



7. Using the UMLS Terminology Services (UTS) via the Internet

The UMLS Terminology Services (UTS) is a computer application that provides Internet access to the UMLS Knowledge Sources. The purpose of the UTS is to make the UMLS data more accessible to users and, in particular, to systems developers. The system architecture is based on the client server model, allowing remote site users (individuals as well as computer programs) to send requests to a centrally managed server at the U.S. National Library of Medicine. Access to the system is provided through a command line interface, through the World Wide Web, an Extensible Markup Language (XML)-based socket programming interface, and through an Application Programmer Interface (API).

Users are encouraged to consult the [UTS Web site](#) for the most current UTS documentation, including the Developer's API Guide and information on downloading the UMLS release files.

7.1. Downloading the UMLS Knowledge Sources

UMLS licensees may access the UTS and create an account with a username and password of their choosing. Licensees can download the current UMLS Knowledge Sources from the [UTS](#). Archives of UMLS releases are kept and made available for several previous years. For detailed technical specifications and installation instructions refer to the README.TXT file available on the [Knowledge Sources downloads page](#).

7.2. System Architecture

The UTS, made available in December 2010, replaced the UMLS Knowledge Source Server (UMLSKS). The UTS provides access to the UMLS Knowledge Sources through a browser-based application and a Web services client. The UTS uses the same underlying domain model as other UMLS systems, including [MetamorphoSys](#), which allows for integrity at the data store level. The UTS features the following enhancements:

- Highly responsive search engine for quick retrieval
- Increased capacity by an order of magnitude
- Scalability to accommodate past and future releases
- High availability via co-location redundancy
- 508 compliance
- More intuitive graphical user interface
- Real-time monitoring and collection of statistics
- Integration of licensing and reporting requirements

7.3. Querying the UTS

7.3.1. Metathesaurus Browser

The UTS allows the user to request information about particular Metathesaurus concepts, including attributes such as the concept's definition, its semantic types, and the concepts that are related to it.

Basic concept information includes the Metathesaurus unique identifier of the concept, the preferred name for the concept, and the names and sources of all terms that comprise that concept. Additional concept information often includes a definition and the source of that definition. Semantic type information is also included. Information about the hierarchical contexts of Metathesaurus concepts is readily available in the system. Related concepts are easily found.

An important perspective on the Metathesaurus is source specific data. It is possible to query the server by limiting the query to a particular vocabulary. The user may wish to see the ancestors or descendants for a term in just a particular vocabulary, or the user may wish to see just the synonyms for a particular term in a particular vocabulary.

The Metathesaurus Tree tab allows the user to navigate the hierarchy of a selected source vocabulary in order to browse both its content and structure. *Note: Some source vocabularies in the Metathesaurus are not organized into a hierarchical arrangement and cannot be browsed using the Metathesaurus Tree tab.*

7.3.2. Semantic Network Browser

The Semantic Network contains information about semantic types and their relationships. The implementation of the network module computes the relationships between semantic types using the inheritance property of the network type hierarchy. Information in the Semantic Network can be browsed for semantic types and the relationships between them.

It is possible to retrieve all the relations between a pair of types. For example, "treats", "prevents", and "complicates" would be listed, among others, as potential relationships between drugs and diseases. It is also possible to retrieve an exhaustive list of all related types in the network. Queries can be made about the definition, unique identifier, tree number, ancestors, parents, children, descendants, and siblings of a semantic type or relation.

7.3.3. SNOMED CT Browser

The UTS provides access to SNOMED CT content, as included in the Metathesaurus. Users may request information about particular SNOMED CT terms, including descriptions, relationships, hierarchical tree positions, etc. Users may query by SNOMED CT term, SNOMED CT ConceptID, or SNOMED CT DescriptionID.

Concept information includes the SNOMED CT unique identifier of the concept, concept status, and whether or not a concept is primitive. Additional concept information includes its descriptions, parents and children of the concept, relationships to other concepts, and its hierarchical tree positions. The unique identifier(s) and semantic type(s) of the UMLS Metathesaurus concept(s) to which the SNOMED CT concept belongs are also included with the SNOMED CT concept information.

The SNOMED CT Tree tab allows the user to navigate the hierarchy of SNOMED CT in order to browse both its content and structure.

7.4. Gaining Access to the UTS

Access to the UTS is available to anyone who has signed the UMLS Metathesaurus License Agreement and activated a UTS account. First time users should click “Sign Up” on the [UTS homepage](#) to begin the license request and UTS account activation process. Any questions or problems should be addressed via e-mail to [NLM Customer Support](#).

7.5. UTS Documentation

UTS users should always consult the documentation on the [UTS](#) for the most current information.

The following are publicly available on the site, under Documentation:

- Source documentation pages.
- UMLS database query diagrams.
- Developer's API Guide -- documentation generated using the javadoc facility that includes the object model, interfaces and some examples.
- Information on validating UMLS licensees for third party applications.
- A link back to the UMLS Reference Manual.
- A link to RxNorm and SNOMED CT documentation.