.Date`), allowing the comparator to use the Gregorian calendar and to take into account the time zone where the date field originated.

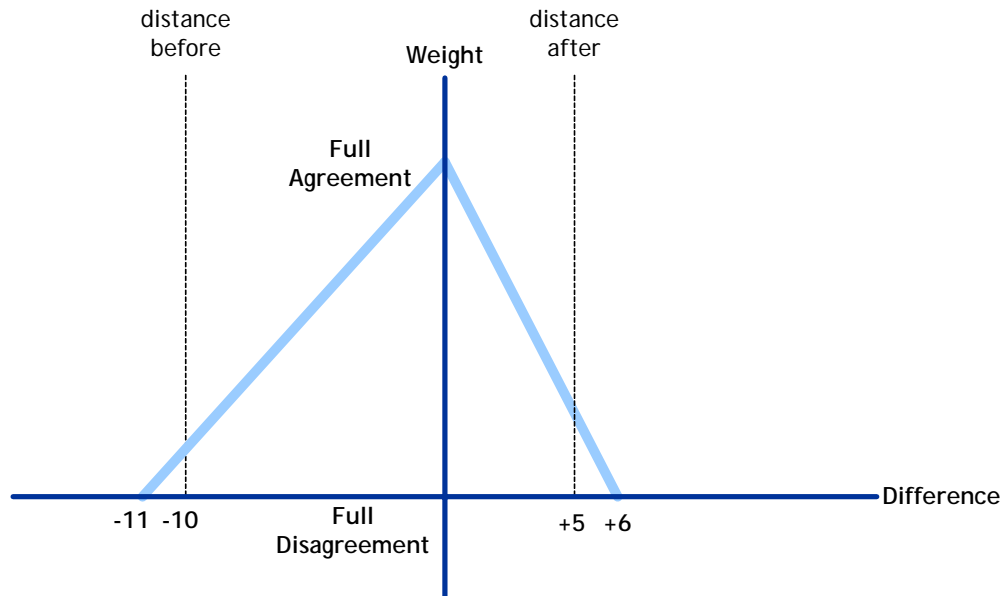
The following comparison functions are available for matching on date fields.

- Date, year (dY)
- Date, month (dM)
- Date, day (dD)
- Date, hour (dH)
- Date, minute (dm)
- Date, second (ds)

As with the numeric comparison functions, the date comparison functions can use either a direct string comparison or a relative distance calculation. When using a relative distance calculation, the matching weight between two dates decreases as the dates become further apart, until the relative distance is reached. When the difference becomes the relative distance plus one, the dates are considered non-matches. You can specify different relative distances for before and after the given date. Any dates falling outside of the specified time period receive a complete disagreement weight. The relative distances are specified in the smallest unit of time being matched (this differs for each date comparison function).

Figure 4 illustrates how the weight is decreased as the difference between the two compared fields reaches either the before or after relative distance. In this diagram, the before relative distance is **11**, the after relative distance is **5**, and the light blue line represents the agreement weight. When the base date is later than the compared date and the difference between the dates reaches **11** (distance before plus one), the fields are considered a non-match and are given the full disagreement weight. When the base date is earlier than the compared date and the difference between the dates reaches **6** (distance after plus 1), the fields are considered a non-match.

Figure 4 Date Relative Distance Comparison



The date comparison functions take the parameters listed in Table 45.

Table 45 Date Comparison Function Parameters

Parameter	Description
distance-or-string	Specifies whether a relative distance calculation or a direct string comparison is used. Specify “y” to use a relative distance calculation; specify “n” to use a string comparison.
distance-before	The number of units prior to the reference date/time for which two date fields can still be considered a match.
distance-after	The number of units following the reference date/time for which two date fields can still be considered a match.

Date, year (dY)

This date comparison function takes only the 4-character year into account for matching. If relative distance calculation is specified, the relative distance is specified in years.

Date, month (dM)

This date comparison function takes the month and year into account for matching. If relative distance calculation is specified, the relative distance is specified in months.

Date, day (dD)

This date comparison function takes the day, month, and year into account for matching. If relative distance calculation is specified, the relative distance is specified in days.

Date, hour (dH)

This date comparison function takes the hour, day, month, and year into account for matching. If relative distance calculation is specified, the relative distance is specified in hours.

Date, minute (dm)

This date comparison function takes the minute, hour, day, month, and year into account for matching. If relative distance calculation is specified, the relative distance is specified in minutes.

Date, second (ds)

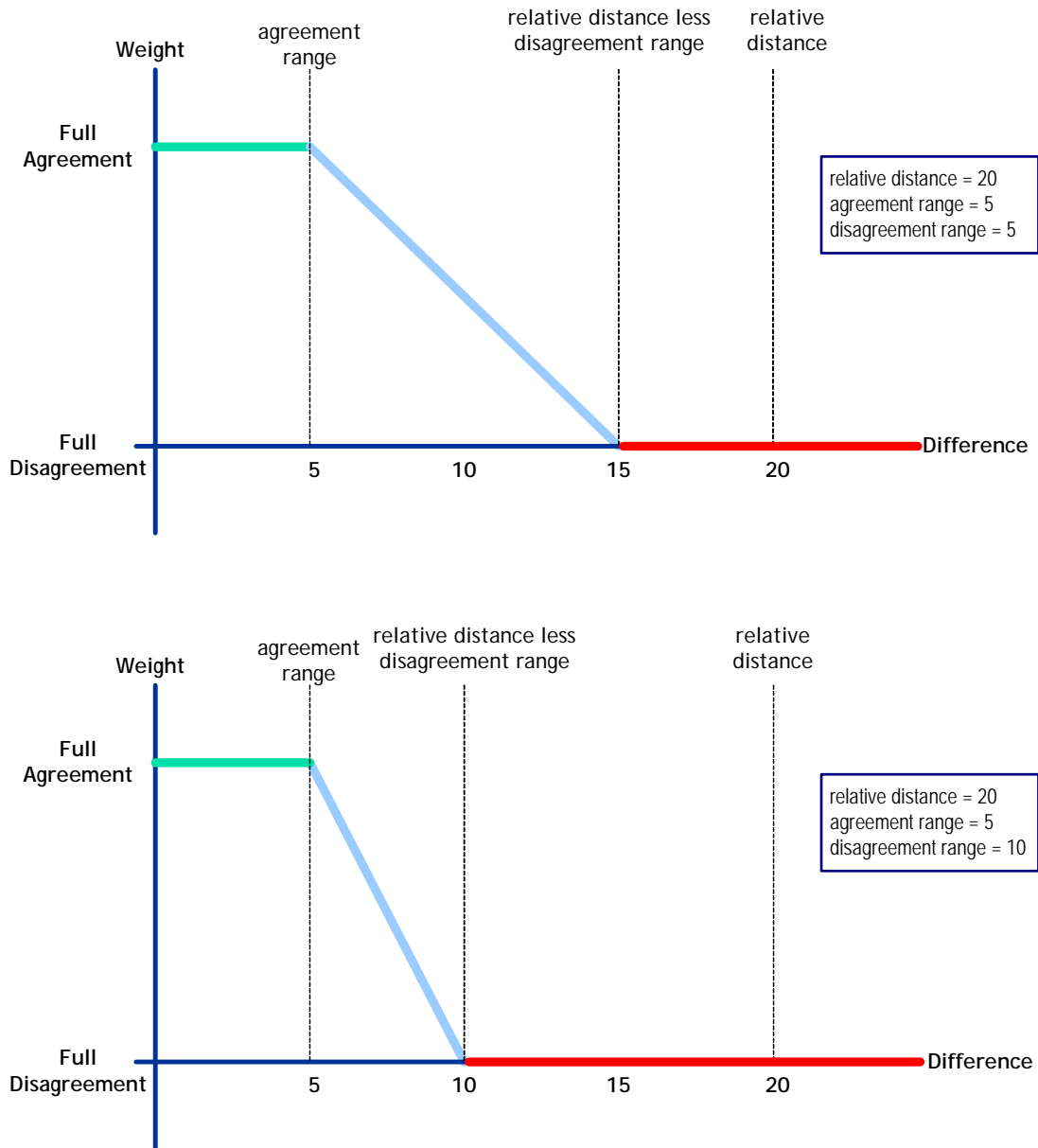
This date comparison function takes the second, minute, hour, day, month, and year into account for matching. If relative distance calculation is specified, the relative distance is specified in seconds.

Prorated Comparison Function (p)

The prorated comparison function uses a relative distance calculation and allows you to specify how quickly the agreement weight between two fields decreases. Matching weights are assigned with a linear adjustment according to the parameters you specify. You specify an initial agreement range. If the difference between two fields falls within that range, the fields are considered a complete match. You also specify a disagreement range ending with the relative distance. If the difference between two fields falls within that range, the fields are considered a non-match. When the difference between the fields falls between those two ranges, they are considered to be partial matches and the agreement weight is adjusted linearly. Any difference greater than the relative distance is always considered a non-match.

Figure 5 illustrates how weighting is adjusted per the parameters you define. In these diagrams, the green line indicates full agreement, the light blue line indicates prorated agreement, and the red line indicates full disagreement. The diagrams illustrate how increasing the disagreement weight causes the prorated agreement weight to decrease more sharply.

Figure 5 Prorated Linear Adjustment Comparison



The prorated comparison function takes the parameters listed in Table 46.

Table 46 Prorated Comparison Function Parameters

Parameter	Description
relative-distance	The greatest difference between two numbers at which they can still be considered a match or partial match.
agreement-range	The greatest difference between two numbers at which they are considered a full match. This number must be less than the relative distance.

Table 46 Prorated Comparison Function Parameters

Parameter	Description
disagreement-range	<p>This number indicates the minimum difference at which two numbers are considered a non-match and shortens or lengthens the weighting scale. To find this difference, the match engine subtracts this value from the relative distance. If the fields differ by that amount or greater, they are considered to be a non-match.</p> <p>The weighting scale decreases in size as the value of the full-disagreement parameter increases (see diagram).</p>

J.2 Comparison Function Options

The options listed below can be used in conjunction with the above string comparison function to give them more functionality. For example, you can use an 'ufl' string comparison function that refers to first name comparison function with the possibility to switch fields if the first one disagree

- **I**—This is a major inversion option that allows for field transpositions. If two compared fields do not match, this option lets the match engine know to compare the original field in the first record with the next field in the second record. If those fields agree, the match engine assigns the full agreement weight and switches the fields.
- **i**—This is a minor inversion option similar to the major inversion (I) described above. This option only assigns one-half of the full agreement weight if the transposed fields match.
- **x**—If two or more fields with this option match, their weight is doubled; but if any of the fields with this option disagree, the weight is not doubled.
- **k**—This option can be used with the 'x' option to give more importance to one field. Specifying this option on a field tells the match engine to double the match weight for a sub-group of fields with the 'x' option by doubling the weight as soon as it comes to the field with the 'k' option.

Glossary

agreement weight

A positive weight assigned to a match field if the values agree between two fields.

Blocking Query

The query used during matching to search the database for possible matches to a new or updated record. This query makes multiple passes against the database using different combinations of criteria. The criteria is defined in the Candidate Select file.

Candidate Select file

The eIndex configuration file that defines the queries you can perform from the Enterprise Data Manager (EDM) and the queries that are performed for matching.

candidate selection

The process of performing the blocking query for match processing. See *Blocking Query*.

candidate selection pool

The group of possible matching records that are returned by the blocking query. These records are weighed against the new or updated record to determine the probability of a match.

comparison function

A command specific to the SeeBeyond Match Engine that specifies how two fields are compared. Comparison functions are specified for each match field in the match configuration file.

disagreement weight

A negative weight assigned to a match field if the field values disagree between two fields.

duplicate threshold

The matching probability weight at or above which two records are considered to potentially represent the same person.

enterprise object

A complete object representing a specific entity, including the SBR and all associated system objects.

ePath

A definition of the location of a field in an eIndex object. Also known as the *element path*.

EUID

The enterprise-wide unique identification number assigned to each member profile in the master index. This number is used to cross-reference member profiles and to uniquely identify each member throughout your organization.

eIndex Manager Service

An eIndex component that provides an interface to all eIndex components and includes the primary functions of eIndex. This component is configured by the Threshold file.

field IDs

An identifier for each field that is defined in the standardization engine and referenced from the Match Field file.

master person index

A database application that stores and cross-references information about the members in a business organization, regardless of the computer system from which the information originates.

Match Field File

An eIndex configuration file that defines normalization, parsing, phonetic encoding, and the match string for an instance of eIndex. The information in this file is dependent on the type of data being standardized and matched.

match pass

During matching several queries are performed in turn against the database to retrieve a set of possible matches to an incoming record. Each query execution is called a match pass.

match string

The data string that is sent to the match engine for probabilistic weighting. This string is defined by the match system object defined in the Match Field file.

match type

An indicator specified in the **MatchingConfig** section of the Match Field file that tells the SeeBeyond Match Engine which matching rules in the match configuration file to use for weighting.

matching probability weight

An indicator of how closely two records match one another. The weight is generated using matching algorithm logic, and is used to determine whether two records represent the same member.

Matching Service

An eIndex component that defines the matching process. This component is configured by the Match Field file.

matching threshold

The lowest matching probability weight at which two records can be considered a match of one another.

matching weight or match weight

See *matching probability weight*.

member

Any person who participates within your business enterprise. A member could be a customer, employee, patient, and so on.

member profile

A set of information that describes characteristics of one member. A profile includes demographic and identification information about a member and contains a single best record and one or more system records.

normalization

A component of the standardization process by which the value of a field is converted to a standard version, such as changing a nickname to a common name.

object

A component of a member profile, such as a person object, which contains all of the demographic data about a person, or an address object, which contains information about a specific address type for a person.

parsing

A component of the standardization process by which a freeform text field is separated into its individual components, such as separating a street address field into house number, street name, and street type fields.

phonetic encoding

A standardization process by which the value of a field is converted to its phonetic version.

phonetic search

A search that returns phonetic variations of the entered search criteria, allowing room for misspellings and typographic errors.

potential duplicates

Two different enterprise objects that have a high probability of representing the same entity. The probability is determined using matching algorithm logic.

probabilistic weighting

A process during which two records are compared for similarities and differences, and a matching probability weight is assigned based on the fields in the match string. The higher the weight, the higher the likelihood that two records match.

probability weight

See *matching probability weight*.

Query Builder

An eIndex component that defines how queries are processed. The user-configured logic for this component is contained in the Candidate Select file.

SBR

See *single best record*.

single best record

Also known as the SBR, this is the best representation of a member's information. The SBR is populated with information from all source systems based on the survivor strategies defined for each field. It is a part of a member's enterprise object and is recalculated each time a system record is updated.

standardization

The process of parsing, normalizing, or phonetically encoding data in an incoming or updated record. Also see *normalization*, *parsing*, and *phonetic encoding*.

standardization type

An indicator specified in the **StandardizationConfig** section of the Match Field file that tells the SeeBeyond Match Engine how to standardize information.

survivor calculator

The logic that determines which fields from which source systems should be used to populate the SBR.

survivorship

Refers to the logic that determines which fields are used to populate the SBR. The survivor calculator defines survivorship.

system

A computer application within your company where information is entered about the members in eIndex and that shares this information with eIndex (such as a registration system). Also known as "source system" or "external system".

system object

A record received from a local system. The fields contained in system objects are used in combination to populate the SBR. The system objects for one person are part of that person's enterprise object.

Threshold file

An eIndex configuration file that specifies duplicate and match thresholds, EUID generator parameters, and which blocking query defined in the Candidate Select file to use for matching.

Index

Numerics

- 1P address token 59
- 2P address token 59

A

- A1 address token 58
- address clues file 54
 - column descriptions 55
- address constants file 53
- address data type
 - input and output patterns 57
 - match configuration file 53
 - match string 52, 65
 - phonetic encoding 64
 - standardization files 53
 - standardization structure 52
- address field identifiers 27
- address master clues file 55
 - column descriptions 56
- address match types 29
- address patterns file 57
 - classes 60
 - column descriptions 57–58
 - modifiers 60
 - priority indicator 61
 - tokens 58
- Address standardization type 29
- addressClueAbbrevUS.dat 54
 - column descriptions 55
- addressConstants.cfg 53
- addressInternalConstants.cfg 53
- addressMasterCluesUS.dat 55
 - column descriptions 56
- addressPatternsUS.dat 57
 - column descriptions 57–58
- adjectiveMax parameter 71
- adjectives key type file 71
- advanced uncertainty comparison function 22, 96
- agreement weights 13, 15, 20
- AJT business name token 80
- alias key type file 71
 - column descriptions 72
- AliasList field identifier 28

- AliasList match type 29
- ALT business name token 80, 81
- AM address token 58
- AND business name token 80
- association key type file 72
 - column descriptions 72
- assocMax parameter 71
- AssocTypeKeyword field identifier 28
- AssocTypeKeyword match type 29
- AST business name token 80, 81
- AU address token 58

B

- B address pattern class 60
- b1 comparison function 22, 96
- b2 comparison function 22, 96
- BCT business name token 80
- BD address token 59
- BI address token 59
- bigram comparison functions 95–96
 - standard bigram 22, 96
 - transposition bigram 22, 96
- bizAdjectivesTypeKeys.dat 71
- bizAliasTypeKeys.dat 71
 - column descriptions 72
- bizAssociationTypeKeys.dat 72
 - column descriptions 72
- bizBusinessGeneralTerms.dat 73
- bizCityorStateTypeKeys.dat
 - column descriptions 73
- bizCityorStateTypekeys.dat 73
- bizCompanyFormerNames.dat 74
 - column descriptions 74
- bizCompanyMergerNames.dat 74
 - column descriptions 74
- bizCompanyPrimaryNames.dat 75
 - column descriptions 75
- bizConnectorTokens.dat 75
- bizConstants.cfg 70
- bizCountryTypeKeys.dat 76
 - column descriptions 76
- bizIndustryCategoryCode.dat 76
 - column descriptions 77
- bizIndustryTypeKeys.dat 77
 - column descriptions 77
- bizOrganizationTypeKeys.dat 78
 - column descriptions 78
- bizPatterns.dat 78
 - column descriptions 79
- bizRemoveSpecChars.dat 81
- blnkdex parameter 38
- blocking query 25, 26, 32, 33
- BN address token 59

- BoxDescript field identifier 27
 - BoxIdentif field identifier 27
 - BP address token 58
 - BS address token 59
 - BT address token 59
 - BU address token 58
 - business constants file 70
 - business former name reference file 74
 - column descriptions 74
 - business name data type
 - input and output patterns 78
 - match configuration file 69–70
 - match string 68
 - phonetic encoding 85–86
 - standardization files 70
 - standardization structure 69
 - business name field identifiers 28
 - business name match types 29
 - business patterns file 78
 - column descriptions 79
 - tokens 79
 - BusinessName standardization type 29
 - businessOrRelated.dat 43
 - business-related category file 43
 - BX address token 59
 - BY address token 59
- C**
- c comparison function 23, 97
 - Candidate Select file 25, 32, 33
 - candidate selection pool 25, 26
 - category files 17
 - Char match type 30
 - charsMax parameter 71
 - city or state key type file 73
 - column descriptions 73
 - cityMax parameter 70
 - clueArraySize parameter 54
 - clues files 17
 - CNT business name token 80
 - column-name 49, 66, 86
 - comparison functions 19
 - advanced uncertainty 22, 96
 - b1 22, 96
 - b2 22, 96
 - bigram 22, 95–96
 - c 23, 97
 - date 23, 100–102
 - minute 102
 - second 102
 - date, day 23, 101
 - date, hour 23, 102
 - date, minute 23
 - date, month 23, 101
 - date, second 23
 - date, year 23, 101
 - dD 23, 101
 - dH 23, 102
 - dM 23, 101
 - dm 23, 102
 - ds 23, 102
 - dY 23, 101
 - exact 23, 97
 - n 23, 99
 - nI 23, 99
 - nR 23, 99
 - nS 23, 99
 - numeric 23, 98–100
 - numeric integer 23, 99
 - numeric real 23, 99
 - numeric SSN 23, 99
 - options 104
 - overview 22–23
 - p 23, 102
 - prorated 23, 102
 - transposition bigram 22, 96
 - types 95
 - u 22, 96
 - ua 22, 96
 - uf 22, 97
 - ul 22, 97
 - un 22, 97
 - uncertainty 22, 96–97, ??–97
 - uncertainty, first name 22, 97
 - uncertainty, house number 22, 97
 - uncertainty, last name 22, 97
 - uncertainty, simplified 22, 97
 - us 22, 97
 - components 14
 - configuration files 14
 - match engine 15
 - standardization engine 14
 - configuration files
 - about 17
 - modifying 30
 - types 17
 - configuration files, about 14
 - conjdex parameter 37
 - conjunction reference file 38
 - connector tokens reference file 75
 - constants files 18
 - country key type file 76
 - column descriptions 76
 - countryMax parameter 70
 - CST business name token 80
 - CTT business name token 80

D

DA address token 59
dashSize parameter 38
data analysis
 and initial load 88
 data extract 88
data types 14
database 36, 52, 69
date
 day comparison function 23, 101
 hour comparison function 23, 102
 match types 29
 minute comparison function 23
 month comparison function 23, 101
 second comparison function 23
 year comparison function 23
date comparison functions 100–102
 parameters 101
date, minute comparison function 102
date, second comparison function 102
date, year comparison function 101
DateDays match type 30
DateHours match type 30
DateMinutes match type 30
DateMonths match type 30
DateSeconds match type 30
DB address token 59
dD comparison function 23, 101
dH comparison function 23, 102
directionOutputFieldSize parameter 54
disagreement weights 13, 15, 20
dM comparison function 23, 101
dm comparison function 23, 102
DR address token 59
ds comparison function 23, 102
duplicate threshold 88
dY comparison function 23, 101

E

EI address token 59
eIndex configuration
 Candidate Select 32, 33
 Match Field 31–34, 35, 44, 61, 68, 82
 Object Definition 31, 32, 33
eIndex Project 25
encoding-type 48, 65, 86
Enterprise Designer 32, 33
ePath 47, 48, 64, 84, 85
EX address token 59
Exac match type 30
exact comparison function 23, 97
extensionOutputFieldSize parameter 54

extrainfoOutputFieldSize parameter 54

F

FC address token 59
field identifiers 26–28
 address 27
 AliasList 28
 AssocTypeKeyword 28
 BoxDescript 27
 BoxIdentif 27
 business name 28
 FirstName 27
 HouseNumber 27
 IndustrySectorList 28
 IndustryTypeKeyword 28
 LastName 27
 MiddleName 27
 OrgTypeKeyword 28
 OrigStreetName 27
 person name 27
 PrimaryName 28
 PropDesPrefDirection 27
 PropDesPrefType 28
 PropDesSufDirection 27
 PropDesSufType 28
 RuralRouteDescript 27
 RuralRouteIdentif 27
 StreetNamePrefDirection 27
 StreetNamePrefType 28
 StreetNameSufDirection 27
 StreetNameSufType 27
 Url 28
first name category file 39
 column descriptions 39
FirstName
 field identifier 27
 match type 29
free-form-text-to-standardize 63, 84
fully qualified field name 49, 66, 86

G

general terms reference file 73
generational suffix category file 40
 column descriptions 40
genTermMax parameter 71
GLU business name token 80

H

H address pattern class 60
H1 address token 59

Index

H2 address token 59
HN address token 60
HouseNumber
 field identifier 27
 match type 29
HR address token 59
HS address token 60
hyphenated name category file 38
 column descriptions 39

I

IDT business name token 80, 81
IDT-AJT business name token 80
imageSize parameter 54
industry key type file 77
 column descriptions 77
industry sector reference file 76
 column descriptions 77
industryMax parameter 70
IndustrySectorList
 field identifier 28
 match type 29
IndustryTypeKeyword
 field identifier 28
 match type 29
input patterns
 address data 57
 business names 78
Integer match type 30
internal match constants file 19
inversion option 104

J

jrsrcdex parameter 37

K

key type files 18

L

last name prefix category file 41
LastName field identifier 27
LastName match type 29

M

match configuration file 19, 35
 address data type 53
 business name data type 69–70
 column descriptions 20–21

 file format 20–21
 person name data type 36
match constants file 19, 24
 parameters 24
match constants file, internal 19
match engine 15
 configuring 34
 specifying 34
match engine components 14
 configuration files 14
 match engine 15
 standardization engine 14
match field configuration 31, 33
Match Field file 25, 26, 27, 31–34, 35, 44, 52, 61, 68, 82
match process 13, 25, 26
match string 25, 26, 32, 33
 address data type 52, 65
 address sample 66
 business name data type 68
 business sample 86
 person name data type 35, 48
 person sample 48
match threshold 88
match types 28
 address 29
 AliasList 29
 AssocTypeKeyword 29
 business name 29
 Char 30
 DateDays 30
 DateHours 30
 DateMinutes 30
 DateMonths 30
 dates 29
 DateSeconds 30
 Exac 30
 FirstName 29
 HouseNumber 29
 IndustrySectorList 29
 IndustryTypeKeyword 29
 Integer 30
 LastName 29
 miscellaneous 30
 Numeric 30
 OrgTypeKeyword 29
 person name 29, 37
 PrimaryName 29
 pro 30
 Real 30
 SSN 30
 StreetDir 29
 StreetName 29
 StreetType 29
 string 30

- Url 29
- match-columns 32, 33
- matching configuration files 19
- matching probability 13, 15
- matching probability type 20
- matching probability weights 19
 - formulation 15
- matching rules 20
- MatchingConfig 26, 32, 33, 48, 65, 86
- match-type 49, 66, 87
- maxFreqTableSize parameter 24
- maxNumberTables parameter 24
- maxPattSize parameter 54
- maxWords parameter 54
- mcls parameter 24
- MEFAConfig 50, 67, 87
- merged business name category file 74
 - column descriptions 74
- mergerMax parameter 71
- MiddleName field identifier 27
- miscellaneous match types 30
- missing values 21
- MP address token 59
- m-probability 13, 15, 20

N

- N address pattern class 60
- n comparison function 23, 99
- NA address token 60
- nameOutputFieldSize parameter 54
- NAT business name token 80
- NB address token 60
- NF business name token 80, 81
- NFC business name token 80
- NFG business name token 80
- nFields parameter 24
- NF-NF business name token 81
- NF-PN business name token 80
- nI comparison function 23, 99
- nickdex parameter 38
- NL address token 59, 60
- normalization 14, 31–32
- normalization structure 31
 - person data type 45
 - person data type sample 45
- normalization-targets 47
- nR comparison function 23, 99
- nS comparison function 23, 99
 - parameters 99
- NU address token 59
- null fields 21
- numberOutputFieldSize parameter 54
- numeric comparison function 23, 99

- parameters 99
- numeric comparison functions 98–100
- numeric integer comparison function 23, 99
- Numeric match type 30
- numeric real comparison function 23, 99
- numeric SSN comparison function 23, 99
- NYSIS 36, 48, 65, 86

O

- Object Definition 31, 32, 33
- object structure
 - address data type 52, 69
 - person data type 36
- Object Type Definition 32, 33
- occupational suffix category file 41
- organization key type file 78
 - column descriptions 78
- orgMax parameter 71
- OrgTypeKeyword
 - field identifier 28
 - match type 29
- OrigStreetName field identifier 27
- ORT business name token 80, 81
- OT address token 59
- OTD 32, 33
- output patterns
 - address data 57
 - business names 78

P

- P address pattern class 60
- p comparison function 23, 102
- P1 address token 60
- P2 address token 60
- parsing 14
- patternArraySize parameter 54
- patternMax parameter 71
- patterns files 18, 32
 - address data type 57
 - person data type 41
- PD address token 60
- person constants file 37
- person name data type
 - match string 35
 - match types 37
 - normalized fields 36
 - phonetic encoding 47
 - phonetic fields 36
 - standardization files 37–43
- person name field identifiers 27
- person name match types 29
- person name patterns file 41

personConjonUS.dat 38
 personConstants.cfg 37
 personFirstNameDash.dat 38
 column descriptions 39
 personFirstNameUS.dat 39
 column descriptions 39
 personGenSuffixUS.dat 40
 column descriptions 40
 personLastNamePrefixUS.dat 41
 PersonName standardization type 29
 personNamePatt.dat 41
 personOccupSuffixUS.dat 41
 personRemoveSpecChars.dat 41
 personThreeUS.dat 42
 personTitleUS.dat 42
 column descriptions 42
 personTwoUS.dat 43
 phonetic encoding 14, 33
 address data type 64
 business name data type 85–86
 person name data type 47
 phonetic structure
 address data type sample 64
 business name data type sample 85
 person name data 47
 phoneticized-object-field-id 48, 65, 85
 phoneticized-target-field-name 48, 65, 85
 phoneticize-fields 48, 65, 85
 PN-NF business name token 80
 PN-PN business name token 80
 PNT business name token 80, 81
 predex parameter 38
 prefixOutputFieldSize parameter 54
 primary business name reference file 75
 column descriptions 75
 primaryMax parameter 70
 PrimaryName
 field identifier 28
 match type 29
 pro match type 30
 probabilistic weighting 25
 probability type 20
 PropDesPrefDirection field identifier 27
 PropDesPrefType field identifier 28
 PropDesSufDirection field identifier 27
 PropDesSufType field identifier 28
 prorated comparison function 23, 102
 parameters 103
 prorated weighting illustration 102
 PT address token 59, 60
 ptrndex1 parameter 38

R

R address pattern class 60
 Real match type 30
 reference files 18
 relative distance
 calculations 98, 100
 illustration 98, 100
 RN address token 60
 RR address token 59, 60
 RuralRouteDescript field identifier 27
 RuralRouteIdentif field identifier 27

S

SA address token 59
 SD address token 60
 SeeBeyond Web site 12
 SEP business name token 80
 SEP-GLC business name token 80
 SEP-GLD business name token 80
 skpdex parameter 38
 Soundex 36, 48, 65, 86
 source-mapping 46
 special characters reference file 41, 81
 SSN match type 30
 ST address token 60
 standardization 13, 25, 32–33
 address data type 62
 business name data type 83
 configuration files 17
 normalization 14
 parsing 14
 phonetic encoding 14
 standardization configuration 31
 standardization engine 14
 configuring 34
 specifying 34
 standardization files
 address data type 53
 business name data type 70
 category 17
 clues 17
 constants 18
 key type 18
 patterns 18
 person name data type 37–43
 reference 18
 standardization process 26
 standardization structure
 address data type 52, 62
 address data type sample 62
 business name data type 69, 83
 business name data type sample 83

- standardization types 28
 - Address 29
 - BusinessName 29
 - default 29
 - PersonName 29
- StandardizationConfig 31, 32, 33, 44, 62, 82
- standardization-type 46, 64, 84
- standardized-object-field-id 47, 64, 85
- standardized-target-field-name 47, 64, 85
- standardized-targets 64, 84
- StreetDir match type 29
- StreetName match type 29
- StreetNamePrefDirection field identifier 27
- StreetNamePrefType field identifier 28
- StreetNameSufDirection field identifier 27
- StreetNameSufType field identifier 27
- StreetType match type 29
- string comparison 98, 100
- String match type 30
- structures-to-normalize 46
- sufdex parameter 38
- suffixOutputFieldSize parameter 54
- survivorship 25

T

- T address pattern class 60
- target fields 32
- target-mapping 47, 64, 84
- TB address token 60
- thredex parameter 38
- Threshold file 25
- titldex parameter 38
- title category file 42
 - column descriptions 42
- tokens 18
 - address data type 58
 - in business patterns 79
- transposition bigram comparison function 96
- transposition bigram comparison functions
 - transposition bigram 22
- twodex parameter 38
- TY address token 59
- typeOutputFieldSize parameter 54

U

- u comparison function 22, 96
- u probability 13
- ua comparison function 22, 96
- uf comparison function 22, 97
- ul comparison function 22, 97
- un comparison function 22, 97
- uncertainty comparison function 96

- uncertainty comparison functions 22, 96–97, ??–97
- uncertainty, first name comparison function 22, 97
- uncertainty, house number comparison function 22, 97
- uncertainty, last name comparison function 22, 97
- uncertainty, simplified comparison function 22, 97
- unmatching probability 13, 15
- unnormalized-source-field-name 47
- unnormalized-source-fields 46
- unphoneticized-source-field-name 48, 65, 85
- unstandardized-source-field-name 64, 84
- unstandardized-source-fields 64, 84
- u-probability 15, 20
- URL business name token 80, 81
- Url field identifier 28
- Url match type 29
- us comparison function 22, 97

W

- W address pattern class 60
- WD address token 59, 60
- WI address token 59, 60
- words parameter 37

X

- XN address token 60