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Apelon Distributed Terminology System (DTS)

Knowledgebase Administrators Guide

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Introduction

A series of tools is included with the installed DTS software to help you generate the required knowledgebase tables, populate the tables with desired data, then update and maintain the DTS knowledgebase moving forward. The **Knowledgebase Create** utility allows you to create the required DTS schema.

Other utilities allow you to populate the new DTS tables with either vocabulary subscription data provided by Apelon, or data migrated from your current knowledgebase. After your DTS knowledgebase is established, a subscription update utility allows you to import vocabulary subscriber updates provided by Apelon, then update your knowledgebase with the vocabulary content deltas. Procedures for populating the tables with migrated data are included in this guide. Refer to the *Subscription Content Import Guide* for procedures on importing new and imported subscription data.

A **Selectors & Extractors** utility allows you to generate and populate individual repositories of knowledgebase data, called **silos**. Silos let you optimize searching capabilities in your knowledgebase; DTS servers try to match search strings that you specify to concepts and their associated synonymous terms in a specific silo. Procedures for configuring the data Selectors & Extractors will acquire from the knowledgebase to populate the silos are included in this guide.

Publish Your Local Vocabulary Content

As an Apelon client, you can publish your local vocabulary content for distribution to your own vocabulary subscribers using the **Knowledgebase Publishing** utility provided with the DTS installation. You can version content modifications to a specific local vocabulary, then export your local content to subscribers.

Knowledgebase Silos and Selectors & Extractors Overview

Apelon DTS provides the capability to create and populate individual repositories of data that will be accessible through the Apelon API. These repositories contain terms and associated concepts derived from designated Ontylog and/or thesaurus namespaces in your knowledgebase. Each repository is referred to as a “**silo**,” and contains selected concepts and extracted character strings associated with these concepts. For namespaces that derive content from UMLS Metathesaurus source vocabularies, UMLS semantic type information can be used to select semantically related concepts (e.g., all descendents of the concept **disease**).

You can customize each silo to contain information based on your needs and specifications. The parameters contained in one or more **filterSpec.xml** configuration files define which data will be acquired from designated namespaces in your knowledgebase to populate the silos.

The **Selectors & Extractors** utility, included with Apelon DTS, creates and populates these silos of terms and associated concepts based on the configurations in the **filterSpec.xml** files. Using silos allows you to optimize searching capabilities when you use Apelon DTS to perform searches of your knowledgebase. The Apelon DTS servers try to match search strings that you specify to concepts and their associated terms in a specific silo.

Purpose of This Guide

This guide provides instructions for creating the DTS schema, and for migrating desired data to the DTS tables. Instructions for publishing and exporting local vocabulary content to your own subscribers are provided as well.

This guide also provides instructions for configuring the **filterSpec.xml** configuration files that define which knowledgebase data the **Selectors & Extractors** utility will acquire to populate generated knowledgebase silos. The **filterSpec.dtd** file and sample **filterSpec.xml** files provided with the Apelon DTS installation are included in this guide for your reference.

Audience for This Guide

The *Knowledgebase Administrators Guide* was written as a reference for individuals who deal with the creation, maintenance, and use of terminology knowledgebases. This audience may also include database developers, and other personnel who install and administer the databases that integrate with Apelon products such as Apelon DTS. These personnel may also need to coordinate with DTS application developers who need to provide matching capabilities against specific data in their applications. This guide was *not* written for end users of applications.

Create DTS Schema

Overview

Regardless of where you will obtain data to populate the DTS 3.5 tables (by migrating data from existing databases, or performing a complete import of new subscription data) you first must run the **Knowledgebase Create** utility. This utility generates the DTS schema, creating the tables (for Oracle users) or the database (for SQL Server users) that will be populated with your imported subscription data or migrated data.

Prior to running Knowledgebase Create you must create a user and tablespace (for Oracle) or a user and database (for Microsoft SQL Server). Procedures for running these utilities are provided in the discussions that follow. The procedures for creating the DTS 3.5 Knowledgebase then are provided for both Oracle and Microsoft SQL users.

Create Oracle Database User and Tablespace

You must define a user and create a tablespace before the DTS tables can be created. Navigate to the *DTSInstall*\scripts\Oracle directory (where *DTSInstall* represents the current DTS version), and run the **userCreate.bat** file (for a Linux installation, execute **userCreate.sh** in **scripts/Oracle**). You are prompted for the following information; note that the defaults are from the previous user and tablespace that were defined.

```
This utility creates a DTS Oracle user.
Please Type the user information OR Press Enter to use the default in brackets.
Enter DTS oracle user (wayne):
Enter password for DTS oracle user (wayne):
Enter tablespace name (wayne):
Enter tablespace datafile directory (D:\Oracle\oradata\HIDE):
Enter tablespace datafile name (wayne.dbf):
Enter datafile initial size (25M):
Enter datafile autoextend size (100M):
Enter datafile maximum size (100000M): _
```

Enter DTS oracle user: Specify the name of the new Oracle user who will have the DTS schema

Enter password for DTS oracle user: Enter the password for the new Oracle user that you specified

Enter tablespace name: Enter the name of the tablespace which will hold the DTS schema for the specified Oracle user

Enter tablespace datafile directory: Specify the directory of the datafile in which the tablespace will be created

Enter tablespace datafile name: Specify the name of the datafile which the specified tablespace will use

Enter datafile initial size: Specify the size of the datafile, in bytes (use K or M to specify the size in kilobytes or megabytes, respectively)

Enter datafile autoextend size: Specify the size, in bytes, of the next increment of disk space to be allocated automatically to the datafile (use K or M to specify this size in kilobytes or megabytes, respectively)

Enter datafile maximum size: Specify the maximum disk space allowed, in bytes, for automatic extension of the datafile (use K or M to specify this size in kilobytes or megabytes, respectively)

For a Linux installation, you are prompted for the Oracle-specific connection parameter, **Connect Identifier**.

```
On Linux the Connect Identifier is needed for Oracle SYSTEM user login.  
The Connect Identifier is usually the same as the name of your computer.
```

```
Enter Connect Identifier (linux):
```

The **Connect Identifier** can be a net service name, a database service name, or a net service alias. The user you are creating can initiate a connection request by specifying a username, a password, and a connect identifier in a connect string for the service to which the connection is desired.

At this point press **Enter**. You are prompted for the **password**:

```
Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.
```

```
Enter password:
```

The new Oracle DTS user and tablespace are created.

Create SQL Server Database File

1. If Microsoft SQL Server is to be used, you must make the following edits in the `drivers.xml` file (`DTSInstall\bin`):
 - Set the `driver_count` property value to **2**.
 - Set the `display_name` value to **2 for the Microsoft SQL Server driver** or the I-Net Sprinta driver.

```
<?xml version="1.0" encoding="UTF-8"?><!DOCTYPE apelprops SYSTEM
"http://apelon.com/dtd/properties/apelprops.dtd">
<apelprops>

  <property name="driver_count" value="1" />

  <!-- Oracle driver -->

  <property name="display_name1" value="Oracle - Thin Client Driver" />
  <property name="db_type1" value="oracle" />
  <property name="jdbc_driver1" value="oracle.jdbc.driver.OracleDriver" />
  <property name="url_template1" value="jdbc:oracle:thin:@[HOST]:[PORT]:[DATABASE]" />

  <!-- MS SQL Server drivers -->

  <!-- If you use MS SQL Server and install a driver for that database
  (Apelon highly recommends the use of the Sprinta2000 driver),
  change the above value of driver_count from "1" to "2", and uncomment the
  appropriate section below -->

  <!-- I-Net Sprinta -->
  <!--
  <property name="display_name2" value="SQL Server - Sprinta Driver" />
  <property name="db_type2" value="sql2k" />
  <property name="jdbc_driver2" value="com.inet.tds.TdsDriver" />
  <property name="url_template2" value="jdbc:inetdae:[HOST]:[PORT]?database=[DATABASE]" />
  -->
  <!-- Microsoft SQL Driver configuration -->
  <!--
    <property name="display_name2" value="SQL Server - Microsoft" />
      <property name="db_type2" value="sql2k" />
      <property name="jdbc_driver2"
value="com.microsoft.sqlserver.jdbc.SQLServerDriver" />
      <property name="url_template2"
value="jdbc:sqlserver://[HOST]:[PORT];datasource=[DATABASE];forwardOnlyMethod=serverC
ursor" />
    -->
  </apelprops>
```

Create DTS Knowledgebase Schema

After you create the Oracle tablespace, or SQL Server database file, you must create the DTS tables, or **schema**. Before you can run the Knowledgebase Create utility to create the schema, you must follow this procedure to configure the parameters by which the schema will be created, and by which a connection will be made to the DTS database.

1. Open the **kbcreate.xml** file (*DTSInstall\bin\kb\create*) where you set the values for **either** an Oracle **or** a Microsoft SQL connection. Note the illustration.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE DBConfig SYSTEM "http://apelon.com/dtd/util/db/dbconfig.dtd">
<DBConfig>
  <!-- ORACLE CONNECTION -->
  <connection>
    <property name="type" value="oracle"/>
    <property name="user" value="dts"/>
    <property name="pass" value="dts"/>
    <property name="host" value="localhost"/>
    <property name="databaseName" value="ORCL"/>
    <property name="databasePort" value="1521"/>
    <property name="jdbcDriver" value="oracle.jdbc.driver.OracleDriver"/>
    <property name="url_template" value="jdbc:oracle:thin:@[HOST];[PORT];[DATABASE]"/>
  </connection>
  <!--
      #####
      # Database Connection (sql2k) #
      #####
  -->
  <!-- Microsoft Driver -->
  <!--
      <connection>
        <property name="direction" value="target" />
        <property name="type" value="sql2k" />
        <property name="user" value="sa" />
        <property name="pass" value="" />
        <property name="host" value="localhost" />
        <property name="databaseName" value="dts" />
        <property name="databasePort" value="1433" />
        <property name="jdbcDriver" value="com.microsoft.sqlserver.jdbc.SQLServerDriver" />
        <property name="url_template"
value="jdbc:sqlserver://[HOST]:[PORT];datasource=[DATABASE];forwardOnlyMethod=serverCursor" />
      </connection>
  -->
```

```

<!-- I-Net Sprinta Driver -->
<!--
    <connection>
        <property name="direction" value="target" />
        <property name="type" value="sql2k" />
        <property name="user" value="sa" />
        <property name="pass" value="" />
        <property name="host" value="localhost" />
        <property name="databaseName" value="dts" />
        <property name="databasePort" value="1433" />
        <property name="jdbcDriver" value="com.inet.tds.TdsDriver" />
        <property name="url_template"
value="jdbc:inetdae:[HOST]:[PORT]?database=[DATABASE]" />
    </connection>
-->

<!--
    If this knowledgebase will be primarily used as a staging database
    for creating incremental subscriptions, then provide the
    Master knowledgebase name in the property for masterKb,
    which has the latest version of vocabularies and against which
    subscription diff process will be done.

    This is needed to synchronize the global sequence with one on
    Master knowledgebase to avoid any IID collisions.

    Note:
    - Expects Master knowledgebase to exist in the same database instance
      as the staging.
    - If this value is left blank then the numerical value provided
      in kbcreate.bat switch -startSeq is used to seed the
      global sequence generator.

    Example:
    - For Oracle, its the user name (e.g dts)
    - For SQL2000, its the databaseName (e.g dts.dbo)
-->
    <property name="masterKb" value="" />
</DBConfig>

```

The connection parameters for an **SQL CONNECTION** are commented out as the default. To establish an **SQL** connection, comment out the **ORACLE CONNECTION** section. Uncomment out the **SQL CONNECTION** section, then select either the **Microsoft Driver** or the **I-Net Sprinta Driver** to set connection parameters.

For the **user** and **pass** property values (highlighted) enter a valid username and password for the user you created when you ran **userCreate.bat** (or **userCreate.sh** for a Linux installation). When you run the Knowledgebase Create utility, a database connection will be established based on the values in this file.

2. Save the **kbcreate.xml** file.

3. Run the file **kbcreate.bat** (*DTSInstall\bin\kb\create*) to start the Knowledgebase Create utility. If this is the first time **kbcreate.bat** is being run, the utility creates all of the tables required to load data into the knowledgebase. (For a Linux installation, execute **kbcreate.sh** in *bin/kb/create* to start Knowledgebase Create.)

Note: If your intent is to subsequently publish this database, or use it to generate a subscription for local namespaces, you must “seed” the sequence generator differently on this database (publishers) and, in turn, the subscriber database. The numbers **1 – 20,000,000,000** are reserved for Apelon’s subscription content. As an example, the publisher sequence should **start** with **20000000001**; the subscriber (i.e., the imported of your local content) should **start** with **40000000001**.

Refer to *Appendix A - Publish Client’s Local Namespace* for local namespace content publishing procedures.

If **kbcreate.bat** (or **kbcreate.sh**) was run previously, the Knowledgebase Create utility checks for existing tables. **Important Note:** If one or more tables are missing from an existing set, the utility automatically drops all existing tables, then recreates them all (without displaying any user prompts).

If all the tables exist, the utility prompts you to drop, or not drop, existing tables.

All the tables exist. Do you want to drop all tables (y/n)?

If you type **y**, the utility drops all existing tables, then recreates them all. Type **n** to bypass the drop of existing tables and creation of new ones, and to exit the utility.

The results of running the Knowledgebase Create utility are written to the log file (the default log file is **kbcreate.log** in *DTSInstall\bin\logs*. If a different log file name and location are specified in the log configuration file **kbcreatelog.xml** (*DTSInstall\bin\kb\create*) the results are written to that file.

If an error occurs in the knowledgebase creation process, the utility stops and updates the log file to reflect the error.

After generation of the DTS tables, you must load data into those tables using one of two methods. Using the first method, you populate the tables by performing a **full subscription import** of initial DTS content from a file that is exported to you from Apelon. This file contains data from the source vocabularies to which you subscribe. For procedures on performing a full subscription import, refer to the *Subscription Content Import Guide*.

The second method for populating the new tables is through migration of your existing data into DTS. For migration procedures, refer to the [Populate New Tables Through Data Migration](#) discussion that follows this section.

SQL Server Internet Connection to a Database with a Named Instance

To use a named instance when establishing an internet connection to an SQL Server database, modify the appropriate xml connection file by adding the highlighted **databaseInstance** property and value; in the illustration, the instance is INSTANCE1 and the host is localhost.

```
<connection>
  <property name="type" value="sql2k"/>
  <property name="jdbcDriver" value="com.inet.tds.TdsDriver"/>
  <property name="url_template"
value="jdbc:inetdae:[HOST]:[PORT]?database=[DATABASE]"/>
  <property name="user" value="sa"/>
  <property name="pass" value=""/>
  <property name="host" value="localhost/INSTANCE1"/>
  <property name="database_name" value="dts"/>
  <property name="database_port" value="1433"/>
</connection>
```

Replace
With
Named
Instance
Value

This type of named instance configuration is supported by both the **Microsoft Driver** and the **I-Net Sprinta Driver**.

Populate DTS Tables Through Data Migration

After you create the DTS tables using the Knowledgebase Create utility, you can populate the new tables with data. If you intend to populate the tables with migrated data from your existing knowledgebase, you must run the **Knowledgebase Load** utility to migrate knowledgebase data from DTS 2.x or TDE data sources. The procedures referenced in this discussion represent a “**standard migration**” of TDE or DTS 2.x data into DTS 3.x schema.

Knowledgebase Load Procedures

1. Each TDE or DTS 2.x source vocabulary you wish to migrate to DTS 3.x must be listed in the **sources.id** file in the *DTSInstall\bin\kb* directory. A portion of the file that is included with the DTS installation is illustrated.

```
#####  
##      ##  
## Ontylog Sources ##  
##      ##  
#####  
  
### ICD (International Classification of Diseases, Ninth Revision,  
Clinical Modification)  
ICD-9-CM=10  
  
### CPT (Physicians' Current Procedural Terminology)  
CPT=20  
  
### SNOMEDCT  
SNOMED CT=30  
  
### SNOMED Historical Relationships (Inactives)  
SNOMED CT Inactive=35  
  
### Semantic Type (STYRT)  
UMLS Semantic Types=40
```

If you want to migrate a local source vocabulary that is not listed in the **sources.id** file, you must add the source vocabulary with a unique ID number. The starting ID number for assignment is listed near the end of the file (e.g., **value** >= **32768**).

For migration of custom TDE or DTS 2.x knowledgebases, you must use the ID number 32768 or **higher**. Subscription vocabularies are assigned ID numbers **lower** than 32768. For migration of a **subscription vocabulary**, the ID number must be **lower** than 32768.

Note: Once you assign an ID number to a vocabulary in **sources.id**, you must use the same ID number consistently when performing subsequent update migrations for the vocabulary content. If you change the vocabulary ID, you will not be able to perform the subscription updates.

- To configure the connection between the source database and target database (i.e., the load destination) open the **kbload.xml** file (*DTSInstall\bin\kb\load*).

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE DBConfig SYSTEM "http://apelon.com/dtd/util/db/dbconfig.dtd">
<DBConfig>
  <!-- The authority for the namespace -->
  <property name="authority" value="Apelon3"/>
  <!-- The version label for content -->
  <property name="version" value="1.0.0.0"/>
  <!-- The version number for content (numerals only) -->
  <property name="versionNumber" value="1"/>
  <!-- The content type to be loaded ('ontylog' or 'thesaurus') -->
  <property name="conceptType" value="ontylog"/>
  <!-- Access mode for the constant ('readwrite' or 'readonly') -->
  <property name="accessMode" value="readonly"/>
  <!-- Namespace type ('local' or 'nonlocal')-->
  <property name="namespaceType" value="nonlocal"/>
  <!-- Namespace has semantic type properties ('true' or 'false') -->
  <property name="hasSemanticType" value="false"/>
  <!-- For Tuning
    <property name="numSourceRecords" value="10000" />
    <property name="numTargetRecords" value="5000000" />
  -->
  <!-- Migrating from database -->
  <connection>
    <property name="direction" value="source"/>
    <property name="type" value="oracle"/>
    <property name="user" value="cpt"/>
    <property name="pass" value="cpt"/>
    <property name="host" value="localhost"/>
    <property name="databaseName" value="ORCL"/>
    <property name="databasePort" value="1521"/>
    <property name="jdbcDriver" value="oracle.jdbc.driver.OracleDriver"/>
    <property name="url_template"
value="jdbc:oracle:thin:@[HOST]:[PORT]:[DATABASE]"/>
    <property name="blockSize" value="256"/>
  </connection>
  <!-- Migrating to database (dts) -->
  <connection>
    <property name="direction" value="target"/>
    <property name="type" value="oracle"/>
    <property name="user" value="dts"/>
    <property name="pass" value="dts"/>
    <property name="host" value="localhost"/>
    <property name="databaseName" value="ORCL"/>
    <property name="databasePort" value="1521"/>
    <property name="jdbcDriver" value="oracle.jdbc.driver.OracleDriver"/>
    <property name="url_template"
value="jdbc:oracle:thin:@[HOST]:[PORT]:[DATABASE]"/>
    <property name="blockSize" value="256"/>
  </connection>
  <!--

```

Source Database
Section

Oracle Target
Database
Section

```

#####
# Database Connection (sql2k) #
#####
-->
<!-- Microsoft Driver -->
<!--
<connection>
  <property name="direction" value="target" />
  <property name="type" value="sql2k" />
  <property name="user" value="sa" />
  <property name="pass" value="" />
  <property name="host" value="localhost" />
  <property name="databaseName" value="dts" />
  <property name="databasePort" value="1433" />
  <property name="jdbcDriver"
value="com.microsoft.sqlserver.jdbc.SQLServerDriver" />
  <property name="url_template"
value="jdbc:sqlserver://[HOST]:[PORT];database=[DATABASE];forwardReadOnlyMetho
=serverCursor" />
</connection>
-->
<!-- I-Net Sprinta Driver -->
<!--
<connection>
  <property name="direction" value="target" />
  <property name="type" value="sql2k" />
  <property name="user" value="sa" />
  <property name="pass" value="" />
  <property name="host" value="localhost" />
  <property name="databaseName" value="dts" />
  <property name="databasePort" value="1433" />
  <property name="jdbcDriver" value="com.inet.tds.TdsDriver" />
  <property name="url_template"
value="jdbc:inetdae:[HOST]:[PORT]?database=[DATABASE]" />
</connection>
-->
</DBConfig>

```

SQL2000 Connection,
Microsoft Driver

SQL2000 Connection,
I-Net Sprinta Driver

Note the following property values in the file:

- The value for the property **authority** is the authority name for this source.
- The value for the property **version** is the version name (i.e., label) for this vocabulary; the initial (full) vocabulary version for a first-time migration may be, for example, **1.0.0.0**. You can replace this value with any alpha/numeric version identifier.
- The value for the **versionNumber** property must increase for each subsequent vocabulary load (e.g., start with **1**, followed by **2**, **3**, etc.).
- The value for the property **conceptType** is **ontylog** for TDE and DTS 2.x data migrations.
- The value for the property **accessMode** is **readonly** for loading standard terminologies, and **readwrite** for local namespaces to make them editable in DTS.

Apelon suggests that you set the **accessMode** to **readonly** for the load of a TDE (i.e., Ontylog) terminology, and then use the DTS Editor to create a separate (editable) local namespace to which new and modified content can be written. This approach prevents the inadvertent overwrite of any new local data (entered using the DTS Editor) if updated TDE content is migrated into the DTS knowledgebase at a later time.

- The value for the property **namespaceType** is **nonlocal** for subscription vocabularies. For **non-subscription vocabularies** and custom TDE migrations, the value is **local**.
 - The value for the property **hasSemanticType** is **true** for UMLS sources only.
3. In the database **source** parameters in the upper portion of the file, modify the source property values (e.g., **user**, **pass**, **host**, etc.) for either the DTS 2.x or TDE knowledgebase, as necessary.
 4. In the database **target** parameters in the lower portion of the file, modify the target property values (e.g., **user**, **pass**, **host**, etc.) for the DTS knowledgebase, as necessary.
 5. Save the **kbload.xml** file.
 6. Run the file **kbload.bat** (*DTSInstall\bin\kb\load*) to start the Knowledgebase Load utility. (For a Linux installation, execute **kbload.sh** in **bin/kb/load** to start the Knowledgebase Load utility.)

The utility opens the source and target database connections specified in the **kbload.xml** file, and migrates data from the source to the target database.

- The results of running the Knowledgebase Load utility are written to the log file (the level of logging is **INFO**). The default log file is **kbload.log** in *DTSInstall\bin\logs*. If a different log file name and location are specified in the log configuration file **kbloadlog.xml** (*DTSInstall\bin\kb\load*) the results are written there. If an error occurs in the load process, the utility stops and updates the log file to reflect the error.
- Since TDE source database does not have any constraints in the table, DTS will generate errors if the migrated TDE data violates the constraints of the DTS schema. When duplication of data occurs, the **INFO** level indicates duplication of data in the table only once. In the **DEBUG** level, duplicate information is recorded in the log file.

Source and Target Connection Files

You have the option of creating one or more custom connection configuration files, each of which can define customized **source** and/or **target** database connections. You can then edit the **kbload.bat** file in *DTSInstall\bin\kb\load* (or **kbload.sh**, for Linux) to reference a custom connection configuration file.

Those custom connections will override the connection parameters specified in the **kbload.xml** file. The template connection files **source-connection.xml** and **target-connection.xml** (in *DTSInstall\bin\kb*) allow you to define custom source and target connections, respectively, for the KB Load utility.

You can create multiple versions of each of these connection files (each with a unique name), with each file reflecting a custom connection from, or to, a data source. Apelon recommends that you rename each custom connection file to reflect its purpose.

The connection parameters portion of a **source-connection.xml** file is illustrated.

```
-->
<connection>
  <property name="direction" value="source"/>
  <property name="type" value="oracle"/>
  <property name="user" value="dts"/>
  <property name="pass" value="dts"/>
  <property name="host" value="localhost"/>
  <property name="databaseName" value="ORCL"/>
  <property name="databasePort" value="1521"/>
  <property name="jdbcDriver" value="oracle.jdbc.driver.OracleDriver"/>
  <property name="url_template" value="jdbc:oracle:thin:@[HOST]:[PORT]:[DATABASE]"/>
  <property name="blockSize" value="256"/>
</connection>
<!--
```

Modify the source connection parameters in each custom source and/or target connection file.

After you define your custom connections, edit the Command Line switches in the **kbload.bat** file (or **kbload.sh**, for Linux) to reference those connections when you run KB Load. The Command Line section of the kbload.bat file is shown.

```
cd ..\..
call runApp_cw 512 com.apelon.common.util.db.DbLoad -c com.apelon.dts.db.admin.config.DBLoadConfig -p
kb\load\kbload.xml
-skipConstraints no -s kb\source-connection.xml -t kb\target-connection.xml
cd kb\load
```

Modify the **-s kb/source-connection.xml** switch to reference the appropriate source-connection.xml file. Similarly, modify the **-t kb/target-connection.xml** switch to reference the appropriate target-connection.xml file.

Miscellaneous Tables Migration

The Knowledgebase Load utility also will copy DTS2.x specific tables such as "SEARCH_INDEX_SPEC". The utility also transfers any "CONTENT_LICENSE" table data if it is present in the source database.

Delete Namespaces from Your Knowledgebase

Overview

Apelon DTS provides a utility that allows you to delete unwanted or obsolete namespaces from your knowledgebase. You first designate the unwanted namespace(s) in the configuration file provided, then run **kbcontent-delete.bat** to delete those namespaces (for a Linux installation, you can execute **kbcontent-delete.sh**).

Configure Namespace(s) for Deletion

Follow this procedure to specify the desired namespace(s) for deletion.

1. Open the **kbcontent-delete.xml** file (*DTSInstall\bin\kb\content\delete*). The **kbcontent-delete.xml** file is illustrated.

```
<?xml version="1.0" encoding="UTF-8"?>

<!--
#####
# This is a configuration file used for deleting a given namespace #
# from the DTS KB #
#####
-->

<!DOCTYPE DBConfig SYSTEM "http://apelon.com/dtd/util/db/dbconfig.dtd">
<DBConfig>
  <!-- Namespace(s) to delete -->
  <namespace name="CPT" >
    <property name="delete" value="true" />
  </namespace>
  <namespace name="ICD-9-CM" >
    <property name="delete" value="true" />
  </namespace>

  <!--
#####
# DTS30 KB Database Connection #
#####
-->

  <!-- Oracle Connection Parameters -->
  <connection>
    <property name="direction" value="target" />
    <property name="type" value="oracle" />
    <property name="user" value="dts" />
    <property name="pass" value="dts" />
    <property name="host" value="localhost" />
    <property name="databaseName" value="ORCL" />
    <property name="databasePort" value="1521" />
    <property name="jdbcDriver" value="oracle.jdbc.driver.OracleDriver" />
    <property name="url_template"
value="jdbc:oracle:thin:@[HOST]:[PORT]:[DATABASE]" />
    <property name="blockSize" value="512" />
  </connection>

  <!--
```

```

#####
# Database Connection (sql2k) #
#####
-->
<!-- Microsoft Driver -->
<!--
<connection>
  <property name="direction" value="target" />
  <property name="type" value="sql2k" />
  <property name="user" value="sa" />
  <property name="pass" value="" />
  <property name="host" value="localhost" />
  <property name="databaseName" value="dts" />
  <property name="databasePort" value="1433" />
  <property name="jdbcDriver"
value="com.microsoft.sqlserver.jdbc.SQLServerDriver" />
  <property name="url_template"
value="jdbc:sqlserver://[HOST]:[PORT];datasource=[DATABASE];forwardReadOnlyMetho
=serverCursor" />
</connection>
-->
<!-- I-Net Sprinta Driver -->
<!--
<connection>
  <property name="direction" value="target" /
  <property name="type" value="sql2k" />
  <property name="user" value="sa" />
  <property name="pass" value="" />
  <property name="host" value="localhost" />
  <property name="databaseName" value="dts" />
  <property name="databasePort" value="1433" />
  <property name="jdbcDriver" value="com.inet.tds.TdsDriver" />
  <property name="url_template"
value="jdbc:inetdae:[HOST]:[PORT]?database=[DATABASE]" />
</connection>
--></DBConfig>

```

2. Note the **<!-- Namespace(s) to delete -->** section that is highlighted.

```

<!-- Namespace(s) to delete -->
  <namespace name="CPT" >
    <property name="delete" value="true" />
  </namespace>
  <namespace name="ICD-9-CM" >
    <property name="delete" value="true" />
  </namespace>

```

Replace the **namespace name** values with those namespaces you want to delete, and add additional namespaces for deletion, as necessary. Note the examples.

```

<!-- Namespace(s) to delete -->
  <namespace name="SNOMED-CT EXTENSION" >
    <property name="delete" value="true" />
  </namespace>
  <namespace name="SNOMED-CT" >
    <property name="delete" value="true" />
  </namespace>
</namespace>
  <namespace name="CPT" >
    <property name="delete" value="true" />
  </namespace>

```

3. Ensure that the appropriate **Database Connection** section (**Oracle** or **Microsoft SQL**) of the file reflects the server location where the namespaces you want to delete are located.
4. Save the **kbcontent-delete.xml** file parameters.

Delete Unwanted Namespaces

1. After you specify the namespaces for deletion in the **kbcontent-delete.xml** file, run the **kbcontent-delete.bat** file (*DTSInstall\bin\kb\content\delete*) to begin the deletion process. For a Linux installation, execute **kbcontent-delete.sh** in **bin/kb/content/delete** to start the deletion process.

The following confirmation message displays.

```
Action: Deleting Namespace..
All the tables exists. Do you want to delete namespaces [SNOMED CT,] (y/n) ?
y
```

2. Enter **y** to begin deletion. The utility deletes the namespaces you designated in the **kbcontent-delete.xml** file from your knowledgebase.

Note: An Ontylog **Extension** namespace is an extension of a specific Ontylog subscription namespace, created for the purpose of creating and/or maintaining the new local content for a linked Ontylog subscription namespace. If one or more Extension namespaces are linked to an Ontylog subscription namespace you designated for deletion, a message displays indicating that all linked Extension namespaces also will be deleted.

```
All extension namespaces ([SNOMED_ExtA1000], [SNOMED_ExtA1], [SNOMED_ExtA100], [SNOMED_ExtA500], [SNOMED_ExtB1], [SNOMED_ExtB100], [SNOMED_ExtB500], [SNOMED_ExtB1000], [SNOMED CT EXTENSION], [A1 SNOMED CT Extension]) will be deleted also. Do you want to continue? (y/n) ?
```

Enter **y** to also delete all Extension namespaces linked to the subscription namespace. Refer to the *Ontylog Extension Namespaces and Extension Namespace Classification in DTS* document for procedures on creating and classifying Ontylog Extension namespaces, and also for instructions on installing and deploying the files necessary to perform classification.

Knowledgebase Admin Utility

Overview

If you are migrating local namespace content from a DTS 2.x or TDE database to DTS 3.x using the **Knowledgebase Load** utility (see *Knowledgebase Load Procedures*) you must run the Knowledgebase Admin utility to prepare the namespace in the DTS 3.x knowledgebase for access by the DTS server and clients. If you imported **only** subscription namespace content by performing the full subscription import procedure (refer to the *Subscription Content Import Guide*) there is no need to run the Knowledgebase Admin utility.

The Knowledgebase Admin utility also allows you to create synonymous terms, and generate mappings between concepts with corresponding property values in any two namespaces. The utility creates database entries that are used in Ontylog class queries and Word Match searches (which work in conjunction with property searches). Mappings (associations) are generated based on the configuration you specify.

Note: The **Search** feature in the DTS Editor and DTS Browser includes a **Word Match** capability that works in conjunction with the property search. This feature lets you search for a concept based on property when you do not know the property's exact search string value. Refer to the *Configure Word Match Search* discussion later in this section to determine if database configurations are needed prior to performing the Knowledgebase Admin procedures.

Knowledgebase Admin Procedures

1. In order to run the Knowledgebase Admin utility, you must establish the connection against which the utility will run in the **kbadmin.xml** file. This file needs to be edited to run against **local** namespaces. The process should not be run against **subscription** namespaces (it has been run already by Apelon).

A sample **kbadmin.xml** file is provided in *DTSInstall\bin\kb\admin* as a template for the creation of synonymous terms and associations. Note the **kbadmin.xml** file illustration.

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE DTSDbConfig SYSTEM "http://apelon.com/dtd/dts/dtsconfig.dtd">
<DTSDbConfig>
  <!--
    This is an example configuration file illustrating
    the various parameters needed to run KBAAdmin process.
    Users are required to modify it according to their needs
    and run KBAAdmin process.
    Note: The kbadmin should be run only on a local or
    non-subscription source
    (e.g., on a local namespace migrated from TDE)
  -->
  <!--
    Specify the connection paramters to connect
    to a DTS knowledgebase.
  -->
  <!-- Oracle Database Parameters -->
  <connection>
    <property name="type" value="oracle"/>
    <property name="user" value="dts"/>
    <property name="pass" value="dts"/>
    <property name="host" value="localhost"/>
    <property name="databaseName" value="ORCL"/>
    <property name="databasePort" value="1521"/>
    <property name="jdbcDriver" value="oracle.jdbc.driver.OracleDriver"/>
    <property name="url_template" value="jdbc:oracle:thin:@[HOST]:[PORT]:[DATABASE]"/>
  </connection>
  <!--
    #####
    # Database Connection (sql2k) #
    #####
  -->
  <!-- Microsoft Driver -->
  <!--
    <connection>
      <property name="direction" value="target" />
      <property name="type" value="sql2k" />
      <property name="user" value="sa" />
      <property name="pass" value="" />
      <property name="host" value="localhost" />
      <property name="databaseName" value="dts" />
      <property name="databasePort" value="1433" />
      <property name="jdbcDriver" value="com.microsoft.sqlserver.jdbc.SQLServerDriver" />
      <property name="url_template"
value="jdbc:sqlserver://[HOST]:[PORT];databasename=[DATABASE];forwardReadOnlyMethod=serverCursor" />
    </connection>
  -->
  <!-- I-Net Sprinta Driver -->
  <!--
    <connection>
      <property name="direction" value="target" />
      <property name="type" value="sql2k" />
      <property name="user" value="sa" />
      <property name="pass" value="" />
      <property name="host" value="localhost" />
      <property name="databaseName" value="dts" />
      <property name="databasePort" value="1433" />
      <property name="jdbcDriver" value="com.inet.tds.TdsDriver" />
      <property name="url_template"
value="jdbc:inetdae:[HOST]:[PORT]?database=[DATABASE]" />
    </connection>
  -->

```


This is the name of the namespace for which synonyms terms and/or associations with other namespace are to be created.

-->

```
<property name="namespace" value="ICD-9-CM"/>
```

<!-- Build synonymous term from a given property

- The first property element name attribute has the property definition name which is to be converted to a synonymous term. The "value" field attribute states whether this synonymous term is a preferred term or not ('true' for preferred, 'false' if not).
- The second property element allows user to add a property to the synonymous term created above. The value of the term property is specified in the 'value' attribute of this element.

Example below attaches a 'Term Type' property with a value 'Preferred Term' to all the synonymous terms created from the property 'Preferred Name' present in ICD-9-CM namespace.

Note:

- For a given namespace, only one type of synonymous term can be a preferred term.
- Once the property is translated to synonymous term corresponding property type definition and its instances are deleted from the namespace.

-->

<!-- Example to create synonymous term for ICD-9-CM -->

<!--

```
<synonym nameSpace="ICD-9-CM" >
  <property name="Preferred Name" value="true" />
  <property name="Term Type" value="Preferred Term" />
</synonym>
<synonym nameSpace="ICD-9-CM">
  <property name="Entry Term" value="false" />
  <property name="Term Type" value="Entry Term" />
</synonym>
```

-->

<!-- Example to create synonymous term for CPT -->

<!--

```
<synonym nameSpace="CPT" >
  <property name="Preferred Name" value="true" />
  <property name="Term Type" value="Preferred Name" />
</synonym>
<synonym nameSpace="CPT" >
  <property name="Synonym" value="false" />
  <property name="Term Type" value="Synonym" />
</synonym>
```

-->

<!-- Build associations (or mappings) between two concepts having the same property values in two different namespaces.

- Mapping element attribute 'sourceNameSpace' specifies the source namespace name.
- Mapping element attribute 'targetNameSpace' specifies the target namespace name.
- Property element 'SOURCE_PROPERTY_NAME' is the property definition used to create the source end of association.
- Property element 'SOURCE_PROPERTY_NAME' is the property definition used to create the source end of association.

- Property element 'DELETE_SOURCE_PROPERTY_POST_MAP' deletes instances of any property in source namespace which are used to create associations if the value is set to 'true' or if the value is set to 'false' does not delete them.

- Property element 'DELETE_TARGET_PROPERTY_POST_MAP' deletes instances of any property in target namespace which are used to create associations if the value is set to 'true' or if the value is set to 'false' does not delete them.

Example below shows that (source) concepts with property 'SNOMED_ICD9_MAP' in SNOMED-CT and (target) concepts with property 'Code in Source' in ICD-9-CM will be mapped (associations if they have the same property value (codes in this case). After associations are created, delete all property instances for 'SNOMED_ICD9_MAP' property definitions in the SNOMED CT namespace and do not delete all property instances for 'Code in Source' property definitions in the 'ICD-9-CM' namespace.

Note:

- Both source and target namespace is required to be present before creating the associations.
- Both properties specified in the 'SOURCE_PROPERTY_NAME' and 'TARGET_PROPERTY_NAME' must be present to successfully create associations.

-->

<!--

- Property element 'ASSOCIATION_NAMESPACE_NAME' is the the name of the namespace for which the new association is to be created.

- Property element 'NEW_ASSOCIATION_NAME' is the name of the new association

- Property element 'NEW_ASSOCIATION_CODE' is the code of the new association

- Property element 'NEW_ASSOCIATION_ID' is the id of the new association

- Property element 'NEW_ASSOCIATION_CONNECTS' is the "connects" portion of the new association ("C" for association between two concepts)

- Property element 'NEW_ASSOCIATION_PURPOSE' is the "purpose" portion of the new association ("M" for mappings)

- Property element 'NEW_ASSOCIATION_INVERSE_NAME' is the inverse name of the new association (default value "NOT DISPLAYABLE")

- Property element 'REUSE_ASSOCIATION' is the boolean value to decide on whether to reuse the association if the association exists in the database.

-->

<!--

```
<mapping sourceNameSpace="SNOMED CT" targetNameSpace="ICD-9-CM" >
  <property name="SOURCE_PROPERTY_NAME" value="SNOMED_ICD9_MAP" />
  <property name="TARGET_PROPERTY_NAME" value="Code in Source" />
  <property name="DELETE_SOURCE_PROPERTY_POST_MAP" value="false" />
  <property name="DELETE_TARGET_PROPERTY_POST_MAP" value="false" />
  <property name="ASSOCIATION_NAMESPACE_NAME" value="SNOMED CT" />
  <property name="NEW_ASSOCIATION_NAME" value="SNOMED CT TO ICD9 MAPPING"/>
  <property name="NEW_ASSOCIATION_CODE" value="C100" />
  <property name="NEW_ASSOCIATION_ID" value="100" />
  <property name="NEW_ASSOCIATION_CONNECTS" value="C" />
  <property name="NEW_ASSOCIATION_PURPOSE" value="M" />
  <property name="NEW_ASSOCIATION_INVERSE_NAME" value="NOT DISPLAYABLE" />
  <property name="REUSE_ASSOCIATION" value="false" />
</mapping>
```

</mapping>

-->

</DTSDbConfig>

2. Modify the connection property values (e.g., **user**, **pass**, **host**, etc.) as necessary.

The source **databaseName** value is case-sensitive. The name you specify must be an exact match with the namespace name in the **sources.id** file (*DTSInstall\bin\kb*); in this file you specify each vocabulary migrated using the KB Load utility. If there is not an **exact** namespace name match (case included), an error message will be written to the log after you run the KB Admin utility. Refer to the [sources.id](#) discussion earlier in the guide.

By default, the **Synonymous Term** block in the *kadmin.xml* file is commented out. To convert properties into synonymous terms, uncomment out that block, then modify the elements appropriately. Note that after converting to synonymous terms, the property definition is deleted from the knowledgebase.

The **Mappings** block in the *kadmin.xml* file also is commented out. To map similar property values, uncomment out that block, then modify the elements appropriately.

3. Save the **kadmin.xml** file.
4. Run the file **kadmin.bat** (*DTSInstall\bin\kb\admin*) to start the Knowledgebase Admin utility. (For a Linux installation, execute **kadmin.sh** in **bin/kb/admin** to start Knowledgebase Admin.) The utility checks if the specified synonym names, namespaces, and mapping names and namespaces exist. If they do not, Knowledgebase Admin logs the error and stops.
5. Refer to the comments in the **kadmin.xml** file for additional information regarding the **synonymous terms** and **mappings** procedures.

Various Configurations

Convert Properties Into Terms: You can “convert” a given property in the source to a DTS term by updating the XML **synonym** element in the following manner. You can add (optionally) a property with a fixed value to each created synonym term.

```
<synonym nameSpace="ICD-9-CM" >
```

```
    Explanation: Convert synonyms in namespace 'ICD-9-CM'
```

```
        <property name="preferredName" value="true" />
```

```
    Explanation: Convert property 'preferredName' in source to a term . Also make the term a 'Preferred term' (value='true')
```

```
        <property name="Term Type" value="Preferred Term" />
```

```
    Explanation: Add a property 'Term Type' to term above having a value 'Preferred Term'. This helps to identify terms and their origination.
```

```
Note: After the terms are created from the concept properties, the original property definitions and their instances are deleted from the database.
```

Create Associations (Mappings) Between Properties with Corresponding Values: A property in one source can be mapped to a property in another source, provided the chosen properties have the same value. For example, the mappings between the vocabularies **SNOMED CT** and **ICD-9-CM** can be created as follows.

```

<mapping sourceNameSpace="SNOMED CT" targetNameSpace="ICD-9-CM" >
  Explanation: The source vocabulary is 'SNOMED CT' while the target vocabulary is 'ICD-9-CM'

  <property name="SOURCE_PROPERTY_NAME" value="SNOMED_ICD9_MAP" />
    Explanation: Use the property 'SNOMED_ICD9-MAP' in source vocabulary

  <property name="TARGET_PROPERTY_NAME" value="Code in Source " />
    Explanation: Use the property 'Code in Source' in target vocabulary to map between SNOMED and
    ICD-9-CM

  Note: After the associations are created between the two vocabularies, the property definitions are NOT deleted
  from the source vocabulary as there might be some concepts in the source vocabulary having no 'matches' in the target
  vocabulary. However, property instances corresponding to mappings (associations) created are deleted from the source
  vocabulary.

```

In the cases of synonyms, if the preferred flag is specified, Knowledgebase Admin checks if the synonym property has multiple values for any concept. If it does, Knowledgebase Admin logs the error and stops.

- o Knowledgebase Admin also performs the same process as in DTS 2.4 **DbAdmin** to populate tables to facilitate search features.

The Knowledgebase Admin utility populates the tables specified in the **kbadmintable.xml** file (*DTSInstall\bin\kb\admin*). The table is populated in ascending order of the table number. The **kbadmintable.xml** file is illustrated.

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE DTSDbConfig SYSTEM "http://apelon.com/dtd/dts/dtsconfig.dtd">
<DTSDbConfig>
  <!-- prefix with table name should be class name to be use -->

  <property name="prefix" value="com.apelon.dts.db.admin.table.Table" />

  <!-- Since DTS30 -->
  <table name="DTS_TERM_ARCHIVE" />
  <table name="DTS_TERM" />
  <table name="DTS_TERM_PROPERTY" />
  <table name="DTS_QUALIFIED_TERM_PROPERTY" />
  <table name="DTS_SYNONYM_CLASS" />
  <table name="DTS_CONCEPT_ASSN_ARCHIVE" />
  <table name="DTS_CONCEPT_ASSOCIATION" />

  <!-- Since DTS2.x -->
  <table name="DIRECT_SUPS_PLUS" />
  <table name="SEARCH_INDEX" />
  <table name="NS1" />

</DTSDbConfig>

```

The Knowledgebase Admin utility populates following DTS tables:

DTS_TERM
DTS_SYNONYM_CLASS
DTS_CON_ASSOCIATION_ARCHIVE
DTS_CONCEPT_ASSOCIATION
DIRECT_SUPS_PLUS
SEARCH_INDEX
NS1

The results of running the Knowledgebase Admin utility are written to the log file (the level of logging is **INFO**). The default log file is **kbadmin.log** in *DTSInstall\bin\logs*. If a different log file name and location are specified in the log configuration file **kbadminlog.xml** (*DTSInstall\bin\kb\admin*) the results are written there. If an error occurs in the admin process, the utility stops and updates the log file to reflect the error.

Since a TDE source database does not have any constraints in the table, DTS will generate errors if the migrated TDE data violates DTS schema constraints. When duplication of data occurs, the **INFO** level indicates duplication of data in the table only once. In the **DEBUG** level, duplicate information is recorded in the log file.

Configure Word Match Search

The Word Match search feature in DTS Browser and DTS Editor works in conjunction with the property search. It lets you search for a concept based on a property when you do not know the property's exact (search string) value. If you specify as the search string those words you believe apply to the property value, the search will retrieve all concepts that contain those words, in any order, as part of the selected property. Refer to the *DTS Editor User Guide* and *DTS Browser Users Guide* for more on using this search feature.

Each Word Match search is restricted to those concepts with property definitions that have been assigned the **<containsIndex/>** tag in the TDE database **XML** file. You can use the Knowledgebase Type Editor to assign the tag to desired property definitions.

If the **<containsIndex/>** tags were never set in the database XML file, you must follow this procedure to prepare the database prior to running the Knowledgebase Admin utility.

1. Review the available properties that are in the database and decide which ones will be configured to permit a word search.
2. Navigate to *DTSInstall\scripts\Oracle*.
3. Locate the file **setContains.sql**, then open it in a text editor such as Notepad. The **setContain.sql** file contains sets of three-line groups like this:

```
UPDATE dts_property_type
-- set CONTAINS_INDEX = 'T'
-- WHERE NAME = '<Enter Property Name>';
-- AND NAMESPACE_ID = <Enter Namespace ID>
```

Each of these groups will set one property in the namespace.

4. The first group is an example of what a correct group looks like. To prepare the **setContains.sql** script, modify each group as follows:
 - a. Change the value of **set CONTAINS_INDEX** to **T** if this property is to be enabled for searches, and to **F** if it is not. Be sure to include the single quotes (' ').
 - b. Change the value of '**<Enter Property Name>**' to the name of the property as it is spelled in the database table. Be sure to include the single quotes (' ').
 - c. Change the value of **<Enter Namespace ID>** to the ID of the namespace in which the indexed property is located.
 - d. Add as many groups as needed to configure all of the properties that are in the database. If the sample **setContains.sql** file contains too many groups, delete the unused ones.
 - e. If the table contains a large number of properties that need to be configured all the same way, **set CONTAINS_INDEX** to either **T** or **F**, as required, in the first group below the example. Delete the “**Where Name**” line entirely and then delete all other groups up to the “**COMMIT**” line.

```
-- UPDATE dts_property_type
-- set CONTAINS_INDEX = 'T'

--WHERE NAMESPACE_ID = <Namespace ID>
```

When executed, this will set all **CONTAINS_INDEX** fields to the specified value for all property types in the specified namespace.

CAUTION: Do not delete any of the lines from the “**COMMIT**” line down. The **COMMIT** line and all that follow are control codes necessary for the script to run properly.

5. When you complete modifying the script, save it to the same folder where **loadContains.bat** resides (*DTSInstall\scripts\Oracle*). (For a Linux installation, the script is **loadContains.sh** located in *scripts/Oracle*.)
6. Double-click the **loadContains.bat** file to run the script (or, for Linux, execute **loadContains.sh**).

The information in **setContains.sql** will be used to modify the database properties table. **Note:** You *will* need to edit **loadContains.bat** (or **loadContains.sh** for Linux) if your database is on a different machine from “**localhost**.”

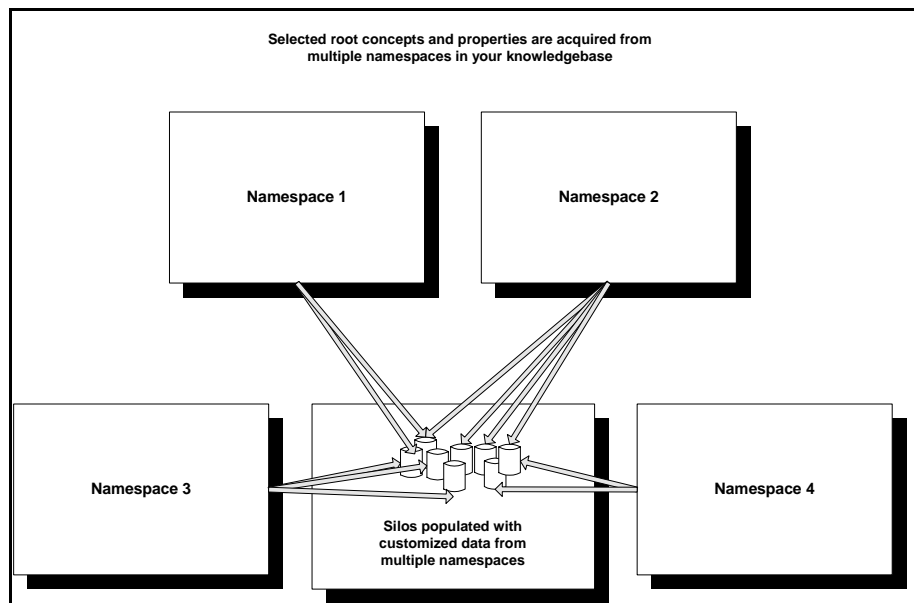
Knowledgebase Silos and Selectors & Extractors

Apelon DTS allows you to search a specific knowledgebase **silo** for concepts and related terms that match the search strings you specify. You can configure a single silo or multiple silos to be populated with knowledgebase data. The Apelon DTS servers attempt to match the search strings that you submit against the clinical terms and associated concepts in a specific silo.

Each unique concept in a silo is associated with a set of alternative terms. A search string must match a term in the knowledgebase (or its lexical variant[s]) in order to be identified and matched by the server.

The **Selectors & Extractors** utility, included with Apelon DTS, creates and populates the silos with knowledgebase terms and associated concepts. The data acquired from the knowledgebase to populate each silo is based on customized filter specifications.

Selectors & Extractors uses specifications from one or more **filterSpec.xml** configuration files to generate the silos, then selects and extracts data from your knowledgebase to populate them with data; this data can be from multiple namespaces within your knowledgebase. Note the illustration.



The specifications from each **filterSpec.xml** file define a two-step filter for acquiring the data to populate the silos. These two steps are called "Selection" and "Extraction," and are explained further in later discussions. You can subsequently modify the data that populates the silos by modifying the **filterSpec.xml** file parameters, then running the Selectors & Extractors utility again to populate the silos with the new customized data. The filterSpec.xml file is located in *DTSInstall\bin\selext*.

Selectors & Extractors

To customize the silos with data from your own knowledgebase, first you must configure the specifications in the **filterSpec.xml** file to reflect the data to be acquired from your knowledgebase. You then must run the **Selectors & Extractors** utility provided with Apelon DTS. **Selectors & Extractors** is a Java program that uses the specifications from the **filterSpec.xml** file to select and extract the desired concept data from designated namespaces in your knowledgebase. **Selectors & Extractors** then generates the silos and populates them with the customized data.

If subsequently you require that one or more existing silos contain additional or alternate terminology, you can modify the **filterSpec.xml** file specifications. You can also add new specifications to the **filterSpec.xml** file to generate and populate one or more *new* silos.

You also have the option of creating multiple filterSpec.xml files, each with a unique name. Whenever you add a new **filterSpec.xml** file, or modify the specifications in an existing **filterSpec.xml** file, you must rerun the **Selectors & Extractors** utility to populate the silos with the new customized data.

Starting Selectors & Extractors

You run the **Selectors & Extractors** utility by executing **selext.bat** on the Command Line (the **selext.bat** file is located in the installed *DTSInstall\bin\selext* directory). For a Linux installation, you execute **selext.sh** in *bin/selext* to run the **Selectors & Extractors** utility.

You must execute **selext.bat** (or **selext.sh** for Linux) for each new **filterspec.xml** file, or each **filterspec.xml** file that has been modified.

For example, if you modified the specifications in the existing file **filterspec.xml**, and created the new files **filterspec2.xml** and **filterspec3.xml**, you would have to run Selectors & Extractors 3 separate times (one each for the **selext filterspec.xml**, **selext filterspec2.xml**, and **selext filterspec3.xml** files) to populate the silos correctly. Run Selectors & Extractors *only* after you have completed modifications to all **filterSpec.xml** file specifications.

Note the following Command Line entry examples.

```
selext -cf selext/filterspec.xml
```

```
selext -cf selext/filterspec2.xml
```

```
selext -cf selext/filterspec3.xml
```

Note the **-cf** prefix that precedes the filterspec name on each line. If you enter this prefix, you will be prompted for server connection parameters for each individual run of Selectors & Extractors.

You have the option of defining server connection values to serve as defaults whenever you start Selectors & Extractors. You define these defaults in the **selextconnection.xml** configuration file, located in *DTSInstall\bin\selext*. Note the illustration.

```
<?xml version="1.0" ?>

<!DOCTYPE SELEXTConfig SYSTEM "http://apelon.com/dtd/selext/selextconfig.dtd">
<SELEXTConfig>
  <connection>
    <property name="type" value="oracle" />
    <property name="user" value="dts" />
    <property name="pass" value="dts" />
    <property name="host" value="localhost" />
    <property name="databaseName" value="orcl"/>
    <property name="databasePort" value="1521" />
  </connection>
</SELEXTConfig>
```

The default connection parameters allow you to schedule Selectors & Extractors to run during off hours (you will not be required to define connection parameters when you start the utility).

To start the utility using the **selextconnection.xml** file connection configuration, enter the following on the Command Line.

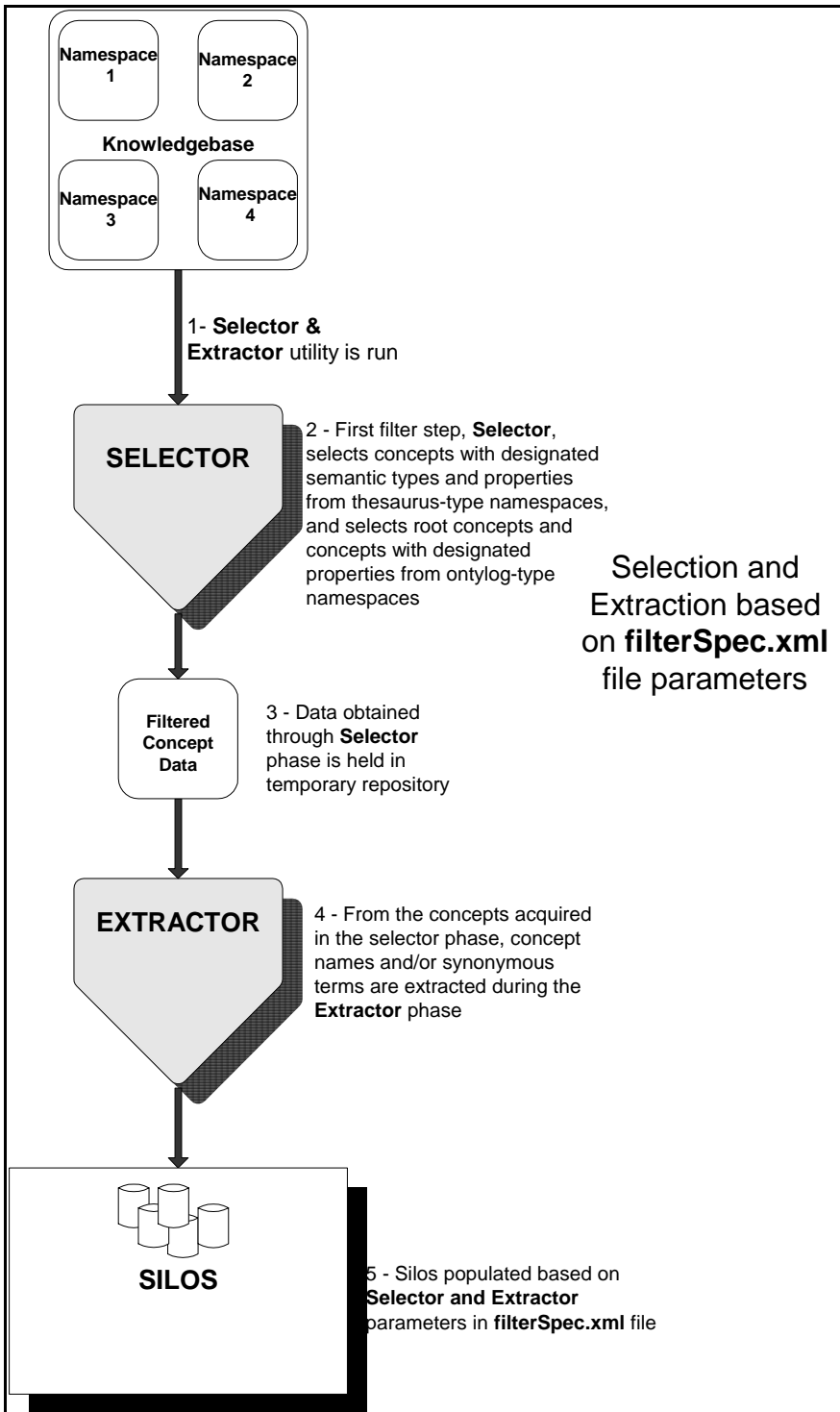
```
selext -cp selext/selextconnection.xml -cf selext/filterspec.xml
```

The **-cp selextconnection.xml** indicates that you want to run Selectors & Extractors using the default connection parameters. You will not be prompted for connection parameters.

To start the utility with a connection configuration other than that defined in the **selextconnection.xml** file, enter the following on the Command Line.

```
selext -cf selext/filterspec.xml
```

You will be prompted for the appropriate connection parameters.



1. The **Selectors & Extractors** utility is selected and run.
2. In the first step of the **Selectors & Extractors** process, “selector” specifications *select* concepts with designated **semantic types** and **properties** from thesaurus-type namespaces, and select **root concepts** and concepts with designated **properties** from Ontylog-type namespaces.
3. **Selectors & Extractors** inserts namespace query results into temporary repositories.
4. From the results of the selector phase, “extractor” specifications *extract concept names* and/or **synonymous terms**.
5. The silos are populated.

MatchPack

The API for Apelon DTS includes the capability to match search strings to knowledgebase terminology based on a series of matching options, referred to as **MatchPack** matching options. These increasingly tolerant matching options let you customize the precision by which matching will occur between your search string and the concepts in the silo you choose for searching.

Based on the option you choose, silo searches return results, which are “ranked.” The results with the fewest matched **tokens** are listed first (i.e., concepts that satisfy the matching criteria and contain the **fewest extraneous words** are returned first). Only concepts that meet the matching criteria are retrieved from the search of the silo. The number of concepts retrieved from each search depends on which combination of matching options you select.

MatchPack Matching Options

Matches are attempted in the order indicated in the following discussions. When matched concepts are returned from the search, you can navigate to any related concept in the knowledgebase.

Complete Match

This is the most exact method of matching your specified text search string to either a concept name, or the name of one of its synonyms, in the silo you selected. Complete Match is the default matching method, and is always active (even if you choose one of the other, more tolerant matching methods).

- Through Complete Match, a match occurs and a concept is retrieved when either the concept name, or the name of one of its synonyms, in the silo contains the same words as the search string you specify, in any order.
- Every concept in the silo with a name, or a synonym with a name, that contains **all** the words in the search string (in any order) is retrieved.

Under Match

If Under Match is activated, a match occurs and a concept is retrieved if the concept name, or the name of one of its synonyms, in the silo matches the search string words (in any order) *and the concept or synonym name in the silo contains words in addition to those in the search string*.

- When Under Match is selected, the order of the words in the search string is not considered in the search (e.g., the identical results are returned for the search strings **myocardial infarction** and **infarction myocardial**).
- You can use the **Best Match Only** option in conjunction with Under Match.
 - If **Best Match Only** also is active, Complete Match is performed first (i.e., if the concept name, or the name of one of its synonyms, in the specified silo contains every word in the search string, in any order, a match occurs).
 - If one or more complete matches are found, *only* these (complete) matches are returned, and no further matching attempt is made.
 - If no concept matches occur from the Complete Match, Under Match is attempted; if under matches are found, *only* these matches are returned.
 - If Under Match is activated, and **Best Match Only** is inactive, under matches will be returned *in addition to* the complete matches.

Partial Under Match

If Partial Under Match is activated, a match occurs and a concept is retrieved if the concept name, or the name of one of its synonyms, in the specified silo contains **all remaining words** (in any order) after all **stopwords** have been removed. The following stopwords are those words that are considered as unnecessary for the search:

A
and
by
for
in
NOS
of
on
the
to
with

- Example: For the search string **attack in the heart and brain**, the string becomes **attack heart brain** because the stopwords **in**, **the**, and **and** are discarded. If the words in the modified search string match a concept name, or the name of one of its synonyms, in the silo (in any order) a match is returned.
- You can use the **Best Match Only** option in conjunction with Partial Under Match.
 - If **Best Match Only** also is active, Complete Match is performed first (i.e., if the concept name, or the name of one of its synonyms, in the specified silo contains every word in the search string, in any order, a match occurs).
 - If one or more complete matches are found, **only** these (complete) matches are returned and no further matching attempt is made.
 - If no concept matches occur from the Complete Match, Under Match is attempted; if under matches are found, **only** these matches are returned.
 - If no matches occur from Under Match, matches are attempted through Partial Under Match.
 - If Partial Under Match is activated, and **Best Match Only** is inactive, partial under matches will be returned **in addition to** the complete matches and under matches.

Spell Checking

Spell Checking is one of the MatchPack options you can use to search a specified silo. In the event a misspelled search string is entered, spell checking generates suggested spelling variants against which matches can be attempted. Spelling correction will occur when MatchPack attempts to match a concept name, or the name of a concept synonym, with the search string you specify.

- You can use spell checking regardless of the matching option you select (**Complete Match**, **Under Match**, or **Partial Under Match**).
- The number of matched concepts retrieved from the search is dependent on the matching method you select.

filterSpec.dtd File

The **filterSpec.dtd** file (*DTSInstall\bin\select*) defines the selection and extraction language used in the **filterSpec.xml** file. Note the sample **filterSpec.dtd** file that is illustrated.

```
<!-- A "silo specification" contains zero or more search specifications (each denoted by a "spec" element)
-->
<!ELEMENT siloSpecs (siloSpec+)>
<!-- The results of a "silo specification" can be appended to an existing silo of the same name, can completely replace an
existing silo of the same name, or can delete the named silo altogether. Note that the "siloSpec" element should be
EMPTY only if the "action" attribute is set to "delete."
-->
-->

<!ELEMENT siloSpec (specName, specId, specCode, (allNamespacesOfType | namespace+), select, extract)>
<!-- Every namespace in a particular search specification must be of the same type, either "thesaurus" or "ontylog."
      "Mixing and matching" namespaces within a single "spec" element is not allowed.
      ( Note, however, that a siloSpec element may contain multiple "spec" elements, which may be of different
namespace types.)
-->
-->
<!ATTLIST siloSpec
      specAction (append | replace | delete) "append"
>
<!ATTLIST siloSpec
      namespaceType (thesaurus | ontylog) #REQUIRED
>
<!ATTLIST siloSpec
      namespaceAction (include | exclude) "include"
>
<!-- If this element is present, then all namespaces of the "nameSpaceType" attribute on the "spec" element will be
included.

      If this element is absent, then one or more "namespace" elements must be present. All of the listed
namespaces
will either be
      included or excluded, according to the value of the "namespaceAction" attribute on the "spec" element.
-->
-->

<!ELEMENT allNamespacesOfType EMPTY>

<!-- Identifying information about this search specification -->
<!ELEMENT specName (#PCDATA)>
<!ELEMENT specId (#PCDATA)>
<!ELEMENT specCode (#PCDATA)>

<!-- The name of an individual namespace. -->
<!ELEMENT namespace (#PCDATA)>
<!-- The values of both these attributes are IMPLIED because they are represented (for every namespace) in the
underlying
"DTS_Namespace" database table
-->
-->
<!ATTLIST namespace
      type (thesaurus | ontylog) #IMPLIED
      hasSemanticTypes (true | false) #IMPLIED
>
<!-- The concept selection criteria that will be applied to all concepts in the namespace or namespace set for
this search specficaton
-->
-->

<!ELEMENT select (selectSemanticType | selectRoot | selectProperty)+>
```

filterSpec.dtd File, continued

```
<!-- The name of a Semantic Type from the UMLS Semantic Network -->
<!ELEMENT selectSemanticType (#PCDATA)>
<!-- Indicates whether to:
  (1) include all Semantic Types in the UMLS Semantic Network,
  (2) include this specific Semantic Type and all of its descendants, or
  (3) exclude this specific Semantic Type and all of its descendants

Note that the "selectSemanticType" element will be EMPTY if the "all" attribute
value is specified.
Note that concepts in either Ontylog or thesaurus namespaces may have Semantic
Types.
-->

<!ATTLIST selectSemanticType
  selectSemanticTypeAction (all | include | exclude) "include"
  requiredNamespaceType (ontylog | thesaurus | either) #FIXED "either"
>

<!-- The "selectRoot" element should only be used in Ontylog namespaces.
-->
<!ELEMENT selectRoot (#PCDATA)>
<!ATTLIST selectRoot
  selectRootAction CDATA #FIXED "include"
  requiredNamespaceType (ontylog | thesaurus | either) #FIXED "ontylog"
>

<!ELEMENT selectProperty (selectPropertyName, selectPropertyValue)>

<!-- Note that concepts in either Ontylog or thesaurus namespaces may have Semantic
Types.-->
<!ATTLIST selectProperty
  requiredNamespaceType (ontylog | thesaurus | either) #FIXED "either"
>
<!-- The name of a Property Type -->
<!ELEMENT selectPropertyName (#PCDATA)>
<!ATTLIST selectPropertyName
  selectPropertyNameAction CDATA #FIXED "include"
>
<!ELEMENT selectPropertyValue (#PCDATA)>
<!ATTLIST selectPropertyValue
  selectPropertyValueAction CDATA #FIXED "include"
>
<!-- After all the concepts satisfying the selection criteria for this search specification have been identified, then the
concept names and/or the names of their synonymous terms will be extracted.
-->

<!ELEMENT extract (extractConceptName | extractSynonymousTerms)>

<!-- If the "extractConceptName" element is present, then the name of the concept will be extracted.
If it is absent, then the name of the concept will NOT be extracted.
-->
<!ELEMENT extractConceptName EMPTY>

<!-- Indicates which of a concept's the synonymous terms will be extracted. -->
<!ELEMENT extractSynonymousTerms (allSynonymousTerms | extractTermProperty+)>

<!-- If the "allSynonymousTerms" element is present, the names of all of a concept's synonomous terms will be extracted.
If it is absent, then only the terms that meet the "extractTermProperty" criteria will be selected.
-->
```

filterSpec.dtd File, continued

```
<!ELEMENT allSynonymousTerms EMPTY>
<!-- If this element is present, only the synonymous terms having the specified properties
will be extracted. -->
<!ELEMENT extractTermProperty (extractPropertyName, extractPropertyValue)>
<!ELEMENT extractPropertyName (#PCDATA)>
<!ATTLIST extractPropertyName
    extractPropertyNameAction CDATA #FIXED "include"
>
<!ELEMENT extractPropertyValue (#PCDATA)>
<!ATTLIST extractPropertyValue
    extractPropertyValueAction CDATA #FIXED "include"
>
```


Installed filterSpec.xml file

The specifications in the **filterSpec.xml** file (*DTSInstall\bin\selext*) determine which data will be selected and extracted for your DTS knowledgebase. A sample **filterSpec.xml** file is illustrated here.

```
<?xml version="1.0" standalone="no"?>
<!-- This is a sample xml file used by the Selector and Extractor utility that is packaged with Apelon's Knowledge Base -->
<!DOCTYPE siloSpecs SYSTEM "filterSpec.dtd">
<siloSpecs>
    <!-- UMLS Diseases -->
    <siloSpec specAction="replace" namespaceType="ontylog" namespaceAction="include">
    <specName>UMLS All</specName>
    <specId>1</specId>
    <specCode>SC1</specCode>
    <!--
    <namespace type="ontylog" hasSemanticTypes="true">
    STYRT
    </namespace>
    -->
    <namespace type="ontylog" hasSemanticTypes="false">
    ICD2003
    </namespace>

    <select>
    <selectSemanticType selectSemanticTypeAction="all"> ← Select Parameter
    </selectSemanticType>
    <!--
    <selectSemanticType selectSemanticTypeAction="exclude">
    SENMATIC_TYPE1
    </selectSemanticType>
    <selectSemanticType selectSemanticTypeAction="include">
    SENMATIC_TYPE2
    </selectSemanticType>
    <selectSemanticType selectSemanticTypeAction="include">
    SENMATIC_TYPE3
    </selectSemanticType>
    -->
    <selectProperty>
    <selectPropertyName>
    Semantic Type
    </selectPropertyName>
    <selectPropertyValue>
    PROPERTY_VALUE1
    </selectPropertyValue>
    </selectProperty>

    </select>
    <extract>
    <extractConceptName/> ← Extract Parameter
    <extractSynonymousTerms>
    <allSynonymousTerms/>
    </extractSynonymousTerms>
    </extract>

    </siloSpec>
```

filterSpec.xml File, continued

```
<silospec specAction="replace" namespaceType="ontylog" namespaceAction="exclude">
  <specName>Ontylog Procedure</specName>
  <specId>2</specId>

  <specCode>SC3</specCode>
  <allNamespacesOfType/>
  <select>

    <selectRoot>
      Procedure
    </selectRoot>
    <selectRoot>
      Procedure23
    </selectRoot>

  </select>
  <extract>
    <extractConceptName/>
    <extractSynonymousTerms>
      <allSynonymousTerms/>
    </extractSynonymousTerms>
  </extract>

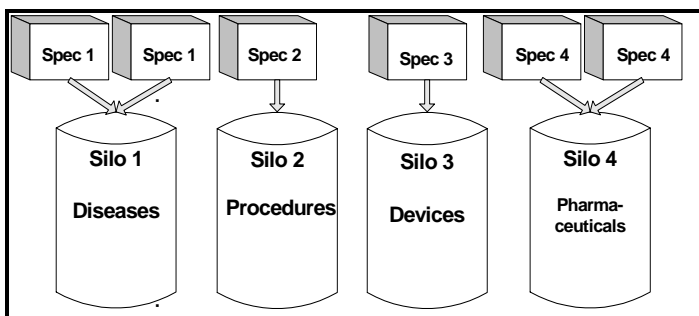
  </silospec>
</silospecs>
```

Configure the filterSpec.xml File Parameters

To generate a silo and customize the data that populates it, you must configure selection and extraction specifications for the corresponding **spec** (e.g., Spec Id) in the **filterSpec.xml** file, then run the Selectors & Extractors utility. The sample **filterSpec.xml** file included with the installed Apelon DTS includes specs for illustration; these specs can serve as templates for the creation of additional specs.

Each spec can reference a set of parameters for acquiring data from one or more namespaces to populate a database silo; the spec parameters determine which data populates the corresponding knowledgebase silo. For example, if you configure parameters for specId **1**, then run the Selectors & Extractors utility, silo **1** is generated and populated with data that reflects those parameters. If you create and configure parameters for specId **2**, then run the Selectors & Extractors utility, silo **2** is generated and populated with data that reflects the parameters from specId **2**.

To customize the silos to include the desired knowledgebase data, you must configure the filterSpec.xml file so that the desired data is acquired. You can define unlimited specs in the filterSpec.xml file. You have the option of defining multiple specs to populate a single silo (i.e., a single silo can be populated based on selection and extraction parameters from multiple occurrences of a spec).



You have the option of replacing selection and extraction specifications in one occurrence of a spec with those in a second occurrence. For example, you could replace the specifications in a previous occurrence of Spec **1** with specifications in a second occurrence of Spec **1**. The data in silo 1 would be replaced with data based on the specifications in the second occurrence of Spec **1**.

You also have the option of appending specifications in multiple occurrences of a spec to those in the original occurrence. For example, you could append the specifications in a second occurrence of Spec **1** to specifications in the original occurrence of Spec **1**. The original data in silo 1 would be left intact, and appended with additional data based on the specifications in the second occurrence of Spec **1**.

The following discussions include examples for configuring individual selection and extraction specs in a **filterSpec.xml** file.

SearchSpec Action (for entire filterSpec.xml file)

From filterSpec.dtd File

```
<!ELEMENT searchSpec (spec*)>  
<!ATTLIST searchSpec action (append | replace) "append">
```

From filterSpec.xml File

```
<searchSpec action="replace">
```

The action referenced here applies to the entire **filterSpec.xml** file. In the **filterSpec.xml** file delivered with Apelon DTS, the action is set to “**replace**” (Note: the action attribute default in the **filterSpec.dtd** file is “**append**”). You have the option of changing the **searchspec action** if you subsequently modify the **filterSpec.xml** file selection and extraction parameters.

searchSpec action="replace"

If you leave **replace** as the **searchSpec action**, when you run **Selectors & Extractors**, all previous data in the existing silos will be replaced (none of the previous data will be retained). The resulting new data in the silos will be based on the new selection and extraction parameters in the customized **filterSpec.xml** file.

searchSpec action="append"

If you change the **searchSpec action** in the initial **filterSpec.xml** file to “**append**,” when you run **Selectors & Extractors** the previous data in the existing silos will be left intact. However, any new data selected and extracted based on the modified **filterSpec.xml** parameters will be **added** (appended) to the existing silos. None of the previous data is replaced if you use the “append” action.

Note that use of the “append” action with multiple runs of **Selectors & Extractors** can produce heavy duplication of data, resulting in the database being unnecessarily large.

SiloSpec Spec Action (for individual spec)

From filterSpec.dtd File

```
<!ATTLIST siloSpec  
          specAction (append | replace | delete) "append"
```

From filterSpec.xml File

```
<SiloSpec specAction="replace">
```

This attribute is specific to each individual spec. It indicates if data selected/extracted based on the spec parameter will be **replaced** in the silo, or added to the existing data in the silo (**append**) if you change the spec parameters subsequently. The replace or append action is based on the specific spec ID; spec parameters for a spec ID are appended to or replaced. The **delete** action deletes an established spec (i.e., silo) completely.

specAction="replace"

In the sample **filterSpec.xml** file delivered with Apelon DTS, there is no **specAction** attribute assigned to an individual spec. Therefore, the **specAction** for each individual spec defaults to that established as the **specAction** for the entire **filterSpec.xml** file (which is **replace**). If you modify any of the other spec selection and extraction parameters, the “**replace**” action is assumed unless you intentionally modify the action assigned to the individual spec.

If you modify the search configuration in a spec and assign **replace** as the action attribute, then run Selectors & Extractors, all existing silo data based on the previous spec parameters will be **replaced**. None of the original data will be retained – **all** silo data will be replaced. The resulting new data in the silo will be based on the new selection and extraction parameters in the modified spec.

The **specAction** for each individual spec overrides the **searchSpec action** for the entire **filterSpec.xml** file (e.g., an individual spec action of **replace** overrides a **searchSpec action** of **append** for the specific spec only).

specAction="append"

To modify the Spec “action” attribute for an individual spec, you must add the attribute value “**append**.” All of the previous data in silo 1 that was generated based on the previous selection and extraction parameters in **spec 1** will be left intact. The new data selected and extracted based on the modified specifications in **spec 1** will be **added** (appended) to the existing data in silo 1.

The **specAction** for each individual spec overrides the **searchSpec action** for the entire **filterSpec.xml** file (e.g., an individual spec action of **append** overrides a **searchSpec action** of **replace** for the specific spec only).

specAction="delete"

The Spec Action **delete** completely removes an established spec, as well as the corresponding silo and the data within it.

namespace type

From filterSpec.dtd File

```
<!ELEMENT siloSpec (specName, specId, specCode, (allNamespaceOfType | namespace+), select, extract)>
```

From filterSpec.xml File

```
<namespaceType="ontylog"
```

This element indicates the type of namespaces (thesaurus or ontolog) for which you are configuring the spec. You can configure each spec (i.e., silo) to acquire data from multiple namespaces of either type (i.e., the elements `namespaceType="ontylog"` and `namespaceType="thesaurus"` may be included in the same spec).

namespaceAction

From filterSpec.dtd File

```
<!ATTLIST siloSpec
    namespaceAction (include | exclude) "include"
```

From filterSpec.xml File

```
<namespaceAction="include"
```

If include is specified as the siloSpecAction, then information will be acquired from all namespaces designated in the spec (i.e., silo).

Spec Name

From filterSpec.dtd File

```
<!ELEMENT siloSpec (specName, specId, specCode, (allNamespaceOfType |
    namespace+), select, extract)>
```

From filterSpec.xml File

```
<specName>PROCEDURE</specName>
```

This element is the user-defined name assigned to each individual spec. You can modify the default names assigned to the specs in the sample filterSpec.xml file. If you subsequently modify the selection and extraction parameters in individual specs, you may want to can modify the spec names, as appropriate.

Spec ID

From filterSpec.dtd File

```
<!ELEMENT siloSpec (specName, specId, specCode, (allNamespaceOfType |
    namespace+), select, extract)>
```

From filterSpec.xml File

```
<specId>1</specId>
```

This element is a numeric identification number assigned to each individual spec; the first **specId** is 1.

Spec Code

From filterSpec.dtd File

```
<!ELEMENT siloSpec (specName, specId, specCode, (allNamespaceOfType | namespace+), select, extract)>
```

From filterSpec.xml File

```
<specCode>SPEC1</specCode>
```

This element is an additional, alphanumeric identification number for each individual spec. The default code assigned to the first **specId** is **SC1**.

namespace type and hasSemanticTypes Indicators

From filterSpec.dtd File

```
<!ATTLIST namespace  
    type (thesaurus | ontylog) IMPLIED  
    hasSemanticTypes (true | false) IMPLIED
```

From filterSpec.xml File

```
<namespaceAction="include"
```

These values are implied (optionally) and are based on the type of namespace you selected for the spec.

Configure Select Parameters

The selector phase of Selectors & Extractors selects concepts with designated **semantic types** and **properties** from either Ontylog or thesaurus-type namespaces, and selects **root concepts** from Ontylog-type namespaces. From the results of the selector phase, the extractor phase extracts **concept names** and/or **synonymous terms**.

```
<!ELEMENT select (selectSemanticType | selectRoot | selectProperty)+>  
<!ATTLIST select getSelect (all | include) "include">
```

The following discussions include examples for configuring the select parameters.

Select Semantic Types

A semantic type is an identifier from the UMLS semantic network that indicates the basic category to which a concept belongs (for example, “**Organ or Tissue Function**”). Relationships (e.g., associations) with other concepts can be established through semantic types. You can configure parameters for semantic type selection for **either** Ontylog or thesaurus namespaces that originate from the UMLS Metathesaurus. Note the segment from the **filterSpec.dtd** file that references semantic type select parameters.

```
<!ELEMENT selectSemanticType (#PCDATA)>
<!ATTLIST selectSemanticType
    selectSemanticTypeAction (all | include | exclude) "include"
    requiredNamespaceType (ontylog | thesaurus | either) #FIXED "either"
```

Select All Semantic Types

To select concepts for **all** semantic types from the designated namespace(s), specify the **selectSemanticTypeAction** attribute value “**all**.” Note the illustration.

```
</select>
  <selectSemanticType selectSemanticTypeAction="all">
</select>
```

No individual semantic types need to be specified. For this spec, no filtering of concepts from the designated namespace(s) will occur based on semantic type.

Exclude Specific Semantic Types

To select concepts from the designated namespace(s) for all semantic types *except* for a specific few, specify the **selectSemanticTypeAction** attribute value “**all**,” add the **selectSemanticTypeAction** attribute value “**exclude**,” then specify the individual semantic type values for exclusion. Note the illustration.

```
<select>
  <selectSemanticType selectSemanticTypeAction="all">
  </selectSemanticType>
  <selectSemanticType selectSemanticTypeAction="exclude">
    Finding
  </selectSemanticType>
</select>
```

Based on this spec, concepts from the designated namespace(s) having any semantic type *except* **Finding** (and its descendents) will be selected to populate the silo. No other filtering will occur based on semantic type.

Select Specific Semantic Types Only

In the **filterSpec.xml** file, the default selection action (as established in the **filterSpec.dtd** file) is to “**include**” concepts from the designated namespace(s) having the specific semantic type(s) referenced in the individual spec, or a descendent semantic type. Note the highlighted **selectSemanticType** attribute values in the following illustration.

```
<select>
  <selectSemanticType>Finding</selectSemanticType>
  <selectSemanticType>Anatomical Abnormality</selectSemanticType>
  <selectSemanticType>Pathologic Function</selectSemanticType>
  <selectSemanticType>Injury or Poisoning</selectSemanticType>
</select>
```

In the example, concepts from the designated namespace(s) that have the semantic types **Finding**, **Anatomical Abnormality**, **Pathologic Function**, and **Injury or Poisoning**, as well as their descendent semantic types, will be selected to populate the silo. For example, concepts with a semantic type of **Laboratory** or **Test Result** would be included if those semantic types were subconcepts of **Finding**.

Select Properties

A property is a piece of user-defined information attached to a concept. Each property can reference anything (documentation strings, numeric codes, etc.). **Properties can be selected from Ontylog-type namespaces (Subscription or Ontylog Extension) and thesaurus-type namespaces.**

Each property is assigned a name; each property assigned to a concept can have a property value that may, or may not, be unique. For example, the property name **Medical Code** can be assigned to unlimited concepts. The value of the property assigned to each of these concepts can be unique. For example, **HAZARDOUS** may be the **Medical Code** property value for one concept; for another concept, **NON-TOXIC** may be the value for the property **Medical Code**.

The following segment from the **filterSpec.dtd** file references property select parameters.

```
<!ELEMENT selectProperty (selectPropertyName, selectPropertyValue)>
<! ATTLIST selectProperty
    requiredNamespaceType (ontylog | thesaurus | either) #FIXED "either"
<!ELEMENT selectPropertyName (#PCDATA)>
<!ATTLIST selectPropertyName
    selectPropertyNameAction CDATA #FIXED "include">
<!ELEMENT selectPropertyValue (#PCDATA)>
<!ATTLIST selectPropertyValue
    selectPropertyValueAction CDATA #FIXED "include">
```

The highlighted line indicates that a selected property must consist of a property name and property value combination. There are **selectProperty** and **selectPropertyValue** parameters included in the sample **filterSpec.xml** file that is installed with Apelon DTS. “**include**” is the **FIXED** selection attribute value defined for “**selectProperty**” and “**selectPropertyValue.**” There are no attribute values for “**all**” or “**exclude.**”

Select Specific Property Names and Property Values

In the **filterSpec.xml** file, the fixed default selection action (i.e., the **fixed** selection value established in the **filterSpec.dtd** file) is to “**include**” only concepts having the specified property name(s) and value(s) referenced in the individual spec. Each property name and value must be referenced individually. When you add new property name and value selection parameters to the **filterSpec.xml** file, the default is to “**include**” only concepts that have properties with the specific property name(s) and value(s) referenced in the individual spec.

In the following illustration, note the highlighted **selectPropertyName** and **selectPropertyValue** attribute values added to the **filterSpec.xml** file.

```
<select>
  <selectProperty>
    <selectPropertyName>Medical Code</selectPropertyName>
    <selectPropertyValue>Hazardous</selectPropertyValue>
  </selectProperty>
</select>
```

The **selectPropertyName** and **selectPropertyValue** element values are “nested” inside the **selectProperty** tags. Based on these added **selectPropertyName** and **selectPropertyValue** parameters, only concepts having the property **Medical Code** with the property value **Hazardous** will be selected from the designated namespace(s) to populate the silo.

Each combination of **selectPropertyName** and **selectPropertyValue** element values must be listed separately within a set of **selectProperty** tags. Note the added parameters highlighted in the illustration.

```
<select>
  <selectProperty>
    <selectPropertyName>Medical Code</selectPropertyName>
    <selectPropertyValue>Hazardous</selectPropertyValue>
  </selectProperty>
  <selectProperty>
    <selectPropertyName>Medical Code</selectPropertyName>
    <selectPropertyValue>Non-toxic</selectPropertyValue>
  </selectProperty>
  <selectProperty>
    <selectPropertyName>Medical Code</selectPropertyName>
    <selectPropertyValue>Inert</selectPropertyValue>
  </selectProperty>
</select>
```

Based on these added **selectPropertyName** and **selectPropertyValue** parameters, only concepts having the property **Medical Code** with the property values **Hazardous**, **Non-toxic**, and **Inert** will be selected from Ontylog and included in the silo that is populated based on the parameters in this spec.

Select Ontylog Root Concept(s)

In an Ontylog concept hierarchy, a root concept refers to a concept that has a sub tree of concepts below it. Root concepts can be included as selection criteria in the **filterSpec.xml** file for Ontylog-type namespaces only. Note the segment from the **filterSpec.dtd** file that references root concept select parameters.

```
<!ELEMENT selectRoot (#PCDATA)>
<!ATTLIST selectRoot
    selectRootAction CDATA #FIXED "include"
```

In the **filterSpec.xml** file, the attribute **selectRoot** references the parameters for selection of root concept(s) from namespaces of ontlylog type. “**include**” is the **FIXED** root selection attribute value defined for “**selectRoot**.” There are no attribute values for “**all**” or “**exclude**.”

Select Specific Root Concepts

In the **filterSpec.xml** file, the default selection value (and the fixed value established in the **filterSpec.dtd** file) is to “**include**” only the specific root concept(s) referenced in the individual spec (the subconcepts, or children, of each selected root concept also are included). Each root concept must be referenced individually.

Note the highlighted **selectRoot** attribute value in the illustration. Based on the **selectRoot** parameter, the root concept **Body structure**, as well as its subconcepts (direct and indirect) will be selected to populate the silo.

```
<select>
    <selectRoot>Body structure (T-D000A)</selectRoot>
</select>
```

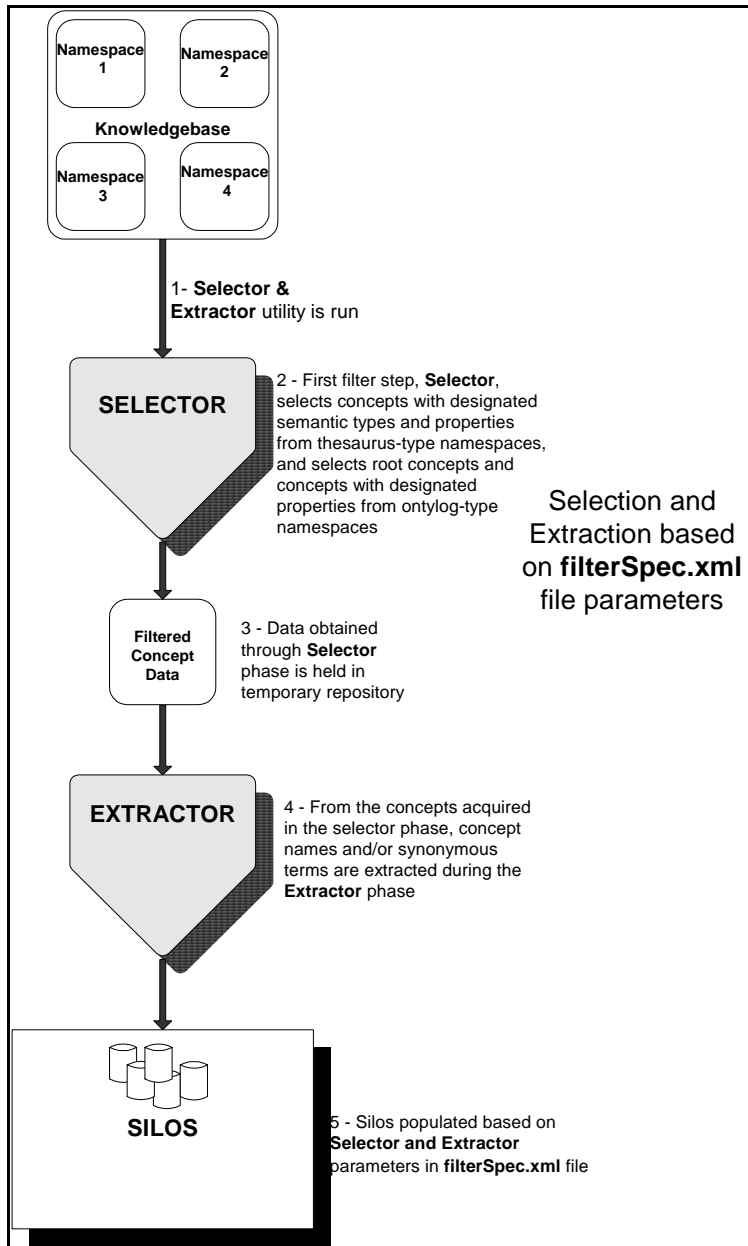
You can subsequently delete unwanted root concept selection parameters, or add new ones, then run Selectors & Extractors. Note the added parameters highlighted in the illustration.

```
<select>
    <selectRoot>Body structure (T-D000A)</selectRoot>
    <selectRoot>Procedure (P0-00000)</selectRoot>
    <selectRoot>Device (A-00100)</selectRoot>
    <selectRoot>Laboratory procedure (P3-00001)</selectRoot>
</select>
```

Based on these **selectRoot** parameters, four root concepts, as well as their subconcepts, will be selected as data sources for the silo.

Configure Extract Parameters

When you run Selectors & Extractors, the **Selector** phase of the process creates a temporary repository, populated with the results of that phase. Note the illustration.



During the **Extractor** phase of the process, the extract parameters in the **filterSpec.xml** file are referenced. Based on these parameters, **concept names** and/or **synonymous terms** are extracted from the concepts selected during the selector phase (i.e., those concepts residing in the temporary repositories) to populate the silos.

The following discussions include extract parameter configuration examples.

Extract Concept Names

You can configure a spec to extract concept names from the concepts acquired in the select phase of Selectors & Extractors. Note the segment from the **filterSpec.dtd** file that references concept name extract parameters.

```
<!ELEMENT extract (extractConceptName | extractSynonymousTerms)>
```

Enter the following spec parameter to extract concepts names for selected concepts.

```
<extract>
    <extractConceptName/>
</extract>
```

Extract Synonymous Terms

You can extract terms that are synonymous with the concepts that were acquired in the select phase of Selectors & Extractors. Note the segment from the **filterSpec.dtd** file that references synonymous term extract parameters.

```
<!ELEMENT extract (extractConceptName | extractSynonymousTerms)>
<!ELEMENT extractSynonymousTerms (allSynonymousTerms | extractTermProperty+)>
```

Enter the following spec parameters to extract concept names, as well as **all** synonymous terms for selected concepts.

```
<extract>
    <extractConceptName/>
    <extractSynonymousTerms>
        <allSynonymousTerms/>
    </extractSynonymousTerms>
</extract>
```

Enter the following spec parameters to extract only synonymous terms (**all**) for selected concepts

```
<extract>
    <extractSynonymousTerms>
        <allSynonymousTerms/>
    </extractSynonymousTerms>
</extract>
```

Extract Concept Synonyms with Specific Property Names

A property is a piece of user-defined information related to a concept or term, and can reference anything (documentation strings, numeric codes, etc.). Each property is assigned a name; each property assigned to a term has, in turn, a unique property value. You can configure a spec to extract from selected concepts only synonymous terms with designated properties.

Note the segment from the **filterSpec.dtd** file that references property extract parameters.

```
<!ELEMENT extractTermProperty (extractPropertyName, extractPropertyValue)>
<!ELEMENT extractPropertyName (#PCDATA)>
<!ATTLIST extractPropertyNameAction CDATA #FIXED "include">
```

“**include**” is the fixed extraction attribute value defined for “**extractPropertyName.**” There are no attribute values for “all” or “exclude.”

Extract Specific Property Names Only

In the **filterSpec.xml** file, the default extraction value (i.e., the **fixed** extraction value established in the **filterSpec.dtd** file) is to “**include**” only synonymous terms having the specific property name(s) referenced in the individual spec. Each property name must be referenced individually.

When you add a new property name extraction parameter to the **filterSpec.xml** file, the default is to “**include**” only the terms having the specific property name(s) referenced in the individual spec. In the following illustration in the sample **filterSpec.xml** file, note the highlighted **extractPropertyName** element values.

```
<extract>
  <extractSynonymousTerms>
    <extractTermProperty>
      <extractPropertyName>preferredName</extractPropertyName>
    </extractTermProperty>
    <extractTermProperty>
      <extractPropertyName>entryTerm</extractPropertyName>
    </extractTermProperty>
    <extractTermProperty>
      <extractPropertyName>ClinicalTerm</extractPropertyName>
    </extractTermProperty>
  </extractSynonymousTerms>
</extract>
```

Based on the parameters in this spec illustration, during the *extract* phase of the Selectors & Extractors process, the **extractPropertyName** parameter would be referenced. Synonymous terms that have the property names **preferredName**, **entryTerm**, and **Clinical Term** will be *extracted* from the concepts selected during the extract phase.

Extract Concept Synonyms with Specific Property Values

A property name (i.e., definition) can be assigned to multiple concepts or terms. For example, the property name **Medical Code** can be assigned to unlimited terms, with a unique value for each term (**HAZARDOUS** may be the **Medical Code** property value for one term; for another term, **NON-TOXIC** may be the value for the property **Medical Code**).

Note the **filterSpec.dtd** file segment that references property value extract parameters.

```
<!ELEMENT extractTermProperty (extractPropertyName, extractPropertyValue)>
<!ELEMENT extractPropertyValue (#PCDATA)>
<!ATTLIST extractPropertyAction CDATA #FIXED "include">
```

“**include**” is the fixed extraction attribute value defined for “**extractPropertyValue**.” There are no attribute values for “all” or “exclude.”

Select Specific Property Values Only

In the **filterSpec.xml** file, the default extraction value (i.e., the **fixed** value established in the **filterSpec.dtd** file) is to “**include**” only synonymous terms having the specific property value(s) referenced in the individual spec. Each property value must be referenced individually.

The **extractPropertyValue** element value is “nested” inside the **extractTermProperty** tags. When you add a new property value extraction parameter to the **filterSpec.xml** file, the default is to “**include**” only concepts with synonymous terms that have the designated property value(s).

In the following illustration, note the highlighted **extractPropertyValue** element values added to the **filterSpec.xml** file.

```
<extract>
  <extractSynonymousTerms>
    <extractTermProperty>
      <extractPropertyName>Medical Code</extractPropertyName>
      <extractPropertyValue>HAZARDOUS</extractPropertyValue>
    </extractTermProperty>
    <extractTermProperty>
      <extractPropertyName>Medical Code</extractPropertyName>
      <extractPropertyValue>NON-TOXIC</extractPropertyValue>
    </extractTermProperty>
    <extractTermProperty>
      <extractPropertyName>Medical Code</extractPropertyName>
      <extractPropertyValue>INERT</extractPropertyValue>
    </extractTermProperty>
  </extractSynonymousTerms>
</extract>
```

Based on the **selectPropertyValue** parameter that was added, only concepts with synonymous terms that have the property value **HAZARDOUS** will be selected.

Appendix A - Publish Client's Local Namespace

Overview

As an Apelon client, you can publish your local namespace content on a regular basis using the **Knowledgebase Publishing** utility provided with the DTS installation (**kbcontent-publish.bat** in *DTSInstall\bin\kb\content\publish*). For a Linux installation, you execute **kbcontent-publish.sh** in *bin/kb/content/publish*. You can assign version numbers to the content modifications to a specific local namespace, then export this local content for subsequent import by your own vocabulary subscribers.

Note: To avoid primary key (or ID) collisions between the publisher and subscriber, “seed” the global sequence differently on the subscriber and publisher ends. For example, the publisher can seed the sequence generator (using the **-startSeq** option in **kbcreate.bat** or **kbcreate.sh**) with a value of **2000000000001** (two trillion and one) while the subscriber can use a seed with a value of **4000000000001** (four trillion and one). The sequence numbers **1-2000000000000** are reserved for subscription content from Apelon.

Apelon Client Publishing Processes

Follow these procedures to publish your local content.

1. Configure the **kbcontent-publish.xml** file (in *DTSInstall\bin\kb\content\publish*). The file is illustrated.

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
#####
# Publishing tool for client local namespaces #
#####
-->
<!DOCTYPE DBConfig SYSTEM "http://apelon.com/dtd/util/dbconfig.dtd">
<DBConfig>
  <!-- Local namespace to publish -->
  <namespace name="[Your local namespace name here]" >
    <property name="add" value="true" />
  </namespace>
  <!-- Content Type to publish
  'full' for first time publishing
  'diff' for subsequent (incremental) publishing
  -->
  <property name="contentType" value="full" />

  <!-- Publishing Version Label -->
  <property name="versionIn" value="1.0.0" />

  <!-- Publishing Version Number (numerals only)
  Note: Increment this number by 1 for each
  new version published.
  -->
  <property name="versionNumber" value="1" />

  <!-- Version assigned for all non-retired entries -->
  <property name="versionOut" value="NOT_RETIRED" />
<!--
```



```

#####
# Database Connection #
#####
-->
<!-- Oracle Connection Parameters -->
<connection>
  <property name="direction" value="target" />
  <property name="type" value="oracle" />
  <property name="user" value="dts" />
  <property name="pass" value="dts" />
  <property name="host" value="localhost" />
  <property name="databaseName" value="ORCL" />
  <property name="databasePort" value="1521" />
  <property name="jdbcDriver" value="oracle.jdbc.driver.OracleDriver" />
  <property name="url_template" value="jdbc:oracle:thin:@[HOST]:[PORT]:[DATABASE]" />
  <property name="blockSize" value="512" />
</connection>
<!--
#####
# Database Connection (sql2k) #
#####
-->
<!-- Microsoft Driver -->
<!--
<connection>
  <property name="direction" value="target" />
  <property name="type" value="sql2k" />
  <property name="user" value="sa" />
  <property name="pass" value="" />
  <property name="host" value="localhost" />
  <property name="databaseName" value="dts" />
  <property name="databasePort" value="1433" />
  <property name="jdbcDriver" value="com.microsoft.sqlserver.jdbc.SQLServerDriver" />
  <property name="url_template"
value="jdbc:sqlserver://[HOST]:[PORT];datasource=[DATABASE];forwardReadOnlyMethod=serverCursor" />
</connection>
-->
<!-- I-Net Sprinta Driver -->
<!--
<connection>
  <property name="direction" value="target" />
  <property name="type" value="sql2k" />
  <property name="user" value="sa" />
  <property name="pass" value="" />
  <property name="host" value="localhost" />
  <property name="databaseName" value="dts" />
  <property name="databasePort" value="1433" />
  <property name="jdbcDriver" value="com.inet.tds.TdsDriver" />
  <property name="url_template"
value="jdbc:inetdae:[HOST]:[PORT]?database=[DATABASE]" />
</connection>
-->
</DBCConfig>

```

2. Provide your local namespace name by replacing the placeholder [**LOCAL NAMESPACE**].

```

<namespace name="[LOCAL NAMESPACE]" >
  <property name="add" value="true" />
</namespace>

```

3. Specify **full** for initial content publication, or **diff** for a subsequent incremental publication.

```

<property name="contentType" value="full " />

```

4. Provide the version for the content to be published.

```
<property name="versionIn" value="1.0.0.0" />
<property name="versionNumber" value="1" />
```

5. The value for the property **versionNumber** is the version number for the published content; the initial (full) version number for a first-time publication is **1.0.0.0**. You can replace this number with any alpha/numeric version identifier.

```
<property name="versionNumber" value="1" />
```

The value for the **versionNumber** property must increment by **1** for each subsequent publication (starting with **1**, followed by **2**, **3**, etc.).

6. In the **kbcontent-publish.xml** file, provide the not retired version string for the content to be published. Note that the not retired version string in most cases is **NOT_RETIRED**.

```
<property name="versionOut" value="NOT_RETIRED" />
```

7. Save the **kbcontent-publish.xml** file.
8. A template connection file, **target-connection.xml** (in *DTSInstall\bin\kb*), allows you to define a custom connection based on the **target** connection parameters. To establish a target connection in the **target-connection.xml** file, the value of the **direction** property should be **target**. Note the illustration.

```
<property name="direction" value="target" />
```

(Note that in the **kbcontent-publish.xml** file, the value of the **direction** property also is **target**.) You can create multiple versions of the **target-connection.xml** files, each with its own specific name, and each reflecting a specific connection to a data source.

After you establish your custom publishing connection parameters in the **target-connection.xml** file, you must insert a Command Line switch in the **kbcontent-publish.bat** file (in *DTSInstall\bin\kb\content\publish*) that references the appropriate custom configuration file. (For a Linux installation, you insert the Command Line switch in **kbcontent-publish.sh** in *bin/kb/content/publish*.)

Apelon recommends that you rename each modified **kbcontent-publish.bat** batch file to reflect its purpose (e.g., **kbcontent-publish-test.bat**, **kbcontent-publish-production.bat**, etc.).

Note the highlighted Command Line switch parameter in **kbcontent-publish.bat**.

```

@echo off
REM
REM Process Arguments : -p <properties-file.xml> -c <configuration full-class name>
REM If no properties-file is specified, default configuration file used -> kbcontent.xml
REM
REM
REM Process arguments overriding the properties file configuration variables:
REM (i.e., connection params from a separate file overrides one in the property file):
REM Usage: -c <system configuration class name> which is mandatory
REM      -action [export, import, export_mappings, import_mappings, content_change_report,
publish_namespace]
REM      export -> exporting content from DTS
REM      import -> importing content into DTS
REM      export_mappings -> exporting inter-source mappings (associations) from DTS
knowledgebase
REM      import_mappings -> importing inter-source mappings (associations) into DTS
knowledgebase
REM      content_change_report -> to generate reports showing concept associations affected by
subscription content update
REM      publish_namespace -> publish a local namespace
REM      -p <user property file name>
REM      file having the properties needed to run this process
REM      -skipConstraints (yes/no)
REM      If yes, the process does not disable/enable constraints and drop/add indexes while updating
DTS knowledgebase
REM      -t <target connection config file>
REM      file with the target connection params.
REM      The application loads connection params from this file, not from kbcontent-publish.xml
REM      If user wants to use connection params in kbcontent-publish.xml, "-t kb/target
connection.xml" should be taken out from "call runApp_cw ..."
REM      -d <data extract directory>
REM      path to folder where subscription content is to be read from/written to.
REM      -pre <pre processes file name>
REM      -post <post processes file name>
REM
REM -- Publishes a given namespace
cd ..\..\..

call runApp_cw 512 com.apelon.dts.db.admin.DbContentMgr -c
com.apelon.dts.db.admin.config.DBContentMgrConfig -p kb/content/publish/kbcontent-publish.xml -action
publish_namespace -t kb/target-connection.xml

cd kb\content\publish

```

Custom Publishing Target Configuration File

To use the **target** connection established in a **target-connection.xml** file (rather than the connection from the **kbcontent-publish.xml** file) modify the Command Line switch parameter in **kbcontent-publish.bat** (or **kbcontent-publish.sh**, for Linux) by specifying the **target-connection.xml** file name.

- Update the **sources.id** in **DTSInstall\bin\kb** to provide an entry for the local namespace to be published. The local namespace name should match the namespace name as it appears in the database (including case). Data files for the local namespace will be published here.

10. If a directory for the namespace does not exist already, the Publish utility creates a directory with an appropriate namespace ID. For example, if the namespace has an ID of **40000**, the folder **40000** is added under *DTSInstall\bin\data*. Ensure that any existing subscription data in that directory is backed up, as the publish process **overrides** the existing data files
11. Run **kbcontent-publish.bat** to publish the selected local namespace with the specified version information. For a Linux installation, execute **kbcontent-publish.sh** in **bin/kb/content/publish** to publish the selected local namespace.
12. If you are publishing the local namespace for the first time (**contentType=full**), the publishing tool generates **.full** files in the *DTSInstall\bin\data\[LOCAL-NAMESPACE-ID]* directory.

If you are publishing the local namespace for incremental data (**contentType=diff**) the publishing tool generates **.new** and **.del** files in the *DTSInstall\bin\data\[LOCAL-NAMESPACE-ID]* directory. The **versionIn** value must be different from the existing version in the database for the vocabulary. For example, if you are publishing the second time, the **versionIn** can be **2.0.0.0**, replacing an existing source database with a **versionIn** of **1.0.0.0**.

For each namespace that you publish, the publishing tool also generates a configuration file that includes information on the version of the namespace being published.

kbcontent-import-full.xml for **FULL** content

kbmap-import-full-[source_nsp_id]-[target_nsp_id].xml for **FULL** mapping

kbcontent-import-diff.xml for **DIFF** content

kbmap-import-diff-[source_nsp_id]-[target_nsp_id].xml for **DIFF** mapping

Using the information in the configuration file, the DTS Subscription Import process can perform integrity checks to verify that the published namespace content is compatible with the namespace version to be imported by a client. The import of a published namespace is prevented if the Subscription Import process detects a version incompatibility between the published namespace content and the content in the client's target database. Refer to the *Subscription Content Import Guide* for subscription namespace import procedures.

Note: If you are publishing DIFF or FULL subscription content from DTS Version 3.3 (or older) you must generate a valid Import Integrity Verification configuration file, and package that file with that older subscription content. Refer to the *Generate Import Integrity Verification File* discussion later in this section.

13. Package the *DTSInstall\bin\data*\[LOCAL-NAMESPACE-ID] for subscription.
Note: It is recommended that the package reflect the name of the folder (e.g., *\data\40000*) along with the data files.

Generate Import Integrity Verification File

For each namespace for which you are publishing **DIFF** or **FULL** subscription content from DTS Version 3.3 (or older), you must configure one of the following Import Integrity Verification configuration files to reflect the namespace version you are publishing.

kbcontent-import-full.xml for **FULL** Content Publishing

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE DBConfig SYSTEM "http://apelon.com/dtd/util/db/dbconfig.dtd">
<DBConfig>

  <!-- Name of namespace being imported. -->
  <namespace name="Triad">
    <property name="add" value="true" />
  </namespace>

  <!-- Type of namespace content. -->
  <property name="contentType" value="full" />

  <!-- Latest version name of namespace
       (from DTS_VERSION.full file).
  -->
  <property name="newVersionIn" value="1.0.0.0" />

  <!-- Latest version id of namespace
       (from DTS_VERSION.full file).
  -->
  <property name="versionNumber" value="1" />
```

Package this configuration file in *DTSInstall\bin\data*\[LOCAL-NAMESPACE-ID] along with the subscription content.

kbcontent-import-diff.xml for DIFF content

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE DBConfig SYSTEM "http://apelon.com/dtd/util/db/dbconfig.dtd">
<DBConfig>

  <!-- Name of namespace being imported. -->
  <namespace name="Triad">
    <property name="add" value="true" />
  </namespace>

  <!-- Type of namespace content. -->
  <property name="contentType" value="diff" />

  <!-- Latest version name of namespace
    (from DTS_VERSION.new file).
  -->
  <property name="newVersionIn" value="2.0.0.0" />

  <!-- Latest version id of namespace
    (from DTS_VERSION.new file).
  -->
  <property name="versionNumber" value="2" />

  <!-- Latest version id of namespace
    required in target database
    (from DTS_VERSION table).
  -->
  <property name="currentVersionId" value="1" />

  <!-- Latest version name of namespace
    required in target database.
    (from DTS_VERSION table).
  -->
  <property name="currentVersionName" value="1.0.0.0" />

  <!-- The version name of not retired field
    for namespace.
    Note: No changes required to this property.
  -->
  <property name="versionOut" value="NOT_RETIRED" />

</DBConfig>
```

Package this configuration file in *DTSInstall\bin\data*[LOCAL-NAMESPACE-ID] along with the subscription update content.

kbmap-import-full-[source_nsp_id]-[target_nsp_id].xml for FULL Mapping Publishing

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE DBConfig SYSTEM "http://apelon.com/dtd/util/db/dbconfig.dtd">
<DBConfig>

  <!-- Type of inter-namespaces mapping content. -->
  <property name="contentType" value="fullMap" />

  <!-- Latest version name of mapping namespace
  (from DTS_VERSION.full file).
  -->
  <property name="newVersionIn" value="1.0.0.0" />

  <!-- Latest version id of mapping namespace
  (from DTS_VERSION.full file).
  -->
  <property name="versionNumber" value="1" />

  <!-- The name of not retired version entry
  for mapping namespace (from DTS_VERSION.full file)
  Note: No changes required to this property.
  -->
  <property name="versionOut" value="NOT_RETIRED" />

  <!-- Name of mapping source namespace being imported. -->
  <namespace name="Triad">
    <property name="type" value="source" />
  </namespace>
  <!-- Name of mapping target namespace being imported. -->
  <namespace name="ACHT">
    <property name="type" value="target" />
  </namespace>
  <!-- Name of mapping association namespace being imported. -->
  <namespace name="Triad">
    <property name="type" value="association" />
  </namespace>

  <!-- Latest version name of mapping source namespace
  required in target database
  (from DTS_VERSION table).
  -->
  <property name="currentVersionSourceName" value="1.0.0.0" />

  <!-- Latest version id of mapping source namespace
  required in target database
  (from DTS_VERSION table).
  -->
  <property name="currentVersionSourceId" value="1" />

  <!-- Latest version name of mapping target namespace
  required in target database
  (from DTS_VERSION table).
  -->
  <property name="currentVersionTargetName" value="1.0.0.0" />

  <!-- Latest version id of mapping target namespace
  required in target database
  (from DTS_VERSION table).
  -->
  <property name="currentVersionTargetId" value="1" />
```

xml for FULL Mapping Publishing, Continued

```
<!-- Latest version name of mapping association namespace
      required in target database
      (from DTS_VERSION table).
-->
<property name="currentVersionAssociationName" value="1.0.0.0" />
<!-- Latest version id of mapping association namespace
      required in target database
      (from DTS_VERSION table).
-->
<property name="currentVersionAssociationId" value="1" />
</DBConfig>
```

Package this configuration file in *DTSInstall*\bin\data\[LOCAL-NAMESPACE-ID]\mapping.

kbmap-import-diff-[source_nsp_id]-[target_nsp_id].xml for DIFF mapping

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE DBConfig SYSTEM "http://apelon.com/dtd/util/db/dbconfig.dtd">
<DBConfig>

  <!-- Type of inter-namespaces mapping content. -->
  <property name="contentType" value="diffMap" />

  <!-- Latest version name of mapping namespace
    (from DTS_VERSION.full file).
  -->
  <property name="newVersionIn" value="2.0.0.0" />

  <!-- Latest version id of mapping namespace
    (from DTS_VERSION.full file).
  -->
  <property name="versionNumber" value="2" />

  <!-- The name of not retired version entry
    for mapping namespace (from DTS_VERSION.full file)
    Note: No changes required to this property.
  -->
  <property name="versionOut" value="NOT_RETIRED" />

  <!-- Name of mapping source namespace being imported. -->
  <namespace name="Triad">
    <property name="type" value="source" />
  </namespace>

  <!-- Name of mapping target namespace being imported. -->
  <namespace name="ACHT">
    <property name="type" value="target" />
  </namespace>

  <!-- Name of mapping association namespace being imported. -->
  <namespace name="Triad">
    <property name="type" value="association" />
  </namespace>

  <!-- Latest version name of mapping source namespace
    required in target database
    (from DTS_VERSION table).
  -->
  <property name="currentVersionSourceName" value="2.0.0.0" />

  <!-- Latest version id of mapping source namespace
    required in target database
    (from DTS_VERSION table).
  -->
  <property name="currentVersionSourceId" value="2" />

  <!-- Latest version name of mapping target namespace
    required in target database
    (from DTS_VERSION table).
  -->
  <property name="currentVersionTargetName" value="2.0.0.0" />

```

xml for DIFF mapping, Continued

```
<!-- Latest version id of mapping target namespace
      required in target database
      (from DTS_VERSION table).
-->
<property name="currentVersionTargetId" value="2" />

<!-- Latest version name of mapping association namespace
      required in target database
      (from DTS_VERSION table).
-->
<property name="currentVersionAssociationName" value="2.0.0.0" />

<!-- Latest version id of mapping association namespace
      required in target database
      (from DTS_VERSION table).
-->
<property name="currentVersionAssociationId" value="2" />

</DBConfig>
```

Package this configuration file in *DTSInstall\bin\data\LOCAL-NAMESPACE-ID\mapping*.

Creating License Files

License files are documents that define the legal conditions that apply to use of the information contained in a namespace (for example, if the namespace contains proprietary information for which use should be restricted). The license document displays when the DTS Browser or DTS Editor opens; you will be required to read the license text and click **Accept** to approve the terms of the license.

Follow this procedure to create a license document for the namespace you are publishing for your subscriber clients. Note: if you migrated a TDE namespace into DTS, a license file **may** already exist; in that case, there is no need to follow this procedure.

1. To create the license table, run **LicenseUtility.bat** in *DTSInstall\bin\kb\load* (for a Linux installation, execute **LicenseUtility.sh** in *bin/kb/load*). The following displays.

```
D: \Program Files\Apelon\DTS\bin>call runApp_cw 128
com.apelon.dts.db.LicenseImporter
Default Logging Loaded from a Jar.build parser and it is
validating true
Database/Driver engine:
[1] Oracle - Thin Client Driver
[2] SQL Server - Sprinta Driver
: 1
```

2. Enter the number for the appropriate database application, then press **Enter**. The login prompts display.

```
Database User: ctrm
Password: ctrm
Host: acre
Port [hit enter to use 1521]:
Instance [hit enter to use ORCL]:
You are connected to acre:1521:ORCL
```

3. Enter the login information (**Database User, Password, Host, Port, and Instance**) for the database where the license table is to be created. The following prompt displays.

```
Do you want to -  
[1] Add License  
[2] Create license table  
[3] Exit
```

4. Select **2, Create license table** to create the table. When the table creation is complete the following message displays.

```
SUCCESS: TABLE 'CONTENT_LICENSE (NAMESPACE_ID, LICENSE_TEXT LONG  
RAW)' created for users
```

If the license table exists already, an error message displays indicating this.

5. After creation of the license table, you must import the license document into it. Create the license document in either text (.txt) or web (.htm, html) format, then save the file to a folder accessible to the machine where DTS is installed.

The license importer is set to default to the filename **license.txt** located in the same folder as **LicenseUtility.bat** (or **LicenseUtility.sh** for a Linux installation). While you can designate any other filename and path, naming your license document **license.txt** and saving it in the **DTSInstall\bin\kb\load** directory will simplify the import process. If the volume of license text required the creation of multiple license files, name the files sequentially.

6. Run **LicenseUtility.bat** again (or **LicenseUtility.sh** for Linux). The following displays.

```
D: \Program Files\Apelon\DTS\bin>call runApp_cw 128  
com.apelon.dts.db.LicenseImporter  
Default Logging Loaded from a Jar. build parser and it is  
validating true  
Database/Driver engine:  
[1] Oracle - Thin Client Driver  
[2] SQL Server - Sprinta Driver  
: 1
```

7. Enter the number for the appropriate database application, then press **Enter**. The login prompts display.

```
Database User: ctrm  
Password: ctrm  
Host: acre  
Port [hit enter to use 1521]:  
Instance [hit enter to use ORCL]:  
You are connected to acre:1521:ORCL
```

8. Enter the login information (**Database User, Password, Host, Port, and Instance**) for the database where the license table is to be created. The following prompt displays.

```
Do you want to -  
[1] Add License  
[2] Create license table  
[3] Exit
```

9. Enter **1**, **Add License**. The following displays.

*Enter the name of the license file to import [hit enter to use
'license.txt'] -*

If you saved your license document as **license.txt** in the **DTSInstall\bin\kb\load** folder, press **Enter**. If you are using another filename or path, specify the path to the license document. Note the illustration.

>> {local drive}: \My Documents\DTS\CurrentLicense.txt

10. Specify the **Namespace** where the license table resides, or press **Enter** to use the default Namespace.

Enter Namespace ID for the license [Hit Enter for Default ID] >>

11. The **LicenseUtility** menu displays, along with a success message indicating that the license document was added to the database.

*Do you want to -
[1] Add License,
[2] Create license table,
[3] Exit
>> SUCCESS: License added to the database*

Knowledgebase Administrator Glossary

The glossary provides brief definitions of the terms used with and throughout the DTS Knowledgebase.

DTS Knowledgebase

An integrated knowledgebase of healthcare terminology that supports clinical application development and deployment, and also provides the components for creating a customized database of terminology. A DTS Knowledgebase may include repositories of terminology called “silos,” each containing terminology acquired from one or more namespaces.

Extension Namespace

An Ontylog Extension namespace is an extension of a specific Ontylog subscription namespace, created for the purpose of creating and maintaining new local content for the linked Ontylog subscription namespace. The Extension namespace is comprised of **supplemental** content that you create locally. In an Ontylog namespace, concepts can be organized into a hierarchy through the **classification** process; DTS allows you to classify each Extension namespace. Classification produces a namespace’s **inferred view** from the **defined view**. The inferred Extension namespace view takes defined concept and role relationships into account, then, if necessary, positions concepts in the namespace hierarchy based on these inferred relationships.

“Extract” Parameter

In the **filterSpec.xml** file, the second of two types of parameters (the “**select**” parameter being the other), you can specify for each spec which concepts and terms are acquired to populate a specific silo in the DTS Knowledgebase. As a result of running the Selectors & Extractors utility, the extract parameter extracts **concept names** and **synonymous terms** from the designated namespace(s).

filterSpec.dtd File

Defines the selection and extraction language for the **filterSpec.xml** file, referenced when you run the **Selection and Extraction** utility.

filterSpec.xml File

Contains the specifications by which data will be selected and extracted (when you run the Selectors & Extractors utility) from the designated namespace(s) to populate the silos in the DTS Knowledgebase. A default **filterSpec.xml** file is packaged with DTS.

Namespace

Refers to an individual source vocabulary contained in your knowledgebase.

Ontylog

Refers to a language and data model used to create and maintain terminology databases through the use of Apelon's Terminology Development Environment (TDE) suite of tools.

Property Name

In the DTS Knowledgebase, a piece of user-defined information of any kind (documentation strings, numeric codes, etc.) related to a concept or term. Each property is assigned a name, and each property can, in turn, have a unique property value.

Through **filterSpec.xml** file specifications, concepts with specific property names can be selected from designated namespaces to populate the silos in the DTS Knowledgebase.

Property Value

The user-defined value assigned to an established property name in the knowledgebase. Through **filterSpec.xml** file specifications, concepts having specific property values can be selected from designated namespaces to populate the silos in the DTS Knowledgebase.

Root

In the Ontylog concept hierarchy, refers to a concept that has a sub tree of concepts below it. Based on **filterSpec.xml** file specifications, data from one or more root concepts can be selected from designated namespaces to populate the silos in the DTS Knowledgebase.

Selectors & Extractors

A Java program that reads the filtering specifications in the **filterSpec.xml** file. Based on these specifications, **Selectors & Extractors** creates SQL queries for designated namespaces. Retrieved query results are returned to **Selectors & Extractors**, which inserts the results into the silos in the DTS Knowledgebase.

“Select” Parameter

In the **filterSpec.xml** file, the first of two types of parameters (the “**extract**” parameter being the other) you can specify for each spec which data are acquired from designated namespaces to populate a specific silo in the DTS Knowledgebase. As a result of running **Selectors & Extractors**, the selected parameter acquires concepts with designated **semantic types** and **properties**, and acquires **root concepts** and descendent concept's Ontylog-type namespaces.

Semantic Type

In the DTS Knowledgebase, a semantic type indicates the basic category or categories to which a concept belongs (for example, “**Organ or Tissue Function**”). Grouping with other concepts can be established through semantic types. Through **filterSpec.xml** file specifications, data can be selected and extracted from designated namespaces based on semantic type to populate the silos in the DTS Knowledgebase.

Silos

Repositories of terminology, each containing data based on the selection and extraction parameters in the corresponding spec in the **filterSpec.xml** file (i.e., silo 1 is populated based on the parameters in specs with an ID number of 1, silo 2 is populated based on the parameters in specs with an ID number of 2, etc.).

Spec

In the **filterSpec.xml** file, a spec refers to a specific set of parameters for **selection** and/or **extraction** of data from designated namespaces in the DTS Knowledgebase. As subsequent data selection and extraction requirements occur, you can modify any spec in the **filterSpec.xml** file, or add new specs (the **filterSpec.xml** file can have unlimited specs).

Spec Code

In the **filterSpec.xml** file, an alphanumeric identification number assigned to each individual spec.

Spec ID

In the **filterSpec.xml** file, a numeric identification number assigned to each individual spec. The number of the DTS Knowledgebase silo that is populated based on the selection and extraction parameters in the spec corresponds with the Spec ID number. You can define multiple specs to populate a single silo. For example, you can define multiple specs with Spec ID **1**, all containing specifications to populate silo 1.

Spec Name

In the **filterSpec.xml** file, a name assigned to each individual spec (e.g., **Diseases**).

UMLS Metathesaurus

The source of many subscription namespaces in the DTS Knowledgebase. The UMLS Metathesaurus consists of semantic information about medical concepts, and the relationships between the various names that identify those concepts. It contains information from many medical vocabularies.

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