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DTS 4: Release Notes

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A. Introduction

Version 4 is a major revision to Apelon's open source Distributed Terminology System (DTS) terminology management platform. Version 4 has been designed to meet emerging enterprise requirements for creating, maintaining and deploying terminologies, with local enhancements, into enterprise, regional, and national distributed application environments.

DTS 4 introduces a new Enterprise Architecture and Namespace Versioning features, a new DTS Browser and an enhanced DTS Editor with a new Module Architecture. Metadata additions to Namespaces and Subsets are now available that further expand the DTS Object Model. All DTS APIs are now available in web services formats. DTS 4 also provides Local Ontylog Namespace Modeling, enhanced DTS Subsets, Namespace Root specification, Namespace and Subset Publishing, and a new role-based permissions access control mechanism.

DTS 4.9.0 release should be used for updating all production and mission critical systems.

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B. DTS Version 4.9.0 (09/2026)

B.1 Operating System Compatibility

DTS 4.9 introduces compatibility with Windows Server 2022 based systems. DTS 4.9.0 continues to support Windows 11 Professional client environments.

For Linux installations, DTS 4.9.0 adds support for Red Hat Enterprise Linux 8 and AlmaLinux 8. CentOS is no longer supported.

B.2 Additional Database Support – MS SQL Server 2025 and MySQL 8.4

DTS 4.9.0 provides accommodations for use of Microsoft SQL Server 2025 and MySQL 8.4 LTS databases for DTS Server transactions. See the DTS 4.9.0 Installation Guide for complete information on configuring supported application servers with these databases for DTS.

DTS 4.9.0 is the last version planned to support Microsoft SQL Server 2019. Customers using SQL Server 2019 should plan migration to a newer supported SQL Server version before a future DTS release removes SQL Server 2019 support.

B.3 Sunset of Oracle Database and GlassFish Application Server Support

As of the release of DTS 4.9.0, Oracle databases are no longer supported. DTS 4.8 was the last version that supported Oracle databases.

As of the release of DTS 4.9.0, GlassFish application servers are no longer supported. DTS 4.8 was the last version that supported GlassFish application servers.

If your organization requires assistance planning a DTS migration from Oracle or GlassFish, please reach out to Apelon Customer Support at support@apelon.com.

B.4 Additional Application Server Support – JBoss EAP 7.4 Update 23 and WildFly 26.1.3.Final

DTS 4.9.0 provides support for the use of JBoss EAP 7.4 Update 23 and WildFly 26.1.3.Final application servers. See the DTS 4.9.0 Installation Guide for complete information on configuring these application servers for DTS.

B.5 Java Runtime Update – Eclipse Temurin 8 JRE

DTS 4.9.0 replaces the Oracle Java 8 JRE bundled with the Windows installation with Eclipse Temurin 8 JRE.

The DTS 4.9.0 Windows installation includes Eclipse Temurin 8 JRE for DTS 4 Editor use only. This bundled runtime is not for use by the JBoss EAP or WildFly application server; existing Java installations on the target machine are not affected.

Linux installations use the OpenJDK 8 supplied by the supported Linux operating system package manager.

B.6 DTS Enhancements

DTS 4.9.0 includes dependency, runtime, and supportability updates intended to improve security posture while preserving DTS 4 behavior.

1. Upgraded Log4j to version 2.25.5 and standardized SLF4J on version 2.0.17.

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2. Removed obsolete and conflicting logging libraries, including Logback 1.1.9 and related Logback XML configuration files.
3. Updated selected third-party libraries, including Apache Commons, Jackson, XStream, Gson, XNIO, JUnit, MySQL JDBC, Microsoft SQL Server JDBC, and Apache HttpClient dependencies, to current Java 8-compatible versions.
4. Updated the Module Manager default URL to HTTPS and made the URL configurable using the “InfoManager.bat” utility to create a “module.url” context_key with the URL as the context_value in the dts_system_context table.

B.7 DTS Editor Updates

DTS 4.9.0 includes several DTS 4 Editor usability and supportability updates.

1. Updated the About Apelon DTSEditor window with the new Apelon logo and expanded Java runtime/vendor reporting.
2. Updated Search panel behavior so Type Namespace defaults to the selected Search Namespace when performing attribute-type searches.
3. Added case-insensitive, alphanumeric sorting by concept name to Template Editor dropdown lists.

B.8 Resolved Issues

DTS 4.9.0 fixes several issues and bugs, listed below.

1. Resolved issue causing the Apelon DTS Browser and/or Uninstall shortcuts not to display correctly in the Windows Start Menu on supported modern Windows systems.
2. Resolved RichFaces compatibility-related Java errors written to JBoss EAP and WildFly server logs during DTS Browser actions.
3. Resolved TQL FOR statement parser issue that incorrectly rejected valid FOR statements.
4. Corrected TQL Plug-in User Guide CREATE examples so quoted namespace/type names are shown correctly.
5. Improved TQL export performance for namespaces and subsets in environments with a large number of namespaces/subsets, and added new content-property search APIs to support it.
5. Resolved TQL issue where a period (".") at the end of certain queries could result in an out-of-memory error.
6. Resolved Import Wizard namespace import failure when the source .xml file name contained an additional period.
7. Resolved Import Wizard issue where imports could apply incorrect attribute types to parent attributes.
8. Resolved Import Wizard log display issue after completing an import.
9. Resolved Import Wizard issue importing subsets whose expressions reference multiple subset filters.
10. Resolved Excel Wizard issue where the source Excel file could be corrupted and processing could become unresponsive during certain import operations.
11. Resolved Concept Walker stale-field behavior after DTS Editor logout and login.

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12. Resolved issue where the Namespace Profile Editor could throw a background error when saving after clicking into a Validator field with no validators available.
13. Corrected DTS 4 Javadoc related to null DataTypeFilter behavior in query.find(filter, descriptor) and dao.findSubset.
14. Updated DTS Programming Tutorial and Web Services Tutorial sample code and tutorial text for the current logging stack.
15. Updated server setup documentation to include SQL Server datasource validation guidance for JBoss EAP and WildFly.
16. Updated Linux installation documentation for Red Hat Enterprise Linux 8 and AlmaLinux 8.
17. Created support documentation describing how to update the Eclipse Temurin 8 JRE bundled with the DTS 4.9.0 Windows installation after release.
18. Various minor bug fixes.

B.9 Known Restrictions, Limitations, and Issues

The following are known DTS 4.9.0 restrictions, limitations, and issues:

1. Ability to create Extension namespace based on Local Ontylog namespace is currently not supported.
2. When adding a Synonym Filter to a Subset Expression, the Term Status filter is ignored.
3. Concepts cannot be deleted if they have non-local Attributes.
4. Namespaces and Subsets cannot be deleted if they use non-local Attributes.
5. The DTS Browser Search panel Status Filter does not work when searching for Terms.
6. The existing SQL Server subset-expression parameter limit remains unchanged by SQL Server 2025 support.

B.10 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.9.0

B.10.1 DTS Server Hardware Requirements

- CPU
  - 4 Cores - Minimum
  - 8 or more Cores - Recommended
- System Memory
  - 8GB RAM – Minimum
  - 16GB – 32GB RAM – Recommended (Minimum if both server and database are on the same machine and using classification)
- Available hard drive space
  - 100GB Minimum and 200GB+ Recommended

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- This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
- Actual available hard drive space must be sufficient to accommodate the DTS installation (~900MB) as well as the space requirements for your specific knowledgebase configuration

B.10.2 DTS Server and Client Software Requirements (only 64-bit recommended)

a. Operating Systems

- Windows 11 Professional
- Windows Server 2019 or Windows Server 2022
- Red Hat Enterprise Linux 8 or AlmaLinux 8

b. Web Browser (for DTS Browser)

- Microsoft Edge, Firefox, Chrome

c. Database Management System

- One of the following:
  - Microsoft SQL Server 2019 Standard or Enterprise Edition (Express Edition not supported. Must be hosted on a Windows Server) (NOTE: DTS 4.9.0 is the last version where this Database will be supported)
  -
  - Microsoft SQL Server 2025 Standard or Enterprise Edition (Express Edition not supported. Must be hosted on a Windows Server)
  - MySQL Community Server 8.4 LTS

d. Application Server

- One of the following:
  - JBoss EAP 7.4 Update 23 Application Server
    - JBoss EAP 7.4 Update 23 only supported on JDK 1.8
  - WildFly 26.1.3.Final Application Server
    - WildFly 26.1.3.Final only supported on JDK 1.8

e. Runtime Environment

- The DTS 4.9.0 Windows installation includes Eclipse Temurin 8 JRE for DTS 4 Editor use
- The JRE included with the DTS 4.9.0 Windows installation is only used by DTS – it is not for use by the JBoss EAP or WildFly application server (existing Java installations on the target machine are not affected)
- Linux installations can use the OpenJDK 8 runtime supplied by the supported Linux operating system package manager

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C. DTS Version 4.8 (08/2023)

A.1 Operating System Compatibility

DTS 4.8 introduces compatibility with Windows Server 2019 based systems and client support on Windows 11 Professional.

Windows 2012 R2 Server will reach end of support from Microsoft on October 10th, 2023 and as a result DTS 4 versions will not officially support it in the future.

C.1 Additional Database Support – MS SQL Server 2019 and MySQL 8

DTS 4.8 provides accommodations for the use of MS SQL Server 2019 and MySQL 8 databases for DTS Server transactions. See the ***DTS 4.8 Installation Guide*** for complete information on configuring supported application servers with MS SQL Server 2019 and MySQL 8 for DTS.

C.2 Sunset of MySQL 5.6 and Oracle Databases

DTS 4.8 is the last version supporting MySQL 5.6 and Oracle 12c databases. This is also the last version that will support an Oracle database.

If you are currently using either of these databases and your organization requires assistance in planning your DTS migration, please reach out to Apelon Customer Support at support@apelon.com.

C.3 Additional Application Server Support – JBoss EAP 7.4 and WildFly 23

DTS 4.8 provides accommodations for the use of JBoss EAP 7.4 and WildFly 23 Application Servers. See the ***DTS 4.8 Installation Guide*** for complete information on configuring these application servers for DTS.

Note: Keystores are no longer required for DTS 4 Editor connections to any supported Application Server.

C.4 Sunset of WildFly 12 and Jboss EAP 7.1 Application Servers

DTS 4.8 is the last version supporting the WildFly 12 and JBoss EAP 7.1 application servers.

If you are currently using either of these application servers and your organization requires assistance in planning your DTS migration once support is removed, please reach out to Apelon Customer Support at support@apelon.com.

C.5 DTS Enhancements

DTS 4.8 introduces an update to Log4j version 2.19.0.

Please note that previous versions of DTS are packaged with Log4j version 1.2.17. The recent Log4j vulnerabilities do not affect the version of Log4j packaged with previous DTS 4 releases, as the affected versions are 2.0.0 through 2.15.0-rc1.

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C.6 Resolved Issues

DTS 4.8 fixes a few issues and bugs, listed below.

1. Resolved issue where Namespace Content License displayed special characters, such as copyright and registered trademark symbols, incorrectly with block type characters.
2. Included DTS 4.7.2 Patch 1 fix that resolved issue with DTS Editor Audit Report and Grid Editor modules failing to launch.
3. Resolved subset build issue where Namespace Filter Version is set to 'Current' and the Concept Filter contains 'ONLY' Modifier.
4. Resolved subset issue where duplicate codes would be displayed after building subset expression that contained multiple versions of the same concept.
5. Resolved issue where DTS Editor connection did not validate user's password against older JBoss EAP and WildFly Application Servers.
6. Resolved Import Wizard issue where performing concept name updates on concepts in Local Ontylog namespaces resulted in the concepts incorrectly being changed from 'Primitive' to 'Defined'.
7. Resolved TQL issue where Namespace and Subset export performance had been reduced from that of the previous version.
8. Various minor bug fixes.

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.8 restrictions, limitations, and issues:

1. Ability to create Extension namespace based on Local Ontylog namespace is currently not supported.
2. When using the SQL Server 2012 “userCreate2012.bat” or the SQL Server 2016 “userCreate2016.bat” script to create a user, an error is thrown but a valid DTS4 user is created and no additional action is necessary.
3. When adding a Synonym Filter to a Subset Expression, the Term Status filter is ignored.
4. Concepts cannot be deleted if they have non-local Attributes.
5. Namespaces and Subsets cannot be deleted if they use non-local Attributes.
6. The DTS Browser Search panel Status Filter does not work when searching for Terms.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.8

A.1.1 DTS Server Hardware Requirements

- CPU
  - 1 or more Dual Core - Minimum
  - 1 or more Quad Core - Recommended
- System Memory
  - 8GB RAM – Minimum

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  - 16GB RAM – Recommended (Minimum if both server and database are on the same machine and using classification)

- Available hard drive space
  - 100GB Minimum and 150GB+ Recommended
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~900MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Server and Client Software Requirements (only 64-bit recommended)

a. Operating Systems

- Windows 10 Professional or Windows 11 Professional
- Windows Server 2016 or Windows Server 2019
- Redhat Enterprise Linux 6 or 7 (or CentOS 6 or 7)

b. Web Browser (for DTS Browser)

- Microsoft Edge 44+, Firefox 81+, Chrome 85+

c. Database Management System

- One of the following:
  - Oracle 12c (12.1.0.2) Standard or Enterprise Edition (depending on Application Server) (Oracle 12c 12.2 or later not supported) **(NOTE: DTS 4.8 is the last version where this Database or any Oracle Database will be supported)**
  - MS SQL Server 2016 (Express Edition not supported. Must be hosted on a Windows Server)
  - MS SQL Server 2019 (Express Edition not supported. Must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier and later versions not supported) **(NOTE: DTS 4.8 is the last version where this Database will be supported)**
  - MySQL 8 (earlier and later versions not supported)

d. Application Server

- One of the following:
  - JBoss EAP 7.4.0 Application Server

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- JBoss EAP 7.4.0 only supported on JDK 1.8

- JBoss EAP 7.1.0 Application Server
  - JBoss EAP 7.1.0 only supported on JDK 1.8 **(NOTE: DTS 4.8 is the last version where this Application Server will be supported)**

- WildFly 23.0.2 Application Server
  - WildFly 23.0.2 Application Server only supported on JDK 1.8

- WildFly 12.0.0 Application Server
  - WildFly 12.0.0 Application Server only supported on JDK 1.8 **(NOTE: DTS 4.8 is the last version where this Application Server will be supported)**

- GlassFish 3.1.22 Application Server
  - GlassFish Application Server version 3.1.2.2 (Full Platform) only supported on JDK 1.8 (only this version is supported) **(NOTE: DTS 4.8 is the last version where this Application Server will be supported)**

e. Runtime Environment

- The DTS 4.8 Windows installation includes Version 1.8 of the Sun Java Runtime Environment (JRE)
  - The JRE 1.8 included with the DTS 4.8 Windows installation is only used by DTS – it is not for use by the JBoss EAP, WildFly or GlassFish application server (existing Java installations on the target machine are not affected)

D. DTS Version 4.7.2 (03/2021)

D.1 DTS Editor Upgrades

DTS 4.7.2 introduces several new features to the DTS Editor. Below is a bulleted list of new tools, features, and capabilities included in the DTS Editor.

1. Namespace and Subset Export – Namespaces and Subset XMLs can now be generated with a push-button export operation.
2. Non-local Properties and Qualifiers can now be added to Content objects: Namespaces, Namespace Versions, Subsets, Subset Versions, and Authorities. Non-local Properties are Properties whose Property Type owner (Namespace, Subset, or Authority) is not the same as the Namespace, Namespace Version, Subset, Subset Version, or Authority on which the Property is placed. These non-local attributes will display in *italics*. Previously, only local Properties could be placed on Namespaces, Namespace Versions, Subsets, Subset Versions, and Authorities. Note: In order to add a non-local attribute, the DTS user must

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have Manage permissions over the Namespace, Subset, or Authority of the associated Property Type.
To accommodate these additions, a new Type Namespace (or Type Subset or Type Authority) dropdown has been added to the Attribute Editors. These dropdowns contain all Content objects from which associated Attributes can be drawn (inclusion is subject to User Permissions). Previously, only Attributes from the Current Local Namespace (CLN), or the active Content Object, could be used in the Editors. As well as more easily supporting non-local Content Properties, the inclusion of the Type Namespace field simplifies the addition of non-local Concept and Term attributes without the necessity of changing the Current Local Namespace. When adding Concept and Term attributes, the default Attribute Type Namespace remains the CLN. When adding Content Attributes, the default Content Type is the selected object's Content (Namespace, Subset, Authority).

3. Attribute Type Filtering – Attribute Type Filtering in the Attribute Editors (Property Editor, Association Editor, and Synonym Editor) and Attribute Filter panels (Filter Property Types, Filter Association Types, Filter Synonym Types, and Filter Qualifier Types panels) has been enhanced to provide a more intuitive experience. In the Attribute Filter panels upper and lower sections, sorting by Attribute Type or Content Type is now available by clicking on the column headers. Additionally, a 'For Namespace', 'For Subset', or 'For Authority' dropdown has been added to restrict the displayed Attribute Types to those for a specific Content. In the Attribute Editors, when the available Attributes have been filtered, an orange 'F' icon ("filtered") appears at the end of the Attribute Type field in the Editor, next to the validator icon. If no Filter is was applied, an orange 'A' icon ("all") appears next to the validator icon.
4. When adding or modifying a Property, Association, or Synonym in the Property, Association, or Synonym Editor, if unsaved changes are present and a request to close the Editor window is made, a warning/confirmation dialog will be shown so any unsaved changes are not lost.
5. Subsets versions can now be published with no changes to the subset expression.

D.2 DTS FHIR Upgrades

DTS 4.7.2 includes updates and new capabilities to DTS's implementation of the FHIR terminology service. Below is a bulleted list of these new features and capabilities.

1. Added support for searching on DTS Namespace or DTS Subset Names with the '_name' search parameter. Note this is different than the 'name' FHIR search parameter which references the FHIR_Name Namespace or Subset Property.
    a. Ex.: [FHIR_root]/CodeSystem/?_name=apelon-codesystem-001
2. FHIR ValueSet $expand operations now support returning the DTS Concept Name instead of a FHIR_Display Property value or preferred synonym using an additional 'display' parameter with the value set to 'name'.
    a. Ex.: [FHIR_root]/ValueSet/apelon-valueset-001/$expand?display=name
3. Added support for specification of result format ("json", "xml") using the '_format' parameter. The value of this parameter will override any *Accept* header value when returning content. Please see DTS FHIR CodeSystem Support and DTS FHIR ValueSet Support Guides for accepted parameters.
    a. Ex.: [FHIR_root]/CodeSystem/apelon-codesystem-001?_format=xml

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D.3 DTS Browser Upgrades

DTS 4.7.2 introduces several new features to the DTS Browser. Below is a bulleted list of new tools, features, and capabilities included in the DTS Browser.

1. Updated DTS Browser presentation to match that in the DTS Editor.
    a. DTS Browser Tree sorting of Namespaces is consistent with the DTS Editor. Concept sorting is available by name, code, or id.
    b. DTS Details panels Attribute Sorting is consistent with the DTS Editor.
    c. DTS Browser Tree supports ontylog extension concepts in *italics* to match the representation of the DTS Editor.
    d. DTS Details panels show non-local Attributes in *italics* to match the representation of the DTS Editor.
    e. DTS Browser Details panel supports Inferred and Defined view of concepts.
    f. Added a Subset Details Panel to the DTS Browser.
    g. Added support for displaying all Property Qualifier Types to be shown in the DTS Browser.
    h. Added support for displaying all Inverse Names for all Content Types
    i. DTS Browser Search panel supports a concept and term status filter option as an additional search parameter.
    j. DTS Browser Namespace and Subset search panels have been added.
2. Added a timeout message if the DTS Browser is idle for 30 minutes. This timeout will require the user to refresh the DTS Browser to continue use.

D.4 DTS Enhancements

DTS 4.7.2 introduces several new enhancements. Below is a bulleted list of new features and capabilities.

1. Added a batch process to recreate table indices and constraints. If tables indices or constraints have been deleted, DTS performance can be reduced. A new DTS batch process has been provided with the DTS Server installation that recreates table indices and constraints.
2. Added Subset delete batch process to reduce time for large subset deletes. Performing deletions of large Subsets from this tool will result in improved delete times compared to manual Subset delete within the DTS Editor.
3. Enhanced performance when publishing new Namespace Versions against MySQL.
4. Enhanced performance for large Subset building against SQL Server.

D.5 Namespace Summary

A Namespace Summary plugin has been added to display Namespace statistics.

D.6 TQL Editor

TQL 4.7.2 includes several new features. Below is a list of new features and capabilities.

1. Added support for exporting non-local content (Namespace, Namespace Version, Subset, Subset Version, Authority) Properties and Qualifiers. Export format is the same as that implemented in the DTS Editor.

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D.7 Import Wizard

Import Wizard 4.7.2 includes several new features. Below is a list of new features and capabilities.

1. Added support for importing non-local content Properties and Qualifiers using the Import Wizard.
2. Added additional expression verification when performing Subset XML import to prevent loading when specified content versions are not present. After selecting the XML to be imported, the XML is parsed to ensure any Namespace or Subset versions referenced in the Subset Expression exist in the database. If this condition is not met, the import will not proceed.

A.1 Sunset of Oracle 11g Database

As of the release of DTS 4.7.2, the Oracle 11g Database is no longer supported.

If you are currently using this database and your organization requires assistance in planning your DTS migration, please reach out to Apelon Customer Support at support@apelon.com.

D.8 Sunset of Windows 7 and Windows Server 2008 Operating System

As of the release of DTS 4.7.2, the Windows 7 and Windows Server 2008 Operating Systems are no longer supported.

If you are currently using either of these Operating Systems and your organization requires assistance in planning your DTS migration, please reach out to Apelon Customer Support at support@apelon.com.

A.1 WebSphere Application Server Support

Application Servers previously supported in DTS 4.7.1 remain under support, but it should be noted that future development plans include sunsetting WebSphere Application Server support.

If you are currently using this application server and your organization requires assistance in planning your DTS migration once support is removed, please reach out to Apelon Customer Support at support@apelon.com.

D.9 Resolved Issues

DTS 4.7.2 fixes a few issues and bugs, listed below.

9. Corrected representation of LOINC properties when performing FHIR calls.
10. Resolved issue causing extension concepts to incorrectly appear in the base namespace tree view.
11. Resolved issue causing Subset Current check box to become unchecked if a Subset Property had been added, modified, or removed. The Subset Current check box only becomes unchecked if the Subset expression has been modified since the last successful build.

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12. Resolved issue causing an error to be thrown when a Subset expression contained a kind or property filter on a published subset version.
13. Resolved issue causing Subset expressions with nested concept filters to ignore deleted and retired concepts.
14. Resolved issue causing Synonym Association Inverse Names to not be used in Term Details Panel.
15. Resolved issue causing Validator and Kind sequence ID errors resulting from Import Wizard plug-in Namespace Import.
16. Workaround identified for running DTS Editor on monitors with resolution 3000x2000 or greater. See DTS Installation Guide or DTS Editor Guide for additional details.
17. Various bug fixes.

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.7.2 restrictions, limitations, and issues:

7. Ability to create Extension namespace based on Local Ontylog namespace is currently not supported.
8. When using the SQL Server 2012 “userCreate2012.bat” or the SQL Server 2016 “userCreate2016.bat” script to create a user, an error is thrown but a valid DTS4 user is created and no additional action is necessary.
9. After connecting the Editor to a GlassFish application server, the Editor must be closed and reopened in order to connect to either a JBoss EAP or WildFly 12 application server.
10. When adding a Synonym Filter to a Subset Expression, the Term Status filter is ignored.
11. Concepts cannot be deleted if they have non-local Attributes.
12. Namespaces and Subsets cannot be deleted if they use non-local Attributes.
13. The DTS Browser Search panel Status Filter does not work when searching for Terms.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.7.2

A.1.1 DTS Server Hardware Requirements

- CPU
  - 1 or more Dual Core - Minimum
  - 1 or more Quad Core - Recommended
- System Memory
  - 8GB RAM – Minimum
  - 16GB RAM – Recommended
- Available hard drive space
  - 100GB Minimum and 150GB+ Recommended

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- This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
- Actual available hard drive space must be sufficient to accommodate the DTS installation (~900MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Server and Client Software Requirements (only 64-bit recommended)

a. Operating Systems

- Windows 10 Professional, Windows Server 2012 R2, or Windows Server 2016
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Microsoft Edge 44+, Firefox 81+, Chrome 85+

c. Database Management System

- One of the following:
  - Oracle 12c (12.1.0.2) Standard or Enterprise Edition (depending on Application Server) (**NOTE: Oracle 12c 12.2 or later not supported**)
  - MS SQL Server 2016 (Express Edition not supported. Must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier and later versions not supported)

d. Application Server

- One of the following:
  - JBoss EAP 7.1.0 Application Server
    - JBoss EAP 7.1.0 only supported on JDK 1.8
  - WildFly 12.0.0 Application Server
    - WildFly 12.0.0 Application Server only supported on JDK 1.8
  - GlassFish 3.1.22 Application Server
    - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
  - IBM WebSphere Application Server
    - Only supported in Oracle DB Environments, See DTS Websphere Setup Guide for details on version and configuration steps **(NOTE: DTS 4.7.2 is the last version where this Application Server will be supported)**

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e. Runtime Environment

- The DTS 4.7.2 Windows installation includes Version 1.8 of the Sun Java Runtime Environment (JRE)
    - The JRE 1.8 included with the DTS 4.7.2 Windows installation is only used by DTS – it is not for use by the JBoss, WildFly, GlassFish, or WebSphere application server (existing Java installations on the target machine are not affected)

E. DTS Version 4.7.1 (12/2019)

E.1 DTS Editor Upgrades

DTS 4.7.1 introduces several new features to the DTS Editor. Below is a bulleted list of new tools, features, and capabilities included in the DTS Editor.

6. DTS4 Security Model – "_MANAGE" roles are no longer created during Namespace, Subset, and Authority creation to simplify role management. A one-time cleanup of old "_MANAGE" will be performed upon deployment of the Application Server .ear file from the DTS 4.7.1 installation. Additional features have been added to the User Manager module to assist in Role and User management.
7. Subsets – Subset expressions can now reference the 'current' version of a namespace or subset. Expressions can also include multiple namespace filters referencing the same namespace if they are different versions of the namespace. A new Build feature has been added to allow for batch building of subsets. The Subset Preview panel now has a display option to indicate the version of each concept in the subset.
8. Added warning listing the subsets that reference a namespace upon deletion of this namespace. This prevents inadvertently creating subsets with invalid expressions.
9. Added link to 'DTS Web Service Programming Tutorial' in Start Menu

E.2 DTS FHIR Updates

DTS 4.7.1 includes updates and new capabilities to DTS's implementation of the FHIR terminology service. Below is a bulleted list of these new features and capabilities.

3. FHIR Configuration file – It is now possible to configure the specification of installation-specific FHIR parameters, such as increasing the maximum expansion count and maximum search count.
4. Optimized search for multi-attribute searches
5. Support for Extensions
6. Support for no version specifications in compose elements
7. Support for Value Set reference search IN parameter
8. Support for IN parameters conceptMapVersion and URL for Concept Map $translate requests

E.3 TQL Editor

TQL 4.7.1 includes several new features. Below is a list of new features and capabilities.

3. Added TQL Preferences
    a. Syntax elements are color coded and color is configurable

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   b. ToolTip help available
   c. Tab size is configurable
   d. Smart processing option handles auto-close of doublets and auto-indent of new lines
4. Added Reference Guide showing major syntax elements
5. Added READ statement that can process any Excel or text file

A.1 Sunset of JBoss 7.1.1 and WildFly 10 Application Server Support

As of the release of DTS 4.7.1, the JBoss 7.1.1 and WildFly 10 application servers are no longer supported.

If you are currently using either of these application servers and your organization requires assistance in planning your DTS migration, please reach out to Apelon Customer Support at support@apelon.com.

A.1 Oracle 11g Database and Windows 7/Windows Server 2008 R2 Operating System Support

Databases and operating systems previously supported in DTS 4.7 remain under support, but it should be noted that future development plans include sunsetting Oracle 11g as well as Windows 7 and Windows Server 2008 R2 operating systems.

If you are currently using Oracle 11g or any of these operating systems and your organization requires assistance in planning your DTS migration once support is removed, please reach out to Apelon Customer Support at support@apelon.com.

E.4 Resolved Issues

DTS 4.7.1 fixes a few issues and bugs, listed below

18. Resolved issue caused by negative ID values by adding checks to ensure no negative IDs are accepted
19. Resolved issue causing total terms and term property qualifiers to be missing in Namespace Stats
20. Resolved issue causing Ontylog Extension concepts to appear in the Ontylog Base namespace within the DTS Editor Tree View
21. Resolved issue causing error to be thrown when subset contains duplicate concepts from different versions of the same namespace
22. Resolved issue where Value Set and Code System ‘status’ elements were accepted that are not from the PublicationStatus HL7 Value Set
23. Resolved issue with Value Set $expand designation IN parameter
24. Resolved issue with $expand code count not matching database count
25. Various bug fixes

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.7.1 restrictions, limitations, and issues:

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14. Ability to create Extension namespace based on Local Ontylog namespace is currently not supported.
15. When using the SQL Server 2012 “userCreate2012.bat” or the SQL Server 2016 “userCreate2016.bat” script to create a user, an error is thrown but a valid DTS4 user is created and no additional action is necessary.
16. After connecting the Editor to a GlassFish application server, the Editor must be closed and reopened in order to connect to either a JBoss EAP or WildFly 12 application server.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.7.1

A.1.1 DTS Server Hardware Requirements

- CPU
  - 1 or more Dual Core - Minimum
  - 1 or more Quad Core - Recommended
- System Memory
  - 8GB RAM – Minimum
  - 16GB RAM – Recommended
- Available hard drive space
  - 100GB Minimum and 150GB+ Recommended
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~600MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Server and Client Software Requirements (only 64-bit recommended)

a. Operating Systems

- Windows 7 Professional, Windows Server 2008 R2, Windows 10 Professional, or Windows Server 2012 R2
- Windows 10 Professional, Windows Server 2012 R2 (**NOTE: Only supported with DTS 4.4.1 build or above**)
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Internet Explorer 10 - 11, Firefox 50+, Chrome 55+

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c. Database Management System

- One of the following:
    - Oracle 11g (11.2.0.1) or Oracle 12c (12.1.0.2) Standard or Enterprise Edition (depending on Application Server) (**NOTE: Oracle 12c 12.2 or later not supported**)
    - MS SQL Server 2016 (Express Edition not supported. Must be hosted on a Windows Server)
    - MySQL Community Server 5.6 (earlier and later versions not supported)

d. Application Server

- One of the following:
    - JBoss EAP 7.1.0 Application Server
        - JBoss EAP 7.1.0 only supported on JDK 1.8
        - JBoss EAP 7.1.0 only supported on MS SQL Server 2016, Oracle 11g, Oracle 12c, and MySQL 5.6
    - WildFly 12.0.0 Application Server
        - WildFly 12.0.0 Application Server only supported on JDK 1.8
        - WildFly 12.0.0 only supported on MS SQL Server 2016, Oracle 11g Oracle 12c, and MySQL 5.6
    - GlassFish 3.1.22 Application Server
        - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
        - Use of a GlassFish 3.1.22 running JDK 1.8 is currently only supported for MS SQL Server 2016, Oracle 11g, Oracle 12c, and MySQL 5.6
    - IBM WebSphere Application Server
        - Only supported in Oracle DB Environments, See DTS Websphere Setup Guide for details on version and configuration steps

e. Runtime Environment

- The DTS 4.7.1 Windows installation includes Version 1.8 of the Sun Java Runtime Environment (JRE)
    - The JRE 1.8 included with the DTS 4.7.1 Windows installation is only used by DTS – it is not for use by the JBoss, WildFly, GlassFish, or WebSphere application server (existing Java installations on the target machine are not affected)

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F. DTS Version 4.7 (12/2018)

F.1 DTS Editor Upgrades

1. Published Subset Expression View – DTS Users are now able to view the subset expression for published subsets. Previously the expression was only visible for the current working version of a Subset.
2. Namespace Editor, Subset Editor, and Authority Editor Table Exporter – DTS Users are now able to export the table view in these three Editor panels. This allows the user to get a list of all Namespaces, Subsets, and Authorities which previously was not possible within the Editor.

F.2 DTS FHIR Updates

1. Support has been added to allow local updates of a FHIR Code System.
2. R4 Updates – The following updates have been included in this release to bring DTS's implementation of the FHIR terminology service to R4 spec compliance:
    a. Changed the FHIR URL for $closure
    b. Added the TerminologyCapabilities resource
    c. Changed ValueSet $validate-code value to denote the version of the CodeSystem from 'version' to 'systemVersion'
    d. Added ValueSet $validate-code ValueSetVersion IN parameter
    e. Added ValueSet $expand valueSetVersion IN parameter
    f. Added ValueSet.code search parameter
    g. Added ValueSet constraint that status must now be 'active' if expansion is present and compose is absent
    h. Added $validate-code operation for CodeSystems
    i. Removed ValueSet ExpansionProfile and added parameters from ExpansionProfile to $expand operation
    j. Added fhirVersion parameter to application/fhir mime typeDTS

A.1 JBoss EAP 7.1 and Wildfly 12 Application Server Support

1. DTS 4.7 introduces new support for the JBoss EAP 7.1 and Wildfly 12 application servers for use with MS SQL 2016, Oracle 12c, or MySQL 5.6 databases.

   Applications servers previously supported in DTS 4.6.1 remain under support, but it should be noted that future development plans include sunsetting WildFly 10 and JBoss 7.1.1.

   If you are currently using either of these application servers and your organization requires assistance in planning your DTS migration once support is removed, please reach out to Apelon Customer Support at support@apelon.com.

F.3 TQL Editor

1. Expanded the selector syntax to include the 'pointing' (displaying) syntax
2. Added a top-level statement for renaming Namespaces, Subsets, and Authorities Please review the new TQL Editor documentation included with the download of the updated module version for more details.

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F.4 Resolved Issues

DTS 4.7 fixes a few issues and bugs, listed below

1. Resolved issue performing ConceptMap operations that were triggering an XML download
2. Resolved issue with missing 'FHIR_' prefix on ConceptMap concept properties
3. Resolved issue causing error when the value in a TQL hierarchy filter ended in a bracket
4. Resolved issue when copying/pasting synonym in to a text editor
5. Resolved issue causing editing inconsistencies when a user is connected to a server in another Time Zone
6. Resolved issue when using an ONLY in an EXCLUDE filter within ValueSets

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.7 restrictions, limitations, and issues:

1. Ability to create Extension namespace based on Local Ontylog namespace is currently not supported.
2. When using the SQL Server 2012 “userCreate2012.bat” or the SQL Server 2016 “userCreate2016.bat” script to create a user, an error is thrown but a valid DTS4 user is created and no additional action is necessary.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.7

A.1.1 DTS Server System Requirements

- System Memory
  - 8GB RAM – Minimum.
  - 16GB RAM – Recommended
- Available hard drive space
  - 100GB Minimum and 150GB+ Recommended
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~600MB) as well as the space requirements for your specific knowledgebase configuration

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A.1.1 DTS Server Software Requirements

a. Operating Systems

- Windows 7 Professional, Windows Server 2008 R2, Windows 10 Professional, or Windows Server 2012 R2
- Windows 10 Professional, Windows Server 2012 R2 (**NOTE: Only supported with DTS 4.4.1 build or above**)
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Internet Explorer 9.0 - 10, Firefox 20+, Chrome 20+

c. Database Management System

- One of the following:
  - Oracle 11g or Oracle 12c Standard or Enterprise Edition (depending on Application Server)
  - MS SQL Server 2016 (Express Edition not supported. Must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier and later versions not supported)

d. Application Server

- One of the following:
  - JBoss Application Server
    - JBoss Application Server version 7.1.1 Final (only this version is supported, and only support JDK 1.7)
  - JBoss EAP 7.1
    - JBoss EAP 7.1 only supported on JDK 1.8
    - JBoss EAP 7.1 only supported on MS SQL Server 2016, Oracle 12c, and MySQL 5.6
  - WildFly 10 Application Server
    - WildFly 10 Application Server version 10.1.0 Final (Only this version supported, and only supported on JDK 1.8)
    - WildFly 10 only supported on MS SQL Server 2016, Oracle 12c, and MySQL 5.6
  - WildFly 12 Application Server
    - WildFly 12 Application Server only supported on JDK 1.8

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- WildFly 10 only supported on MS SQL Server 2016, Oracle 12c, and MySQL 5.6

- GlassFish Application Server
  - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
  - Use of a GlassFish 3.1.22 running Java 8 is currently only supported for MS SQL Server 2016, Oracle 12c, and MySQL 5.6

- IBM WebSphere Application Server
  - Only supported in Oracle DB Environments, See **DTS WebSphere Setup Guide** for details on version and configuration steps

e. Runtime Environment

- The DTS 4.7 Windows installation includes Version 1.8 of the Sun Java Runtime Environment (JRE)
  - The JRE 1.8 included with the DTS 47 Windows installation is only used by DTS – it is not for use by the JBoss, WildFly, or GlassFish application server (existing Java installations on the target machine are not affected)

G. DTS Version 4.6.1 (6/2018)

G.1 DTS Editor Upgrades

1. Explicit Search Page Results – The DTS Editor's Search function now includes functionality to request a specific page from the result set of a search, removing the need for users to page over numerous times to find desired results from larger result sets.

2. New Filters have been added to the Subset Editor and Namespace Editor to narrow the list of Subsets or Namespaces. The list can now be filtered by Property and Version, and for Namespaces users can use the Extends filter to find Ontylog Extension namespaces which extend a specific base namespace.

G.2 DTS FHIR Updates

1. Support has been added for "descendant-of" ValueSet filter operators.
2. We have also introduced new functionality to support paging via "prev" and "next" links for CodeSystem, ValueSet, and ConceptMap searches for FHIR.
3. Searching CodeSystems and ValueSets up to 7X faster performance than previous versions.
4. FHIR ConceptMap POST now supports the user of the 'Content-Type' header in addition to the previously supported 'Accept' header.

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A.1 DTS API Update

1. New API methods have been added to support property-based searching of Namespaces, Namespace Versions, Subsets, and Subset Versions. This API update goes hand-in-hand with the new DTS Editor features, and utilizes the same back-end calls.

G.3 Resolved Issues

DTS 4.6.1 fixes a few issues and bugs, listed below

1. Resolved an issue when searching by DTS Code or ID, where the Search Status value was being ignored
2. Resolved issue where publishing multiple versions of an existing CodeSystem via a FHIR CodeSystem POST operation was nonoperational
3. Resolved an issue when adding root concepts by publishing a new version of a FHIR CodeSystem via CodeSystem POST operation which would cause the POST to be nonoperational
4. Resolved an issue when adding child concepts by publishing a new version of a FHIR CodeSystem via FHIR CodeSystem POST operation which would cause the POST to be nonoperational
5. Resolved issue where attempting to add root concepts to a FHIR CodeSystem via FHIR CodeSystem PUT operation would result in the addition of non-root concepts.
6. Resolved an issue where FHIR CodeSystem DELETE operation was not functioning.
7. Resolved issue where, against Oracle 11g and 12c, FHIR POST operations would fail unless a 'jurisdiction' value was specified.
8. Resolved issue where FHIR Id value property was not being set during ConceptMap POST even if it was specifically defined.
9. Resolved issue where Reload option on Tree context menu didn't display externally created Namespaces added during the Editor session

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.6.1 restrictions, limitations, and issues:

1. Ability to create Extension namespace based on Local Ontylog namespace is currently not supported.
2. When using the SQL Server 2012 "userCreate2012.bat" or the SQL Server 2016 "userCreate2016.bat" script to create a user, an error is thrown but a valid DTS4 user is created and no additional action is necessary.
3. ConceptMap concept properties currently lack the "FHIR_" prefix, to be addressed for future release.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.6.1

A.1.1 DTS Server System Requirements

- System Memory

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  - 8GB RAM – Minimum.
  - 16GB RAM – Recommended
- Available hard drive space
  - 100GB Minimum and 150GB+ Recommended
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~600MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Server Software Requirements

a. Operating Systems

- Windows 7 Professional, Windows Server 2008 R2, Windows 10 Professional, or Windows Server 2012 R2
- Windows 10 Professional, Windows Server 2012 R2 (**NOTE: Only supported with DTS 4.4.1 build or above**)
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Internet Explorer 9.0 - 10, Firefox 20+, Chrome 20+

c. Database Management System

- One of the following:
  - Oracle 11g or Oracle 12c Standard or Enterprise Edition
  - MS SQL Server 2016 (Express Edition not supported. Must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier and later versions not supported)

d. Application Server

- One of the following:
  - JBoss Application Server
    - JBoss Application Server version 7.1.1 Final (only this version is supported, and only support JDK 1.7)
  - WildFly 10 Application Server
    - WildFly 10 Application Server version 10.1.0 Final (Only this version supported, and only support JDK 1.8)

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- WildFly 10 only supported on MS SQL Server 2016, Oracle 12c, and MySQL 5.6

- GlassFish Application Server
  - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
  - Use of a GlassFish 3.1.22 running Java 8 is currently only supported for MS SQL Server 2016, Oracle 12c, and MySQL 5.6

- IBM WebSphere Application Server
  - Only supported in Oracle DB Environments, See **DTS WebSphere Setup Guide** for details on version and configuration steps

e. Runtime Environment

- The DTS 4.6.1 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
  - DTS 4.6.1 software was compiled using JDK Version 1.7
  - The JRE 1.7 included with the DTS 4.6.1 Windows installation is only used by DTS – it is not for use by the JBoss, WildFly, or GlassFish application server (existing Java installations on the target machine are not affected)

H. DTS Version 4.6 (10/2017)

H.1 Additional Application Server Support – WildFly 10

DTS 4.6 provides accommodations for the use of WildFly 10 Application Server. WildFly can be used in conjunction with SQL Server 2016, Oracle 12c, or MySQL 5.6 database installations.

H.2 Java 8 Support for GlassFish and WildFly

This release also now includes support for running Java 8 with open-source application server GlassFish 3.1.2.2 or WildFly 10 for DTS Server transactions using SQL Server 2016, Oracle 12c, or MySQL 5.6 databases. For a comprehensive list of supported environments, see the DTS4 Installation Guide.

A.1 DTS Editor Upgrades

DTS 4.6 introduces several new features to the DTS Editor. Below is a bulleted list of new tools, features, and capabilities included in the DTS Editor.

1. Dynamic Click to Edit Assignments – Customize “Click to Edit” concept transfer assignments
2. License attribute added to Namespace Detail panel, allowing you to view the namespace license if present

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3. Reload option on Tree and Walker context menus now allows you to refresh panels when data has been externally modified
4. Details panel permanent Delete now only permitted on unpublished concepts and terms
5. Multiline qualifiers now more easily viewed and edited in the property and association editors
6. Subset Editor subset table now includes Modified Date and Modified By Username fields
7. Version Date attribute node now shows publish username
8. History Tool Tips in Details panel now show associated username, and now are supported on top level concepts, terms and subsets.

A.1 Template Editor Upgrades

DTS 4.6 introduces new features to the Template Editor plugin.

1. Local Ontylog Namespaces are now supported including the creation and modification of Role Groups
2. DTS Validators are now supported on Property and Qualifier attributes (read only, cannot be overridden)

A.1 Excel Wizard Upgrades

DTS 4.6 introduces new features to the Excel Wizard plugin.

1. Added support for Extension Roles
2. Improved attribute load performance

H.3 Resolved Issues

DTS 4.6 fixes a few issues and bugs, listed below

1. Resolved an issue causing the DTS Editor to disconnect after being left idle for a short period when using JBoss Application Server
2. Fixed an issue causing classify, subset build, search, and publish to stop working after many iterations of the action.
3. Various other bug fixes and performance enhancements, including fixes for the Import Wizard and TQL Plugins

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.6 restrictions, limitations, and issues:

1. Ability to create Extension namespace based on Local Ontylog namespace is currently not supported.
2. When using the SQL Server 2012 “userCreate2012.bat” or the SQL Server 2016 “userCreate2016.bat” script to create a user, an error is thrown but a valid DTS4 user is created and no additional action is necessary.
3. DTS Editor Search – When searching by DTS Code or ID, the Search Status value is ignored.
4. Ability to perform a FHIR CodeSystem DELETE operation is currently not supported.
5. Ability to retrieve list of CodeSystems via FHIR CodeSystem GET operation is currently not supported on MySQL
6. On Oracle 11g and 12c, FHIR POST operations will fail unless a “jurisdiction” value is specified.

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7. Publishing multiple versions of an existing CodeSystem via a FHIR CodeSystem POST operation is currently not supported.
8. Adding root concepts by publishing a new version of a FHIR CodeSystem via FHIR CodeSystem POST operation is currently not supported.
9. Adding child concepts by publishing a new version of a FHIR CodeSystem via FHIR CodeSystem POST operation is currently not supported.
10. Attempting to add root concepts to a FHIR CodeSystem via FHIR CodeSystem PUT operation will result in the addition of non-root concepts.
11. FHIR ConceptMap POST does not support use of the **Content-Type** header. As an alternative, use the **Accept** header.
12. FHIR Id value property is not being set during ConceptMap POST even if it is specifically defined. As an alternative the FHIR Id value property is set to the same value as the mapping Concept name which is derived from the url value property.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.6

A.1.1 DTS Server System Requirements

- System Memory
  - 8GB RAM – Minimum.
  - 16GB RAM – Recommended
- Available hard drive space
  - 100GB Minimum and 150GB+ Recommended
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~600MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Server Software Requirements

a. Operating Systems

- Windows 7 Professional, Windows Server 2008 R2, Windows 10 Professional, or Windows Server 2012 R2
- Windows 10 Professional, Windows Server 2012 R2 (**NOTE: Only supported with DTS 4.4.1 build or above**)
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Internet Explorer 9.0 - 10, Firefox 20+, Chrome 20+

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c. Database Management System

- One of the following:
    - Oracle 11g or Oracle 12c Standard or Enterprise Edition
    - MS SQL Server 2012 or MS SQL Server 2016 (Express Edition not supported. Must be hosted on a Windows Server)
    - MySQL Community Server 5.6 (earlier and later versions not supported)

d. Application Server

- One of the following:
    - JBoss Application Server
        - JBoss Application Server version 7.1.1 Final (only this version is supported, and only support JDK 1.7)
    - WildFly 10 Application Server
        - WildFly 10 Application Server version 10.1.0 Final (Only this version supported, and only support JDK 1.8)
        - WildFly 10 only supported on MS SQL Server 2016, Oracle 12c, and MySQL 5.6
    - GlassFish Application Server
        - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
        - Use of a GlassFish 3.1.22 running Java 8 is currently only supported for MS SQL Server 2016, Oracle 12c, and MySQL 5.6
    - IBM WebSphere Application Server
        - Only supported in Oracle DB Environments, See **DTS WebSphere Setup Guide** for details on version and configuration steps

e. Runtime Environment

- The DTS 4.6 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
    - DTS 4.6 software was compiled using JDK Version 1.7
    - The JRE 1.7 included with the DTS 4.6 Windows installation is only used by DTS – it is not for use by the JBoss, WildFly, or GlassFish application server (existing Java installations on the target machine are not affected)

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I. DTS Version 4.5.1 (03/2017)

A.1 Additional Database Support – MS SQL Server 2016

DTS 4.5.1 provides accommodations for the use of a MS SQL Server 2016 database with open-source application servers GlassFish and JBoss for DTS Server transactions. See the ***DTS 4.5.1 Installation Guide*** for complete information on configuring the GlassFish or JBoss application server with MS SQL Server 2016 for DTS.

I.1 Java 8 Support for GlassFish and MS SQL Server 2016

This release also supports running Java 8 with open-source application server GlassFish for DTS Server transactions using the MS SQL Server 2016 database. See the ***DTS 4.5.1 Installation Guide*** for complete information on configuring the GlassFish application server with MS SQL Server 2016 running with Java 8 for DTS.

A.1 Performance Improvements

DTS 4.5.1 includes many performance improvements within both the Grid Editor and Search Panel. Additionally, performance has been increased for classification of Ontylog Extension namespaces.

A.1 Search Panel Enhancements

The Search Panel in DTS 4.5.1 contains several new features and performance improvements. Search Panel queries now report the total number of results and includes an option to only display the number of results without returning the actual results. Primary search parameters are now saved in the Editor configuration so that the most recently used parameters are automatically populated. Additionally, Search result Tooltips can now be turned off as an optional performance enhancer. Note that the maximum search page size is now 999.

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.5.1 restrictions, limitations, and issues:

1. Classification becomes unresponsive after performing many iterations in a short period. Restarting the DTS Editor will resolve the issue.

2. Ability to create Extension namespace based on Local Ontylog namespace is currently not available.

3. Subset Hierarchy does not currently display in Tree and Walker Views if namespace version is other than “Working” or most current version for Local Ontylog namespaces.

4. When using the SQL Server 2012 “userCreate2012.bat” or the SQL Server 2016 “userCreate2016.bat” script to create a user, an error is thrown but a valid DTS4 user is created and no additional action is necessary.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.5.1

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A.1.1 DTS Server System Requirements

- System Memory
  - 8GB RAM – Minimum.
  - 16GB RAM – Recommended
- Available hard drive space
  - 100GB Minimum and 150GB+ Recommended
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~600MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Server Software Requirements

a. Operating Systems

- Windows 7 Professional, Windows Server 2008 R2, Windows 10 Professional, or Windows Server 2012 R2
- Windows 10 Professional, Windows Server 2012 R2 (NOTE: Only supported with DTS 4.4.1 build or above)
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Internet Explorer 9.0 - 10, Firefox 20+, Chrome 20+

c. Database Management System

- One of the following:
  - Oracle 11g or Oracle 12c Standard or Enterprise Edition
  - MS SQL Server 2012 or MS SQL Server 2016 (Express Edition not supported. Must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier and later versions not supported)

d. Application Server

- One of the following:
  - JBoss Application Server
    - JBoss Application Server version 7.1.1 Final (only this version is supported)
  - GlassFish Application Server

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- GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
- Use of a GlassFish 3.1.22 running Java 8 is currently only supported for MS SQL Server 2016

- IBM WebSphere Application Server
  - Only supported in Oracle DB Environments, See **DTS WebSphere Setup Guide** for details on version and configuration steps

e. Runtime Environment

- The DTS 4.5.1 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
  - DTS 4.5.1 software was compiled using JDK Version 1.7
  - The JRE 1.7 included with the DTS 4.5.1 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

J. DTS Version 4.5 (12/2016)

J.1 Local Ontylog Support

DTS 4.5 introduces support for Local Ontylog Namespaces. With these new tools, users will have full functions of modeling and classification of local, writable Ontylog Namespaces. Updates to the Attribute Types Editor, Namespace Profile Editor, and Details Panel have been made to fully support the addition of this new feature. A Defined Hierarchy view in addition to the Superconcept/Subconcept hierarchy view is available for Ontylog and Ontylog Extension Namespaces.

J.2 Performance Improvements

DTS 4.5 boasts a number of performance improvements. The new classifier performs seven times faster than previous versions. The Subset Builder performs 300% faster for some Subset types. Additionally, the Attribute Types Editor opens significantly faster than previous versions.

J.3 Deferred Editing

DTS 4.5 includes the ability to edit concepts in the Details Panel in “Deferred Mode”. Edits in this mode are color-coded to indicate whether the attribute was added, modified, or deleted. When this mode is selected, all edits are not committed until saved in the Details Panel. Edits made in Deferred Mode must be saved or discarded before leaving the objects view. Changes can still be made immediately using “Immediate Mode”.

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J.4 Details Panel Enhancements

The Details Panel has received a number of enhancements in DTS 4.5. The ability to clone Concepts and Terms with selected attributes is now available. Keyboard cut (ctrl-x), copy (ctrl-c), and paste (ctrl-v) are supported for all attributes. Likewise, drag and drop (via ctrl-drop) allows copy of attributes from one concept/term on to another. Inverse Defining Concepts are displayed in the Details Panel, but are only informational. A permanent Delete button is now available.

J.5 Validators

New to DTS 4.5 is a Validator function. Users creating Property and Qualifier Type attributes, can now define and assign a Validator to govern the string data allowed to be entered into these fields when editing attribute data. Validators can be defined as either a preselected dropdown pick list of values, or a user-defined Regular Expression to control the input. Data validation is then systematically performed in the Property Editor and Association Editor panels in both Deferred and Immediate Mode. Updates made to the Namespace Profile tool now also support Validators.

J.6 Audit Report

DTS 4.5 also introduces a new Audit Report tool under the Options menu of the DTS Editor. With this tool, users can define and create reports to gather historical data on DTS Editor activity to be run against a given namespace. Reports can gather statistics on any or all users, any or all concepts, including Terms and Attributes, over a given date range. Generated reports are created in CSV format and can be set to output sorted by User or Date. Reports can be saved and rerun.

J.7 Grid Editor

The Grid Editor is a new feature in DTS 4.5 that allows for table-based viewing and editing of Concepts and Terms. The Grid Editor can be used for writeable Ontylog or Thesaurus namespaces, and also allows for copy/paste to your clipboard, or export to CSV. This tool allows for larger scale batch-type editing of namespace data.

J.8 Concept Compare

The Concept Compare panel now allows comparison of different concepts from the same namespace. Previous versions only allowed comparing different versions of the same concept.

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.5 restrictions, limitations, and issues:

1. Classification becomes unresponsive after performing many iterations in a short period. Restarting the DTS Editor will resolve the issue.

2. Ability to create Extension namespace based on Local Ontylog namespace is currently not available.

3. When using a Local Ontylog namespace filter in a subset expression, the ALL filter will return only the selected concept and ONLY DESCENDANT OF filter will return zero results.

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4. Subset Hierarchy does not currently display in Tree and Walker Views if namespace version is other than “Working” or most current version.

5. Subset Hierarchy View Axis within the Tree Viewer does not currently display subconcepts.

6. When using the SQL Server 2012 “userCreate2012.bat” script to create a user, an error is thrown but a valid DTS4 user is created and no additional action is necessary.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.5

A.1.1 DTS Server System Requirements

- System Memory
  - 8GB RAM – Minimum.
  - 16GB RAM – Recommended
- 50G available hard drive space
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~200MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Server Software Requirements

a. Operating Systems

- Windows 7 Professional, Windows Server 2008 R2, Windows 10 Professional, or Windows Server 2012 R2
- Windows 10 Professional, Windows Server 2012 R2 (NOTE: Only supported with DTS 4.4.1 build or above)
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Internet Explorer 9.0 - 10, Firefox 20+, Chrome 20+

c. Database Management System

- One of the following:
  - Oracle 11g or Oracle 12c Standard or Enterprise Edition

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- MS SQL Server 2008 R2 or MS SQL Server 2012 (Express Edition not supported. Must be hosted on a Windows Server)
- MySQL Community Server 5.6 (earlier and later versions not supported)

d. Application Server

- One of the following:
  - JBoss Application Server
    - JBoss Application Server version 7.1.1 Final (only this version is supported)
  - GlassFish Application Server
    - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
  - IBM WebSphere Application Server
    - Only supported in Oracle DB Environments, See **DTS WebSphere Setup Guide** for details on version and configuration steps

e. Runtime Environment

- The DTS 4.5 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
  - DTS 4.4.5 software was compiled using JDK Version 1.7
  - The JRE 1.7 included with the DTS 4.4.5 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

K. DTS Version 4.4.1 (06/2016)

A.1 Operating System Compatibility

DTS 4.4.1 introduces compatibility with Windows 10 Professional and Windows Server 2012 based systems. It also is compatible with environments upgraded from Windows 7 to Windows 10 while preserving DTS on the system.

A.1 Additional Database Support – MS SQL Server 2012 and Oracle 12c

DTS 4.4.0 and 4.4.1 provide accommodations for the use of a MS SQL Server 2012 database with open-source application servers GlassFish and JBoss for DTS Server transactions. Additionally, they support the use of an Oracle 12c database with application servers GlassFish, JBoss, and WebSphere for DTS Sever transactions. See the ***DTS 4.4 Installation Guide*** for

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complete information on configuring the GlassFish, JBoss, or WebSphere application server with Oracle 12c for DTS. No additional changes are required for configuring the GlassFish or JBoss application server with MS SQL Server 2012 for DTS.

Note: There is no need to upgrade a DTS 4.4 environment to DTS 4.4.1 in order to take advantage of these newly supported databases. They are supported in both releases.

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.4.1 restrictions, limitations, and issues:

1. Intermittent Search Functionality issue. Restart of DTS Editor will resolve.
2. DB2 and InterSystems Cache support is not available.
3. DTS Workflow support is not available.
4. Silos and associated Matchpack functionality have been permanently removed from DTS

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.4.1

A.1.1 Minimum System Requirements (DTS Server)

- System Memory
  - 4GB RAM – Database exists on separate server.
  - 8GB RAM – Database exists on same server as DTS Server
- 50G available hard drive space
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~200MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Software Requirements (Server)

a. Operating Systems

- Windows 7 Professional, Windows Server 2008 R2, Windows 10 Professional, or Windows Server 2012
- Windows 10 Professional, Windows Server 2012 R2 (NOTE: Only supported with DTS 4.4.1 build or above)
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Internet Explorer 9.0 - 10, Firefox 20+, Chrome 20+

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c. *Database Management System*

- One of the following:
    - Oracle 11g or Oracle 12c Standard or Enterprise Edition
    - MS SQL Server 2008 R2 or MS SQL Server 2012 (Express Edition not supported. Must be hosted on a Windows Server)
    - MySQL Community Server 5.6 (earlier and later versions not supported)

d. *Application Server*

- One of the following:
    - JBoss Application Server
        - JBoss Application Server version 7.1.1 Final (only this version is supported)
    - GlassFish Application Server
        - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
    - IBM WebSphere Application Server
        - Only supported in Oracle DB Environments, See **DTS WebSphere Setup Guide** for details on version and configuration steps

e. *Runtime Environment*

- The DTS 4.4.1 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
    - DTS 4.4.1 software was compiled using JDK Version 1.7
    - The JRE 1.7 included with the DTS 4.4.1 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

L. DTS Version 4.4 (01/2016)

A.1 DTS on FHIR

With the release of DTS 4.4, Apelon is now also offering DTS on FHIR, an instance of DTS that also functions as a FHIR Terminology Service (http://hl7-fhir.github.io/terminology-service.html). This instance of DTS fully integrates all of the functionality of DTS 4.4.0 with a built in FHIR Terminology Service implementation.

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The FHIR Terminology Service specification is evolving and we are in the process of incrementally implementing this specification. Therefore there will be some functionality that is not fully implemented in the current release and documentation is pending. The FHIR release of DTS 4.4.0 has been designated as DTS 4.4.0-452-FHIR. The installation packages for this version can be downloaded from www.apelondts.org. For more information on the supported FHIR Terminology Service functionality please see our demo DTS on FHIR page at http://fhir.ext.apelon.com:8081/DtsOnFhirDemo or contact info@apelon.com

L.1 Login Performance

The DTS Editor's login processes have been optimized to reduce login times. This especially will a large positive impact on the amount of time DTS takes to recognize a failed login due to bad credentials or other errors, returning the fail message quicker and allowing the user to re-enter credentials or further troubleshoot.

Users will also notice clear and concise error messages on failed logins (greater details logged to the logging system). The system now reflects that the login is in progress by inactivating the "Connect" button, changing the displayed text to "Connecting", making it clear to the user that the connection is in progress.

L.2 Application Server Naming Convention Update

To facilitate the above login performance enhancement a new naming convention will be applied to determine the server type:

- All instances ending with 'gf' will be assumed to be GlassFish instances
- All instances ending with 'jboss' will be assumed to be JBoss instances
- All instances ending with 'websphere' will be assumed to be WebSphere instances
- All instances ending with 'websphere:custom' will be assumed to be websphere instances using custom JNDI properties
- All instances ending in 'ws' will be assumed to be REST clients.
- All other named instances will connect using the same process as previous iterations of DTS 4

DTS Administrators can use this scheme to leverage the new performance enhancements and clearly indicate to DTS which application server is in use.

A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.4 restrictions, limitations, and issues:

1. Intermittent Search Functionality issue. Restart of DTS Editor will resolve.
2. DB2 and InterSystems Cache support is not available.
3. DTS Workflow support is not available.

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4. Silos and associated Matchpack functionality have been permanently removed from DTS

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.4

A.1.1 Minimum System Requirements (DTS Server)

- System Memory
  - 4GB RAM – Database exists on separate server.
  - 8GB RAM – Database exists on same server as DTS Server
- 50G available hard drive space
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~200MB) as well as the space requirements for your specific knowledgebase configuration

A.1.1 DTS Software Requirements (Server)

a. Operating Systems

- Windows 7 Professional, Windows Server 2008 R2 (DTS is not supported on Windows 8 or newer)
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)

b. Web Browser (for DTS Browser)

- Internet Explorer 9.0 - 10, Firefox 20+, Chrome 20+

c. Database Management System

- One of the following:
  - Oracle 11g Standard or Enterprise Edition
  - MS SQL Server 2008 R2 (Express Edition not supported. Must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier and later versions not supported)

d. Application Server

- One of the following:
  - JBoss Application Server
    - JBoss Application Server version 7.1.1 Final (only this version is supported)
  - GlassFish Application Server

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- GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)

- IBM WebSphere Application Server
  - Only supported in Oracle DB Environments, See **DTS WebSphere Setup Guide** for details on version and configuration steps

e. Runtime Environment

- The DTS 4.4 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
  - DTS 4.4 software was compiled using JDK Version 1.7
  - The JRE 1.7 included with the DTS 4.4 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

M. DTS Version 4.3 (07/2015)

M.1 Layout Editor

The DTS Editor now provides a flexible, easy-to-use GUI editor for customized DTS Editor Layouts. Like Namespace and Subset Profiles, User and System Layouts are maintained on the server, although xml import and export options are present in the Layout Editor for exchange. Both User and System Default Layouts are available. See the **DTS Editor Module Guide** for a complete description of Layouts and the Layout Editor.

Due to these new DTS Editor Layout capabilities, the Editor opens with an empty window consisting only of Connect options. Once connected, the appropriate layout for the user is loaded. For most users, this will be the familiar standard DTS layout.

M.2 Module Architecture

A number of additions have been made to the Module Architecture API to support Layouts, the Layout Editor, and to simplify menu and toolbar item enablement. Developers of custom Modules should review the Converting Plug-in Modules section of the **DTS Editor Module Guide** for detailed information.

M.3 Publish/Subscribe Notifications

DTS 4.3 introduces the ability to send XML messages to either automated systems or key personnel notifying them of specific Namespace events. The following Namespace events will be tracked through the DTS Publish/Subscribe system:

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- Namespace Creation
- Namespace Version Publication

Subscribers can be configured to receive messages for all Namespaces or only those associated with specific Namespaces. In addition, alerts for failed messages can also be configured. A description of this new feature is given in the **DTS 4 - Publish Subscribe Introduction** documentation. DTS Administrator Users can access the Configure DTS Notifiers panel from the DTS Editor "Options> PUB/SUB Notifications…" menu.

M.4 Property Values Containing URLs

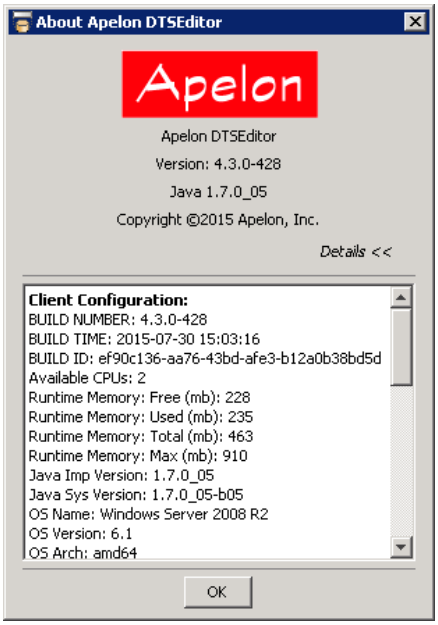
The DTS Editor's Details Panel has been updated to support URLs within Property values. When a DTS Property's value consists only of an absolute URL, i.e. a string beginning with http:// or https://, a new "Open Target" option appears in the Property's right click context menu. Selecting this option opens the URL in the user's default browser. See the **Apelon DTS 4 Editor Users Guide** for further information regarding this feature.

M.5 Microsoft SQL Server Formatting and Performance

DTS servers using Microsoft SQL Server as a database have been updated to utilize some Microsoft SQL Server specific dialect. This will provide more consistent data formatting (e.g. dates) and data display as well as potential improvements in performance.

M.6 DTS Editor – About Apelon DTSEditor Window

The DTS Editor's About Apelon DTSEditor window now offers additional client and server configuration information such as operating system, version number, memory utilization, etc... Access this information from the DTS Editor "Help> About Apelon DTS Editor" menu by clicking on the "Details >>" label in the window.



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A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.3 restrictions, limitations, and issues:

1. Intermittent Search Functionality issue. Restart of DTS Editor will resolve.
2. DB2 and InterSystems Cache support is not available.
3. DTS Workflow support is not available.
4. Silos and associated Matchpack functionality have been permanently removed from DTS

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.3

A.1.1 Minimum System Requirements (DTS Server)

- System Memory
  - 4GB RAM – Database exists on separate server.
  - 6GB RAM – Database exists on same server as DTS Server
- 50G available hard drive space
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~200M) as well as the space requirements for your specific knowledgebase configuration

A.1.1 Minimum Software Requirements (Server)

- Windows 7 Professional, Windows Server 2008 R2
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)
- Internet Explorer 9.0 - 10, Firefox 20+, Chrome 20+
- One of the following:
  - Oracle 10g Standard or Enterprise Edition
  - Oracle 11g Standard or Enterprise Edition
  - MS SQL Server 2008 R2 (must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier versions not supported)
- JBoss Application Server

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- JBoss Application Server version 7.1.1 Final (only this version is supported)

- GlassFish Application Server
  - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)

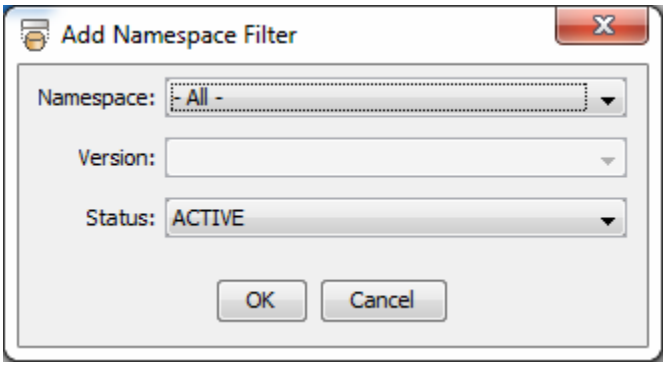
- The DTS 4.3 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
  - DTS 4.3 software was compiled using JDK Version 1.7
  - The JRE 1.7 included with the DTS 4.3 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

N. DTS Version 4.2 (01/2015)

N.1 Subsets

N.1.1 All Namespace Filter

The DTS Subset Expression *Namespace Filter* now has a new option of **All** namespaces. This filter option allows subordinate filters such as the *Concept Name Filter* or *Property Filter* to be applied across all Namespaces in the DTS Knowledgebase.



The *All Namespace Filter* operates like other *Namespace Filters* with two exceptions:

1. *Concept Hierarchy Filters* are not permitted below an *All Namespace Filter*.
2. The **Version** field is disabled in the *Namespace Filter*.

In addition, when subordinate to an *All Namespace Filter*, attribute type filters, i.e., the *Synonym Filter*, the *Property Filter*, and the *Association Filter*, allow a **Type Namespace** field value of **All**. When this value is selected, the attribute type names are “anonymous”; the names are not associated with any specific namespace. This option can be used to filter on common type names such as the **Code in Source** property type across all namespaces having the type. The values in

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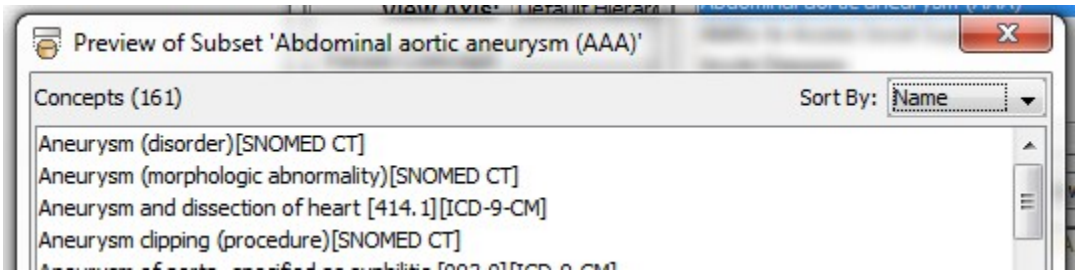
the attribute type name dropdown will be the set of all (unique) Property Type names in the DTS Knowledgebase.

> See the **Subset Expression Filters** section of the **DTS Editor User Gui**de for more information on the *All Namespace Filter*.

N.1.2 Subset Preview

Concepts displayed in the **Subset Preview** panel can now be displayed with a primary sort of either Concept Name or Concept Namespace. The sort selection is made via a **Sort By** dropdown at the top of the panel.



If this value is **Name**, the list is sorted first by concept name, then by namespace name. If the value is **Namespace**, then the primary sort is by namespace name, then by concept name. The **Sort By** value is saved in the DTS Editor configuration file and applies across all **Subset Preview** instances. This feature has been added to support preview of multi-namespace Subsets.

N.2 Namespace and Subset Profiles

For some projects, it may be desirable to create a number of Namespaces, or Subsets, that have similar Synonym, Property and Association types; that is, types having the same names. DTS 4.2 provides the Profile capability to meet this need. When creating a new Namespace, or Subset, the New dialog includes the ability to specify a Profile.

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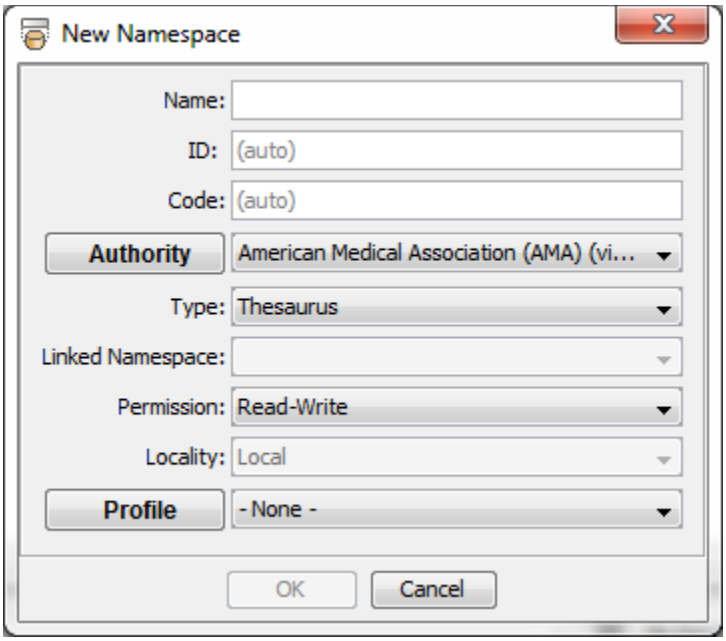

The **Profile** combo contains the list of available Profiles. When the new Namespace is created, the types in the Profile are automatically added. It is not necessary to add the types through the Attribute Editor.

To create and maintain Profiles, you can click on the Profile button in the Namespace (or Subset) Editor. Links to the Namespace and Subset Profile Editors is also available in the Tools menu.

N.3 Profile Editor

The *Namespace Profile Editor* enables users to create, manage, and delete Namespace Profiles. (The layout and operation of the *Subset Profile Editor* is similar).

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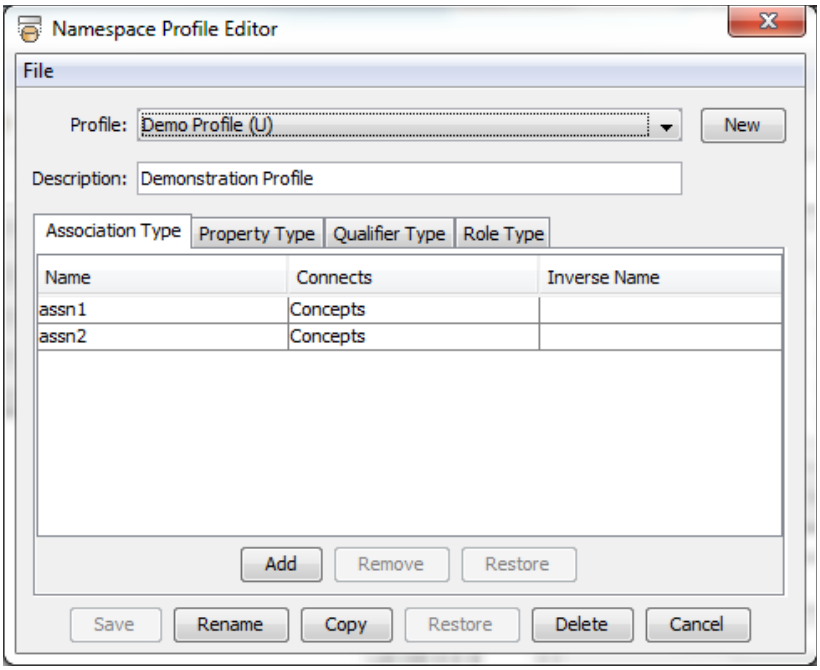

Profiles have a name, a description and a set of attribute types. Each of the attribute type tabs show the types that are part of the Profile. The operation of these tabs is similar to that of the Attribute Editor tabs.
Two classes of Profiles are available. User Profiles "(U)" are known only to the current user. They can be freely created, edited and deleted by the user. User profiles are not seen by any other user on the DTS system.
System Profiles "(S)", on the other hand, are seen by all users, and are read-only to these users. Only users logged in with the "**apelondtsadmin**" role can create or edit system profiles.

All Profile definitions are saved in the DTS database. They are not maintained locally on the client system. It may be desired, however, for users to share Profiles without promoting them to System status, and user Profiles wishing to be promoted to System status must be transferred to the DTS System Manager for review and posting. The Export and Import options in the Profile Editor **File** menu are available to save and restore Profile definitions via XML files. Once saved, the resulting XML file can be emailed to recipients for reloading or curation.
See the **Namespace Profile View and Maintenance** section of the **DTS Editor User Guide** for a complete description of the Profile Editor.

N.4 Module Manager

The DTS Module Manager is a new Module that enables the loading, updating, and removal of DTS Editor User Modules with minimal user intervention. Direct file manipulation is not required. The Module Manager is available from the DTS Editor **Options** menu.

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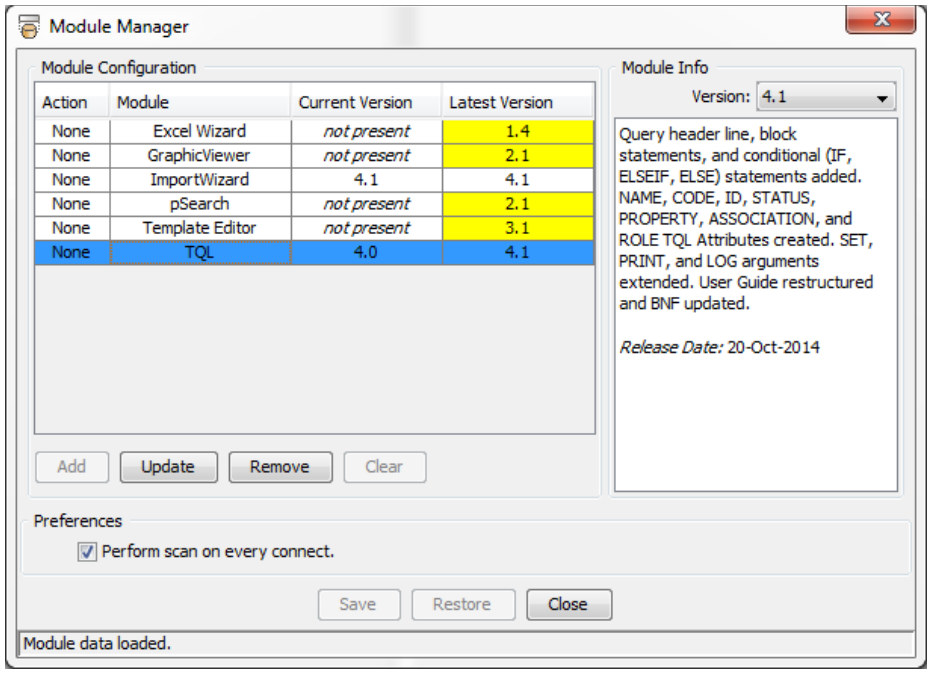

The Module Manager accesses current User Module information from an Internet-accessible Module Folder. The folder also contains installation kits for all available User Modules. Module information is displayed in the *Module Manager* panel, and Module actions (**Add**, **Update**, and **Remove**) can be specified. These actions are performed on the next DTS Editor restart. The **Module Manager** section in the **DTS Editor User Guide** provides complete documentation on this new capability.

The DTS Module Folder is typically maintained by Apelon on behalf of all DTS installations, but organizations can create and maintain their own Module Folder in order to limit Module availability or add organization-specific Modules. See the **Maintaining a Module Manager Facility** guide for further information on hosting your own Module Folder.

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A.1 Known Restrictions, Limitations, and Issues

The following are known DTS 4.2 restrictions, limitations, and issues:

1. DB2 and InterSystems Cache support is not available.
2. DTS Workflow is not available.
3. Silos and associated Matchpack functionality have been permanently removed from DTS 4.0.
4. Intermittent Search Functionality issue. Restart of DTS Editor will resolve.

A.1 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.2

A.1.1 Minimum System Requirements (DTS Server)

- System Memory
  - 4GB RAM – Database exists on separate server.
  - 6GB RAM – Database exists on same server as DTS Server
- 50G available hard drive space
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~200M) as well as the space requirements for your specific knowledgebase configuration

A.1.1 Minimum Software Requirements (Server)

- Windows 7 Professional, Windows Server 2008 R2
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)
- Internet Explorer 8.0 - 10, Firefox 20+, Chrome 20+
- One of the following:
  - Oracle 10g Standard or Enterprise Edition
  - Oracle 11g Standard or Enterprise Edition
  - MS SQL Server 2008 R2 (must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier versions not supported)
- JBoss Application Server
  - JBoss Application Server version 7.1.1 Final (only this version is supported)

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- GlassFish Application Server
    - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
- The DTS 4.2 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
    - DTS 4.2 software was compiled using JDK Version 1.7
    - The JRE 1.7 included with the DTS 4.2 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

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O. DTS Version 4.1 (07/2014)

O.1 Additional Database Support - MySQL

DTS 4.1 provides accommodations for the use of a MySQL 5.6 database with open-source application servers GlassFish and JBoss for DTS Server transactions. See the ***DTS 4.1 Installation Guide*** for complete information on configuring the GlassFish or JBoss application server with MySQL for DTS.

O.2 DTS Editor

O.2.1 Module Versions

The DTS 4.1 Module Architecture has been updated to record Module Versions. The Configuration Options window, accessed from the "Options>Configuration Options…" menu, contains a new Modules tab that displays the name and version of all installed Modules. For User Modules (plug-ins), the latest Module release must be loaded to see the module's version.

O.2.2 Subset Concept Status Filtering

All Subset Expression Filters now include a Concept Status parameter that permits additional filtering by Concept Status value. See the ***DTS Editor User Guide*** for further information.

O.2.3 Permanent Concept/Term delete

A "permanent" (not Status-based) delete function is available for local namespace Concepts and Terms via a right click option on the Concept/Term name in the Detail panel. This option is provided as a convenience for testing against local Thesaurus / Ontylog Extension namespaces with Concepts and Terms in the "Working" version.

O.3 API

O.3.1 Web Services

A Web Services Programming Tutorial has been added (available from the bottom of the Javadoc Overview page). Associated Tutorial classes can be found in the <DTS_HOME>/samples/wstutorial directory.

The first version of a DTS Web Service Reference Guide is available from the Start Menu à Apelon DTS 4.X à Documentation menu. This version includes documentation for all web service methods. Documentation of objects will be added in a future release

O.4 Known Restrictions, Limitations, and Issues

The following are known DTS 4.1 restrictions, limitations, and issues:

1. DB2 and InterSystems Cache support is not available.
2. DTS Workflow is not available.
3. Silos and associated Matchpack functionality have been permanently removed from DTS 4.0.
4. For MySQL databases only, will not be allowed to create a new Authority Property Type with a name that already exist for another Authority.

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5. For MySQL databases only, will not be allowed to add Property Qualifiers on an Authority.
6. May not be allowed to delete Association, Property, Qualifier or Role types. The DTS Editor may appear to "hang" which will require closing the Attribute Types window.

O.5 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.1

O.5.1 Minimum System Requirements (DTS Server)

- System Memory
  - 4GB RAM – Database exists on separate server.
  - 6GB RAM – Database exists on same server as DTS Server
- 50G available hard drive space
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~200M) as well as the space requirements for your specific knowledgebase configuration

O.5.2 Minimum Software Requirements (Server)

- Windows 7 Professional, Windows Server 2008 R2
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)
- Internet Explorer 8.0 - 10, Firefox 20+, Chrome 20+
- One of the following:
  - Oracle 10g Standard or Enterprise Edition
  - Oracle 11g Standard or Enterprise Edition
  - MS SQL Server 2008 R2 (must be hosted on a Windows Server)
  - MySQL Community Server 5.6 (earlier versions not supported)
- JBoss Application Server
  - JBoss Application Server version 7.1.1 Final (only this version is supported)
- GlassFish Application Server
  - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)

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- The DTS 4.1 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
    - DTS 4.1 software was compiled using JDK Version 1.7
    - The JRE 1.7 included with the DTS 4.1 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

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P. DTS Version 4.0.1 (02/2014)

P.1 Additional Application Server Support

DTS 4.0.1 now provides accommodations for the use of open-source application server GlassFish for DTS Server transactions. Also, support has been added for running the DTS Server as a JBoss or GlassFish Linux Daemon Service. See the ***DTS 4.0 Installation Guide*** for complete information on configuring the GlassFish or JBoss application server for DTS.

P.2 Subscription Content License Acceptance

DTS 4 Editor users will only be required to review and accept Subscription content license agreements if the Subscription content is new or has been updated since the last connection to the DTS Server.

P.3 Known Restrictions and Limitations

The following are known DTS 4.0.1 limitations and restrictions:

1. MySQL, DB2 and InterSystems Cache support is not available.
2. DTS Workflow is not available.
3. A Migration Wizard for 3.5.2 local Namespaces and Subsets must be used to migrate existing data. See the ***Migration Guide*** for further information. When migrating Namespaces and Subsets with the new Migration Wizard, migration "batch size" (the number of Namespaces/Subsets migrated at one time) should be limited to 100. Remaining Namespaces/Subsets can be migrated in subsequent batches.
4. Silos and associated Matchpack functionality have been permanently removed from DTS 4.0.
5. When local Namespace data is loaded using the Import Wizard plug-in or custom API applications, and code/id are explicitly supplied, subsequent "type" additions, e.g., Property Types, may throw Exceptions. If this occurs, refer to the *Apelon DTS.org FAQs* for assistance.

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P.4 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.0.1

P.4.1 Minimum System Requirements (Server)

- Pentium© Processor
- 3G RAM
- 50G available hard drive space
    - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
    - Actual available hard drive space must be sufficient to accommodate the DTS installation (~200M) as well as the space requirements for your specific knowledgebase configuration

P.4.2 Minimum Software Requirements (Server)

- Windows 7 Professional, Windows Server 2008\2008 R28 R2
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)
- Internet Explorer 8.0 - 10, Firefox 20+, Chrome 20+
- One of the following:
    - Oracle 10g Standard or Enterprise Edition
    - Oracle 11g Standard or Enterprise Edition
    - MS SQL Server 2008 R2 (must be hosted on a Windows Server)
- JBoss Application Server
    - JBoss Application Server version 7.1.1 Final (only this version is supported)
- GlassFish Application Server
    - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
- The DTS 4.0.1 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
    - DTS 4.0.1 software was compiled using JDK Version 1.7

The JRE 1.7 included with the DTS 4.0.1 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

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Q. DTS Version 4.0 (12/2013)

Q.1 Enterprise Architecture

The DTS server has been completely rewritten to use Enterprise JavaBeans 3 (EJB) and Service Oriented Architecture (SOA). EJB replaces much of the "back-end"/transaction aspects of DTS (concurrency, pooling, and security) with industry-standard, open source components, e.g., JBoss. Use of EJB simplifies many operational aspects of DTS and will provide enhanced security and transaction options. With this new architecture, the comprehensive DTS API is also now available as web services in addition to Java form simplifying the integration of DTS with web-based applications. The API is, however, fully backwards-compatible, so existing DTS applications can run essentially unmodified.

See the ***DTS 4.0 Installation Guide*** for complete information on installing DTS 4.0 and downloading, installing and configuring the open source JBoss application server.

Q.2 Versioning

Version 4.0 extends the DTS Object Model to support complete history (versioning) of Namespaces and Subsets. Search and browse functions can specify the desired version/date and comparison and full historical views are supported. For further information on Versioning in DTS 4.0, see the ***DTS 4.0 Versioning Guide***.

Q.3 Role Based Access Control

Version 4.0 implements a new User access model based on a set of atomic *Permissions*. Example Permissions are *Write Permission to MyNamespace*, and *Permission to create Subsets*. These Permissions can be grouped in installation-defined *Roles*. Roles could be defined for System Administrators, content modelers, and clinical browsers. Finally, Application Server *Users* are assigned one, or more, of these Roles. When a User logs in to DTS, their Roles are accessed, and in turn, the Permissions associated with those Roles. The union of all of the User's Role's Permissions define what that User can access/do.

A new **User Manager** module has been written to maintain these access relationships. The **User Manager** is available within the DTS Editor for Users having the *apelondtsadmin* Application Server Role. See the new ***DTS User Manager Guide*** for more information.

Q.4 DTS Browser

Version 4.0 introduces a new DTS Browser, based on the Java Server Faces 2 architecture and Rich Faces 4 framework. We are very excited about the opportunities to provide enhanced web browsing of terminologies via this platform.

Once installed, the DTS Browser is available via the shortcut on the Windows *Start* menu or at http://localhost:8080/dtsserverws. Once loaded, press the *Browser* button in the upper left corner to see the new layout. As with the previous browser, concept references are hyperlinked to the detail panel.

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Q.5 Metadata Additions

User-definable metadata (implemented as Property Types and Properties) can now be added to Namespaces, Versions, and Authorities. Metadata additions are available for both Subscription and Local DTS Objects. This new metadata can be used to create more expressive objects including definitions, provenance, OIDs, URIs, etc. Metadata additions are described further in the DTS Editor section below.

Q.6 The DTS Editor

The DTS Editor provides extensive support of Version 4.0 features. The Search, Browse and Detail panels, for example, all support one-click selection and viewing of version ”snapshots” of DTS objects. The Version 4.0 DTS Editor also extends its popular Plug-in Framework to a new Module Framework. All Editor Functionality is now provided through independent Modules. This means that the Editor can be completely customized for specific user requirements. The Editor is no longer an *extensible application*, but a *customizable platform* for the delivery of terminology management functionality. See the ***DTS Editor Module Guide*** for a complete description of the new framework.

The DTS Editor has also been enhanced for internationalization; prompts and messages have been relocated to a Locale-dependent Resources file. This enables the GUI of the Editor to be translated into many non-English languages. Further information on internationalization is available in the ***DTS Internationalization Guide.***

For the most part, the default DTS Editor in Version 4.0 should appear familiar to current DTS users. There are, however, some changes in module behavior and functionality. These changes are described below, organized by the standard DTS Editor menus.

Note that in 4.0, the content and structure of the DTS Editor (menus, toolbar and panel layout) are completely customizable. See the ***DTS Editor Module Guide*** for further information on customizing the DTS Editor.

Q.6.1 File Menu

There is now only one connection option, EJB Connection. The connect and disconnect options in the File menu have been simplified as a result. The Connect option is now silent and immediately attempts to connect according to the default connect parameters. To change the connection parameters, use the Connect Parameters … item. This dialog now has a new “Auto-connect on start-up” check box. Checking this box sets the **autoConnect** parameter in the DTS Editor configuration file. When the Editor is subsequently started, it attempts to automatically connect to the default DTS Server.

Q.6.2 View Menu

The View menu has been removed. To hide the Status panel, edit the DTS Editor layout file as described in the ***DTS Editor Module Guide***.

Q.6.3 Tools Menu

a. Concept Tree

Concept Tree panels now open with an All Namespaces selection showing expandable trees for all Namespaces. When a single Namespace is selected, the Version Select widget is enabled, allowing tree

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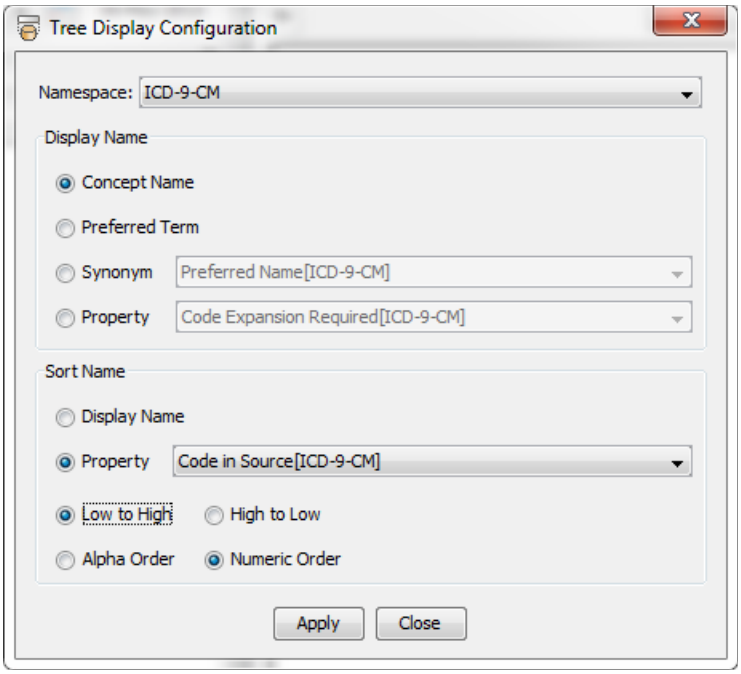
display of a specific Namespace Version, or, via a click on the calendar icon, the state of a Namespace on a specific date. In the latter case, the associated Version is automatically selected. See the ***DTS Versioning Guide*** for more information. Direct Drag and Drop (DnD) into the tree window is also supported. When a Concept is dropped into the tree display area, the Concept's Namespace is selected and the path to the dropped Concept is made visible.

Node display names and node display order in the **Tree** and **Walker** panels can now be customized. Right click in the Tree or Walker panels and select Set Tree Config … to open the Tree Display Configuration panel (see below). First select the Namespace for customization from the dropdown combo box at the top of the panel. Then select the desired Display Name. Concept Display Names can be any Synonym or Property of the associated Concept. The Preferred Synonym is also supported.



Next select the name (value) used for sorting the tree nodes. This name can be either the Display Name or the value of a selected Property Type. If the designated Property Type is not present on a Concept, the Display Name is used. Sorting can be Low to High (ascending) or High to Low (descending), and can be Alpha-based or numeric-based, via the Radio Button selections. Configurations settings are persisted in the DTS Editor configuration file and are shared by the **Tree** and **Walker** panels.

b. Search

Search panels have had a significant restructuring. Silo support has been deprecated throughout the Editor, and Silo searching has been removed. The Status combo at the top of the panel selects what types of Concepts will be returned by the search. All, Active, Deleted, and Inactive options are available. See the ***DTS Versioning Guide*** for further information on Concept and Term Status.

Search results are now "paged" so the previous Maximum Results combo is now the Page Size combo and also supports direct entry of the size. Search For is a combo; it remembers the search history and is also droppable. Namespace (and Subset) selection is from a combo rather than a list. The previous Concepts & Synonyms checkbox is now the Name & Synonyms selection in the Search By

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combo, and Type Namespace and Attribute Type are combos as well. Qualifier searching is also supported with the addition of a new Qualifier Type combo. Namespace and Subset Versioning is supported via the Version Select wizard. In the Search Results section, the number of displayed results is shown in red if additional results are available, and previous page and next page buttons are available at the bottom of the panel. Changing any search parameters except Page Size disables paging. When searching for Concepts with Status All, individual search results are prefixed with an icon if Inactive or Deleted. Tool Tips on search results show which and where matches were found, e.g. in a Synonym, Property, etc.

c. Concept Walker

Concept Walker panels include the Version Select widget as described above. A new display style is also available for the upper (parent) panel. Right click in the upper panel and select Bottom Up Tree display. Trees will be displayed starting at the bottom of the panel and growing up toward the root. The display style is saved as part of the DTS Editor configuration. The sizes of the top and bottom tree panels in the **Walker** panel can now be individually adjusted. The relative size of the two panels is maintained when the overall panel is resized. This ratio is saved in the DTS Editor Preferences and is used when another panel (or the Editor) is reopened. Double clicking on any Concept in the top or bottom tree panels sets that Concept to be the Focus Concept for the panel.

d. Details

The **Details** panel now provides independent tabs for Concepts, Terms, Namespaces, Subsets, and Authorities. Each tab supports the addition, modification, and deletion of Properties and other Attributes. Inverse Synonyms (the Concepts associated with a Term via a Synonymous relationship) are now displayed on Terms. Drag and Drop is supported on all objects. The **Detail**s panel centralizes edit functionality on all major DTS Objects. The visibility of the tabs and their modifiability can be customized in the DTS Editor Layout file (see the ***DTS Editor Module Guide*** for further details).

The **Details** panels also includes a Version Select widget to move between Concept “snapshots” in Namespace Versions. The Concepts and Term “trees” also include an Active/Inactive/Deleted status attribute. This attribute is read-write on Concepts/Terms in Thesaurus and Ontylog Extension Namespaces. Right click on the Status line to edit. The configuration menu includes Status and History ToolTip items. If selected, the latter shows Concept/Term and Attribute Created/Retired dates in ToolTips.

The **Namespaces** and **Authorities** panels now incorporate an editable “details” panel. This panel replicates all display and editing features of the equivalent **Details** panel.

A new “print” option is available to produce hard copy of the information in a **Details** panel (including those panels embedded in the **Namespace Editor**, **Subset Editor**, and **Authority Editor)**. The **Print Details …** option is available from the right-click context menu associated with the panel’s “name” element, e.g. Concept name, or Namespace Name. Selecting this option shows the preliminary print dialog:

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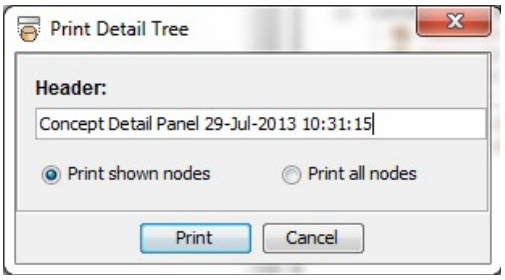

Enter a descriptive header string, then select one of the radio buttons to print either just the currently shown (expanded) nodes, or all nodes in the tree. Then click **Print** to open your operating system's print dialog to complete the print process.

e. Associations, Properties and Synonyms

There have been no changes to the Associations, Properties and Synonyms panels.

f. Attribute Types

A new single **Attribute Types** panel replaces the previous **Association Types**, **Property Types**, **Qualifier Types**, **Kinds** and **Role Types** editors. Equivalent functionality is provided, but the new panel facilitates management of Types (metadata) for a specific Namespace.

The new **Attribute Types** panel now adds a "top level" tab structure to accommodate the richer Metadata features. The Namespaces tab includes all the Namespace-based types: **Association Types**, **Property Types**, **Qualifier Types**, **Kinds** and **Role Types**. Namespace **Property Types** now have **Attaches To** values of Namespace, Version, Concept, and Term. Namespace **Qualifier Types** have **Modifies** values of Concept Property, Concept Association, Term Property and Term Association. The new Subsets and Authorities tabs includes types supported by these objects: **Property Types** and **Qualifier Types**. These types have **Attaches To** and **Modifies** values appropriate for their base object.

Note that DTS Attribute Types no longer have a Code attribute, the Purpose attribute on Association Types has been eliminated, and the Value Size attribute for Property Types has been eliminated. The latter attribute was seen as an unnecessary complication in creating this metadata element. All Property values may now contain up to 4,000 characters and the first 255 characters are automatically indexed. Also, the Word Searchable Property Type attribute has been removed pending future implementation support.

g. Namespace Editor

The **Namespace Editor** panel replaces the previous **Namespaces** option. This panel supports creating, editing, deleting and viewing of Namespaces and related data, including Version information. A new **Publish** option has been added. This option requests a Version name then creates a new Content Version object and adds it to the Namespace.

h. Publishing

New Versions of both local Namespaces and Subsets can be created via the **Publish** feature of DTS 4.0. Publish is available via the associated button on the **Namespace Editor** and **Subset Editor** panels. After selecting, enter the name of the new Version and confirm the operation. When a Namespace is published, all data since the last published Version is "finalized", i.e., intermediate edits are removed and deleted Concepts and deleted Terms are changed to Inactive status. (The exception is Concepts and Terms added since the last Publish that are given a Deleted status will be completely removed, not inactivated.). Subset processing is similar. The

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new Version is then created and its Release Date set to the current time. Finally, the Published content is now considered Read-Only and a writable “Working” Version is created for further development. See the ***DTS Versioning Guide*** for more information on the publishing process.

i. Subset Editor

The **Subset Editor** panel provides similar creation, editing and deletion capabilities for Subsets as those provided by the **Namespace Editor**. Selecting The Expr button in this panel (or double clicking on the Subset Expression value in the lower detail display) open the new Subset Expression Editor. See the **DTS Editor Guide** for further information on editing Subset Expressions.

j. Authority Editor

The **Authority Editor** panel provides similar creation, editing and deletion capabilities for Authorities as those provided by the **Namespace Editor**. This is the same panel available from the Authorities button in the **Namespace** panel.

k. Concept Diff

The **Concept Diff** panel is available to show the differences between two versions of a Concept. Drag the desired Concept into the Concept combo, and then select the working and base Versions as desired. See the **DTS Versioning Guide** for further information.

l. Concept History

A new **Concept History** panel complements the **Concept Diff** panel and shows the history (across all Namespace Versions) of Concept Attributes for a selected Concept. See the ***DTS Versioning Guide*** for further information.

m. Subset Compare

The new **Subset Compare** panel is available to compare the Concept membership between two Versions of the same Subset, or between Versions of two different Subsets. For additional information on the **Subset Compare** panel, see the ***DTS Versioning Guide***.

Q.6.4 Options Menu

a. Clipboard Module

The DTS Editor supports system-wide keyboard copy (Ctrl-C) on displayed DTS objects to permit the transfer of information from DTS to other desktop applications. Multi-select copy is supported. A new **Clipboard Module** has been develop to allow users to customize the strings created by the Editor in a copy operation. To use this option, select the **Set Clipboard Formats** option in the DTS Editor **Options** menu. See the ***DTS Editor Guide*** for further information.

b. Configuration Options

The previous Code and Id Generator option has been replaced by a more general ConceptTermInitializer capability in the Configurations option. User-written ConceptTermInitializers are invoked when a new Concept or Term is being created and allow complete initialization of the object, including specification of Code, Id, Synonyms, Properties,

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or Associations. See the ***DTS Editor Users Guide*** for detailed information on creating ConceptTermInitializers.

c. Preferences

The new **Preference** option provides three sub-items for managing DTS Editor panel "preference" settings:

AutoLocate Panel: Enable/disable the autoLocate configuration item. Checking (enabling) this item results in the Editor remembering the screen location of floating panels and opening new instances of the same panel type at the previous location.

AutoSize Panel: Enable/disable the autoSize configuration item. Checking (enabling) this item results in the Editor remembering the screen size of floating panels and opening new instances of the same panel type at the previous size.

Clear Preferences: Selecting this item opens a confirmation dialog for clearing all the panel Preferences. If accepted, all saved panel locations and sizes will be reset to their defaults, generally centered in the Editor at their preferred sizes.

Q.7 DTS Subsets

Version 4.0 adds significant new functionality to DTS Subsets. Like Namespaces, Subsets now can have Properties and are versioned. Subset Versions themselves can have Properties and the Subset Expression is associated with a Version. Subset Expressions are also much richer, supporting multiple Namespace and Subset filters in addition to the familiar Concept, Concept Name and Attribute Filters. Namespace and Subset filters can also be nested under other filters. Descendant and Children options in the Concept Filter are now available for Thesaurus Namespaces (using the "Parent Of" association).

To create or edit a Subset, open the **Subset Editor**, available from the **Tools** menu or the Toolbar. This panel is similar to the **Namespace Editor** but adds a filtering capability for the Subset list. You can select All Subsets or filter the Subset list by Name pattern, enclosed Namespace, or enclosed Subset. The lower panel of the Subset Editor is the same as the Subset tab in the Details Panel and offers similar functionality. Right click nodes to add/edit. Note that Subset Publish, however, like Namespace Publish, is only available in the Editor.

Subset Expressions can be viewed under the Expression folder in Subset Versions. To edit an Expression (only the Expression in the Working Version is editable), right click on the Expression and open the **Subset Expression Editor**. As in DTS 3.5, right click on any Expression filter to see the available options. The **Expression Editor** now decorates all filters as they are being edited: adds, modifications and removals are clearly seen. For modifications, the original filter is available as a ToolTip. Modifications and removals can be "undone" by using the *Restore* option in the popup menu. Note that the Expression must be explicitly saved to the

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Subset via the Toolbar *Save* icon to commit the changes to the Subset. An Expression can also be saved to a different, existing, Subset.
The **Tree** and **Walker** panels take advantage of the new Subset functionality. Subset views are available for the *All* Namespace option and the Subset Hierarchy view is supported (using *Parent Of*) for Thesaurus Namespaces.

Q.8 Namespace Roots

Version 4.0 simplifies the specification of Thesaurus Namespace Roots. While the previous Root specification process (using Term Attributes) is still supported, the new method is highly recommended as it does not require the creation of separate Term Properties. To create a Root, right click on the Roots folder for the desired Namespace in the **Details Panel** or the **Namespace Editor**. Note that Roots are versioned (are under a Version folder) and only those in the Working Version of a Namespace are editable. Drop the desired Root Concept into the resulting **Add Namespace Root** panel. To delete a Root, right click on the Root under the Roots folder.

Q.9 Other Additions

When creating new Namespaces, Subsets, and Authorities, the associated Codes and Ids can now be created automatically by the DTS Server. The entry fields for these values show a default "(Auto)" prompt. If nothing further is entered, the server will create unique values. If a specific Code or Id is required, just enter the value into the field.

Finally, to simplify management of DTS Editors logs, logs are now created on a daily rolling basis, i.e., a new log file is created each day.

Q.10 Known Restrictions and Limitations

The following are known DTS 4.0 limitations and restrictions:

1. MySQL, DB2 and InterSystems Cache support is not available.
2. DTS Workflow is not available.
3. A Migration Wizard for 3.5.2 local Namespaces and Subsets must be used to migrate existing data. See the ***Migration Guide*** for further information. When migrating Namespaces and Subsets with the new Migration Wizard, migration "batch size" (the number of Namespaces/Subsets migrated at one time) should be limited to 100. Remaining Namespaces/Subsets can be migrated in subsequent batches.
4. Silos and associated Matchpack functionality have been permanently removed from DTS 4.0.
5. When local Namespace data is loaded using the Import Wizard plug-in or custom API applications, and code/id are explicitly supplied, subsequent "type" additions, e.g., PropertyTypes, may throw Exceptions. If this occurs, refer to the *Apelon DTS.org FAQs* for assistance.

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6. Certain Linux features, such as running DTS as a Linux service, are not included in this release. If you are a Linux implementer, check http://apelondts.org for updates.

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Q.11 System and Software Requirements

The following are minimum system and software requirements to install and run DTS 4.0.

Q.11.1 Minimum System Requirements (Server)

- Pentium© Processor
- 3G RAM
- 50G available hard drive space
    - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS Knowledge base configured with SNOMED
    - Actual available hard drive space must be sufficient to accommodate the DTS installation (~200M) as well as the space requirements for your specific knowledgebase configuration

Q.11.2 Minimum Software Requirements (Server)

- Windows 7 Professional, Windows Server 2008\2008 R28 R2
- Redhat Enterprise Linux 5 or 6 (or CentOS 5 or 6)
- Internet Explorer 8.0 - 10, Firefox 20+, Chrome 20+
- One of the following:
    - Oracle 10g Standard or Enterprise Edition
    - Oracle 11g Standard or Enterprise Edition
    - MS SQL Server 2008 R2 (must be hosted on a Windows Server)
- JBoss Application Server
    - JBoss Application Server version 7.1.1 Final (only this version is supported)
- The DTS 4.0 Windows installation includes Version 1.7 of the Sun Java Runtime Environment (JRE)
    - DTS 4.0 software was compiled using JDK Version 1.7
    - The JRE 1.7 included with the DTS 4.0 Windows installation is only used by DTS – it is not for use by the JBoss or GlassFish application server (existing Java installations on the target machine are not affected)

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