



APELON

BECAUSE TERMINOLOGY MATTERS

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DTS FHIR Configuration Guide

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A. Introduction

The FHIR Configuration File allows users to set specific configuration values for FHIR-related parameters within DTS. The parameters have default values within DTS, but the parameter values can be overridden by settings within the FHIR Configuration File. This document discusses how the FHIR Configuration File is configured against the Application Server and what parameters are contained in the FHIR Configuration File.

B. FHIR Configuration File

A copy of the default FHIR Configuration File, 'FhirConfiguration.xml', is located in the following directory, where <DTS_HOME> is the DTS installation path:

<DTS_HOME>\lib\conf\

The copy of the 'FhirConfiguration.xml' located in this directory is not used by DTS. It is only present as a *template* for user modifications. Editing the values of the 'FhirConfiguration.xml' file in this location will not make any changes to the FHIR Server in DTS. For the changes to be made, the user must place the modified copy of the file in the correct directory according to the Application Server on which their DTS instance is running.

B.1 Installing a New FHIR Configuration

Locate the 'FhirConfiguration.xml' file, in [<DTS_HOME>\lib\conf\]. Modify the file as desired, then copy and paste the file into the working directory of the user's Application Server as described below.

The Application Server's "Working" directories where the updated 'FhirConfiguration.xml' file needs to be copied and placed are the following:

JBoss EAP:

..\jboss-eap-7.1\bin\

WildFly 12:

..\wildfly-12.0.0.Final\bin\

GlassFish:

..\glassfish3\glassfish\domains\domain1\config\

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are written to R4 sequence (version 4.0.1)

Note: In order for the Application Server to register the newly placed xml file, the Application Server must be restarted. Restarting the Application Server can be accomplished in a variety of ways. Refer to the DTS 4 Installation Guide for directions on restarting the Application Server.

B.2 Implementation specific parameters explained

Within the ‘FhirConfiguration.xml’, there are six different parameters users can choose to modify. Below are descriptions, the default values, and examples for each parameter.

Change the parameter value by modifying the ‘value’ attribute associated with the parameter element, i.e. `value="2000"`

B.2.1 defaultExpansionCount

```
<parameter name="defaultExpansionCount" value="1000" />
```

This parameter refers to the default number of codes that will be returned in a ValueSet \$expand operation when no ‘count’ modifier is present on the request. Ex. when performing a ValueSet \$expand operation, only the first 1,000 codes will be returned by default.

B.2.2 maximumExpansionCount

```
<parameter name="maximumExpansionCount" value="10000" />
```

This parameter refers to the maximum number of codes that will be returned in a ValueSet \$expand operation. Ex. when performing a ValueSet \$expand with a count modifier equal to 11,000 the first 10,000 codes of that ValueSet will be returned. Attempting to perform a ValueSet \$expand with a count modifier greater than the *maximumExpansionCount* will return an error indicating the request is too costly.

B.2.3 maximumSearchCount

```
<parameter name="maximumSearchCount" value="50" />
```

This parameter refers to the maximum number of resources that will be returned in a FHIR Search. Ex. when performing a search for all CodeSystems in the database only the first 50 CodeSystems will be returned. Attempting to perform a search when the number of resulting resources is greater than the *maximumSearchCount* will return an error. Attempting to perform a search with a count modifier greater than the *maximumSearchCount* will also return an error.

B.2.4 searchOptimizationLimit

```
<parameter name="searchOptimizationLimit" value="2500" />
```

The *searchOptimizationLimit* is a parameter used in multi-parameter FHIR Searches. For multi-parameter FHIR Searches, an associated API is called for each parameter within the FHIR Search query. After each API call, there is an interim number of results. The *searchOptimizationLimit* is used to compare against the interim number of results and determine whether subsequent API calls should be made, or an in-memory test is completed against the interim list of results. If the interim number of results is fewer than the *searchOptimizationLimit*, then an in-memory test is completed against the interim results list. If the interim number of results is greater than or equal to the *searchOptimizationLimit*, then the associated API is called for the next parameter in the query.

The default value of 2500 was determined empirically to provide the best search performance for multi-attribute FHIR Searches in a variety of client, server, and database configurations. It is not recommended that users modify this default value. Changing this value to a smaller number may cause increased times in retrieving results for multi-attribute searches. Increasing the value to a larger number is unlikely to affect FHIR Search performance.

B.2.5 codeSystemPrefix

```
<parameter name="codeSystemPrefix" value="http://www.apelon.com/CodeSystem/" />
```

This parameter determines the default CodeSystem (Namespace) URL prefix used for determining the DTS Namespace Display Name in the DTS Database. When attempting to Post a CodeSystem, if the CodeSystem URL starts with the prefix specified then the DTS Namespace Display Name is determined using a set of rules described below. Ex. performing a CodeSystem Post with a CodeSystem URL value equal to

‘http://www.apelon.com/CodeSystem/TestCodeSystem’ will set the DTS Namespace Display Name to ‘TestCodeSystem’.

The CodeSystem's name is set as one of the following when performing a POST or PUT operation:

1. If the CodeSystem URL string starts with the codeSystemPrefix, then set the DTS Namespace Display Name to the remainder of the URL string unless there is no remainder.
 - i. If there is no remainder but there is a “/” in the URL string, then set the DTS Namespace Display Name to the text after the last “/” in the URL string.
 - a. If there is no text after the last “/” then set the DTS Namespace Display Name to the entire URL string.
 - ii. If there is no remainder and there is no “/” in the URL string, then set the DTS Namespace Display Name to the entire URL string.

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2. If the CodeSystem URL string does not begin with the codeSystemPrefix, then:
 - i. If there is a “/” in the URL string, then set the DTS Namespace Display Name to the text after the last “/” in the URL string.
 - a. If there is no text after the last “/” then set the DTS Namespace Display Name to the entire URL string.
 - ii. If there is no “/” in the URL string, then set the DTS Namespace Display Name to the entire URL string.

a. CodeSystem Prefix Examples

Rule 1

codeSystemPrefix: http://apelon.com/Prefix1/CodeSystem/

CodeSystem URL: http://apelon.com/Prefix1/CodeSystem/TestCodeSystem

DTS Namespace Display Name: TestCodeSystem

Explanation: This uses Rule 1. The CodeSystem URL string starts with the codeSystemPrefix, so the DTS Namespace Display Name is set to the remainder of the URL string.

Rule 1.i

codeSystemPrefix: http://apelon.com/Prefix1.i/CodeSystem

CodeSystem URL: http://apelon.com/Prefix1.i/CodeSystem

DTS Namespace Display Name: CodeSystem

Explanation: This uses Rule 1.i. The CodeSystem URL string starts with the codeSystemPrefix, but there is no remainder (i.e. the CodeSystem URL string matches the codeSystemPrefix exactly). Since there is a “/” in the URL string, the DTS Namespace Display Name is set to the text after the last “/” in the URL string.

Rule 1.i.a

codeSystemPrefix: http://apelon.com/Prefix1.i.a/CodeSystem/

CodeSystem URL: http://apelon.com/Prefix1.i.a/CodeSystem/

DTS Namespace Display Name: http://apelon.com/Prefix1.i.a/CodeSystem/

Explanation: This uses Rule 1.i.a. The CodeSystem URL string starts with the codeSystemPrefix, but there is no remainder (i.e. the CodeSystem URL string matches the codeSystemPrefix exactly). Since there is a “/” in the URL string and there is no text after the last “/”, the DTS Namespace Display Name is set to the entire URL string.

Rule 1.ii

codeSystemPrefix: Prefix1.iiCodeSystem

CodeSystem URL: Prefix1.iiCodeSystem

DTS Namespace Display Name: Prefix1.iiCodeSystem

Explanation: This uses Rule 1.ii. The CodeSystem URL string starts with the codeSystemPrefix, but there is no remainder (i.e. the CodeSystem URL string matches the codeSystemPrefix exactly). Since there is no “/” in the URL string, the DTS Namespace Display Name is set to the entire URL string.

Rule 2.i

codeSystemPrefix: http://apelon.com/Prefix2.i/CodeSystem/

CodeSystem URL: http://apelon.com/Prefix2.i/TestCodeSystem

DTS Namespace Display Name: TestCodeSystem

Explanation: This uses Rule 2.i. The CodeSystem URL string does not begin with the codeSystemPrefix. Since there is a “/” in the URL string, the DTS Namespace Display Name is set to the text after the last “/” in the URL string.

Rule 2.i.a

codeSystemPrefix: http://apelon.com/Prefix2.i.a/CodeSystem/

CodeSystem URL: http://apelon.com/Prefix2.i.a/TestCodeSystem/

DTS Namespace Display Name: http://apelon.com/Prefix2.i.a/TestCodeSystem/

Explanation: This uses Rule 2.i.a. The CodeSystem URL string does not begin with the codeSystemPrefix. Since there is a “/” in the URL string but there is no text after the last “/” the DTS Namespace Display Name is set to the entire URL string.

Rule 2.ii

codeSystemPrefix: http://apelon.com/Prefix2.ii/CodeSystem/

CodeSystem URL: TestCodeSystem

DTS Namespace Display Name: TestCodeSystem

Explanation: This uses Rule 2.ii. The CodeSystem URL string does not begin with the codeSystemPrefix. Since there is not a “/” in the URL string the DTS Namespace Display Name is set to the entire URL string.

B.2.6 valueSetPrefix

```
<parameter name="valueSetPrefix" value="http://www.apelon.com/ValueSet/" />
```

This parameter determines the default ValueSet (Subset) URL prefix used for determining the DTS Subset Display Name in the DTS Database. When attempting to Post a ValueSet, if the ValueSet URL starts with the prefix specified then the DTS Subset Display Name is determined using a set of rules described below. Ex. performing a ValueSet Post with a ValueSet URL value

equal to 'http://www.apelon.com/ValueSet/TestValueSet' will set the DTS Subset Display Name to 'TestValueSet'.

The ValueSet's name is set as one of the following when performing a POST or PUT operation:

1. If the ValueSet URL string starts with the valueSetPrefix, then set the DTS Subset Display Name to the remainder of the URL string unless there is no remainder.
 - i. If there is no remainder but there is a "/" in the URL string, then set the DTS Subset Display Name to the text after the last "/" in the URL string.
 - a. If there is no text after the last "/" then set the DTS Subset Display Name to the entire URL string.
 - ii. If there is no remainder and there is no "/" in the URL string, then set the DTS Subset Display Name to the entire URL string.
2. If the ValueSet URL string does not begin with the valueSetPrefix, then:
 - i. If there is a "/" in the URL string, then set the DTS Subset Display Name to the text after the last "/" in the URL string.
 - a. If there is no text after the last "/" then set the DTS Subset Display Name to the entire URL string.
 - ii. If there is no "/" in the URL string, then set the DTS Subset Display Name to the entire URL string.

a. ValueSet Prefix Examples

Rule 1

valueSetPrefix: http://apelon.com/Prefix1/ValueSet/

ValueSet URL: http://apelon.com/Prefix1/ValueSet/TestValueSet

DTS Subset Display Name: TestValueSet

Explanation: This uses Rule 1. The ValueSet URL string starts with the valueSetPrefix, so the DTS Subset Display Name is set to the remainder of the URL string.

Rule 1.i

valueSetPrefix: http://apelon.com/Prefix1.i/ValueSet

ValueSet URL: http://apelon.com/Prefix1.i/ValueSet

DTS Subset Display Name: ValueSet

Explanation: This uses Rule 1.i. The ValueSet URL string starts with the valueSetPrefix, but there is no remainder (i.e. the ValueSet URL string matches the valueSetPrefix exactly). Since there is a "/" in the URL string, the DTS Subset Display Name is set to the text after the last "/" in the URL string.

Rule 1.i.a

valueSetPrefix: http://apelon.com/Prefix1.i.a/ValueSet/

ValueSet URL: http://apelon.com/Prefix1.i.a/ValueSet/

DTS Subset Display Name: http://apelon.com/Prefix1.i.a/ValueSet/

Explanation: This uses Rule 1.i.a. The ValueSet URL string starts with the valueSetPrefix, but there is no remainder (i.e. the ValueSet URL string matches the valueSetPrefix exactly). Since there is a “/” in the URL string and there is no text after the last “/”, the DTS Subset Display Name is set to the entire URL string.

Rule 1.ii

valueSetPrefix: Prefix1.iiValueSet

ValueSet URL: Prefix1.iiValueSet

DTS Subset Display Name: Prefix1.iiValueSet

Explanation: This uses Rule 1.ii. The ValueSet URL string starts with the valueSetPrefix, but there is no remainder (i.e. the ValueSet URL string matches the valueSetPrefix exactly). Since there is no “/” in the URL string, the DTS Subset Display Name is set to the entire URL string.

Rule 2.i

valueSetPrefix: http://apelon.com/Prefix2.i/ValueSet/

ValueSet URL: http://apelon.com/Prefix2.i/TestValueSet

DTS Subset Display Name: TestValueSet

Explanation: This uses Rule 2.i. The ValueSet URL string does not begin with the valueSetPrefix. Since there is a “/” in the URL string, the DTS Subset Display Name is set to the text after the last “/” in the URL string.

Rule 2.i.a

valueSetPrefix: http://apelon.com/Prefix2.i.a/ValueSet/

ValueSet URL: http://apelon.com/Prefix2.i.a/TestValueSet/

DTS Subset Display Name: http://apelon.com/Prefix2.i.a/TestValueSet/

Explanation: This uses Rule 2.i.a. The ValueSet URL string does not begin with the valueSetPrefix. Since there is a “/” in the URL string but there is no text after the last “/” the DTS Subset Display Name is set to the entire URL string.

Rule 2.ii

valueSetPrefix: http://apelon.com/Prefix2.ii/ValueSet/

ValueSet URL: TestValueSet

DTS Subset Display Name: TestValueSet

Explanation: This uses Rule 2.ii. The ValueSet URL string does not begin with the valueSetPrefix. Since there is not a “/” in the URL string the DTS Subset Display Name is set to the entire URL string.