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Overview

The Schema Subset Generation Tool (SSGT) presents the schema designer with an interface that permits searching through the National Information Exchange Model (NIEM) for desired types and properties by substrings in names, definitions, and other fields of NIEM. When appropriate types or properties are found, the user may select them for inclusion in a schema subset. SSGT applies the appropriate rules and automatically includes any types and elements that the user selections depend on. The designer does not have to manage subsetting rules or dependencies. After selecting all of the desired types and properties, the designer can generate the schema subset. The result is a **zip** archive file containing the relevant, valid subset schemas derived from the NIEM reference schemas and any referenced code list schemas. The **[zip]** archive directory structure and file placement is arranged automatically.

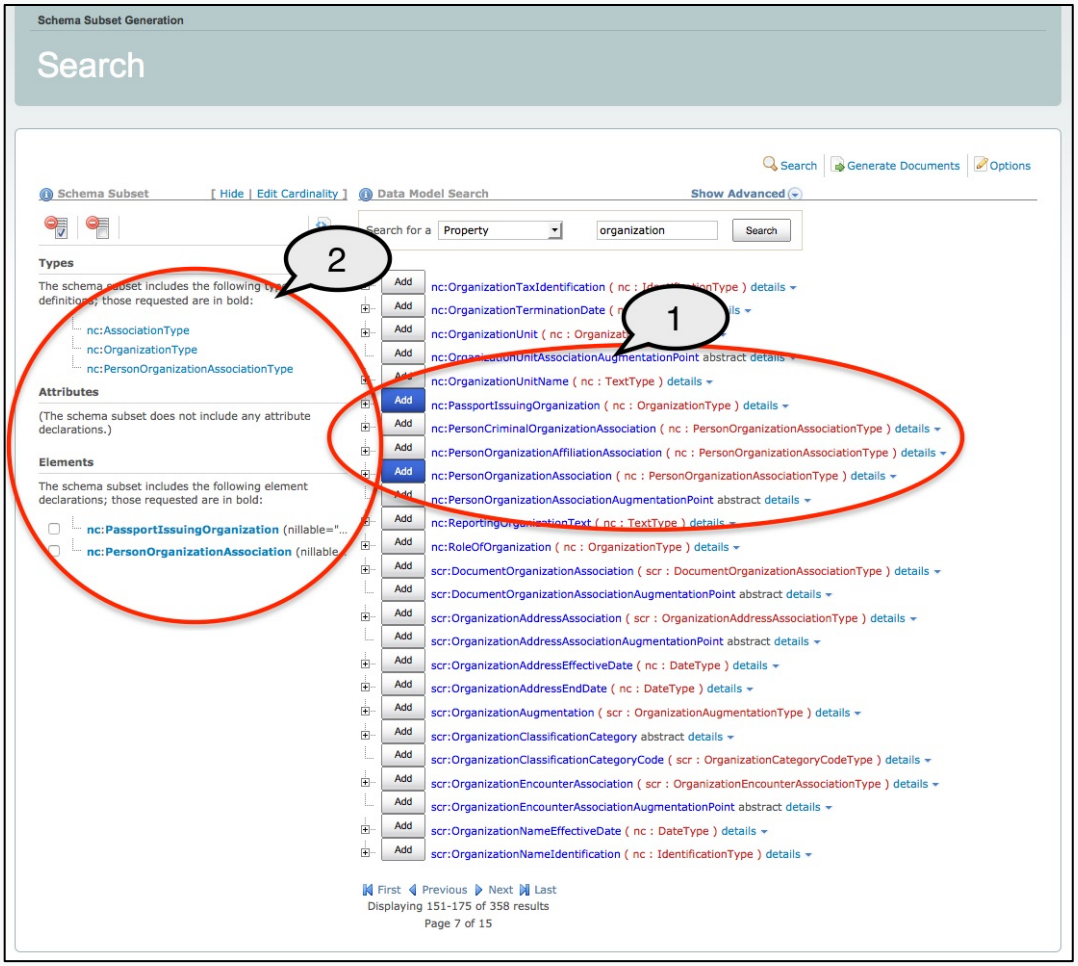


Figure: SSGT Automatic Dependencies

Search and Discovery

The Schema Subset Generation Tool (SSGT) search function allows you to:

- Enter search terms and view matching results in a data hierarchy format.
- Navigate through the various data types, properties, namespaces, and facets and their relationships.
- Select advanced search options to refine your search results.

Search Page

- Click the Search link to display the search page.

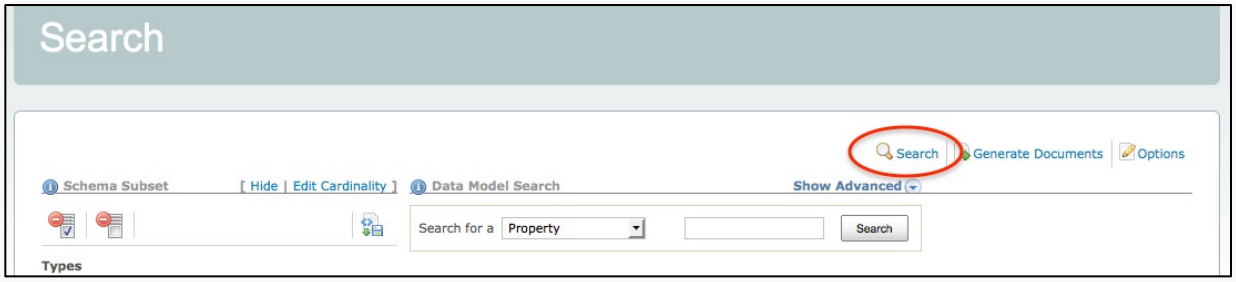


Figure:SSGT Search Page

Note: The search page is displayed by default.

Basic Search

1. Click the Search for a drop-down and select either Property, Type, *Namespace*, or *Facet*.
2. Enter a search term in the text box next to the drop-down.
3. Click the Search button.

Property: A *Property* is a global schema xsd:element.

Type: A *Type* is a schema xsd:complexType or xsd:simpleType that contains any number of properties. For example, nc:OrganizationType contains properties, such as

nc:OrganizationLocation, nc:OrganizationStatus, etc. Properties from the namespace xsd-proxy are wrappers for schema simple types such as xsd-proxy:string for xsd:string or xsd-proxy for xsd:integer. Proxy simple types allow for adding metadata to the properties.

Namespace: A *Namespace* is a logical grouping of data types, properties, and facets associated with a particular domain. If *Namespace* is selected in the search drop-down, the namespace prefixes, fully qualified namespace URIs, and namespace descriptions will be searched for the matching search term. The namespace or a hyperlinked list of namespaces that contain the matching term will be returned.

Facet: A *Facet* is a constraint on the values of eXtensible Markup Language (XML) simple types (such as strings, integers, dates, binaries, etc.). Such constraints can be on data value length, patterns, or specific values. For example, an enumeration facet constrains a string type property to a particular set of values, often referred to as a code list. A code list for an organization category type might constrain valid string values to Business, Charity, Criminal Justice, etc. If set to *Facet*, all code lists (enumeration facets) matching a substring either in a code value or definition will be returned.

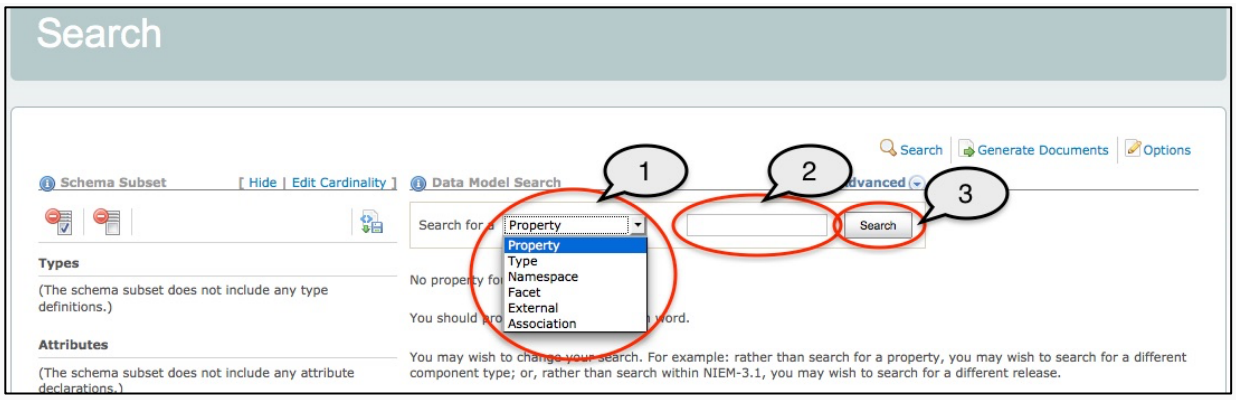


Figure: SSGT Search and Discovery

Advanced Search

- Click the toggle link Show Advanced to show advanced search options.
- Click the toggle link Hide Advanced to hide advanced search options (green circle).Enter search terms in the text-box labeled with the exact phrase to search multiple terms.

- Enter search terms in the text-box labeled with at least one of the words to conduct a logical OR search.
- Enter search terms in the text-box labeled without the words to exclude terms from the search results.
- Uncheck the check-boxes Names, Definition, Keywords, Usage, and Example Content to exclude the unchecked item from being searched for the search terms entered above.

⚠ **Note**: If all check-boxes are unchecked, **no results will be returned**.

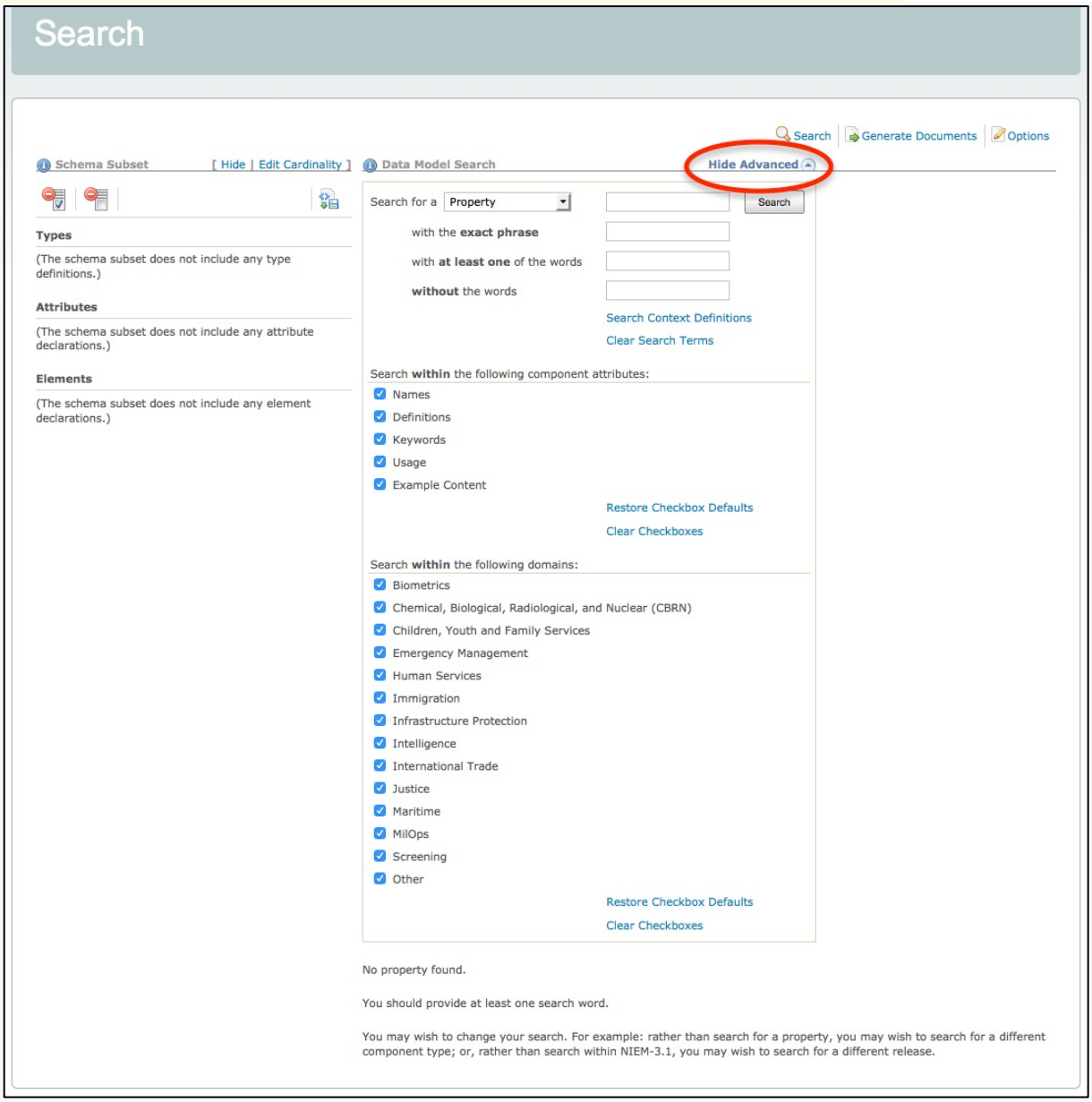


Figure: SSGT Advanced Search

Exploring search results

The properties and types displayed in the search results are hyperlinked to display more detailed information about that component. This helps users navigate through the data model to find associated properties and to explore the model hierarchy.

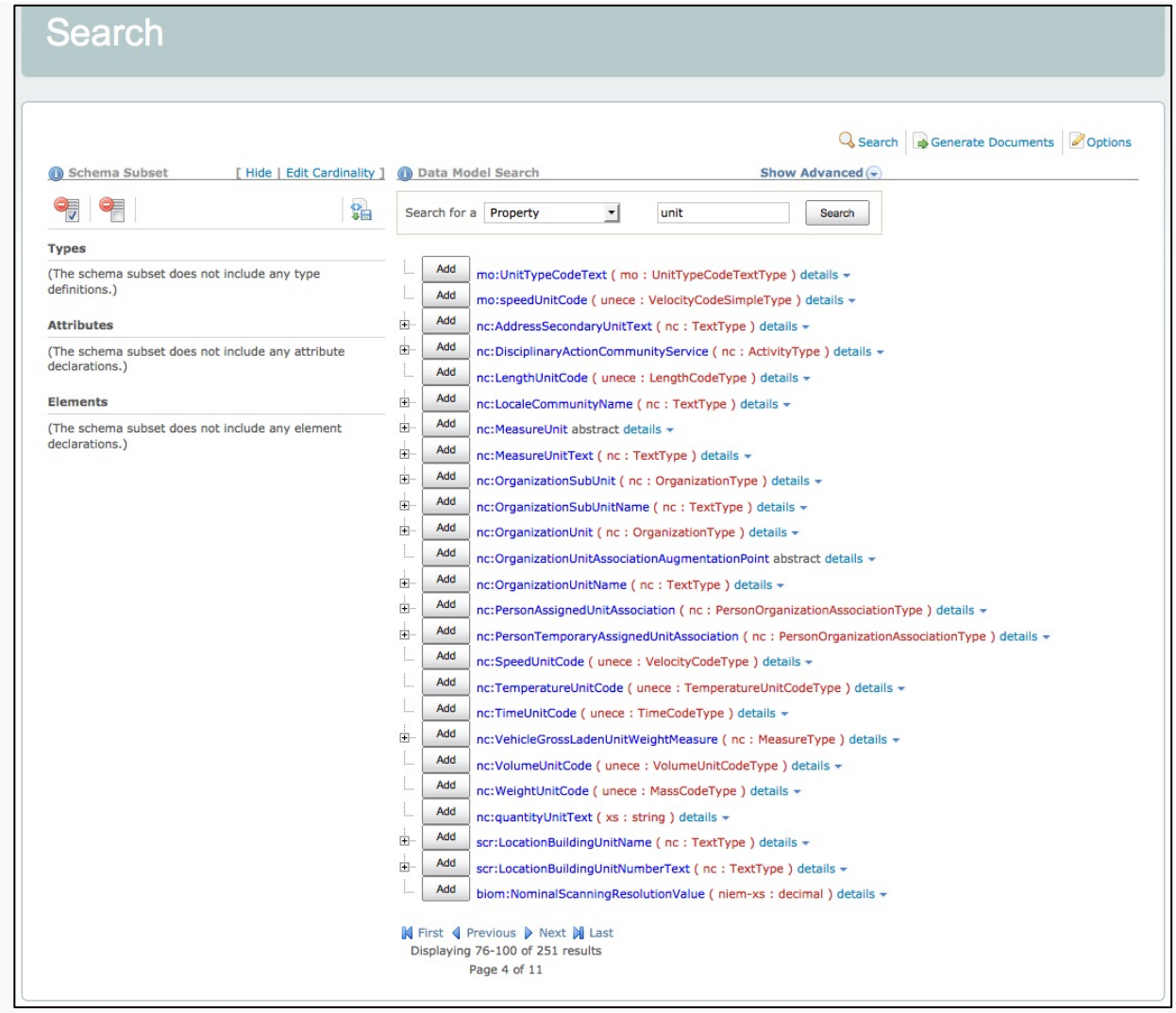


Figure: SSGT Exploring the Model

Showing Properties

- Click the plus-sign icon to the left of a component to expand the list of properties for that component.
- Click the minus-sign icon to the left of a component to hide the list of properties for that component.

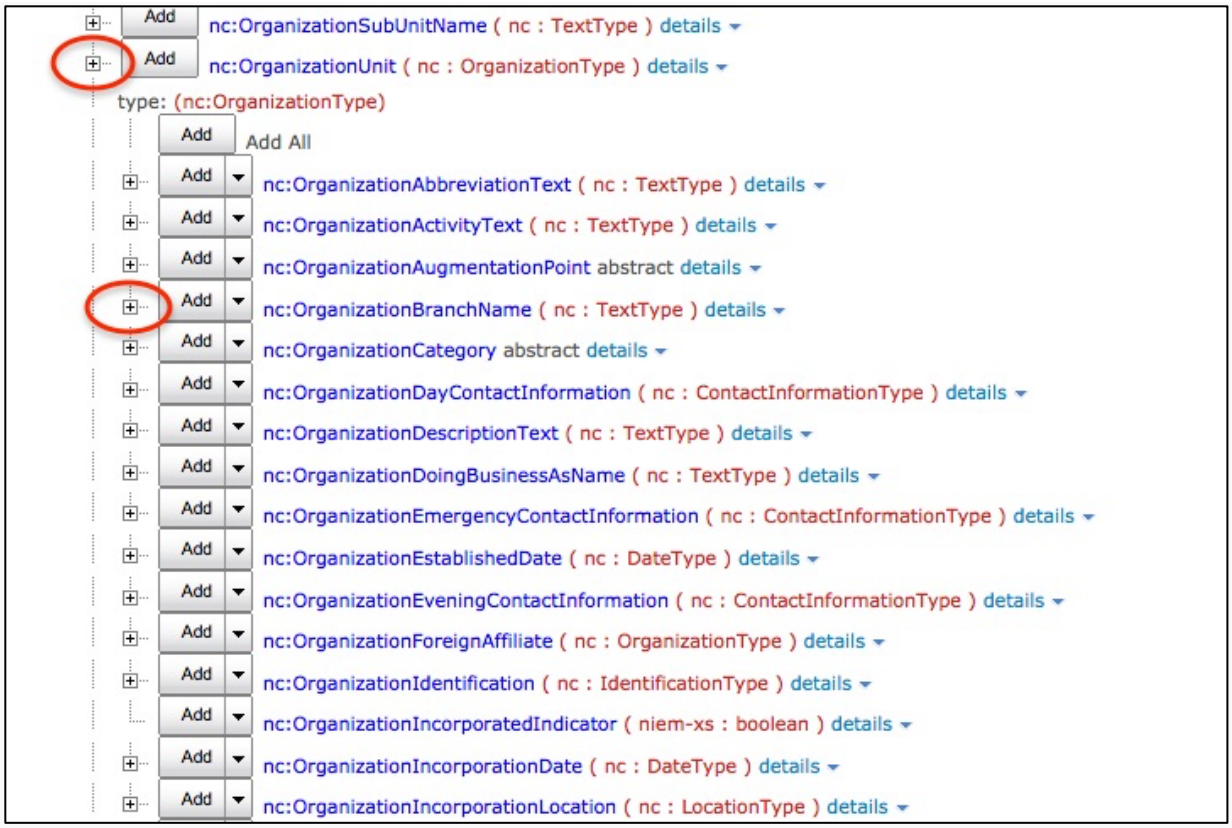


Figure: SSGT Show Properties

Showing Details

- Click the toggle link details to the right of a component to display the details view for that component.
- Click the toggle link details again to hide the details view.

The details view contains the component definition and two radio buttons that allow selection of whether to make the component nillable = “true” or nillable = “false”.

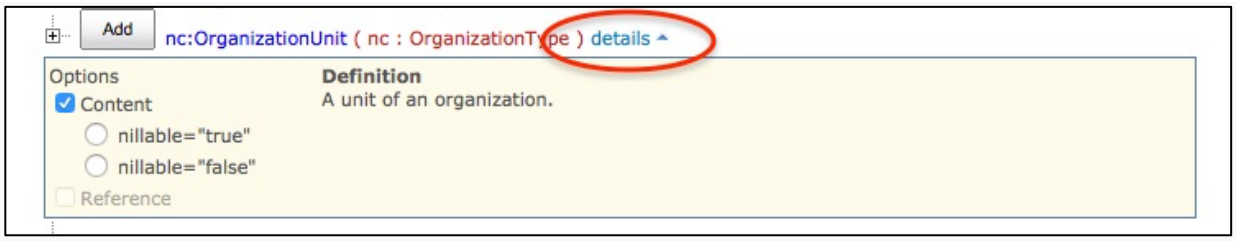


Figure: SSGT Show Details

Showing a Namespace Page

- Click a namespace name link before a component name to display that namespace's page.

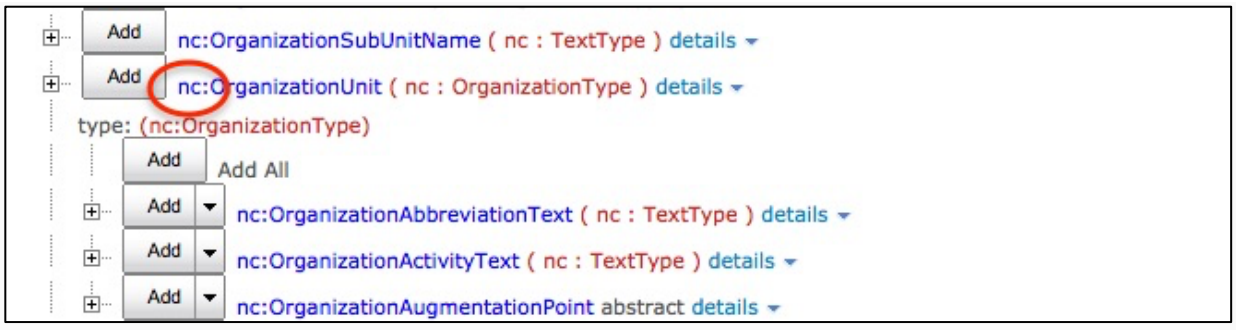


Figure: SSGT Show Namespace

- The namespace page displays the namespace's prefix, Uniform Resource Identifier (URI) and description.

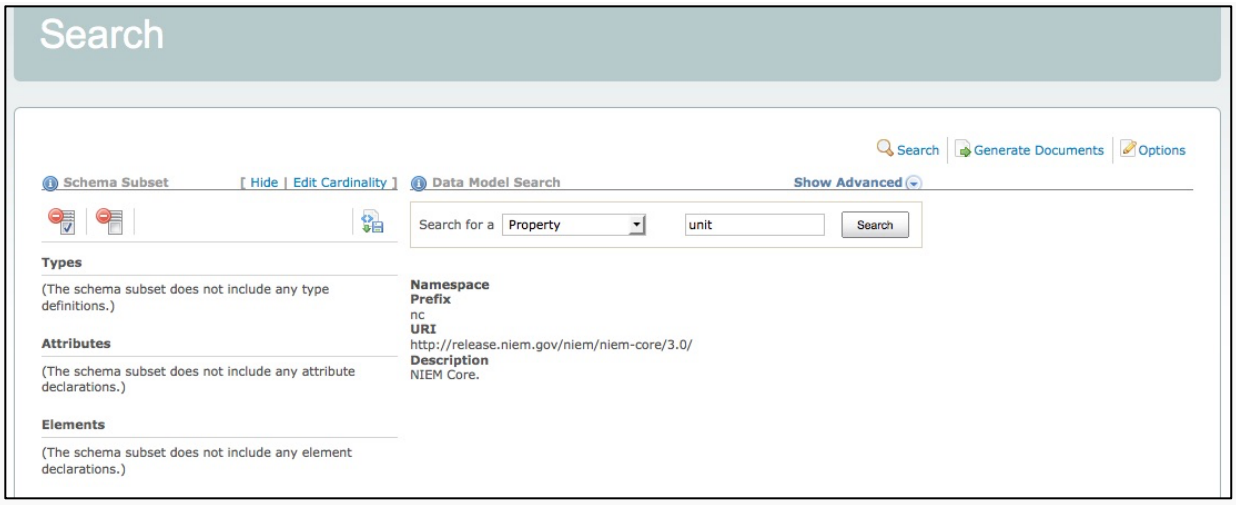


Figure: SSGT Namespace Page

Showing a Type Page

- Click a red type name link to display that type's page.

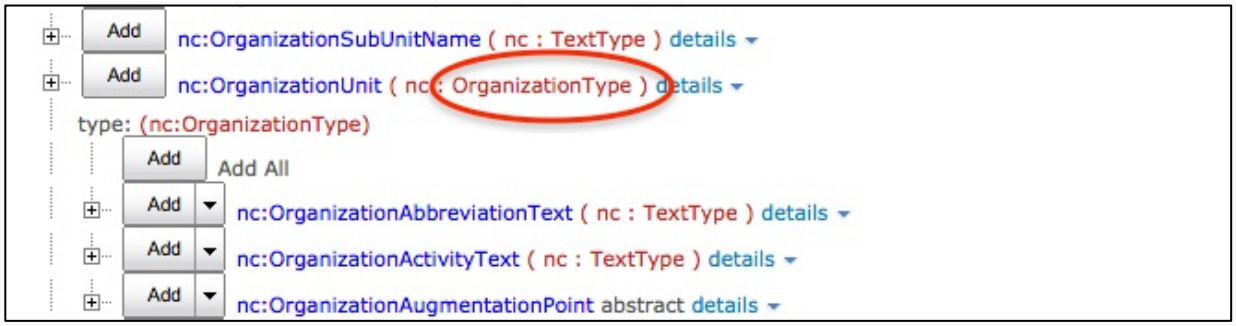


Figure: SSGT Show Type

- The type page displays the type's definition, content style (complex content or simple content), parents, possible properties, and a list of other properties (elements) that are of the type being displayed.

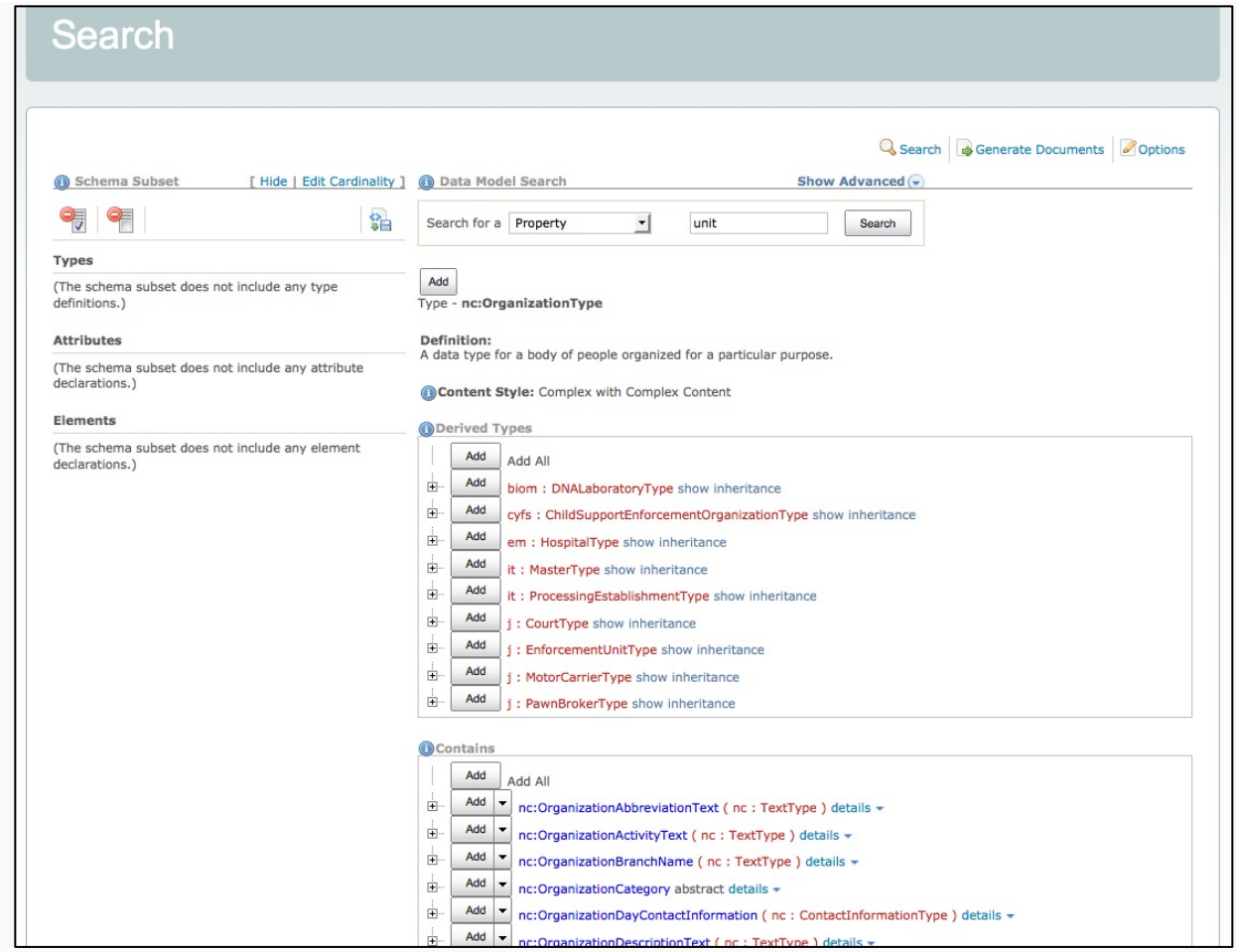


Figure: SSGT Type Page

Showing a Property Page

- Click a blue type name link to display that property's page.

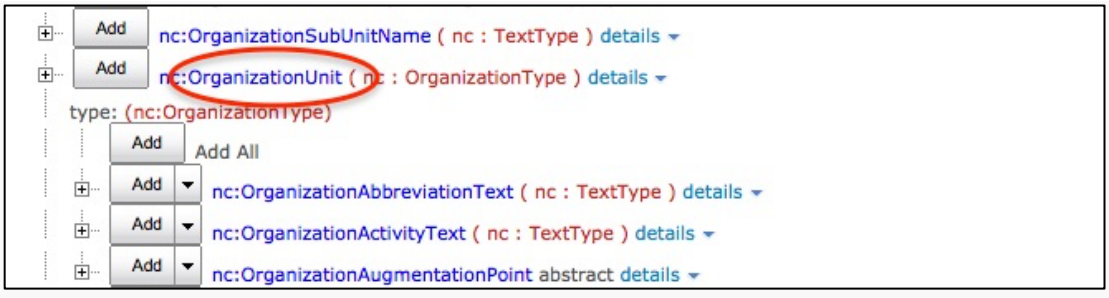


Figure: SSGT Show Property

The property page displays a property's definition, nillable options, types the property is contained in, and the type of the property. Check the appropriate nillable option radio

button. The Contained In group box, if present, contains the type that the property is a member of.

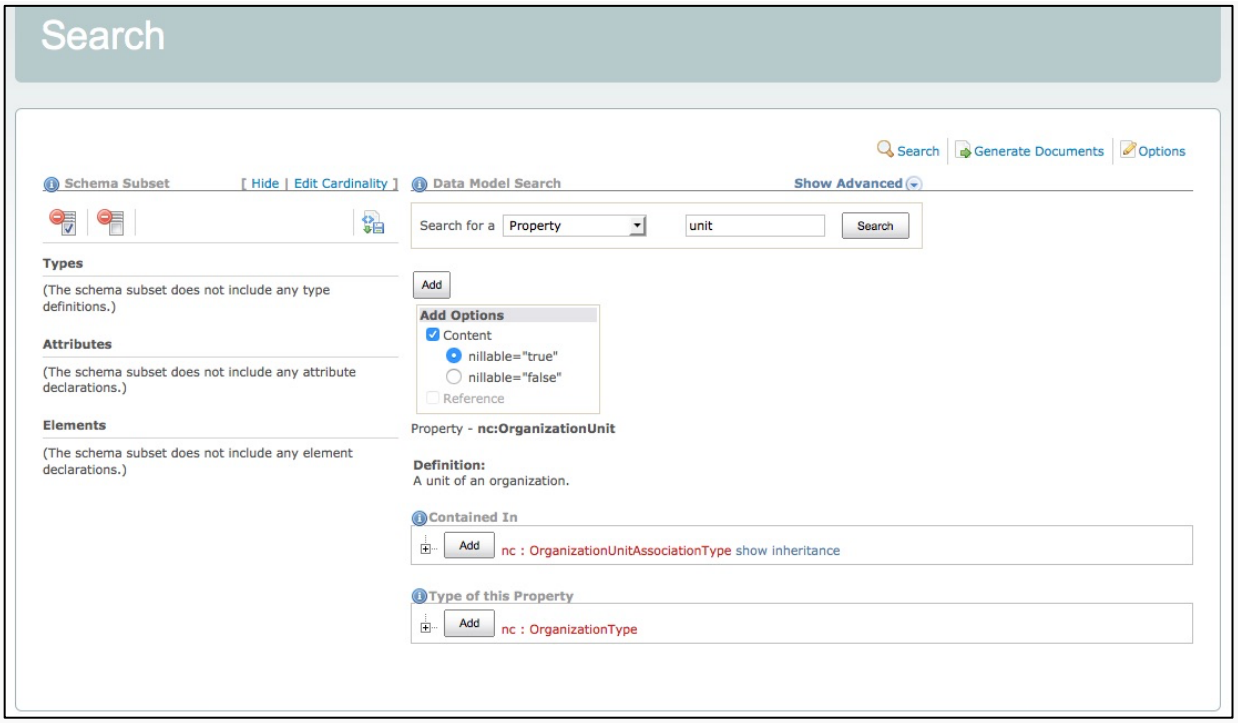


Figure: SSGT Property Page

Options Page

- Click the Options link to display the options page.

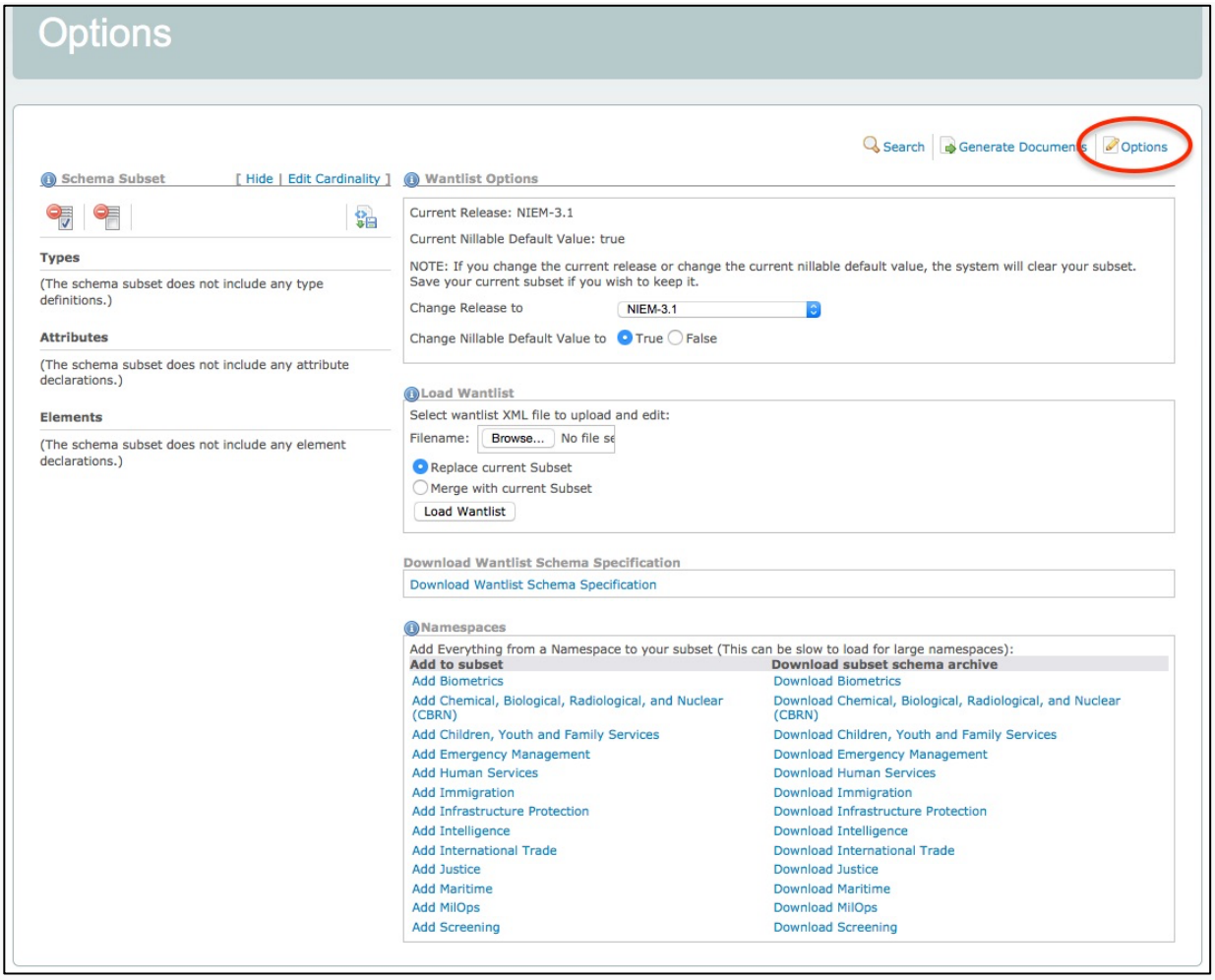


Figure: SSGT Options Page

Change Release Version

- Click the Change Release To: drop-down box to select the version NIEM to use when generating the subset zip-file.

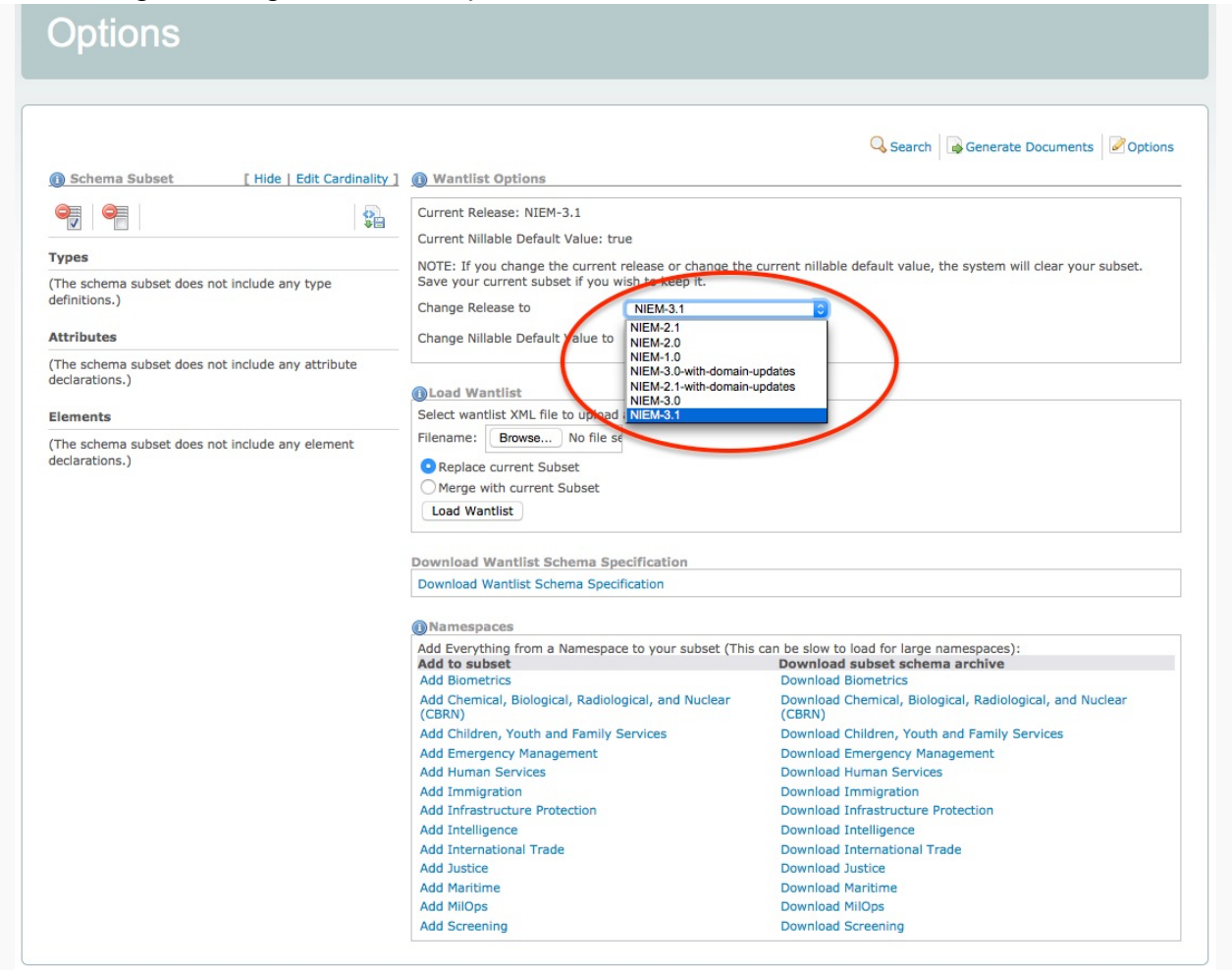


Figure: SSGT Change Release Version

⚠ **Note**: Change release before doing a subset.

Add a Property to the Current Subset

1. Click the Add button next to a property to add that property to the current subset.
2. The property added appears in the Elements section.
3. Additionally, the selected type of that property (and all required parent types) will appear in the Types section.

Note: Sub-properties of a type (or parent type) will **NOT** be added automatically. Sub-properties must be added individually or by using the add all function.

Note: In the current subset, properties or types in **BOLD** (#2, below) indicate components directly selected to be added to the subset by the user. Components with normal font weight indicate automatically added dependencies (#3, below), required by at least one **BOLD** component.

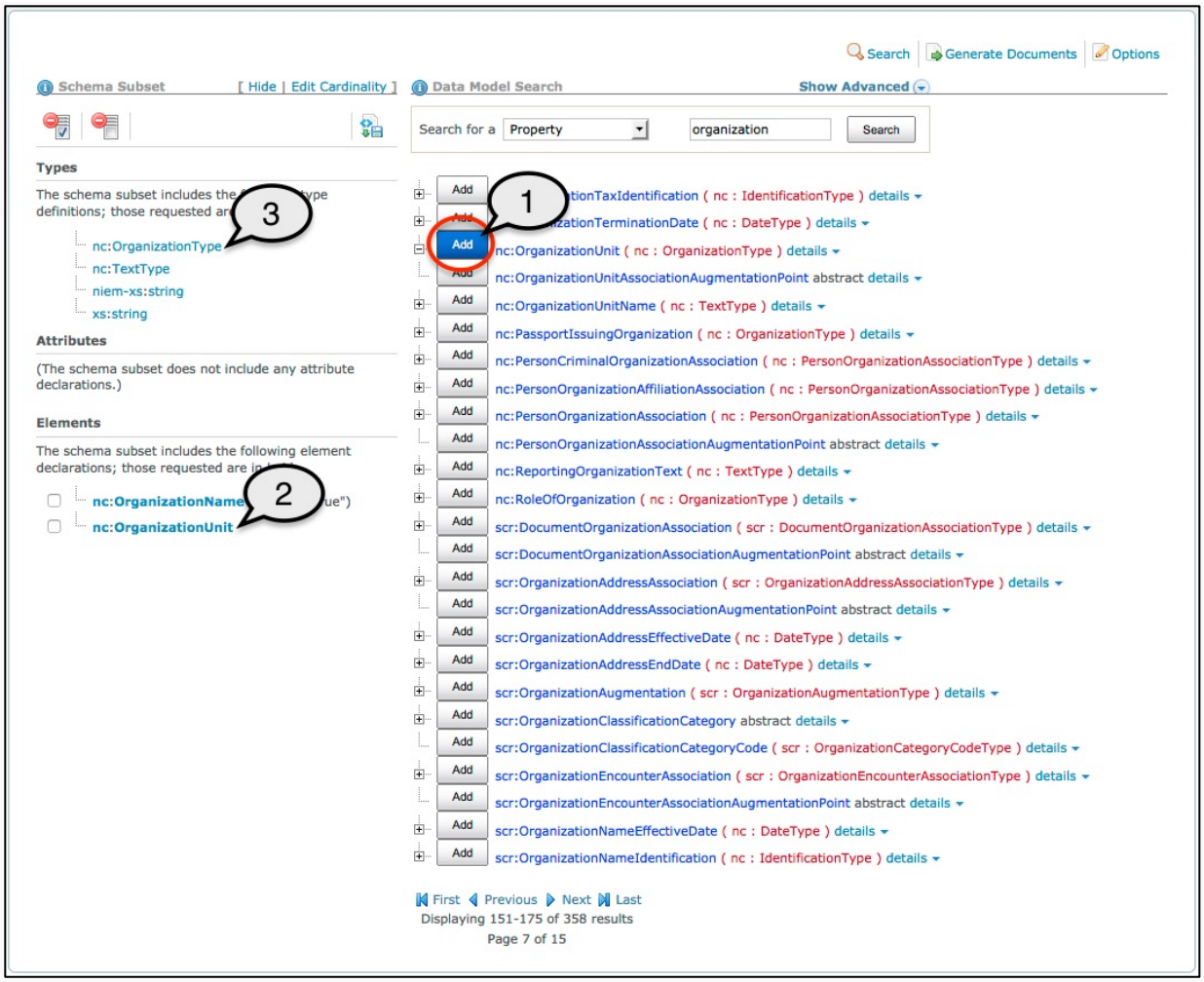


Figure: SSGT Adding a Property to the Current Subset

Add a sub-property of a type to the current subset

Note: Because all properties are global in the NIEM Data Model, sub-properties of a type may be added to the current subset WITHOUT also adding them as sub-properties of their parent type.

1. Click the plus-sign icon next to a property to expand all the sub-properties for the type of that property.
2. Click the Add button next to a sub-property to add that sub-property to the current subset.
3. The property added appears in the Elements section.
4. Additionally, the property also appears as a sub-property of the type in the Types section.

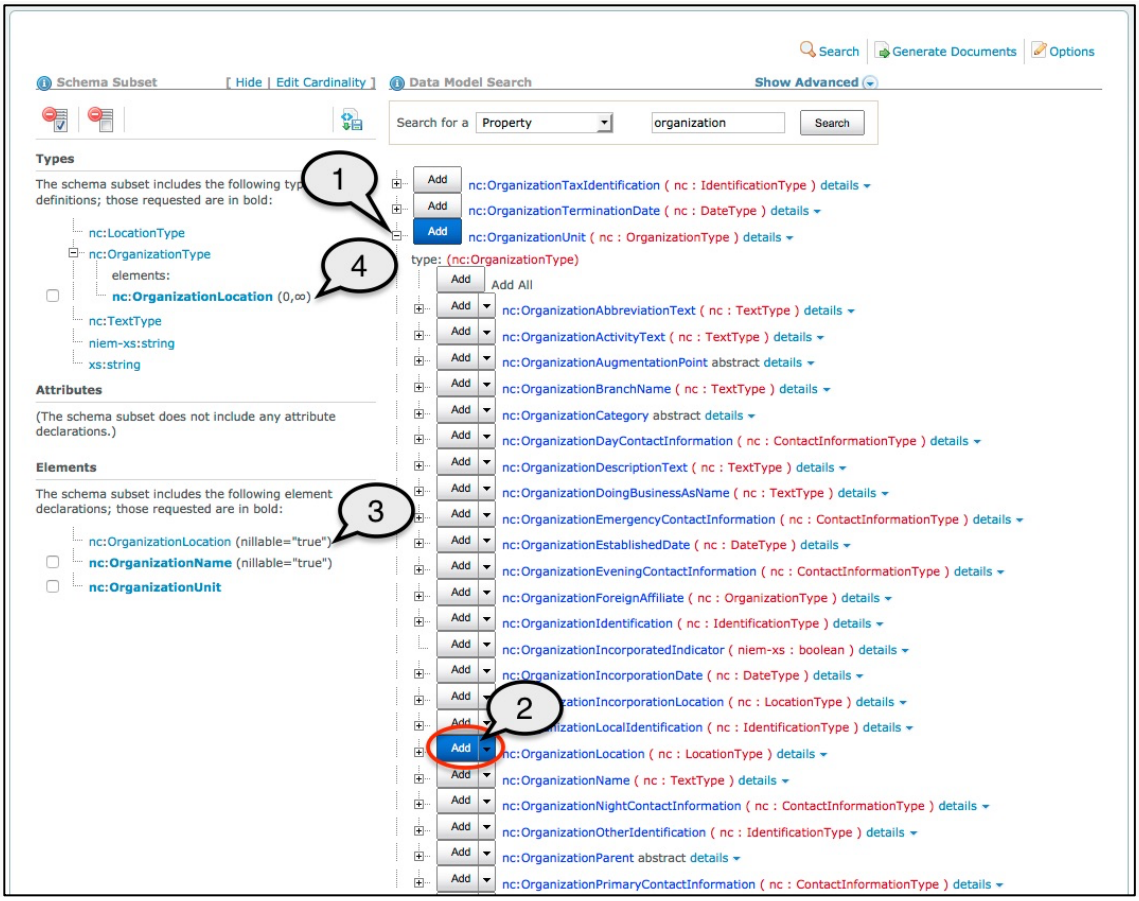
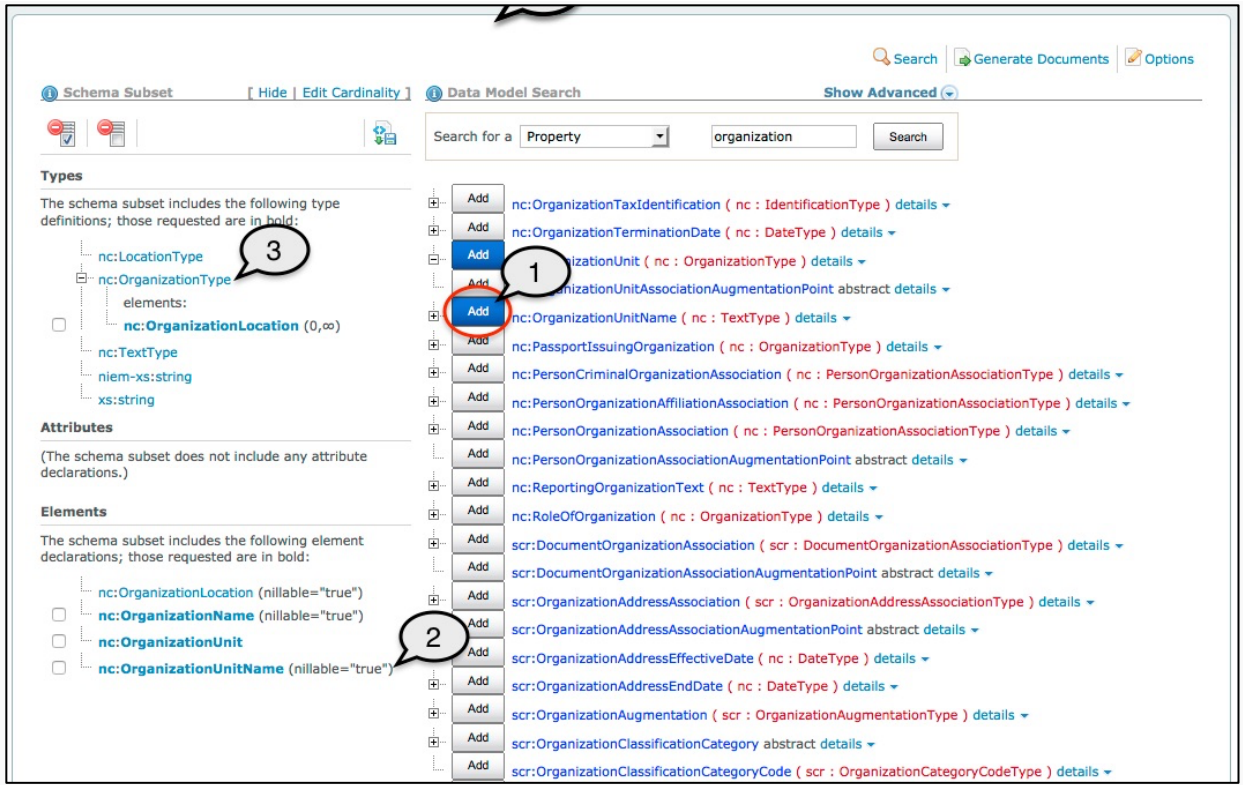


Figure: SSGT Adding a Sub-Property to the Current Subset

⚠ **WARNING:** Sub-properties of a type added from outside of a hierarchical type are **NOT** added as sub-properties of that type:



In the above example:

5. Property OrganizationUnitName (which is a sub-property of OrganizationType) is added to the subset outside of the type
6. The property OrganizationUnitName appears in the current subset
7. The property OrganizationUnitName is NOT added to the sub-properties of OrganizationType

Add all sub-properties of a type to the current subset

1. Click the plus-sign icon next to a property to expand all the sub-properties for the type of that property.
2. Click the Add button next to the Add All label to add all properties below the button.
3. All properties are added to the current subset.
4. Additionally, all properties are added as sub-properties of that type.

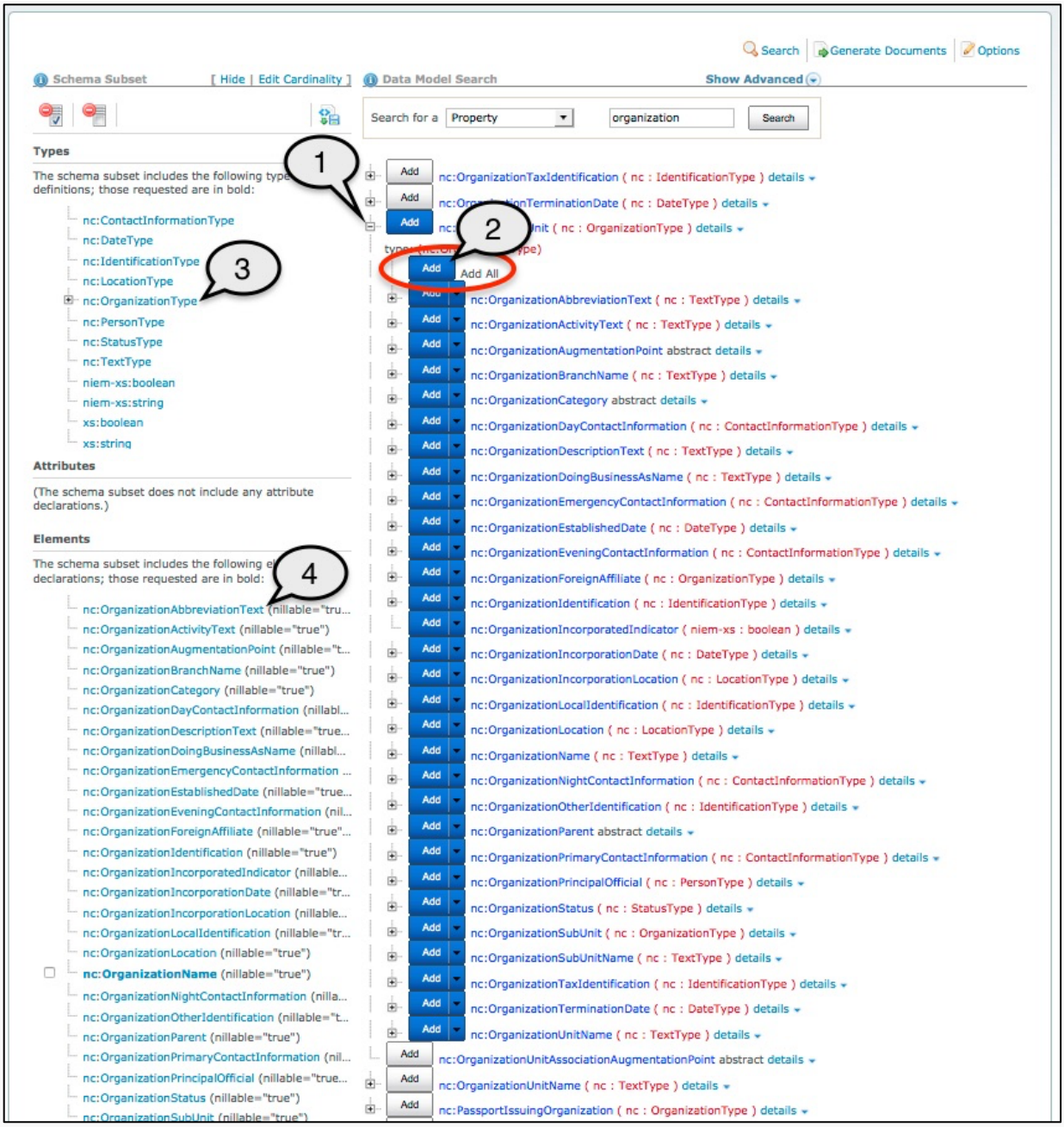


Figure: SSGT Adding All Properties to the Current Subset

Add a type to the current subset

1. Click the Add button next to a type to add that type to the current subset.

2. The selected type and all parent types required will appear in the left subset window.

Note: Sub-properties of any type added to the current subset will **NOT** be added automatically. Sub-properties must still be added individually or by using the add all function.

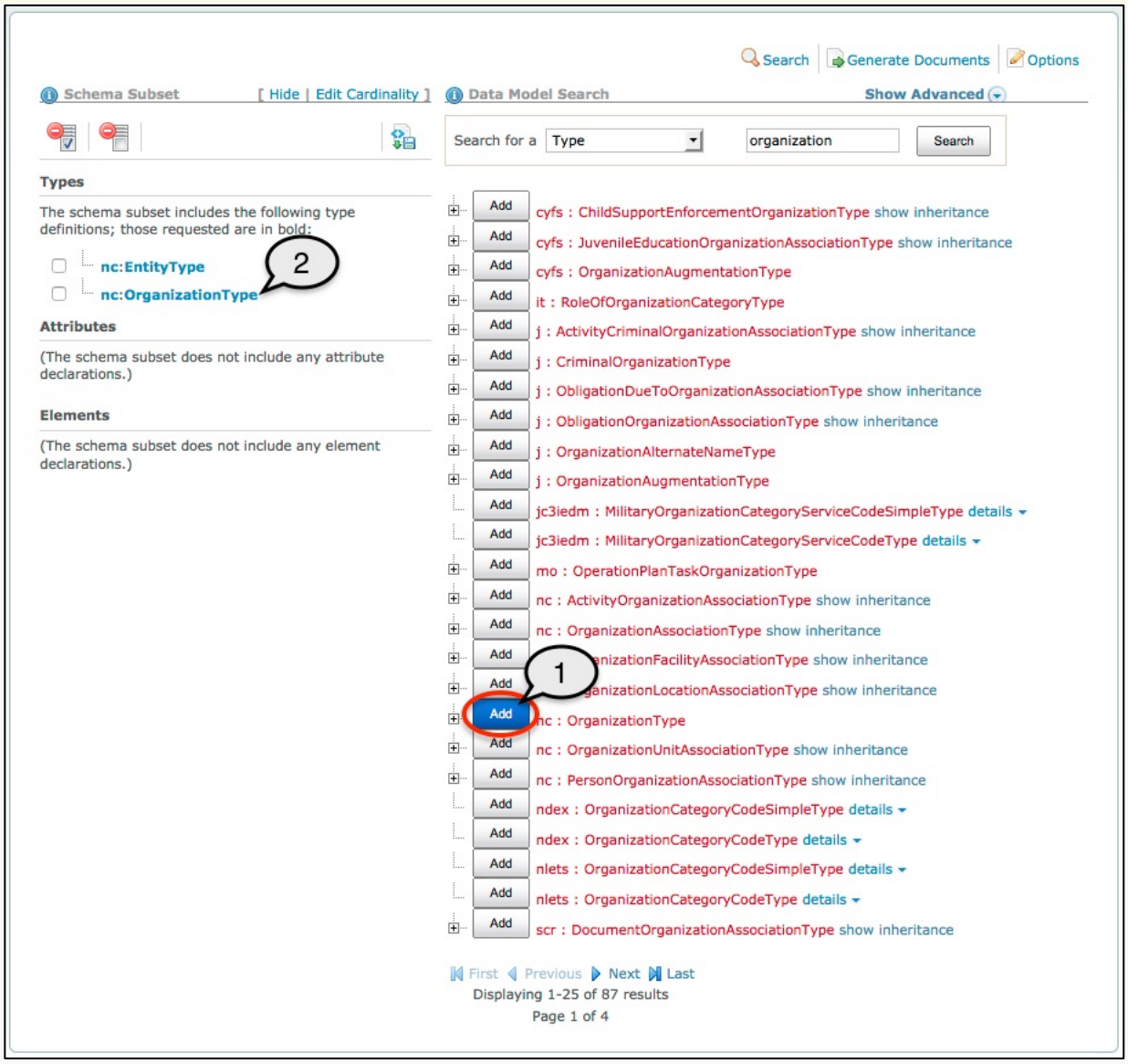


Figure: SSGT Adding to the Current Subset

Delete a type or property from the current subset

1. Check the check-box next to a component to select it for removal from the current subset.
2. Click the Delete button to remove all selected components and dependencies from the current subset.

Note: If there is no check-box present to the left of a component, then that component is a required dependency and may not be removed manually. To remove a component without a check-box, delete all components requiring that dependency.

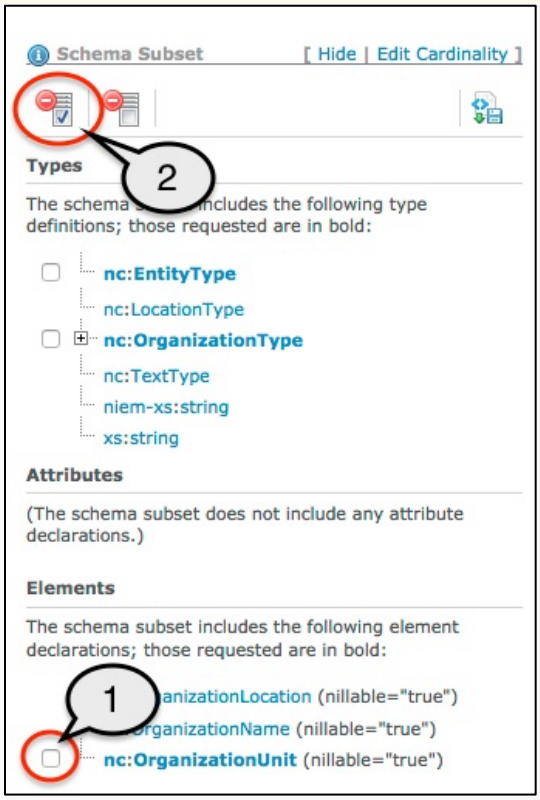


Figure: SSGT Deleting from the Current Subset

Clear the Current Subset

- Click the Clear Subset button.

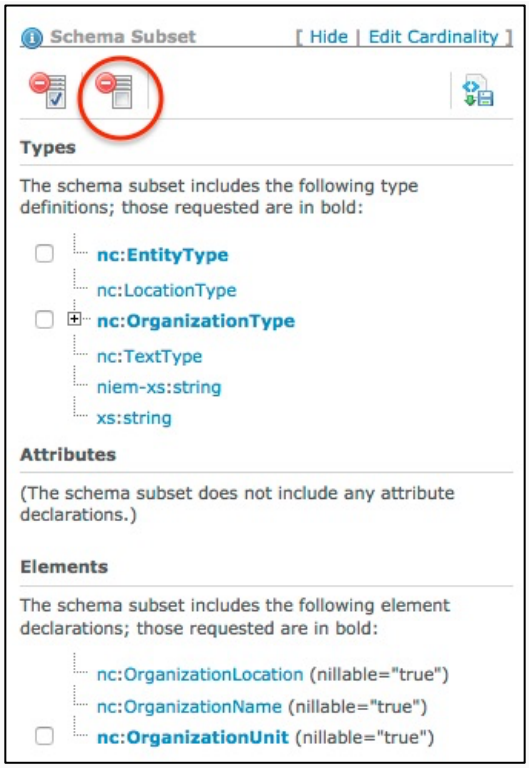


Figure: SSGT Clearing the Current Subset

Edit cardinalities of all properties in the current subset

Note: To provide maximum flexibility to developers, cardinalities of NIEM reference schema sub-properties default to minOccurs="0" and maxOccurs="unbounded". IES Developers should ensure that the appropriate cardinalities are assigned to all sub-properties for their exchange prior to generating the subset.

- Click the Edit Cardinality link.

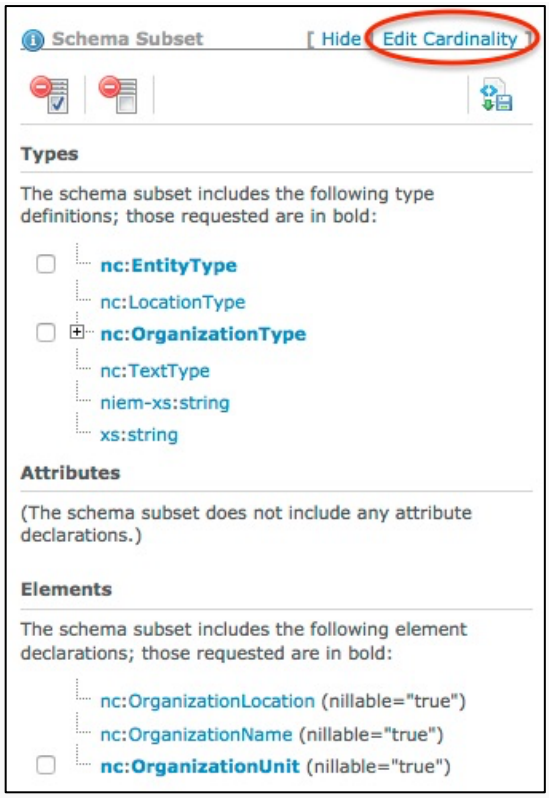


Figure: Edit Cardinality

1. Enter the minimum cardinality in the minOccurs text-box.
2. Enter the maximum cardinality in the maxOccurs text-box.
3. Click the Submit for all properties button.

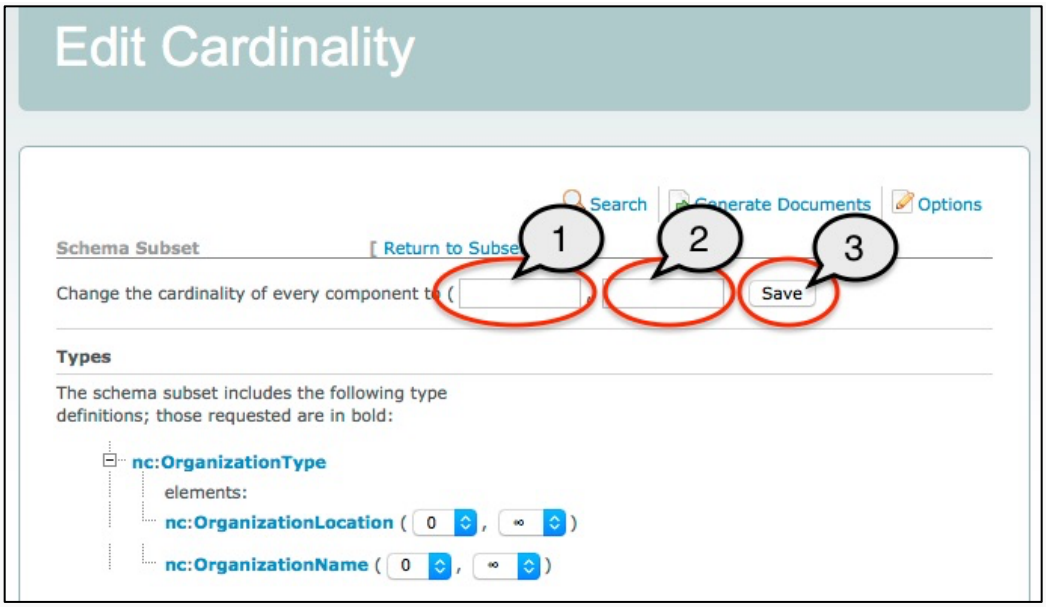


Figure: Edit Cardinality for All Properties

Edit Cardinalities of Properties in the Current Subset

Note: To provide maximum flexibility to developers, most cardinalities of NIEM reference schema sub-properties default to minOccurs="0" and maxOccurs="unbounded". IEPD Developers should ensure that the appropriate cardinalities are assigned to all sub-properties for their exchange prior to generating the subset.

- Click the Edit Cardinality link.

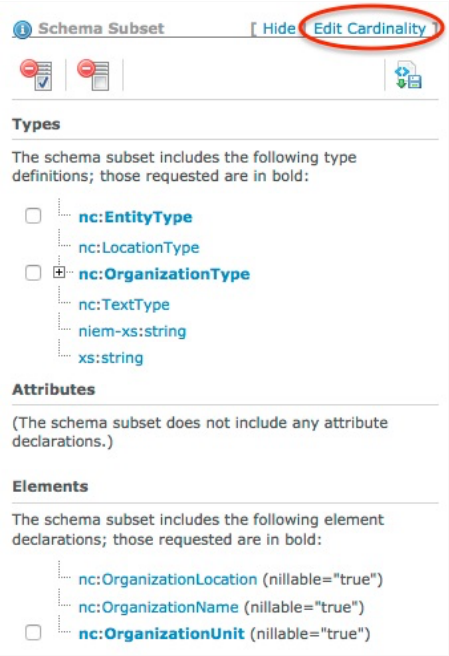


Figure: Edit Cardinality

1. Click the plus-sign icon next to a type, or the Expand all label to expand all types.
2. Select a value from the min: drop-down box to assign the minimum cardinality.
3. Select a value from the max: drop-down box to assign the maximum cardinality.
4. A message banner at the top of the dialog echoes the new settings.

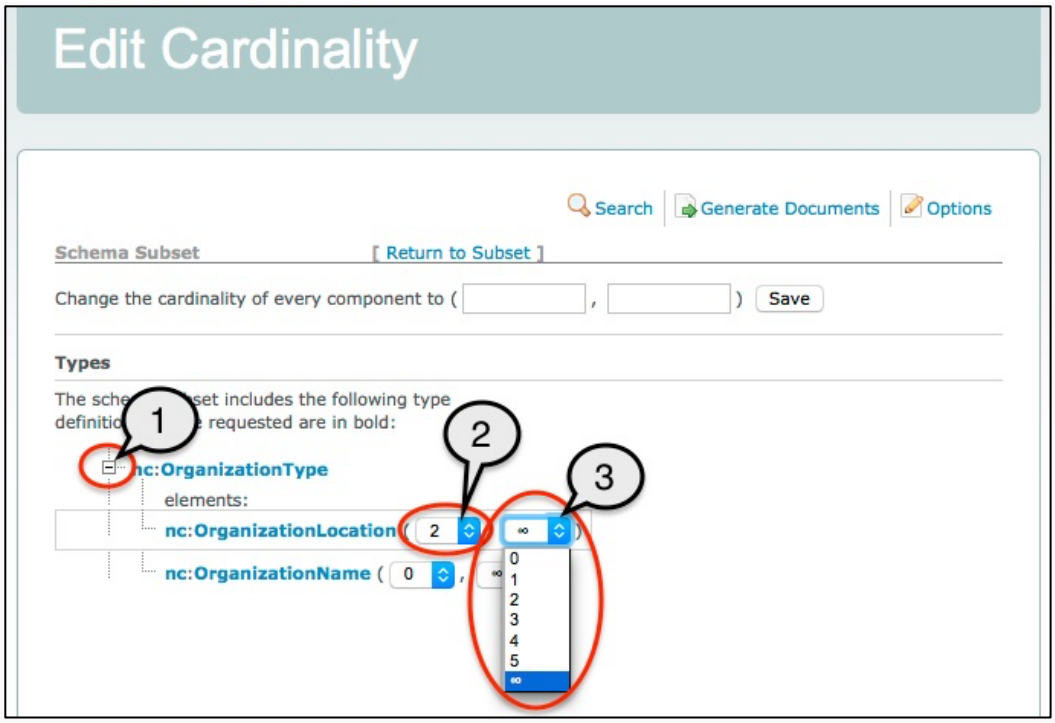


Figure: Edit Cardinality for a Property

Options Page

- Click the Options link to display the options page.

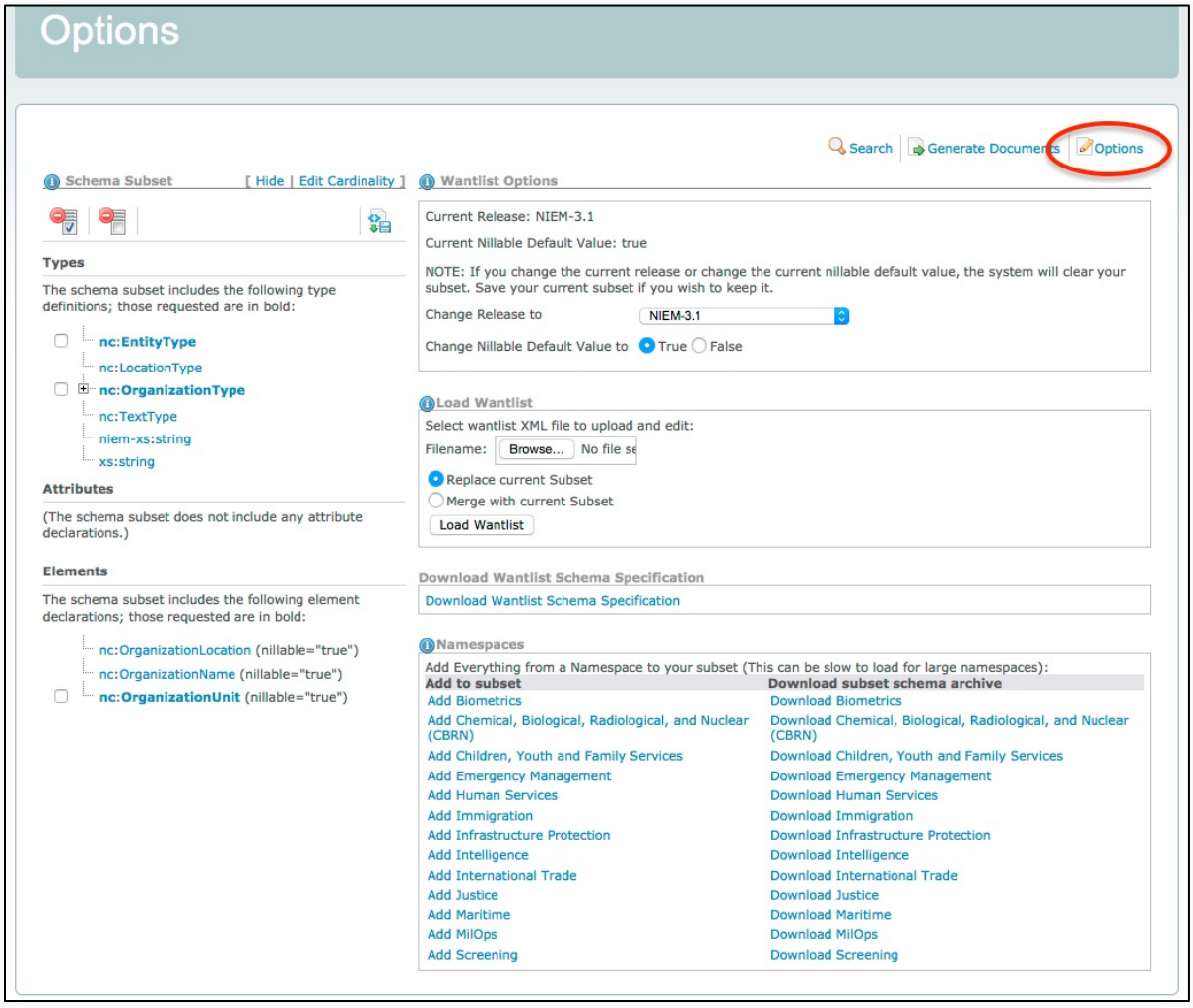


Figure: SSGT Options Page

Add all NIEM components to current subset

- Click the Add NIEM link to add ALL NIEM components to the current subset.

⚠ **Note:** Due to the large number of components, this option may time-out before the operation completes. All NIEM content may downloaded as either a Microsoft Excel spreadsheet (XLS) from the NIEM web page.

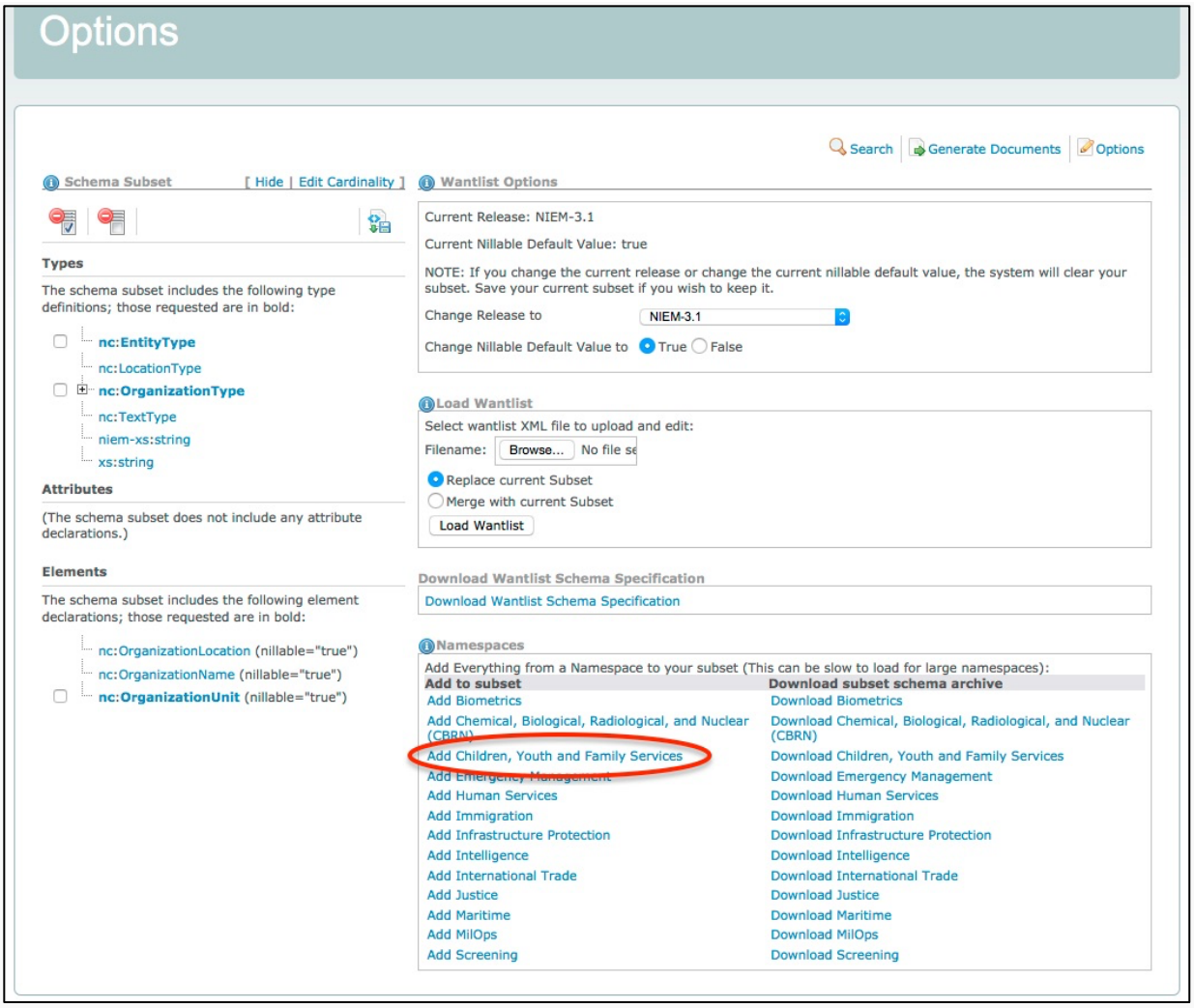


Figure: SSGT Add All NIEM

Generate Documents

1. Click the Generate Documents link to display the generate documents page.
2. Click the Save current wantlist to a file link to save the current subset to an eXtensible Markup Language (XML) wantlist file (allowing for later recall).

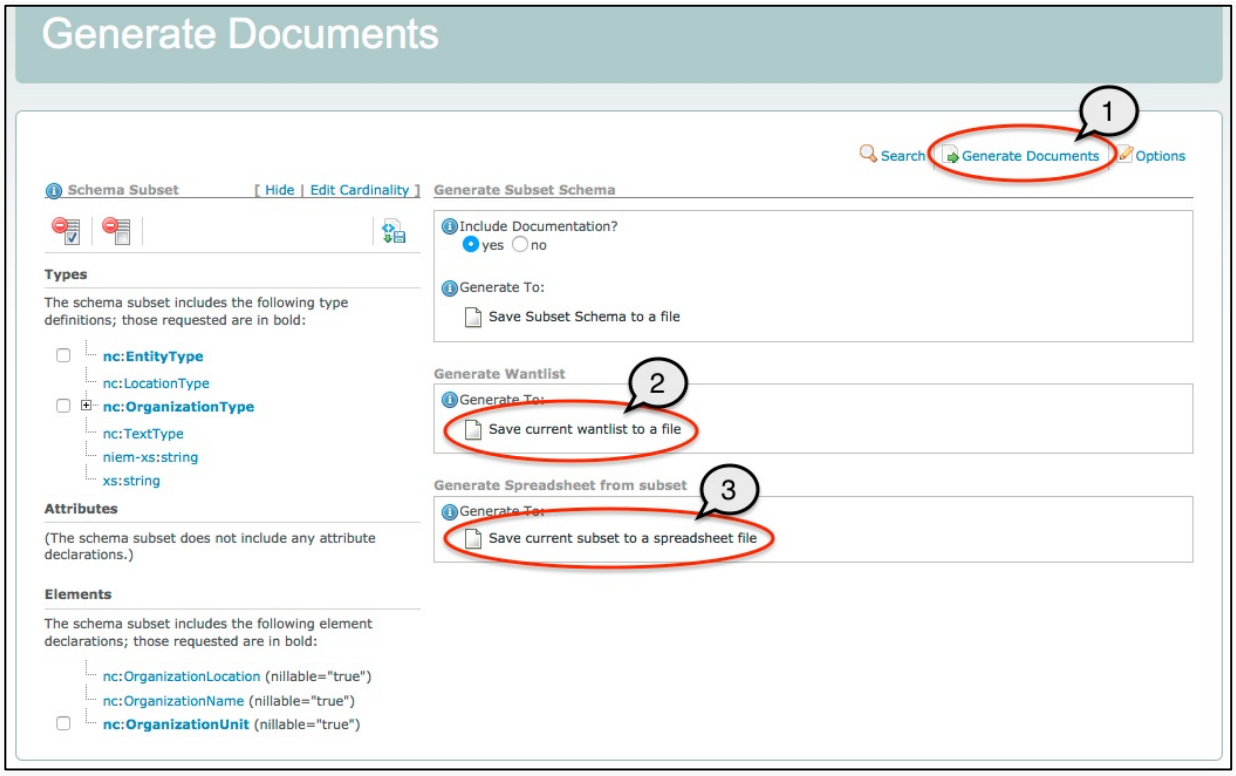


Figure: Generate Documents Page

Options Page

- Click the Options link to display the options page.

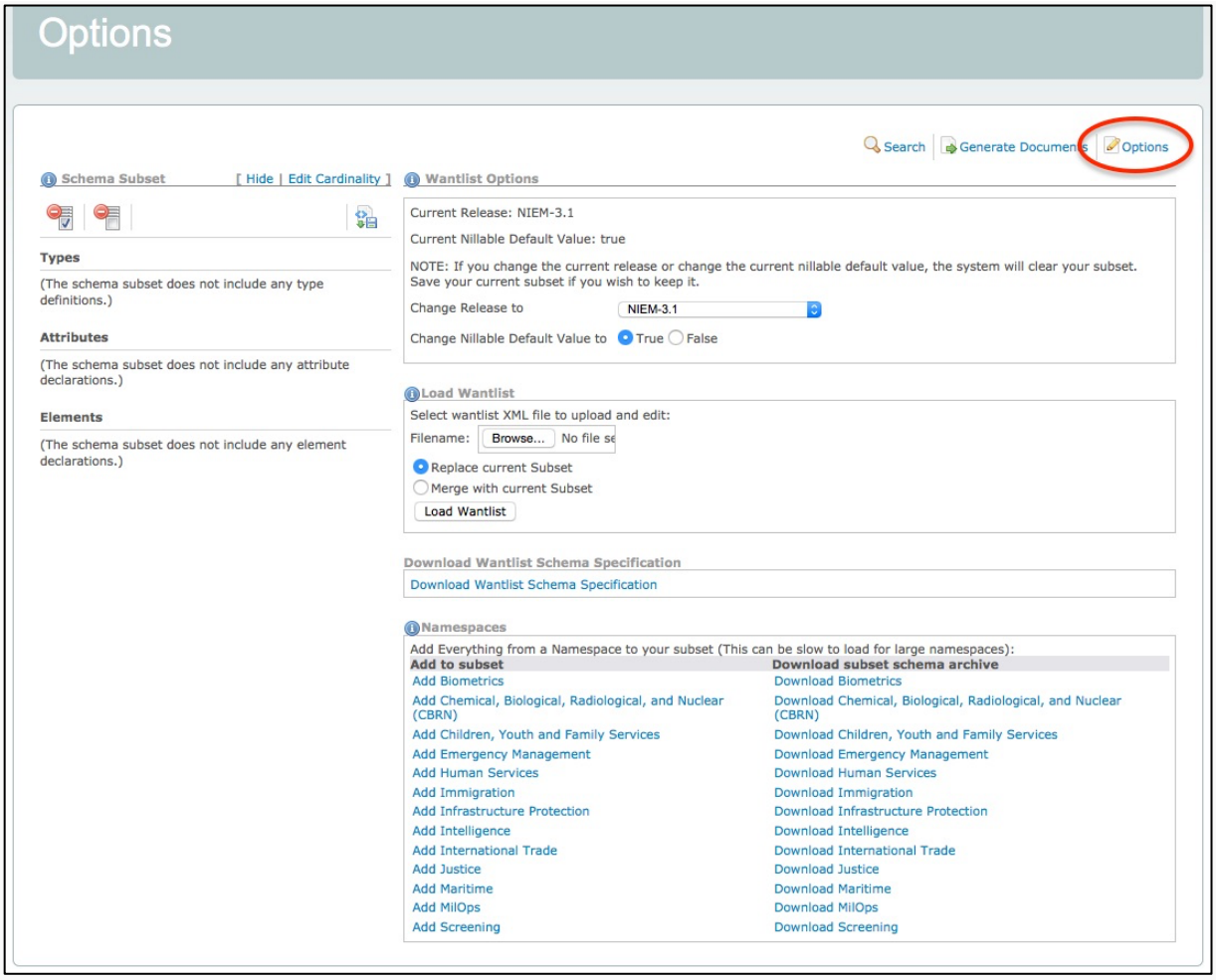


Figure: SSGT Options Page

Load Wantlist

1. Click Choose File button.
    1. Select a wantlist file previously saved from Schema Subset Generation Tool (SSGT) from local machine using browser dialog.
2. Select EITHER:
    1. Replace current Subset radio-button to replace the current subset with the wantlist file.

2. Merge with current Subset radio-button to merge the current subset with the wantlist file.
3. Click Load Want List button.

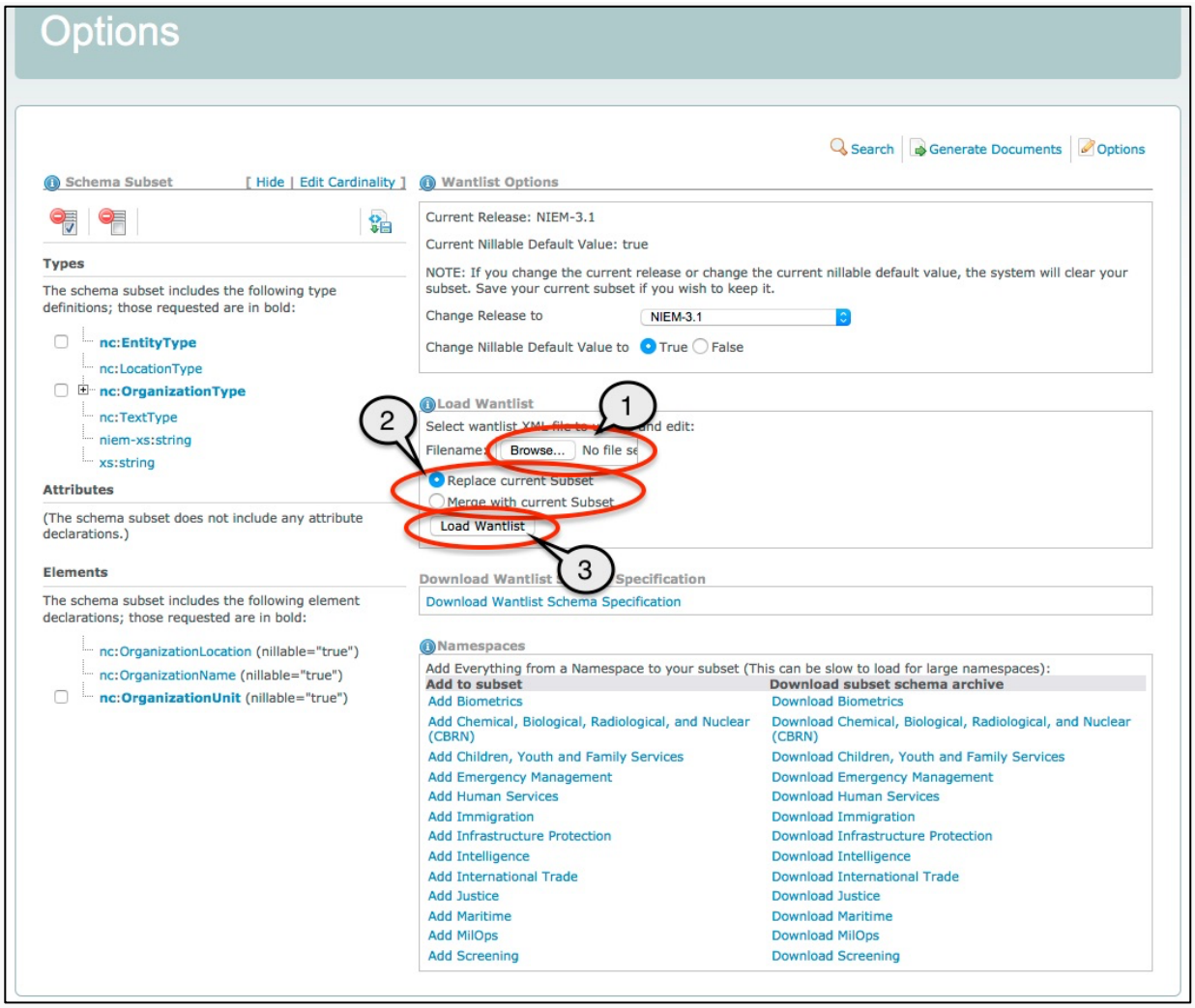


Figure: SSGT Load Wantlist

Options Page

- Click the Options link to display the options page.

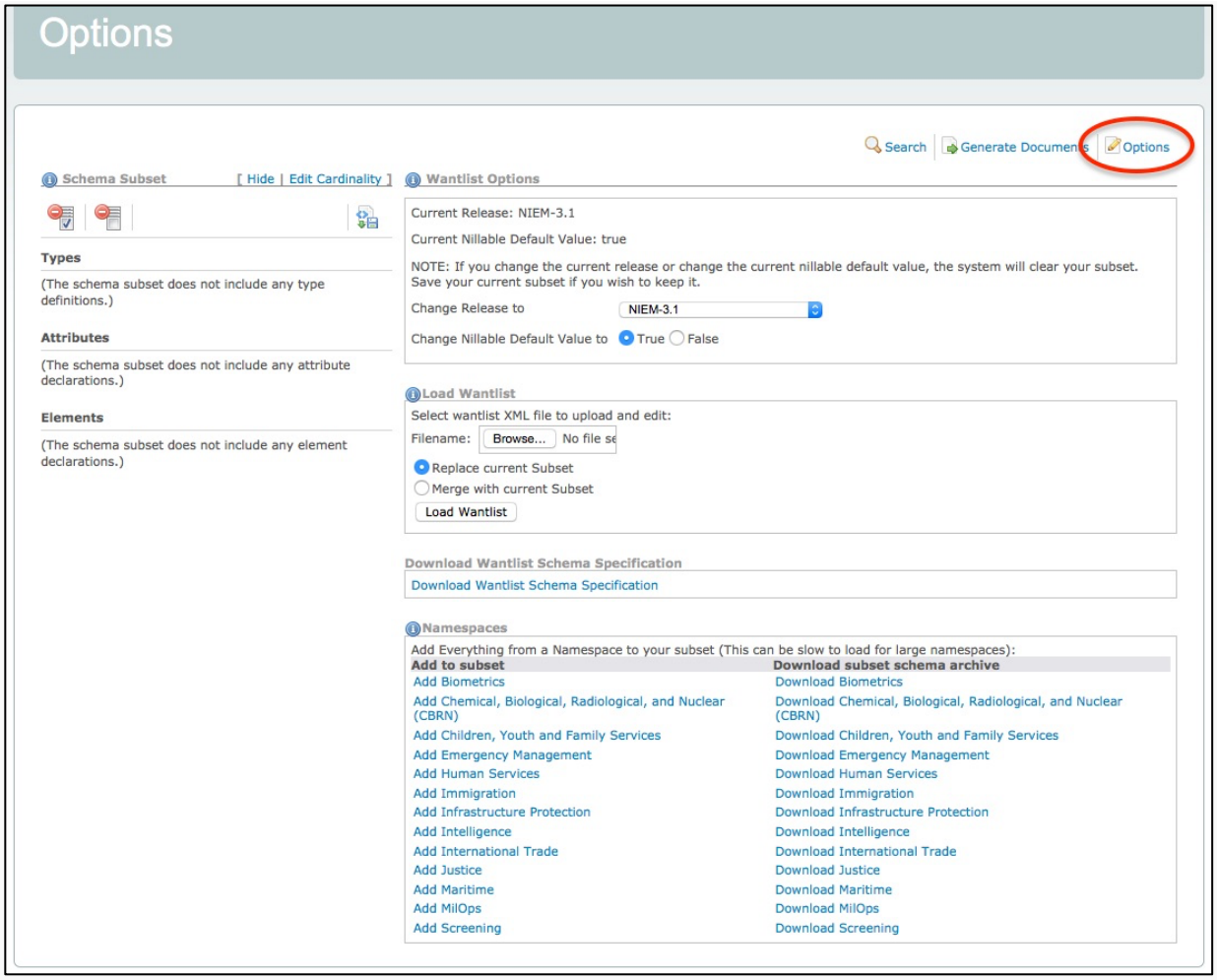


Figure: SSGT Options Page

Download Wantlist Schema Specification

- Click the Download Wantlist Schema Specification link to download a XSD Schema file for Schema Subset Generation Tool (SSGT) wantlist files.

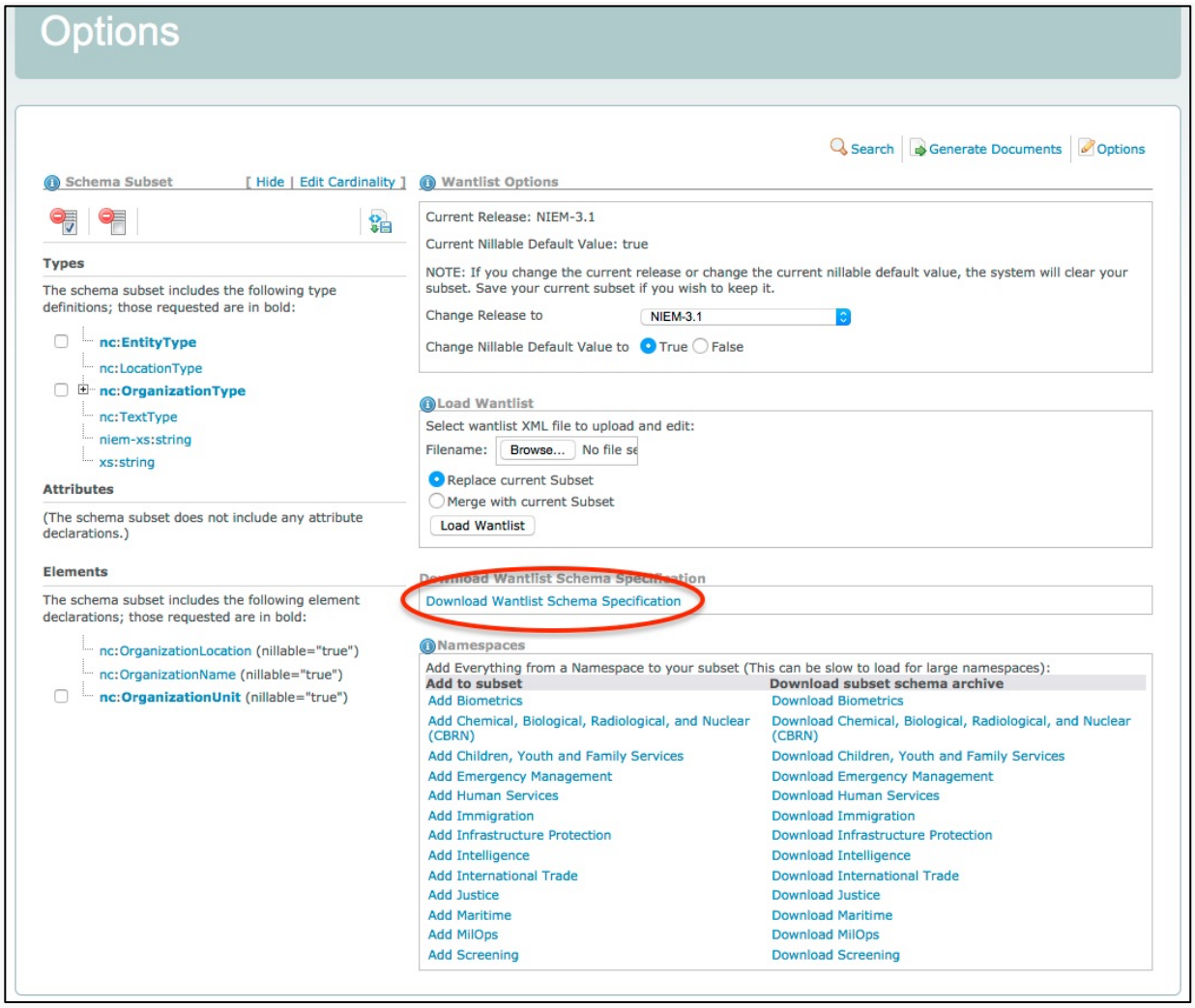


Figure: SSGT Download Wantlist XSD

Generate Documents

1. Click the Generate Documents link to display the generate documents page.

2. Click the Save current subset to a spreadsheet file to save comprehensive type information about the current subset to an Excel XLS file.

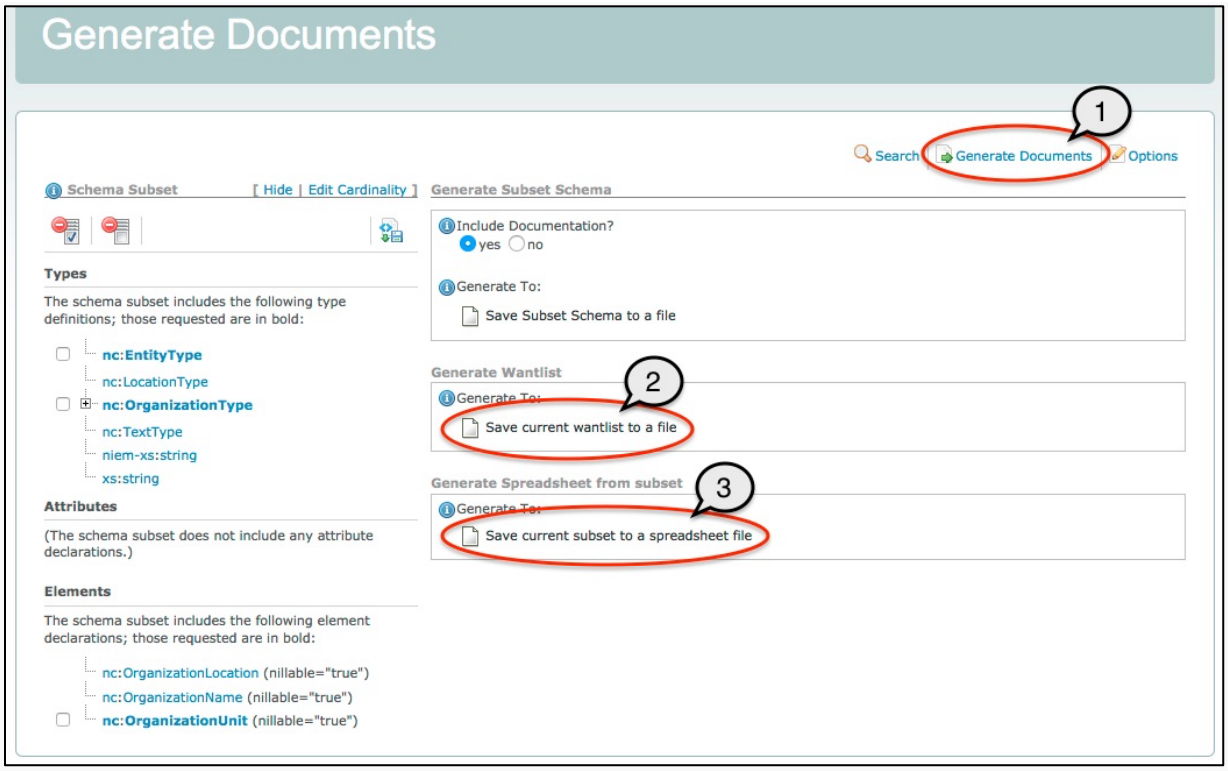


Figure: Generate Documents Page

Generate a subset from the current subset

1. Click Generate Documents link to display the generate documents page.
2. Click the Include documentation? yes/no radio-button to toggle inclusion data defintions (xsd:documentation) in the generated subset **[Zip]** file.
3. Click the link Save Subset Schema to a file to generate a subset **[Zip]** file from the currently selected subset.

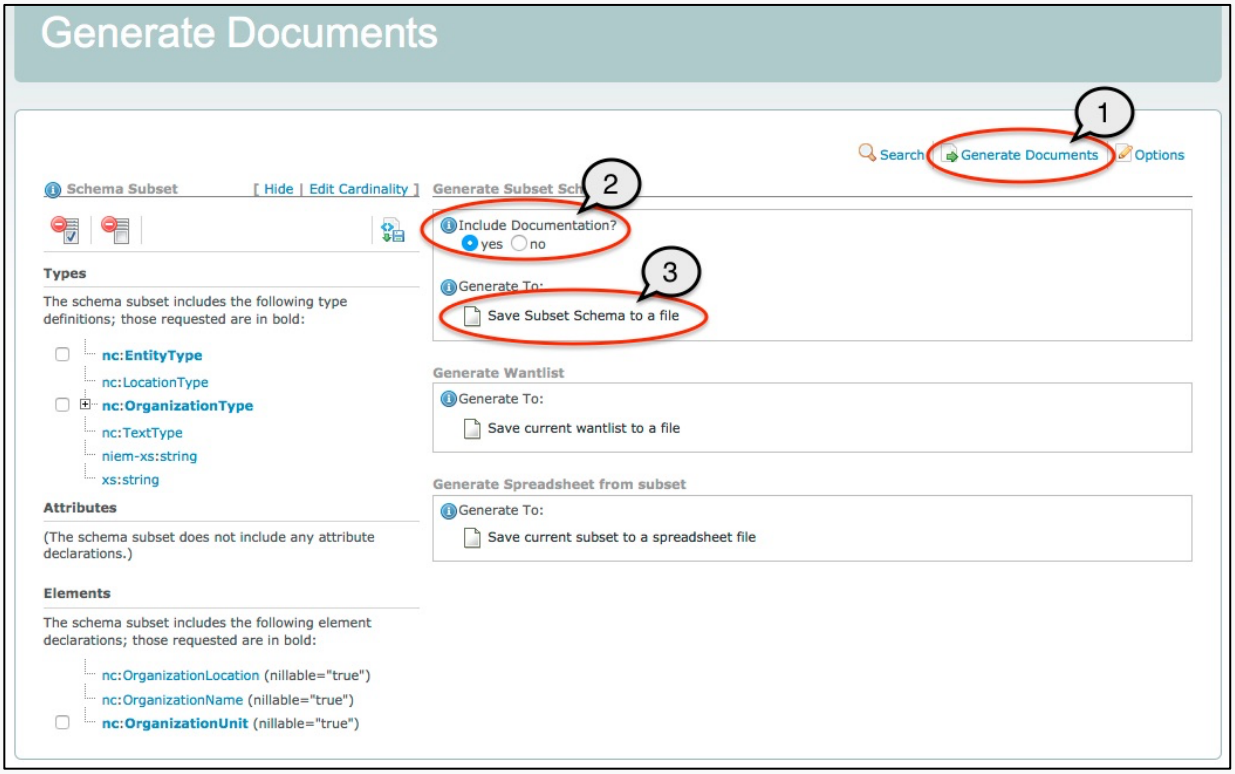


Figure: SSGT Generate Subset

Browsing the Subset

- After download the subset and extracting the zip file, the subset contents may be browsed:

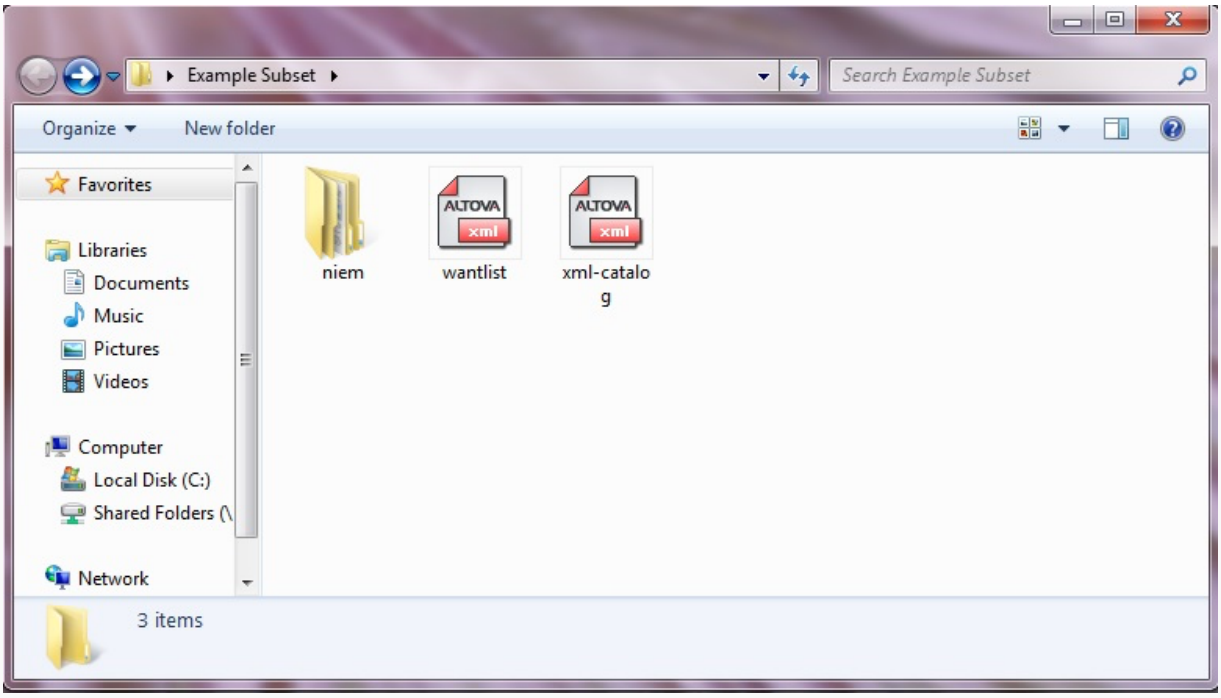


Figure: SSGT Browsing the Subset

Editing Contents

- Any XML tool may be used to browse the Schema files:

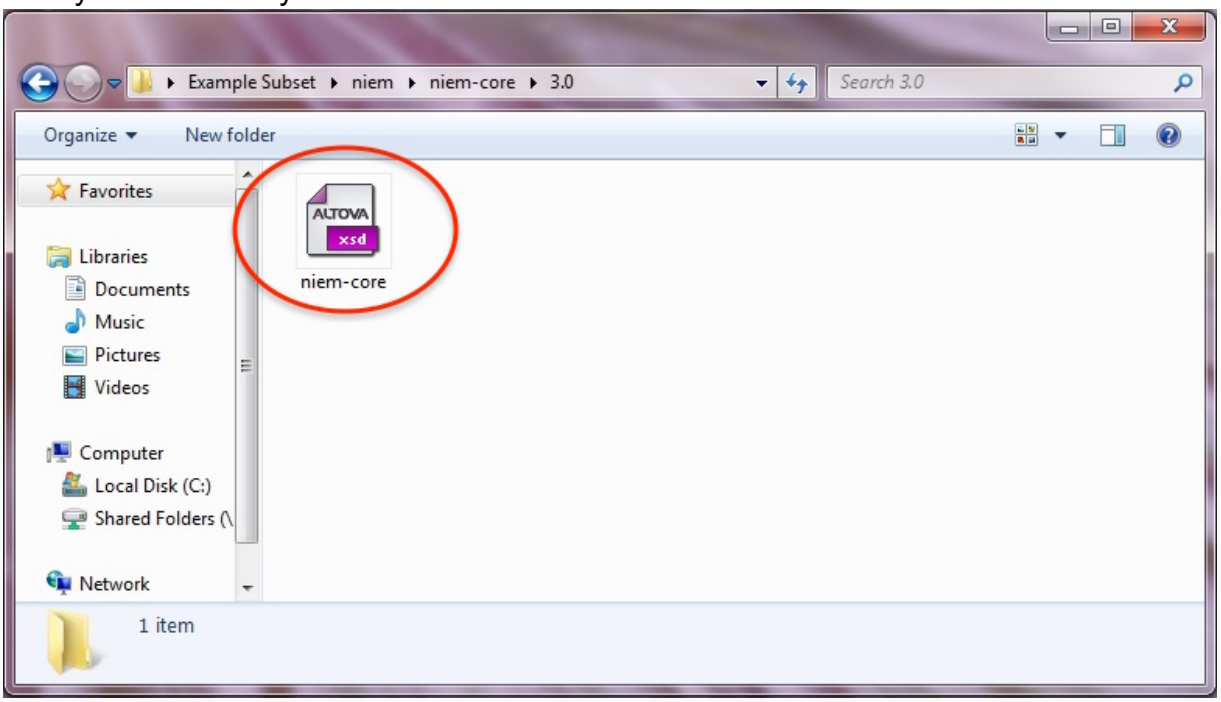


Figure: SSGT Browsing the Subset

- In this example, Altova XMLSpy is used to display niem-core.xsd:

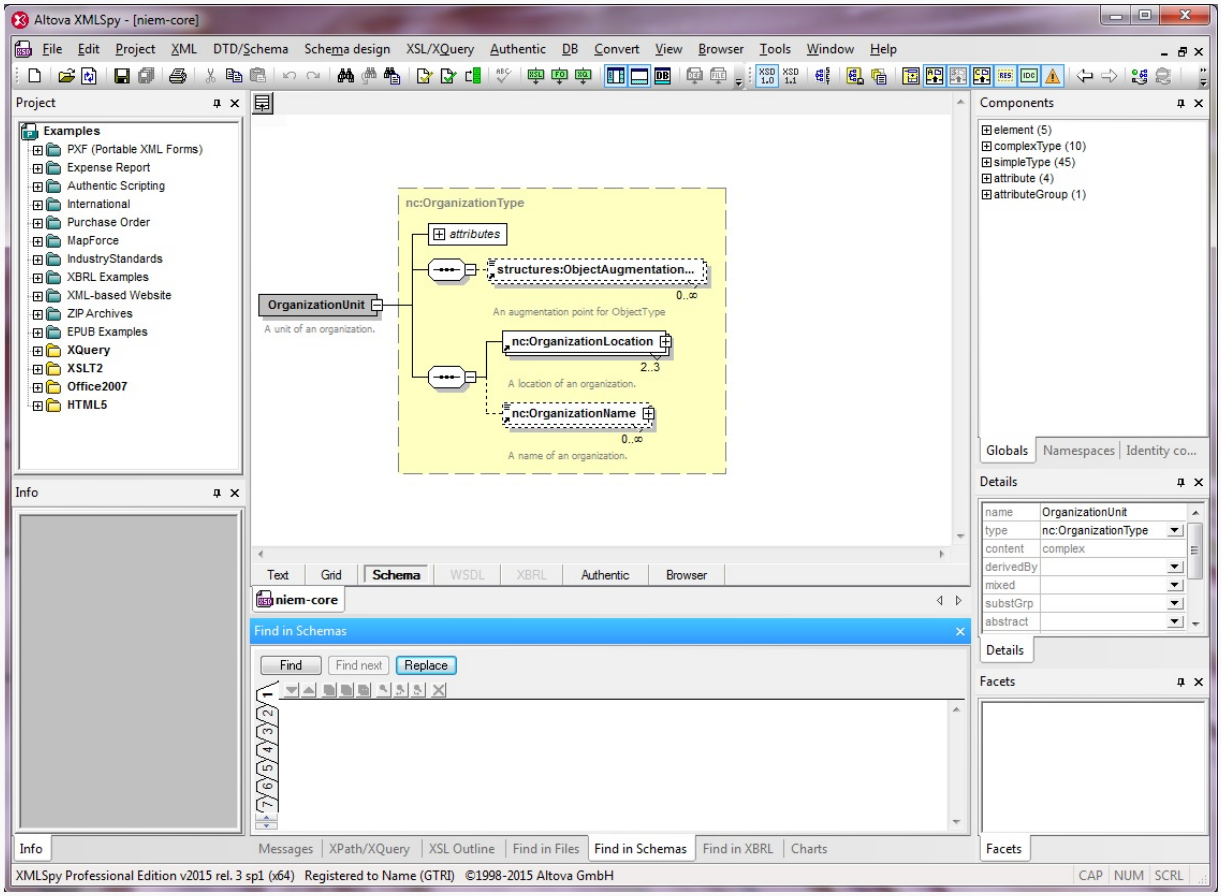


Figure: SSGT Display Schema File Using Altova XML Spy