

# Endeca® Platform Services

Data Foundry Expression Reference

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ENDECA



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# Preface

Oracle Endeca's Web commerce solution enables your company to deliver a personalized, consistent customer buying experience across all channels — online, in-store, mobile, or social. Whenever and wherever customers engage with your business, the Oracle Endeca Web commerce solution delivers, analyzes, and targets just the right content to just the right customer to encourage clicks and drive business results.

Oracle Endeca Commerce is the most effective way for your customers to dynamically explore your storefront and find relevant and desired items quickly. An industry-leading faceted search and Guided Navigation solution, Oracle Endeca Commerce enables businesses to help guide and influence customers in each step of their search experience. At the core of Oracle Endeca Commerce is the MDEX Engine,™ a hybrid search-analytical database specifically designed for high-performance exploration and discovery. The Endeca Content Acquisition System provides a set of extensible mechanisms to bring both structured data and unstructured content into the MDEX Engine from a variety of source systems. Endeca Assembler dynamically assembles content from any resource and seamlessly combines it with results from the MDEX Engine.

Oracle Endeca Experience Manager is a single, flexible solution that enables you to create, deliver, and manage content-rich, cross-channel customer experiences. It also enables non-technical business users to deliver targeted, user-centric online experiences in a scalable way — creating always-relevant customer interactions that increase conversion rates and accelerate cross-channel sales. Non-technical users can control how, where, when, and what type of content is presented in response to any search, category selection, or facet refinement.

These components — along with additional modules for SEO, Social, and Mobile channel support — make up the core of Oracle Endeca Experience Manager, a customer experience management platform focused on delivering the most relevant, targeted, and optimized experience for every customer, at every step, across all customer touch points.

## About this guide

This reference describes the Data Foundry expressions available for use in a record manipulator component in Developer Studio.

## Who should use this guide

This reference is intended for developers who are building Forge pipelines using Endeca Developer Studio.

## Conventions used in this guide

This guide uses the following typographical conventions:

Code examples, inline references to code elements, file names, and user input are set in `monospace` font. In the case of long lines of code, or when inline monospace text occurs at the end of a line, the following symbol is used to show that the content continues on to the next line: ↵

When copying and pasting such examples, ensure that any occurrences of the symbol and the corresponding line break are deleted and any remaining space is closed up.

## Contacting Oracle Support

Oracle Support provides registered users with important information regarding Oracle Endeca software, implementation questions, product and solution help, as well as overall news and updates.

You can contact Oracle Support through Oracle's Support portal, My Oracle Support at <https://support.oracle.com>.





## XML syntax for EXPRESSION elements

### EXPRESSION

An `EXPRESSION` element instructs Forge about how to modify records. An expression consists of an `EXPRESSION` element with `TYPE` and `NAME` attributes.

Expressions may contain `EXPRNODE` sub-elements, which have `NAME` and `VALUE` attributes, to supply additional configuration information. Expressions may also contain other expressions; the contained expressions may provide values used by the containing expression, or the containing expression may provide control over which of the contained expressions are evaluated.

Endeca recommends that you perform record manipulation with a Perl manipulator rather than use a record manipulator and `EXPRESSION` elements. However, if you need to access and modify dimension sources (such as a dimension adapter or dimension server), you should still use expressions such as `DVAL PERL`. The Perl manipulator does not access dimension sources. For more information about using a Perl manipulator, see the *Endeca Developer Studio Help*.

### DTD

```
<!ELEMENT EXPRESSION
    (
      COMMENT?
      , EXPRBODY?
      , (EXPRNODE | EXPRESSION)*
    )
>
<!ATTLIST EXPRESSION
    TYPE ( PROPERTY
          DVAL
          INTEGER
          STRING
          STREAM
          VOID
          FLOAT ) #REQUIRED
    NAME CDATA #REQUIRED
    LABEL CDATA #IMPLIED
    URL CDATA #IMPLIED
>
```

## Attributes

The following points describe the `EXPRESSION` element's attributes.

- `TYPE` - Describes the return value for the expression. For example, a `FLOAT` expression returns a floating point number. The valid values for `TYPE` are as follows: `PROPERTY`, `DVAL`, `INTEGER`, `STRING`, `VOID`, and `FLOAT`.



**Note:** `STREAM` is used internally by the MDEX Engine.

- `NAME` - Describes the operation being performed. Expressions are typically referred to by the combination of their `TYPE` and `NAME` values (for example `DVAL CONST`). This combination helps to distinguish cases where there are several expressions with different `TYPE` values but the same `NAME` value (for example, `DVAL CONST`, `FLOAT CONST`, and `INTEGER CONST`).
- `URL` - Used in `PERL` expressions. Specifies the URL (file) from which an expression can read Perl code. The code can be up to 65534 characters long.

## Sub-elements

The following table provides a brief overview of the `EXPRESSION` sub-elements.

Sub-element	Description
COMMENT	Associates a comment with a parent element and preserves the comment when the file is rewritten. This element provides an alternative to using inline XML comments of the form .
EXPRBODY	Contains Perl code that manipulates records.
EXPRNODE	Provides a generic way of sending a variety of information to an <code>EXPRESSION</code> .
EXPRESSION	Instructs Forge about how to modify records.

## Example

This example shows a mathematical expression that adds two constant values (5 and 6).

```
<EXPRESSION TYPE="INTEGER" NAME="MATH">
  <EXPRNODE NAME="TYPE" VALUE="INTEGER" />
  <EXPRNODE NAME="OPERATOR" VALUE="ADD" /
  <EXPRESSION TYPE="INTEGER" NAME="CONST">
    <EXPRNODE NAME="VALUE" VALUE="5" />
  </EXPRESSION>
  <EXPRESSION TYPE="INTEGER" NAME="CONST">
    <EXPRNODE NAME="VALUE" VALUE="6" />
  </EXPRESSION>
</EXPRESSION>
```

This example adds a dimension value ID to the current record. The dimension value ID is determined by the mapping between the value of the `P_Score` property in the source data and the dimension values contained in the dimension with ID equal to 9.

```
<EXPRESSION NAME="ADD_DVAL" TYPE="VOID">
  <EXPRESSION NAME="MATCH" TYPE="DVAL">
    <EXPRNODE NAME="DIMENSION_ID" VALUE="9" />
  <EXPRESSION NAME="IDENTITY" TYPE="PROPERTY">
    <EXPRNODE NAME="PROP_NAME" VALUE="P_Score" />
```

```

    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>

```

## EXPRNODE

An `EXPRNODE` element provides a generic way of sending a variety of information to an `EXPRESSION`. The information could be descriptions, data types, constant values (parameters), and so on. Comparatively speaking, this information is similar to a parameter for a function.

### DTD

```

<!ELEMENT EXPRNODE ( EXPRNODE* )>
<!ATTLIST EXPRNODE
  NAME      CDATA      #REQUIRED
  VALUE     CDATA      #IMPLIED
>

```

### Attributes

The following points describe the `EXPRNODE` element's attributes.

- **NAME** - Describes the `EXPRNODE` element. Because `EXPRNODE` can be so broadly used to modify an expression, the `NAME` attribute varies in relation to the expression that it modifies. For example, `NAME` can specify a variety of values such as `TYPE`, `NAME`, `OPERATOR`, `AUTO_GEN`, `OPERATION`, and so on. See an expression's help topic for details about how the `NAME` attribute of an expression node modifies an expression.
- **VALUE** - Provides a value that corresponds to the `NAME` attribute. Because `EXPRNODE` can be so broadly used, the `VALUE` attribute can specify a variety of values. For example, `INTEGER` may correspond to `TYPE`; `SUM` may correspond to `NAME`; `ADD` may correspond to `OPERATOR` and so on. See an expression's help topic for details about how the `VALUE` attribute of an expression node modifies an expression.

### Sub-elements

The `EXPRNODE` element can contain additional `EXPRNODE` elements as sub-elements.

### Example

This example shows an expression adding a dimension value ID to the current record. The second and third expressions use `EXPRNODE` to provide name and value information for the parent `EXPRESSION`.

```

<EXPRESSION NAME="ADD_DVAL" TYPE="VOID">
  <EXPRESSION NAME="MATCH" TYPE="DVAL">
    <EXPRNODE NAME="DIMENSION_ID" VALUE="9" />
    <EXPRESSION NAME="IDENTITY" TYPE="PROPERTY">
      <EXPRNODE NAME="PROP_NAME" VALUE="P_Score" />
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>

```

## EXPRBODY

An `EXPRBODY` element contains Perl code that manipulates data. Perl code is often useful if a data manipulation task is too complicated to perform using the Data Foundry expressions. `EXPRBODY` is a child of `EXPRESSION`.

Endeca recommends that you perform record manipulation with a Perl manipulator rather than with a record manipulator that uses `EXPRESSION` elements. However, if you need to access and modify dimension sources (e.g., a dimension adapter or dimension server), you should still use expressions such as `DVAL PERL`. The Perl manipulator does not access dimension sources. For more information about using a Perl manipulator, see the *Endeca Developer Studio Help*.

### DTD

```
<!ELEMENT EXPRBODY (#PCDATA)>
```

### Attributes

The `EXPRBODY` element has no attributes.

### Sub-elements

The `EXPRBODY` element has no sub-elements.

### Example

This example shows the outline of an expression using Perl.

```
<EXPRESSION TYPE="VOID" NAME="PERL">
  <EXPRBODY>
    ...Perl code here...
  </EXPRBODY>
</EXPRESSION>
```

## DVAL expressions

### DVAL CONST

`DVAL` expressions return dimension values. `DVAL CONST` expressions return the dimension value (or set of dimension values), specified in `DIMENSION_ID/DVAL_ID` expression node pairs.

For example, using a `DVAL CONST` expression within a `VOID ADD_DVAL` expression instructs Forge to add the dimension value to each record processed. The `DIMENSION_ID` and `DVAL_ID` expression nodes may be repeated in pairs to create sets of dimension values. Forge then adds the set of dimension values to each record processed.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example adds the dimension value to the record being processed.

```
<EXPRESSION TYPE="VOID" NAME="ADD_DVAL">
  <EXPRESSION TYPE="DVAL" NAME="CONST">
    <EXPRNODE NAME="DIMENSION_ID" VALUE="2090" />
```

```
<EXPRNODE NAME="DVAL_ID" VALUE="2091" />
</EXPRESSION>
</EXPRESSION>
```

## DVAL MATCH

DVAL expressions return dimension values. Although the `DVAL MATCH` expression is not deprecated, we strongly recommend that you use the `PROP_MAPPER` element to perform property and dimension value mapping operations.

The `DVAL MATCH` expression is used to perform text matching within one or more dimensions. The dimensions are specified in `DIMENSION_ID EXPRNODE` elements. Specify the values to match in one or more `PROPERTY` expressions. The expression returns a set of matching dimension values. This is useful within a `VOID ADD_DVAL` expression that contains `PROPERTY IDENTITY` sub-expressions, to assign the dimension values matching each record's property values to the record.

You can adjust the behavior of the `DVAL MATCH` expression by nesting `EXPRNODE` elements within the `DVAL MATCH` expression. The nested expression node has a `NAME` attribute that specifies how to adjust the behavior.

The following list provides the supported values of the `NAME` attribute and describes their effects on the behavior of `DVAL MATCH`.

- `AUTO_GEN` - Causes new dimension values to be generated automatically to match property values that do not already match dimension values within the dimension. The `VALUE` attribute for `AUTO_GEN` may be either `TRUE` or `FALSE`. The default value is `TRUE`.
- `DEFAULT_SIFT_HIER_DEPTH` - Builds a auto-generated sift hierarchy to the depth specified in the `VALUE` attribute. For example, `<EXPRNODE NAME="DEFAULT_SIFT_HIER_DEPTH" VALUE="2" />` builds to a depth of two. See "Working with Large Dimension Hierarchies" in the *Endeca Developer Studio Help* for details.
- `LOG` - Identifies the `LOG` to which `MATCH` errors should be written. To avoid duplicate error messages, this is normally a unique log. See the `LOG` element's `TYPE` attribute to specify unique error message logging.
- `MATCH_EMPTY_PROPS` - Specifies that Forge create an empty dimension value for any empty property value Forge finds during matching. This empty property to dimension value matching occurs when you use `AUTO_GEN` with `MATCH_EMPTY_PROPS` set to `TRUE`. If this expression node is set to `FALSE` or omitted, Forge ignores empty properties.
- `MUST_MATCH` - Specifies that every property value must match a dimension value within the specified dimensions. If a property value does not have a match, an error is written out to the log named in the `LOG` expression node. Note that `MUST_MATCH` should not be used in combination with `AUTO_GEN`, because all property values match if `AUTO_GEN` is specified.
- `REMOVE_PROP` - Removes the properties used for the `MATCH` from the current record after the match is performed. This is useful if the dimension is being indexed, but not the source property.
- `SIFT_MATCH` - `SIFT_MATCH` is a special variation of `AUTO_GEN`. See the *Endeca Basic Development Guide* for details.
- `SYN_MATCH` - Uses the name of the first property value that matches a dimension value as the synonym name for any property values that do not match to a dimension value. The Forge matching process goes as follows: First, `AUTO_GEN` must be set to `FALSE`. During matching, if more than one property value matches a dimension value, Forge logs an error. If a property value does not match a dimension value, Forge creates a new dimension value using the property value as its name. All the non-matching property values are turned into synonyms of this dimension value.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example assigns the dimension value 2090 to records with the property name FORMAT.

```

<EXPRESSION TYPE="VOID" NAME="ADD_DVAL">
  <EXPRESSION TYPE="DVAL" NAME="MATCH">
    <EXPRNODE NAME="DIMENSION_ID" VALUE="2090" />
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="FORMAT" />
      <EXPRNODE NAME="LOG" VALUE="salog" />
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>

```

## DVAL PERL

DVAL expressions return dimension values. The DVAL PERL expression uses Perl to manipulate the data.

The Perl code is contained in an EXPRBODY element. The Zinc Perl module provides classes and methods for gaining access to and manipulating the current record. Objects accessed from Perl are copies of the current data; changing the Perl objects has no effect on the current data until a function is called to explicitly copy the Perl objects back.

See the EXPRESSION element for DTD and attribute information.

### Example

This example assigns the dimension value 2090 to records with the property name FORMAT.

```

<EXPRESSION TYPE="DVAL" NAME="PERL">
  <EXPRBODY>
    ...your Perl code here. The VOID PERL topic has an example...
  </EXPRBODY>
</EXPRESSION>

```

## FLOAT expressions

### FLOAT CONST

FLOAT expressions return floating point (fractional) numbers. The FLOAT CONST expression returns the same floating-point number, specified in the VALUE attribute of an EXPRNODE sub-element.

For example, using a FLOAT CONST expression within a VOID CREATE expression adds the new property whose value is the constant specified to each record processed.

See the EXPRESSION element for DTD and attribute information.

### Example

This example deletes discount properties if they are less than 20%. The FLOAT CONST expression defines the value for the percentage.

```

<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="MATH">
    <EXPRNODE NAME="TYPE" VALUE="FLOAT" />

```

```

<EXPRNODE NAME="OPERATOR" VALUE="LT" />
<EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
  <EXPRNODE NAME="PROP_NAME" VALUE="DISCOUNT" />
</EXPRESSION>
<EXPRESSION TYPE="FLOAT" NAME="CONST">
  <EXPRNODE NAME="VALUE" VALUE="20.00" />
</EXPRESSION>
</EXPRESSION>
<EXPRESSION TYPE="VOID" NAME="REMOVE">
  <EXPRNODE NAME="PROP_NAME" VALUE="DISCOUNT" />
</EXPRESSION>
</EXPRESSION>

```

## FLOAT MATH

FLOAT expressions return floating point (fractional) numbers. The `FLOAT MATH` expression performs a floating-point arithmetic operation on two values.

The operation to be performed is supplied in the `VALUE` attribute of an `EXPRNODE` element. The values to be operated on are supplied in two sub-expressions.

The possible operations that may be specified in the `VALUE` attribute are as follows:

- `ADD`
- `SUBTRACT` - expression 1 minus expression 2.
- `MULTIPLY`
- `DIVIDE` - expression 1 divided by expression 2.
- `POWER` - expression 1 raised to the power of expression 2.
- `PERCENT` - the percentage expression 1 is of expression 2 ( $100 * (\text{expression 1} / \text{expression 2})$ ).

The sub-expressions can be `PROPERTY`, `STRING`, `INTEGER`, or `FLOAT` expressions (use `PROPERTY` expressions to retrieve values from the current record). The values returned by the sub-expressions are converted to floating-point numbers prior to performing the parent operation.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example subtracts two constants and returns a floating point result.

```

<EXPRESSION TYPE="FLOAT" NAME="MATH">
  <EXPRNODE NAME="OPERATOR" VALUE="SUBTRACT" />
  <EXPRESSION TYPE="FLOAT" NAME="CONST">
    <EXPRNODE NAME="VALUE" VALUE="9.25" />
  </EXPRESSION>
  <EXPRESSION TYPE="FLOAT" NAME="CONST">
    <EXPRNODE NAME="VALUE" VALUE="11.75" />
  </EXPRESSION>
</EXPRESSION>

```

## INTEGER expressions

### INTEGER AND

INTEGER expressions return integers (whole numbers). INTEGER expressions can be used to combine expressions, do arithmetic, and test conditions for conditional evaluation. The INTEGER AND expression evaluates one or more INTEGER expressions, returning 1 if all the sub-expressions return non-zero values, and otherwise returning 0.

The evaluation of sub-expressions stops as soon as one returns 0. INTEGER AND is the equivalent of the “&&” operator in Perl and C. Used in conjunction with an IF expression, an AND expression can check for more than one condition. The syntax requires one or more nested INTEGER expressions.

See the EXPRESSION element for DTD and attribute information.

#### Example

This example uses an INTEGER AND expression to evaluate whether the records processed have a subject and sales rank property. If the records do not such properties, the REMOVE\_RECORD deletes them.

```
<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="AND">
    <EXPRESSION TYPE="INTEGER" NAME="MATH">
      <EXPRNODE NAME="TYPE" VALUE="INTEGER" />
      <EXPRNODE NAME="OPERATOR" VALUE="EQUAL" />
      <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
        <EXPRNODE NAME="PROP_NAME" VALUE="CATEGORY_ID" />
      </EXPRESSION>
      <EXPRESSION TYPE="INTEGER" NAME="CONST">
        <EXPRNODE NAME="VALUE" VALUE="0" />
      </EXPRESSION>
    </EXPRESSION>
    <EXPRESSION TYPE="INTEGER" NAME="MATH">
      <EXPRNODE NAME="TYPE" VALUE="INTEGER" />
      <EXPRNODE NAME="OPERATOR" VALUE="EQUAL" />
      <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
        <EXPRNODE NAME="PROP_NAME" VALUE="SALESRANK" />
      </EXPRESSION>
      <EXPRESSION TYPE="INTEGER" NAME="CONST">
        <EXPRNODE NAME="VALUE" VALUE="0" />
      </EXPRESSION>
    </EXPRESSION>
  </EXPRESSION>
  <EXPRESSION TYPE="VOID" NAME="REMOVE_RECORD" />
</EXPRESSION>
```

### INTEGER CONST

INTEGER expressions return integers (whole numbers). INTEGER expressions can be used to combine expressions, do arithmetic, and test conditions for conditional evaluation. The INTEGER CONST expression returns the same integer constant, specified in the VALUE attribute of an EXPRNODE element.

For example, using an INTEGER CONST expression within a VOID CREATE expression adds a new property, whose value is the specified constant to each record processed.



See the `EXPRESSION` element for DTD and attribute information.

### Example

As part of an `INTEGER AND` expression, this example uses an `INTEGER CONST` sub-expression to test whether the `PROP_NAME` value equals the constant value.

```
<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="AND">
    <EXPRESSION TYPE="INTEGER" NAME="MATH">
      <EXPRNODE NAME="TYPE" VALUE="INTEGER" />
      <EXPRNODE NAME="OPERATOR" VALUE="EQUAL" />
      <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
        <EXPRNODE NAME="PROP_NAME" VALUE="CATEGORY_ID" />
      </EXPRESSION>
      <EXPRESSION TYPE="INTEGER" NAME="CONST">
        <EXPRNODE NAME="VALUE" VALUE="0" />
      </EXPRESSION>
    </EXPRESSION>
    <EXPRESSION TYPE="INTEGER" NAME="MATH">
      <EXPRNODE NAME="TYPE" VALUE="INTEGER" />
      <EXPRNODE NAME="OPERATOR" VALUE="EQUAL" />
      <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
        <EXPRNODE NAME="PROP_NAME" VALUE="SALESRANK" />
      </EXPRESSION>
      <EXPRESSION TYPE="INTEGER" NAME="CONST">
        <EXPRNODE NAME="VALUE" VALUE="0" />
      </EXPRESSION>
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>
```

## INTEGER MATH

`INTEGER` expressions return integers (whole numbers). `INTEGER` expressions can be used to combine expressions, do arithmetic, and test conditions for conditional evaluation. The `INTEGER MATH` expression can perform a variety of operations on two values, including arithmetic, Boolean tests, and string comparison.

Although the returned value is always an integer, the operation itself can be performed using a variety of data types. A `TYPE` expression node tells the `MATH` expression what type to convert its sub-expressions into prior to performing the operation. The operation to be performed is supplied in an `OPERATOR` expression node; the values to be operated on are supplied in two sub-expressions.

In the `TYPE` expression node, the `VALUE` attribute has the following supported values:

- `STRING`
- `INTEGER`
- `FLOAT`

The following `OPERATOR` expression node require that the `TYPE` attribute of their sub-expressions have a value of either `INTEGER` or `FLOAT`:

- `ADD`
- `SUBTRACT` - expression 1 minus expression 2.
- `MULTIPLY`
- `DIVIDE` - expression 1 divided by expression 2.

- POWER - expression 1 raised to the power of expression 2.
- PERCENT - the percentage expression 1 is of expression 2 ( $100 * (\text{expression 1} / \text{expression 2})$ ).
- MOD - the remainder of expression 1 divided by expression 2.

The following OPERATOR expression nodes require that the TYPE attribute of their two sub-expressions have a value of INTEGER, FLOAT, or STRING.

- EQUAL - returns 1 if expression 1 and expression 2 are equal, 0 otherwise.
- NE - returns 1 if expression 1 and expression 2 are not equal, 0 otherwise.
- GT - returns 1 if expression 1 is greater than expression 2, 0 otherwise.
- GTE - returns 1 if expression 1 is greater than or equal to expression 2, 0 otherwise.
- LT - returns 1 if expression 1 is less than expression 2, 0 otherwise.
- LTE - returns 1 if expression 1 is less than or equal to expression 2, 0 otherwise.
- CMP - returns 1 if expression 1 is greater than expression 2, 0 if the expressions are equal, -1 if expression 1 is less than expression 2.

The following OPERATOR expression nodes require that the TYPE attribute of their two sub-expressions have a value of STRING:

- CMP\_SUBSTR - returns 1 if expression 1 contains expression 2 as a sub-string, 0 otherwise.
- CMP\_START - returns 1 if expression 1 starts with expression 2, 0 otherwise.
- CMP\_END - returns 1 if expression 1 ends with expression 2, 0 otherwise.

In the OPERATOR expression nodes, the following two values of the VALUE attribute have slightly different behavior for STRING than for INTEGER:

- AND - used with STRING, returns 1 if neither expression 1 nor expression 2 is empty, 0 otherwise. Used with INTEGER, returns 1 if neither expression 1 nor expression 2 is not equal to 0.
- OR - used with STRING, returns 1 if either expression 1 or expression 2 is not empty, 0 otherwise. Used with INTEGER, returns 1 if either expression 1 or expression 2 does not equal 0. See Example 2 for the use of this operator.

See the EXPRESSION element for DTD and attribute information.

### Example 1

As part of an INTEGER AND expression, this example uses two INTEGER MATH sub-expressions to test whether the PROP\_NAME value equals the constant value.

```
<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="AND">
    <EXPRESSION TYPE="INTEGER" NAME="MATH">
      <EXPRNODE NAME="TYPE" VALUE="INTEGER"/>
      <EXPRNODE NAME="OPERATOR" VALUE="EQUAL"/>
      <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
        <EXPRNODE NAME="PROP_NAME" VALUE="CATEGORY_ID"/>
      </EXPRESSION>
      <EXPRESSION TYPE="INTEGER" NAME="CONST">
        <EXPRNODE NAME="VALUE" VALUE="0"/>
      </EXPRESSION>
    </EXPRESSION>
  <EXPRESSION TYPE="INTEGER" NAME="MATH">
    <EXPRNODE NAME="TYPE" VALUE="INTEGER"/>
    <EXPRNODE NAME="OPERATOR" VALUE="EQUAL"/>
    <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
      <EXPRNODE NAME="PROP_NAME" VALUE="SALESRANK"/>
    </EXPRESSION>
    <EXPRESSION TYPE="INTEGER" NAME="CONST">
      <EXPRNODE NAME="VALUE" VALUE="0"/>
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>
```

```

    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>
<EXPRESSION TYPE="VOID" NAME="REMOVE_RECORD" />
</EXPRESSION>

```

## Example 2

This example illustrates the use of an OR in the OPERATOR expression node. The example reads: If Category equals "A" or Category equals "B", then create a new instance of the property "ABCompanies" with the value from the Company property. The syntax implicitly selects the first value of a given property if the property is multi-assigned. "IDENTITY" gets the actual value of the property, while "CONST" is a literal.

```

<EXPRESSION LABEL="" NAME="IF" TYPE="VOID" URL="">
  <EXPRESSION LABEL="" NAME="MATH" TYPE="INTEGER" URL="">
    <EXPRNODE NAME="TYPE" VALUE="INTEGER" />
    <EXPRNODE NAME="OPERATOR" VALUE="OR" />
    <EXPRESSION LABEL="" NAME="MATH" TYPE="INTEGER" URL="">
      <EXPRNODE NAME="TYPE" VALUE="STRING" />
      <EXPRNODE NAME="OPERATOR" VALUE="EQUAL" />
      <EXPRESSION LABEL="" NAME="IDENTITY" TYPE="PROPERTY" URL="">
        <EXPRNODE NAME="PROP_NAME" VALUE="Category" />
      </EXPRESSION>
    <EXPRESSION LABEL="" NAME="CONST" TYPE="STRING" URL="">
      <EXPRNODE NAME="VALUE" VALUE="A" />
    </EXPRESSION>
  </EXPRESSION>
  <EXPRESSION LABEL="" NAME="MATH" TYPE="INTEGER" URL="">
    <EXPRNODE NAME="TYPE" VALUE="STRING" />
    <EXPRNODE NAME="OPERATOR" VALUE="EQUAL" />
    <EXPRESSION LABEL="" NAME="IDENTITY" TYPE="PROPERTY" URL="">
      <EXPRNODE NAME="PROP_NAME" VALUE="Category" />
    </EXPRESSION>
    <EXPRESSION LABEL="" NAME="CONST" TYPE="STRING" URL="">
      <EXPRNODE NAME="VALUE" VALUE="B" />
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>
<EXPRESSION LABEL="" NAME="CREATE" TYPE="VOID" URL="">
  <EXPRNODE NAME="PROP_NAME" VALUE="ABCompanies" />
  <EXPRESSION LABEL="" NAME="IDENTITY" TYPE="PROPERTY" URL="">
    <EXPRNODE NAME="PROP_NAME" VALUE="Company" />
  </EXPRESSION>
</EXPRESSION>
</EXPRESSION>

```

## INTEGER PERL

INTEGER expressions return integers (whole numbers). INTEGER expressions can be used to combine expressions, do arithmetic, and test conditions for conditional evaluation. The INTEGER PERL expression uses Perl to manipulate the data.

The Perl code is contained in an EXPRBODY element. The Zinc Perl module provides classes and methods for gaining access to and manipulating the current record. Objects accessed from Perl are copies of the current data; changing the Perl objects has no effect on the current data until a function is called to explicitly copy the Perl objects back.

Endeca recommends that you perform record manipulation with the `PERL_MANIPULATOR` element rather than with the `EXPRESSION` and `RECORD_MANIPULATOR` elements. However, if you need to access and modify dimension sources (such as a dimension adapter or dimension server) you should still use expressions such as `DVAL PERL`. The Perl manipulator does not access dimension sources.

See the `EXPRESSION` element for DTD and attribute information.

### Example

```
<EXPRESSION TYPE="INTEGER" NAME="PERL">
  <EXPRBODY>
    ...your Perl code here. The VOID PERL topic has an example...
  </EXPRBODY>
</EXPRESSION>
```

## INTEGER PROP\_EXISTS

`INTEGER` expressions return integers (whole numbers). `INTEGER` expressions can be used to combine expressions, do arithmetic, and test conditions for conditional evaluation. The `INTEGER PROP_EXISTS` expression checks for a specified property on each record being processed.

The name of the property is specified in a `PROP_NAME` expression node. The expression returns the number of values of the property on each record. For example, if a record has three values from the "Color" property, the `PROP_EXISTS` expression would return 3. If the record has no values for the "Color" property, it would return 0. `INTEGER PROP_EXISTS` is useful as the condition expression in a `VOID IF` expression.

See the `EXPRESSION` element for DTD and attribute information.

### Example

As part of an `INTEGER AND` expression, this example uses two `INTEGER PROP_EXISTS` sub-expressions to test whether the specified `PROP_NAME` exists.

```
<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="AND">
    <EXPRESSION TYPE="INTEGER" NAME="MATH">
      <EXPRNODE NAME="TYPE" VALUE="INTEGER"/>
      <EXPRNODE NAME="OPERATOR" VALUE="EQUAL"/>
      <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
        <EXPRNODE NAME="PROP_NAME" VALUE="CATEGORY_ID"/>
      </EXPRESSION>
      <EXPRESSION TYPE="INTEGER" NAME="CONST">
        <EXPRNODE NAME="VALUE" VALUE="0"/>
      </EXPRESSION>
    </EXPRESSION>
    <EXPRESSION TYPE="INTEGER" NAME="MATH">
      <EXPRNODE NAME="TYPE" VALUE="INTEGER"/>
      <EXPRNODE NAME="OPERATOR" VALUE="EQUAL"/>
      <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
        <EXPRNODE NAME="PROP_NAME" VALUE="SALESRANK"/>
      </EXPRESSION>
      <EXPRESSION TYPE="INTEGER" NAME="CONST">
        <EXPRNODE NAME="VALUE" VALUE="0"/>
      </EXPRESSION>
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>
```

```
<EXPRESSION TYPE="VOID" NAME="REMOVE_RECORD" />
</EXPRESSION>
```

## PROPERTY expressions

### PROPERTY ALL

PROPERTY expressions return properties (name-value pairs). They are typically used to provide data to other expressions. The PROPERTY ALL expression returns all the values from all the properties on the current record.

There are no EXPRNODE elements to configure it.

See the EXPRESSION element for DTD and attribute information.

#### Example

```
<EXPRESSION TYPE="PROPERTY" NAME="ALL" />
```

### PROPERTY DVAL

PROPERTY expressions return properties (name-value pairs). They are typically used to provide data to other expressions. The PROPERTY DVAL expression creates a property value for each dimension value the current record has from the specified dimension.

A PROP\_NAME expression node specifies the name of the property to be created. The dimension can be specified using either a DIMENSION\_ID or a DIMENSION\_NAME expression node. By default, values for the property are created containing the name of each dimension value assigned to the record from the specified dimension. If the FULL\_PATH expression node is specified with a value of TRUE, then the names of all dimension values in the path from the dimension root to the assigned dimension value are concatenated (separated by '/') and used instead of the dimension value name.

See the EXPRESSION element for DTD and attribute information.

#### Example

This example creates the Price property for the specified dimension value in the record being processed.

```
<EXPRESSION TYPE="VOID" NAME="ADD_PROP">
  <EXPRESSION TYPE="PROPERTY" NAME="DVAL">
    <EXPRNODE NAME="DIMENSION_ID" VALUE="300" />
    <EXPRNODE NAME="PROP_NAME" VALUE="Price" />
    <EXPRNODE NAME="FULL_PATH" VALUE="TRUE" />
  </EXPRESSION>
</EXPRESSION>
```

### PROPERTY IDENTITY

PROPERTY expressions return properties (name-value pairs). They are typically used to provide data to other expressions. The PROPERTY IDENTITY expression returns the specified property from the current record.

The name of the property to return is specified in a PROP\_NAME expression node.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example assigns the dimension value 2090 to records with the property name `FORMAT`. The property name is specified within the `PROPERTY IDENTITY` sub-expression.

```
<EXPRESSION TYPE="VOID" NAME="ADD_DVAL">
  <EXPRESSION TYPE="DVAL" NAME="MATCH">
    <EXPRNODE NAME="DIMENSION_ID" VALUE="2090" />
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="FORMAT" />
      <EXPRNODE NAME="LOG" VALUE="salog" />
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>
```

## PROPERTY NVL

`PROPERTY` expressions return properties (name-value pairs). They are typically used to provide data to other expressions. The `PROPERTY NVL` expression evaluates its sub-expressions and returns the properties from the first sub-expression that has a non-empty result.

This is useful if there are several different properties that a record may or may not have, but only one of them should be used in an expression. For example, a record may have a property for a home address or for a business address. `PROPERTY NVL` expression evaluates each possibility and returns the first address it locates.

Note that a sub-expression that returns empty strings is returning values (empty values). For example, a record may not have a value for the "Color" property; however, if the `FILTER_EMPTY_PROPS` attribute of the `RECORD_ADAPTER` is not set to true, an identity expression referencing the property "Color" still has a return value (that is, the property name "Color" with an empty value).

An `NVL` expression may therefore return properties with empty values; it skips only properties that do not exist. There are no `EXPRNODE` elements to configure `PROPERTY NVL`.

See the `EXPRESSION` element for DTD and attribute information.

### Example

As suggested in the above example, this expression returns the first address property that Forge locates in the record.

```
<EXPRESSION TYPE="PROPERTY" NAME="NVL">
  <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
    <EXPRNODE NAME="PROP_NAME" VALUE="address_home" />
  </EXPRESSION>
  <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
    <EXPRNODE NAME="PROP_NAME" VALUE="address_work" />
  </EXPRESSION>
</EXPRESSION>
```

## PROPERTY PERL

`PROPERTY` expressions return properties (name-value pairs). They are typically used to provide data to other expressions. The `PROPERTY PERL` expression uses Perl to manipulate the data.

The Perl code is contained in an `EXPRBODY` element. The Zinc Perl module provides classes and methods for gaining access to and manipulating the current record. Objects accessed from Perl are copies of the current data; changing the Perl objects has no effect on the current data until a function is called to explicitly copy the Perl objects back.

Endeca recommends that you perform record manipulation with the `PERL_MANIPULATOR` element rather than with the `EXPRESSION` and `RECORD_MANIPULATOR` elements. However, if you need to access and modify dimension sources (such as a dimension adapter or dimension server) you should still use expressions such as `DVAL PERL`. The Perl manipulator does not access dimension sources.

See the `EXPRESSION` element for DTD and attribute information.

### Example

```
<EXPRESSION TYPE="PROPERTY" NAME="PERL">
  <EXPRBODY>
    ...your Perl code here. The VOID PERL topic has an example...
  </EXPRBODY>
</EXPRESSION>
```

## VOID expressions

### VOID ADD\_DVAL

VOID expressions return no value but are used to perform other work. The `VOID ADD_DVAL` expression adds dimension values to the current record.

The dimension values to add are given by one or more sub-expressions of type `DVAL`.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example adds the dimension value to the record being processed.

```
<EXPRESSION TYPE="VOID" NAME="ADD_DVAL">
  <EXPRESSION TYPE="DVAL" NAME="CONST">
    <EXPRNODE NAME="DIMENSION_ID" VALUE="2090"/>
    <EXPRNODE NAME="DVAL_ID" VALUE="2091"/>
  </EXPRESSION>
</EXPRESSION>
```

### Related Links

[VOID expressions](#) on page 23

### VOID ADD\_DVAL\_PROP

VOID expressions return no value but are used to perform other work. The `VOID ADD_DVAL_PROP` expression adds dimension value attributes to a dimension value.

This expression is unique in that it does not modify the current record. The attributes are information for an Endeca application's user interface; the attributes are not record processing information for Forge or the MDEX Engine. For example, you might use attributes to indicate the display color or location of a dimension value. See the *Endeca Basic Development Guide* for details.

The dimension to modify can be given in either a `DIMENSION_NAME` or a `DIMENSION_ID` expression node; the dimension value to modify can be given in either a `DVAL_PATH` or `DVAL_ID` expression node. The properties to be added are given by one or more `PROPERTY` sub-expressions.

By default, if the dimension value already has attributes attached, the new attributes are simply added. If the optional `REPLACE` expression node is set to `TRUE`, any duplicate attributes are removed prior to adding the new ones.

By default, the modifications are made to the dimension value immediately. In some cases (for example with `AutoGen`), the specified dimension value may not exist at the time the expression is evaluated, so Forge should wait and make the specified changes after all records have been processed. To do this, the optional `DELAY` expression node should be set to `TRUE`.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This expression adds an attribute named `display` to the `Red` dimension value.

```
<EXPRESSION TYPE="VOID" NAME="ADD_DVAL_PROP">
  <EXPRNODE NAME="DIMENSION_NAME" VALUE="Colors"/>
  <EXPRNODE NAME="DVAL_PATH" VALUE="Colors/Red"/>
  <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
    <EXPRNODE NAME="PROP_NAME" VALUE="display"/>
  </EXPRESSION>
</EXPRESSION>
```

## VOID CLEAN\_DVALS

`VOID` expressions return no value but are used to perform other work. The `VOID CLEAN_DVALS` expression removes ancestor classifications from records.

`CLEAN_DVALS` requires one or more `DIMENSION_ID` expression nodes to tell it which dimensions to clean. You can also specify dimensions from more than one `DIMENSION_SOURCE` if necessary. One `DIMENSION_SOURCE` is required.

If a dimension value and one or more of its ancestors are assigned to a record, a `CLEAN_DVALS` expression deletes the ancestor dimension values, leaving only the child dimension value on the record. A dimension value and one or more of its ancestors would be assigned to a record in a situation where an ancestor and dimension leaf value are both properties of a single record. This is the case in the following example for the properties “Blue” and “Sky Blue”.

For example, suppose one navigation path within a “Colors” dimension looked like this: Colors->Blue->Sky Blue. If a record has a property value of “Blue” and a property value of “Sky Blue”, then both the parent dimension value “Blue” and its child “Sky Blue” will be assigned to it. A `CLEAN_DVALS` expression would remove the dimension value “Blue” from the record. If there were more levels of hierarchy (for example, if the dimension value “Blue” were a grandparent or great-grandparent), the `CLEAN_DVALS` expression would work in the same way; only the child dimension value “Sky Blue” would remain on the record.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example cleans ancestor dimension values from the indicated dimension.

```
<EXPRESSION TYPE="VOID" NAME="CLEAN_DVALS">
  <EXPRNODE NAME="DIMENSION_ID" VALUE="70000" />
```



```
<EXPRNODE NAME="DIMENSION_SOURCE" VALUE="DimensionServer" />
</EXPRESSION>
```

## VOID CONVERTTOTEXT

VOID expressions return no value but are used to perform other work. The VOID CONVERTTOTEXT expression extracts document content, converts it to text, and assigns the text to a record.

This expression is available as part of the optional Document Conversion Module. Recall that the RETRIEVE\_URL expression fetches a document's content and writes the content to a file. The `Endeca.Document.Body` property stores the absolute path of the file that contains the document's content. CONVERTTOTEXT read the path and converts the content of the indicated file to text. The text is then assigned to a record as a property with the name `Endeca.Document.Text`. If the expression fails, a warning is logged, and the property is not assigned to the record.

The following optional expression nodes modify the behavior of VOID CONVERTTOTEXT:

- `TIMEOUT` - Specifies the maximum time allowed to convert a document. The default value is 300 seconds.
- `RESPONSE_TIMEOUT` - Specifies the messaging time out between Forge and the converter process. The default value is 30 seconds.
- `CONVERT_EMBEDDED` - If set to `TRUE`, specifies that embedded documents will also be extracted and converted. If this option is not used, the default is `FALSE`.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example converts `Endeca.Document.Body` to text if the property exists.

```
<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="PROP_EXISTS">
    <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Document.Body" />
  </EXPRESSION>
</EXPRESSION>
<EXPRESSION TYPE="VOID" NAME="CONVERTTOTEXT" />
</EXPRESSION>
```

This example shows how to use the `CONVERT_EMBEDDED` option to process embedded documents.

```
<EXPRESSION TYPE="VOID" NAME="CONVERTTOTEXT">
  <EXPRNODE NAME="CONVERT_EMBEDDED" VALUE="TRUE" />
</EXPRESSION>
```

## VOID CREATE

VOID expressions return no value but are used to perform other work. The VOID CREATE expression creates a new property on the current record.

The name of the property is specified either by a `PROP_NAME` expression node, or by the first sub-expression, which may be of type `STRING`, `PROPERTY`, `INTEGER`, or `FLOAT`. The value for the property comes from a second sub-expression of type `STRING`, `PROPERTY`, `INTEGER`, or `FLOAT`.

See the `EXPRESSION` element for DTD and attribute information.

## Example

This example creates a new property called `Document-Digest`.

```
<EXPRESSION TYPE="VOID" NAME="CREATE">
  <EXPRNODE NAME="PROP_NAME" VALUE="Document-Digest" />
  <EXPRESSION TYPE="STRING" NAME="DIGEST">
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Document.Body" />
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>
```

## VOID EXPORT\_PROP

VOID expressions return no value but are used to perform other work. The `VOID EXPORT_PROP` expression writes a given property to a file and replaces the property value with the value of the newly created file's URL.

Writing a property value to a file is useful when the property is a long text description. You can save memory by writing the property to a file and accessing the file only when necessary via the new URL property value. You can use `VOID REMOVE_EXPORTED_PROP` to delete this file and the property pointing to the file.

The property to export can be specified in either one of the following ways:

- Use the `PROP_NAME` expression node to specify the name of the property to export.
- Use a `STRING` expression to generate the name of the file to export. This mode is useful when crawling files: the file name is generated using a `STRING DIGEST` of the `Endeca.Identifier` property and the expression generates a different file name for each URL identifier.

The following expression nodes can modify `EXPORT_PROP`:

- `URL` - Specifies the base URL that files are written to. This value may be either an absolute path or a path relative to the location of `Pipeline.epx`.
- `PREFIX` - Specifies a file name prefix to use when Forge writes the property value to a file.

See the `EXPRESSION` element for DTD and attribute information.

## Example

This example exports properties `Prop1` and `Prop2` from the `props` directory.

```
<EXPRESSION TYPE="VOID" NAME="EXPORT_PROP">
  <EXPRNODE NAME="PROP_NAME" VALUE="Prop1" />
  <EXPRNODE NAME="PROP_NAME" VALUE="Prop2" />
  <EXPRNODE NAME="URL" VALUE="props" />
  <EXPRNODE NAME="PREFIX" VALUE="out." />
</EXPRESSION>
```

## VOID IF

VOID expressions return no value but are used to perform other work. The `VOID IF` expression provides a way to perform conditional evaluation.

The sub-expressions are grouped into clauses: the first clause consists of all the sub-expressions up to the first `EXPRNODE` element (if any) and any subsequent clauses consist of the sub-expressions between `EXPRNODE` elements. The first clause is an `IF` clause; the first sub-expression is a condition,

and must be of type `INTEGER`. Subsequent sub-expressions form the action, and must be of type `VOID`. If the condition evaluates to anything other than zero, then all of the actions are evaluated, in order. If the condition evaluates to zero, then processing moves to the next clause.

A clause introduced by an `ELSE_IF` expression node (`EXPRNODE`) behaves just like the initial `IF` clause. `ELSE_IF` clauses are optional. If included, there may be any number. For a sample usage, see the second example below. In a clause introduced by an `ELSE` expression node, all sub-expressions form an action, and must be of type `VOID`. The actions are evaluated in order. The `ELSE` clause is optional. If included, it must come last. There can be at most one `ELSE` clause.

See the `EXPRESSION` element for DTD and attribute information.

### Example 1

This example evaluates whether the `Region` property is equal to the constant `Other Italy`. If two are equal, then the `REMOVE` expression deletes the property.

```
<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="MATH">
    <EXPRNODE NAME="TYPE" VALUE="STRING"/>
    <EXPRNODE NAME="OPERATOR" VALUE="EQUAL"/>
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="Region"/>
    </EXPRESSION>
    <EXPRESSION TYPE="STRING" NAME="CONST">
      <EXPRNODE NAME="VALUE" VALUE="Other Italy"/>
    </EXPRESSION>
  </EXPRESSION>
  <EXPRESSION TYPE="VOID" NAME="REMOVE">
    <EXPRNODE NAME="PROP_NAME" VALUE="Region"/>
  </EXPRESSION>
</EXPRESSION>
```

### Example 2

This example implements the following logic using `ELSE` and `ELSE_IF` expression nodes:

```
if (Endeca.Title == "Ad Rotator Test")
  Create Property AdRotate with Property Value "Yes"
else if (Endeca.Title == "Sample Pages")
  Create Property "An Index" with Property Value "Yes"
else
  Create Property "NoMatch" with Property Value "Nothing"
end if
```

The example is as follows:

```
<EXPRESSION LABEL="" NAME="IF" TYPE="VOID" URL="">
  <EXPRESSION LABEL="" NAME="MATH" TYPE="INTEGER" URL="">
    <EXPRNODE NAME="TYPE" VALUE="STRING"/>
    <EXPRNODE NAME="OPERATOR" VALUE="EQUAL"/>
    <EXPRESSION LABEL="" NAME="IDENTITY" TYPE="PROPERTY" URL="">
      <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Title"/>
    </EXPRESSION>
    <EXPRESSION LABEL="" NAME="CONST" TYPE="STRING" URL="">
      <EXPRNODE NAME="VALUE" VALUE="Ad Rotator Test"/>
    </EXPRESSION>
  </EXPRESSION>
  <EXPRESSION LABEL="" NAME="CREATE" TYPE="VOID" URL="">
```

```

    <EXPRNODE NAME="PROP_NAME" VALUE="AdRotate"/>
    <EXPRESSION LABEL="" NAME="CONST" TYPE="STRING" URL="">
      <EXPRNODE NAME="VALUE" VALUE="Yes"/>
    </EXPRESSION>
  </EXPRESSION>

  <EXPRNODE NAME="ELSE_IF" VALUE="" />

  <EXPRESSION LABEL="" NAME="MATH" TYPE="INTEGER" URL="">
    <EXPRNODE NAME="TYPE" VALUE="STRING"/>
    <EXPRNODE NAME="OPERATOR" VALUE="EQUAL"/>
    <EXPRESSION LABEL="" NAME="IDENTITY" TYPE="PROPERTY" URL="">
      <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Title"/>
    </EXPRESSION>
    <EXPRESSION LABEL="" NAME="CONST" TYPE="STRING" URL="">
      <EXPRNODE NAME="VALUE" VALUE="Sample Pages"/>
    </EXPRESSION>
  </EXPRESSION>

  <EXPRESSION LABEL="" NAME="CREATE" TYPE="VOID" URL="">
    <EXPRNODE NAME="PROP_NAME" VALUE="An Index"/>
    <EXPRESSION LABEL="" NAME="CONST" TYPE="STRING" URL="">
      <EXPRNODE NAME="VALUE" VALUE="Yes"/>
    </EXPRESSION>
  </EXPRESSION>

  <EXPRNODE NAME="ELSE" VALUE="" />

  <EXPRESSION LABEL="" NAME="CREATE" TYPE="VOID" URL="">
    <EXPRNODE NAME="PROP_NAME" VALUE="NoMatch"/>
    <EXPRESSION LABEL="" NAME="CONST" TYPE="STRING" URL="">
      <EXPRNODE NAME="VALUE" VALUE="Nothing"/>
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>

```

## VOID IMPORT\_PROP

VOID expressions return no value but are used to perform other work. The `VOID IMPORT_PROP` expression imports a property value from a specified file.

Typically, files containing property values were created using the complementary expression `VOID EXPORT_PROP`. Another typical use of `IMPORT_PROP` is to read a document body created by `VOID RETRIEVE_URL`. (This is useful for HTML pre-processing with a spider.)

The property to import can be specified in either one of the following ways:

- Use the `PROP_NAME` expression node to specify the name of the property to import. The current value of the property is the file name. The current value is replaced with the value read from the file. All properties with a given name are affected in this mode.
- Use a `STRING` expression to generate the name of the file to import. Typically, the file name is generated using a `STRING DIGEST` of the `Endeca.Identifier` property. If this expression is present, then one property can be imported per record. This expression generates a different file name for each record. Existing values are untouched.

The following expression nodes modify `IMPORT_PROP`. Several of these nodes are the same as those used to identify the property during export in `EXPORT_PROP`.

- **URL** - Specifies the URL that files are imported from. This value may be either an absolute path or a path relative to the location of `Pipeline.epx`.
- **PREFIX** - Specifies any prefix used in the file name to remove. This value often corresponds to the value of `PREFIX` in the `VOID EXPORT_PROP` expression.
- **REMOVE\_FILES** - Specifies whether to delete files, after importing their property values. When set to `TRUE`, the files are deleted. The default value is `FALSE`.
- **ENCODING** - Specifies the encoding that should be used during import. If desired, this encoding may be overridden by `ENCODING_PROP`.
- **ENCODING\_PROP** - Specifies the name of the property containing the encoding. The `RETRIEVE_URL` expression creates this property with a default property name of `Endeca.Document.Encoding`.
- **ENCODING\_ID\_BYTES** - Specifies the number of bytes used to identify the encoding. This value defaults to its maximum of 1 MB and can be reduced if necessary to optimize performance.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example imports properties `Prop1` and `Prop2` from the `props` directory. After importing, the expression deletes the files.

```
<EXPRESSION TYPE="VOID" NAME="IMPORT_PROP">
  <EXPRNODE NAME="PROP_NAME" VALUE="Prop1" />
  <EXPRNODE NAME="PROP_NAME" VALUE="Prop2" />
  <EXPRNODE NAME="URL" VALUE="props" />
  <EXPRNODE NAME="PREFIX" VALUE="out." />
  <EXPRNODE NAME="REMOVE_FILES" VALUE="TRUE" />
</EXPRESSION>
```

## VOID\_PARSE\_DOC

`VOID` expressions return no value but are used to perform other work. The `VOID_PARSE_DOC` expression obtains metadata and extracts text from documents and adds the metadata and document text in the form of property values to a record.

Both `text/plain` and `text/html` files can be extracted from documents by this expression; other file types are passed to the Document Conversion Module converters for parsing.

The following list describes the optional expression nodes that can modify `PARSE_DOC`:

- **FILE\_PATH** - Specifies whether the expression interprets the property value as a file path (to the contents of the file) or the contents of the file itself. `TRUE` interprets the property value as a file path. `FALSE` interprets the property value as the contents of the file.
- **PARSE\_META** - Indicates whether to extract metadata of a document. `TRUE` extracts metadata; `FALSE` does not. The default value is `TRUE`.
- **PARSE\_TEXT** - Indicates whether to extract the body text of a document. `TRUE` extracts text; `FALSE` does not. The default value is `TRUE`.
- **MIMETYPE\_PROP** - Describes the name of the property containing the content type. The `RETRIEVE_URL` expression creates this property with a default property name of `Endeca.Document.MimeType`. You do not need to modify this name unless desired.
- **ENCODING\_PROP** - Describes the name of the property containing the encoding. The `RETRIEVE_URL` expression creates this property with a default property name of `Endeca.Document.Encoding`. You do not need to modify this name unless desired.

- `BODY_PROP` - Describes the name of the property containing the document body. The `RETRIEVE_URL` expression creates this property with a default property name of `Endeca.Document.Body`. You do not need to modify this name unless desired.
- `TEXT_PROP` Describes the name of the property to put document text into. The `RETRIEVE_URL` expression creates this property with a default property name of `Endeca.Document.Text`. You do not need to modify this name unless desired.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example parses the property and adds the contents to the record being processed.

```
<EXPRESSION TYPE="VOID" NAME="PARSE_DOC">
  <EXPRNODE NAME="BODY_PROP" VALUE="Endeca.Document.Body" />
  <EXPRNODE NAME="FILE_PATH" VALUE="TRUE" />
</EXPRESSION>
```

## VOID PERL

`VOID` expressions return no value but are used to perform other work. The `VOID PERL` expression uses Perl to manipulate the data.

The Perl code is contained in an `EXPRBODY` element. The Zinc Perl module provides classes and methods for gaining access to and manipulating the current record.

Objects accessed from Perl are copies of the current data; changing the Perl objects has no effect on the current data until a function is called to explicitly copy the Perl objects back.

Endeca recommends that you perform record manipulation with the `PERL_MANIPULATOR` element rather than with the `EXPRESSION` and `RECORD_MANIPULATOR` elements. However, if you need to access and modify dimension sources (such as a dimension adapter or dimension server) you should still use expressions such as `DVAL PERL`. The Perl manipulator does not access dimension sources.

See the `EXPRESSION` element for DTD and attribute information.

### Example

```
<EXPRESSION TYPE="PROPERTY" NAME="PERL">
  <EXPRBODY>
  <![CDATA[
  ### IF ITEM HAS "LPRINT" PROPERTY WITH VALUE OF "Y",
  ### REMOVE CURRENT "FORMAT" PROPERTY,
  ### AND CREATE NEW ONE WITH VALUE OF "LP"

  my @lprint = get_props_by_name("LPRINT");

  my @format = get_props_by_name("FORMAT");

  if (-1 != $#lprint) {
    my $large = ($lprint[0])->value();
    if ($large =~ /Y/) {
      if (-1 != $#format) {
        remove_props("FORMAT");
      }
    }

    my $new_prop = new Zinc::PropVal("FORMAT", "LP");

    add_props($new_prop);
  ]>>
```

```

    }
  }
]]>
</EXPRBODY>
</EXPRESSION>

```

## VOID REMOVE

VOID expressions return no value but are used to perform other work. The VOID REMOVE expression removes the specified properties from the current record.

The names of the properties to be removed are given in PROP\_NAME expression nodes.

See the EXPRESSION element for DTD and attribute information.

### Example

This example evaluates whether the Region property is equal to the constant Other Italy. If two are equal, then the REMOVE expression deletes the property.

```

<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="MATH">
    <EXPRNODE NAME="TYPE" VALUE="STRING"/>
    <EXPRNODE NAME="OPERATOR" VALUE="EQUAL"/>
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="Region"/>
    </EXPRESSION>
    <EXPRESSION TYPE="STRING" NAME="CONST">
      <EXPRNODE NAME="VALUE" VALUE="Other Italy"/>
    </EXPRESSION>
  </EXPRESSION>
  <EXPRESSION TYPE="VOID" NAME="REMOVE">
    <EXPRNODE NAME="PROP_NAME" VALUE="Region"/>
  </EXPRESSION>
</EXPRESSION>

```

## VOID REMOVE\_EXPORTED\_PROP

VOID expressions return no value but are used to perform other work. The VOID REMOVE\_EXPORTED\_PROP expression deletes the file containing the value of an exported property and also the property value itself, if desired.

Use REMOVE\_EXPORTED\_PROP to remove a file created by the VOID EXPORT\_PROP or VOID RETRIEVE\_URL expressions. The following expression nodes can modify REMOVE\_EXPORTED\_PROP:

- PROP\_NAME - Specifies the name of the property to remove.
- URL - Specifies the URL that files were written to. This value may be either an absolute path or a path relative to the location of Pipeline.epx.
- PREFIX - Specifies any prefix used in the file name to remove. This value often corresponds to the value of PREFIX in the VOID EXPORT\_PROP expression.
- REMOVE\_PROPS - Specifies whether to remove the property from the record after deleting the file where the property was stored. TRUE removes the property from the record after removing the corresponding file. FALSE does not remove the property.

See the EXPRESSION element for DTD and attribute information.

### Example

As the COMMENT element indicates, this example removes the temporary file created by EXPORT\_PROP.

```
<EXPRESSION TYPE="VOID" NAME="REMOVE_EXPORTED_PROP">
<COMMENT>This expression removes the temporary file that is created
on disk by the RETRIEVE_URL expression.</COMMENT>
  <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Document.Body" />
  <EXPRNODE NAME="REMOVE_PROPS" VALUE="TRUE" />
</EXPRESSION>
```

## VOID REMOVE\_RECORD

VOID expressions return no value but are used to perform other work. The VOID REMOVE\_RECORD expression removes the current record.

Processing of the record stops, and the next record is retrieved. REMOVE\_RECORD is typically used within an IF expression to remove records that meet or do not meet certain criteria.

See the EXPRESSION element for DTD and attribute information.

### Example

This example removes the record if the value of Name and Text are the same.

```
<EXPRESSION TYPE="VOID" NAME="IF">
  <EXPRESSION TYPE="INTEGER" NAME="MATH">
    <EXPRNODE NAME="TYPE" VALUE="STRING" />
    <EXPRNODE NAME="OPERATOR" VALUE="EQUAL" />
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="Name" />
    </EXPRESSION>
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="Text" />
    </EXPRESSION>
  </EXPRESSION>
  <EXPRESSION TYPE="VOID" NAME="REMOVE_RECORD" />
</EXPRESSION>
```

## VOID RENAME

VOID expressions return no value but are used to perform other work. The VOID RENAME expression changes the name of the specified property for the current record.

The name of the property to change is given in an OLD\_NAME expression node, and the new name is given in a NEW\_NAME expression node. Only the property name is affected—the property values stay the same.

See the EXPRESSION element for DTD and attribute information.

### Example

This example renames PropPrice to Price.

```
<EXPRESSION TYPE="VOID" NAME="RENAME">
  <EXPRNODE NAME="OLD_NAME" VALUE="PropPrice" />
  <EXPRNODE NAME="NEW_NAME" VALUE="Price" />
</EXPRESSION>
```



## VOID RETRIEVE\_URL

VOID expressions return no value but are used to perform other work. The `VOID RETRIEVE_URL` expression processes records that have a URL property by retrieving the URL, its corresponding document content, and metadata.

`RETRIEVE_URL` requires a `STRING` sub-expression that names a file created to store the document content from the URL. The `STRING DIGEST` expression is typically used to generate the file.

Forge adds the location of the file, the document content, and other values to the record as property values. The file containing the document content must be unique for each record or Forge overwrites the content when processing subsequent records.

Parameters that affect how this expression retrieves URLs can be expressed as record properties to configure URL retrieval. These parameters include connection time outs (`Endeca.Fetch.Connect-Timeout`), data transfer rates (`Endeca.Fetch.TransferRateLowSpeedLimit`), the use of proxy servers (`Endeca.Fetch.Proxy`), and so on. See "Implementing the Endeca Crawler" in the *Endeca Forge Guide* for information about metadata properties and configuration properties that the expression retrieves or stores with the record.

The following optional expression nodes modify the behavior of `VOID RETRIEVE_URL`:

- `BODY_PROP_NAME` - Specifies the name of the property containing the document body. The default value of this property is `Endeca.Document.Body`.
- `URL_PROP_NAME` - Specifies the name of the property that contains the URL to retrieve. Only one URL is retrieved per record. The default value of this property is `Endeca.Identifier`.
- `REVISION_PROP_NAME` - Specifies the name of the property that contains the URL's revision information. The default value of this property is `Endeca.Document.Revision`.
- `KEY_RING` - Specifies the path to a `Key_ring.xml` file that contains the authentication information which a SPIDER uses when communicating with a host computer. Specify the path to this file in the `VALUE` attribute. The path to the file may be absolute or relative to the location of the `Pipeline.epx` file.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example generates a file name for the retrieved file and it specifies that a `Key_ring.xml` should be used for authentication.

```
<EXPRESSION TYPE="VOID" NAME="RETRIEVE_URL">
  <!-- this expression generates a filename for the retrieved file -->
  <EXPRESSION TYPE="STRING" NAME="CONCAT">
    <EXPRESSION TYPE="STRING" NAME="CONST">
      <EXPRNODE NAME="VALUE" VALUE="&cwd;"/>
    </EXPRESSION>
    <EXPRESSION TYPE="STRING" NAME="DIGEST">
      <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
        <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Identifier"/>
      </EXPRESSION>
    </EXPRESSION>
  </EXPRESSION>
  <!-- this expression node specifies the path to the key ring file -->
  <EXPRNODE NAME="KEY_RING" VALUE="key_ring.xml"/>
</EXPRESSION>
```

## VOID SPLIT

VOID expressions return no value but are used to perform other work. The VOID SPLIT expression splits the values of a single property into multiple values of a new property, or into multiple properties.

Configure the expression as follows:

- Specify the property to split in an OLD\_NAME expression node.
- Specify the property to contain the new values in a NEW\_NAME expression node.
- Specify the delimiter to split on in a SPLIT expression node.

After performing the split, Forge trims leading and trailing white space from the new property values, so leading or trailing spaces do not have to be included in the delimiter. For example, if the value of the “Colors” property for a certain record is “red, blue, green”, and you split that value on the comma delimiter, with a new name of “Hue”, the output is three separate properties: “Hue1”=“red”, “Hue2”=“blue”, “Hue3”=“green”.

The default value of the optional ENUMERATE expression node is TRUE. If ENUMERATE is set to FALSE, all of the new values are assigned to a single new property. In the previous example, the result would be a single “Hue” property with the values “red”, “blue”, and “green,” instead of three separate properties.

See the EXPRESSION element for DTD and attribute information.

### Example

The example described above is expressed as follows:

```
<EXPRESSION TYPE="VOID" NAME="SPLIT">
  <EXPRNODE NAME="OLD_NAME" VALUE="Colors" />
  <EXPRNODE NAME="NEW_NAME" VALUE="Hue" />
  <EXPRNODE NAME="SPLIT" VALUE="," />
  <EXPRNODE NAME="ENUMERATE" VALUE="TRUE" />
</EXPRESSION>
```

## VOID STRATIFY

VOID expressions return no value but are used to perform other work. The VOID STRATIFY expression identifies a Stratify Classification Server that classifies Endeca records.

For each record that passes through the record manipulator, the STRATIFY expression requests that the Stratify Classification Server classify a document indicated by Endeca.Document.Body. Forge sends the document as an attachment to a Stratify Classification Server. The Stratify Classification Server examines the document including the document’s structure and classifies it according to the classification model you developed in Stratify Taxonomy Manager. You indicate the classification model in the HIERARCHY\_ID expression node. The Classification Server then sends back property values containing a Stratify topic name, a unique ID, and a confidence rating of the classification. Forge appends these values to the record for the document.

The following expression nodes are required in VOID STRATIFY:

- STRATIFY\_HOST - Specifies the machine name or IP address of the Stratify Classification Server.
- STRATIFY\_PORT - Specifies the port on which the Stratify Classification Server listens for requests from Forge.
- HIERARCHY\_ID - Specifies the identifier of a Stratify classification model. To determine the VALUE of HIERARCHY\_ID: First, navigate to the working directory of the Stratify Classification Server that contains your classification model and taxonomy files. This directory is typically located at <Stratify Install

Directory>\ClassificationServer\ClassificationServer\ClassificationServerWorkDir\Taxonomy-N, where N is the number of the directory that contains the classification model you want to use with your Endeca project. (Your environment may have multiple \Taxonomy-N directories each containing different classification model and taxonomy files.) Second, note the number at the end of the of \Taxonomy-N directory. This number is the value of HIERARCHY\_ID. For example, if the classification model you want to use is stored in . . . \Taxonomy-2, then HIERARCHY\_ID should have VALUE=" 2".

- IDENTIFIER\_PROP\_NAME - Specifies the unique ID for the Endeca record being processed. The default is Endeca.Identifier.
- BODY\_PROP\_NAME - Specifies the property that the Stratify Classification Server examines to classify the document. The default property is Endeca.Document.Body. You can provide either Endeca.Document.Body or Endeca.Document.Text. However, specifying Endeca.Document.Body provides better classification because Forge can send the document to Stratify Classification Server as an attachment, and Stratify Classification Server can use the attachment to determine structural information of the document that aids in classification. If you specify Endeca.Document.Text, Forge sends the converted text of the document without any of its structural information.

See the EXPRESSION element for DTD and attribute information.

### Example

This example connects to the indicated Stratify Classification Server and requests that it classify the document indicated by Endeca.Document.Body using against hierarchy ID 1.

```
<EXPRESSION NAME="STRATIFY" TYPE="VOID" >
  <EXPRNODE NAME="STRATIFY_HOST" VALUE="10.0.0.999" />
  <EXPRNODE NAME="STRATIFY_PORT" VALUE="7021" />
  <EXPRNODE NAME="HIERARCHY_ID" VALUE="1" />
  <EXPRNODE NAME="IDENTIFIER_PROP_NAME" VALUE="Endeca.Identifier" />
<EXPRNODE NAME="BODY_PROP_NAME" VALUE="Endeca.Document.Body" />
```

## VOID UNIQUE

VOID expressions return no value but are used to perform other work. The VOID UNIQUE expression deletes every value of a property except the first.

The name of the property is given in a PROP\_NAME expression node. For example, if the "Color" property has three values, "red", "blue", and "green", then the UNIQUE expression removes the values "blue" and "green", leaving just the value "red".

See the EXPRESSION element for DTD and attribute information.

### Example

The example described above is expressed as follows:

```
<EXPRESSION TYPE="VOID" NAME="UNIQUE" >
  <EXPRNODE NAME="PROP_NAME" VALUE="Color" />
</EXPRESSION>
```

## VOID UPDATE

VOID expressions return no value but are used to perform other work. The VOID UPDATE expression changes the value of a property.

The name of the property to update is given in a `PROP_NAME` expression node, and the new value is given in a sub-expression of type `INTEGER`, `FLOAT`, `STRING`, or `PROPERTY`. If the property has multiple values, all values are changed.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example updates records with the `Endeca.Document.Body` property by replacing "cwd" in paths with the actual current working directory.

```
<EXPRESSION TYPE="VOID" NAME="UPDATE">
  <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Document.Body" />
  <EXPRESSION TYPE="STRING" NAME="REPLACE">
    <EXPRNODE NAME="TARGET" VALUE="[cwd]" />
    <EXPRNODE NAME="REPLACEMENT" VALUE="&cwd;" />
  <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
    <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Document.Body" />
  </EXPRESSION>
</EXPRESSION>
</EXPRESSION>
```

## VOID UPDATE\_RECORD

VOID expressions return no value but are used to perform other work. The `VOID UPDATE_RECORD` expression is used as part of a partial update pipeline.epx file to update existing records by adding, removing, or replacing dimensions, dimension values, or property values.

See the *MDEX Engine Partial Updates Guide* for details about partial update processing. `UPDATE_RECORD` requires an `ACTION` expression node to indicate the type of update to perform. You can add additional `PROP_ACTION`, `DIM_ACTION`, and `DVAL_ACTION` expression nodes depending upon whether you want to modify properties, dimensions, or dimension values of the record. The following list further describes the expression nodes that refine the behavior of the `UPDATE_RECORD` expression:

- `ACTION` - Indicates the type of update to perform on a record. Valid values of the `VALUE` attribute are `ADD`, `ADD_OR_REPLACE`, `DELETE`, `DELETE_OR_IGNORE`, `REPLACE`, and `UPDATE`.
- `PROP_ACTION` - Modifies a property on the record. Valid values of the `VALUE` attribute are `ADD`, `DELETE`, `REPLACE`. A `PROP_ACTION` expression node must be followed by a `PROP_NAME` expression node that specifies the property to modify.
- `DIM_ACTION` - Modifies a dimension on the record. Valid values of the `VALUE` attribute are `ADD`, `DELETE`, `REPLACE`. A `DIM_ACTION` expression node must be followed by a `DIMENSION_ID` expression node that specifies the dimension ID of the dimension to modify.
- `DVAL_ACTION` - Modifies a dimension value on the record. The only valid value of the `VALUE` attribute is `DELETE`. A `DVAL_ACTION` expression node must be followed by a `DVAL_ID` expression node that specifies the dimension value ID of the dimension value to remove.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example updates records in the Dgraph by replacing them with the values specified below.

```
<EXPRESSION TYPE="VOID" NAME="UPDATE_RECORD">
  <EXPRNODE NAME="ACTION" VALUE="UPDATE" />
  <EXPRNODE NAME="PROP_ACTION" VALUE="REPLACE" />
  <EXPRNODE NAME="PROP_NAME" VALUE="P_WineType1" />
</EXPRESSION>
```

```

<EXPRNODE NAME="PROP_ACTION" VALUE="REPLACE" />
<EXPRNODE NAME="PROP_NAME" VALUE="P_WineType2" />
<EXPRNODE NAME="DIM_ACTION" VALUE="REPLACE" />
<EXPRNODE NAME="DIMENSION_ID" VALUE="8000" />
<EXPRNODE NAME="PROP_ACTION" VALUE="REPLACE" />
<EXPRNODE NAME="PROP_NAME" VALUE="P_PriceStr" />
</EXPRESSION>

```

## STRING expressions

### STRING CONCAT

STRING expressions return text strings. They are used to manipulate non-numeric data. The STRING CONCAT expression returns a string that is the concatenation of two or more values.

The values to be concatenated are given by sub-expressions, which can be of type STRING, INTEGER, FLOAT, or PROPERTY. There are no EXPRNODE elements to configure STRING CONCAT.

See the EXPRESSION element for DTD and attribute information.

#### Example

This example concatenates the value of the property ChapterNum and ChapterTitle with a space between them.

```

<EXPRESSION TYPE="VOID" NAME="CREATE">
  <EXPRNODE NAME="PROP_NAME" VALUE="ChapterNumTitle" />
  <EXPRESSION TYPE="STRING" NAME="CONCAT">
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="ChapterNum" />
    </EXPRESSION>
    <EXPRESSION TYPE="STRING" NAME="CONST">
      <EXPRNODE NAME="VALUE" VALUE=" " />
    </EXPRESSION>
    <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
      <EXPRNODE NAME="PROP_NAME" VALUE="ChapterTitle" />
    </EXPRESSION>
  </EXPRESSION>
</EXPRESSION>

```

### STRING CONST

STRING expressions return text strings. They are used to manipulate non-numeric data. The STRING CONST expression returns the same string constant, specified in a VALUE expression node.

See the EXPRESSION element for DTD and attribute information.

#### Example

This example creates a property called Name by concatenating three values, one of which is a constant functioning as a term separator.

```

<EXPRESSION NAME="CREATE" TYPE="VOID">
  <EXPRNODE NAME="PROP_NAME" VALUE="Name" />
  <EXPRESSION NAME="CONCAT" TYPE="STRING">

```

```

<EXPRESSION NAME="IDENTITY" TYPE="PROPERTY">
  <EXPRNODE NAME="PROP_NAME" VALUE="file_name"/>
</EXPRESSION>
<EXPRESSION NAME="CONST" TYPE="STRING">
  <EXPRNODE NAME="VALUE" VALUE=", rev "/>
</EXPRESSION>
<EXPRESSION NAME="IDENTITY" TYPE="PROPERTY">
  <EXPRNODE NAME="PROP_NAME" VALUE="revision"/>
</EXPRESSION>
</EXPRESSION>
</EXPRESSION>

```

## STRING DIGEST

STRING expressions return text strings. They are used to manipulate non-numeric data. The STRING DIGEST expression creates a property identifier that is a digest of a specified PROP\_NAME expression node.

STRING DIGEST requires a PROP\_NAME expression node. Typically, a file name is generated using a STRING DIGEST of the `Endeca.Identifier` property.

See the EXPRESSION element for DTD and attribute information.

### Example

This example creates a digest identifier based on the `Endeca.Identifier` property.

```

<EXPRESSION TYPE="STRING" NAME="DIGEST">
  <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
    <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Identifier"/>
  </EXPRESSION>
</EXPRESSION>

```

## STRING FORMAT

STRING expressions return text strings. They are used to manipulate non-numeric data. The STRING FORMAT expression returns the value from its sub-expression, converted to a floating-point number, and formatted as specified.

The sub-expression may be a PROPERTY, STRING or FLOAT expression. A PRECISION expression node sets the number of significant digits to include, and a SHOW\_SIGN expression node sets whether or not to show the sign of the number.

See the EXPRESSION element for DTD and attribute information.

### Example

This example takes a value 8.99, formats it with 3 significant digits, and returns 8.990.

```

<EXPRESSION TYPE="STRING" NAME="FORMAT">
  <EXPRNODE NAME="PRECISION" VALUE="3"/>
  <EXPRNODE NAME="SHOW_SIGN" VALUE="FALSE"/>
  <EXPRESSION TYPE="FLOAT" NAME="CONST">
    <EXPRNODE NAME="VALUE" VALUE="8.99"/>
  </EXPRESSION>
</EXPRESSION>

```

## STRING PERL

STRING expressions return text strings. They are used to manipulate non-numeric data. The STRING PERL expression uses Perl to manipulate the data.

The Perl code is contained in an `EXPRBODY` element. The Zinc Perl module provides classes and methods for gaining access to and manipulating the current record. Objects accessed from Perl are copies of the current data; changing the Perl objects has no effect on the current data until a function is called to explicitly copy the Perl objects back.

Endeca recommends that you perform record manipulation with the `PERL_MANIPULATOR` element rather than with the `EXPRESSION` and `RECORD_MANIPULATOR` elements. However, if you need to access and modify dimension sources (such as a dimension adapter or dimension server) you should still use expressions such as `DVAL PERL`. The Perl manipulator does not access dimension sources.

See the `EXPRESSION` element for DTD and attribute information.

### Example

```
<EXPRESSION TYPE="STRING" NAME="PERL">
  <EXPRBODY>
    ...your Perl code here. The VOID PERL topic has an example...
  </EXPRBODY>
</EXPRESSION>
```

## STRING REPLACE

STRING expressions return text strings. They are used to manipulate non-numeric data. The STRING REPLACE expression returns a string where sections of the string have been replaced by another string.

The replacement occurs by taking an input string from a sub-expression, and replacing all occurrences of a sub-string specified by a `TARGET` expression node, with a replacement sub-string, specified by a `REPLACEMENT` expression node. The sub-expression may be a `PROPERTY` or a `STRING` expression.

See the `EXPRESSION` element for DTD and attribute information.

### Example

This example replaces "cwd" in paths with the current working directory.

```
<EXPRESSION TYPE="VOID" NAME="UPDATE">
  <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Document.Body" />
  <EXPRESSION TYPE="STRING" NAME="REPLACE">
    <EXPRNODE NAME="TARGET" VALUE="[cwd]" />
    <EXPRNODE NAME="REPLACEMENT" VALUE="&cwd;" />
  <EXPRESSION TYPE="PROPERTY" NAME="IDENTITY">
    <EXPRNODE NAME="PROP_NAME" VALUE="Endeca.Document.Body" />
  </EXPRESSION>
</EXPRESSION>
</EXPRESSION>
```





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