Sitecore CMS 6.6

Segment Builder Developer's Guide

A developer's guide to using the Segment Builder API.

Introduction

The Segment Builder component is used to get a list of visitors that matches certain criteria from the Analytics database. This component is used by the Engagement Automation to add a segment to a state of an automation plan. For more information, see the *Engagement Automation Cookbook* — section *Adding a Segment to a State*.

This guide is a combined API reference and a developer's guide. It describes how the Segment Builder works with Sitecore Engagement Automation functionality.

Developers can use the Segment Builder component to:

- Use the dialog to get visitors from selected segments.
- Create new Segment Builder rules.

Using the Segment Builder Dialog

This chapter describes how to:

- Programmatically open the dialog.
- Get the visitors from a segment that is described by a collection of rules (result of the dialog). This is the first part of the document.

Accessing the Segment Builder

To open the Segment Builder dialog and allow end users to get a list of visitors from the Analytics database that matches a certain criteria, you must:

1. Use the following code to open the dialog:

```
var url = new UrlString(Sitecore.Context.Site.XmlControlPage);
url["xmlcontrol"] = "Sitecore.Shell.Applications.Analytics.SegmentBuilder";
var handle = new UrlHandle();
handle["Value"] = <rules value>; //when updating an existing rule, pass the XML
created previously, otherwise - use string.Empty.
handle.Add(url);
SheerResponse.ShowModalDialog(url.ToString(), "800px", "600px", string.Empty, true);
args.WaitForPostBack();
```

2. On the dialog, select various criteria and click **OK**.
3. You can then implement the post back action and get the dialog result. The result is a string that describes the rules. You can use the Segment Builder to convert these rules to a set of criteria and later on to an SQL statement. The following code snippet describes this action:

```
if (args.IsPostBack)
{
    if (args.HasResult)
    {
        var value = args.Result == "-" ? string.Empty : args.Result;
        //processing the value code here. Use SegmentBuilder class to get number of
          visitors of list of Visitor IDs:
        //var segmentBuilderHelper = new
          Sitecore.Shell.Applications.Analytics.SegmentBuilder.SegmentBuilder();
        //int count = segmentBuilderHelper.GetVisitorCount(value);
    }
    return;
}
```

4. Based on this result, you can then implement the code to get the number of visitors or visitor IDs that match the specified user rules.

The following example describes `SegmentBuilderRules` class. This class describes how to open Segment Builder dialog and save its result. The result is saved in the regular *Rules* format.

```
namespace Sitecore.Shell.Applications.ContentEditor
{
    using Sitecore.Diagnostics;
    using Sitecore.Text;
    using Sitecore.Web;
    using Sitecore.Web.UI.Sheer;

    /// <summary>
    /// The segment builder rules.
```

```
            /// </summary>
            public class SegmentBuilderRules : Rules
            {
                /// <summary>
                /// Edits the text.
                /// </summary>
                /// <param name="args">The arguments.</param>
                protected override void Edit(Sitecore.Web.UI.Sheer.ClientPipelineArgs args)
                {
                    Assert.ArgumentNotNull(args, "args");

                    if (this.Disabled)
                    {
                        return;
                    }

                    if (args.IsPostBack)
                    {
                        if (args.HasResult)
                        {
                            this.Value = args.Result == "-" ? string.Empty : args.Result;
                            SheerResponse.SetAttribute(this.ID, "value", this.Value);
                            SheerResponse.SetModified(true);
                            this.Refresh();
                        }

                        return;
                    }

                    var value = this.Value;
                    if (value == EditorConstants.NoValue)
                    {
                        value = string.Empty;
                    }

                    Assert.IsNotNull(Sitecore.Context.Site, "site");
                    var url = new UrlString(Sitecore.Context.Site.XmlControlPage);
                    url["xmlcontrol"] =
                     "Sitecore.Shell.Applications.Analytics.SegmentBuilder";
                    var handle = new UrlHandle();
                    handle["Value"] = this.Value;
                    handle.Add(url);

                    SheerResponse.ShowModalDialog(url.ToString(), "800px", "600px",
                     string.Empty, true);

                    args.WaitForPostBack();
                }
            }
        }
```

Getting the Visitor from a Rule Collection

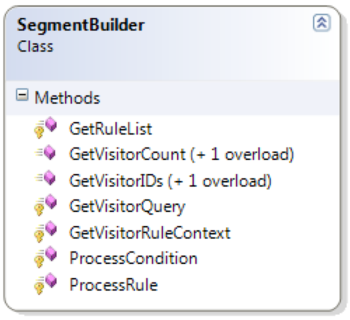
This section describes the important classes, functionalities, parent classes, implementation, methods, and properties in the Segment Builder. Each section presents an important module in the API. Each section contains a description of the class and some tables that describe the properties and methods of this class.

You can also use the following classes to get the visitor's information.

Sitecore.Shell.Applications.Analytics.SegmentBuilder.SegmentBuilder

The `SegmentBuilder` class contains the methods that you can use to get the `VisitorIds` that match to selected rules.

This is a class-helper that gets a list of visitor IDs from the result that you get from the Segment Builder dialog. This result is a string value with serialized list of segments defined in the dialog. Each segment is a combination of segment builder rules.



The following table describes the public methods in the `SegmentBuilder` class and their overloads:

Method	Description

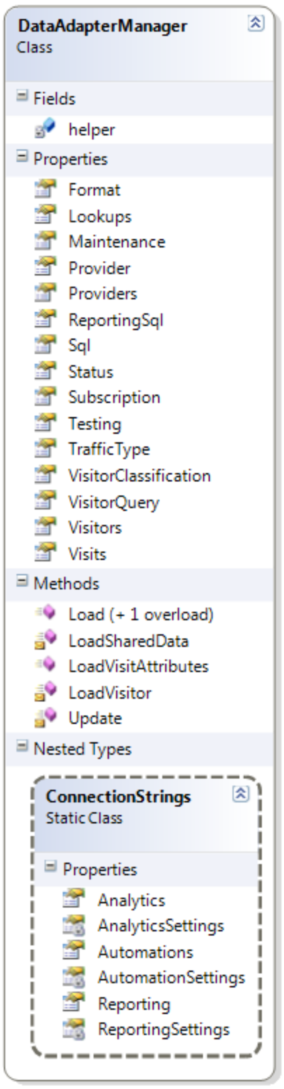
`int GetVisitorCount( string rules, Database database)`	Gets the number of the site visitors.
	The `rules` parameter is a string that represents segment builder rules. The `database` parameter contains the definitions of the rules items.
	For example:
	`<visitorFilters>`
	`<rule uid=\"{F3C60029-4911-4EDA-B8E4-732B81EE17C9}\">`
	`<conditions>`
	`<condition id=\"{CB7EAA5E-3D4D-41DF-8453-34DB6FCE2F9E}\" uid=\"2EE7B61586224E01AC71CAB9C5E819DF\" automationids=\"{D036CAB9-B2F5-4176-A67F-82081463B78E}|{1A9E3116-8D42-46C5-BAD1-FD4D9B342826}\" />`
	`</conditions>`
	`</rule>`
	`</visitorFilters>`
	To process the rule, the method gets the item from the specified database and executes the rule.
	In the content tree, you can navigate to the Segment Builder rule items using the following path:
	`Master/sitecore/system/Settings/Rules/Segment Builder`
	For more information about the rule engine, see the *Rule Engine Cookbook*.

`int GetVisitorCount( string rules)`	This is an overload of the previous method. It gets the number of visitors. It assigns the database value to `Client.ContentDatabase` that is equal to the context database.
`Enumerable<Guid> GetVisitorIDs( string rules, Database database)`	This method is the similar to previous two methods. The only difference is that it returns list of visitor IDs that match specified rules.
`IEnumerable<Guid> GetVisitorIDs( string rules)`	This is an overload of the previous method. It takes the rules and gets the IDs of the visitors. It assigns the database value to `Client.ContentDatabase` that is equal to the context database.

Note
To get other visitor related information, you should use the following class in the Engagement Analytics API: `Sitecore.Analytics.Data.DataAccess.VisitorFactory.GetVisitor`.

Sitecore.Analytics.Data.DataAccess.DataAdapters.DataAdapterManager

The `DataAdapterManager` class defines the data adapter manager that redirects method calls to the `DataAdapterProvider` class.



DataAdapterManager
Class

Fields
- helper

Properties
- Format
- Lookups
- Maintenance
- Provider
- Providers
- ReportingSql
- Sql
- Status
- Subscription
- Testing
- TrafficType
- VisitorClassification
- VisitorQuery
- Visitors
- Visits

Methods
- Load (+ 1 overload)
- LoadSharedData
- LoadVisitAttributes
- LoadVisitor
- Update

Nested Types

ConnectionStrings
Static Class

Properties
- Analytics
- AnalyticsSettings
- Automations
- AutomationSettings
- Reporting
- ReportingSettings

The following table describes the properties of the `DataAdapterManager` class that belongs to the Segment Builder: For information about the other properties, see the *Engagement Analytics API Reference Guide*.

Property	Description
`VisitorQuery VisitorQuery`	This class has two functionalities: • It is the base class for the `GetVisitorIDsSql` and `GetVisitorCountSql` methods that you can use to convert the visitor Query to a statement that can be executed in the DBMS to get the number of visitors and their IDs. • Gets the visitor query. In the Analytics database, it accesses rule items in the that reference the rule classes. These classes are used to construct the query. **Note** You can use inherited classes like the `SqlVisitorQuery` class to convert data that is stored in this object into the appropriate SQL or Oracle statements.
`VisitorBase Visitors`	Gets the visitors. You can also use this property to get the number of the visitors or the visitors IDs from the constructed `VisitorQuery` object.

The methods of this class are not part of the segment builder. They are part of the Engagement Analytics API.

Creating a Segment Builder Rule

This chapter describes how to create a new rule class. It presents all relevant classes in the `Sitecore.Analytics.Data.DataAccess.DataAdapters` namespace.

Segment Builder Rule API

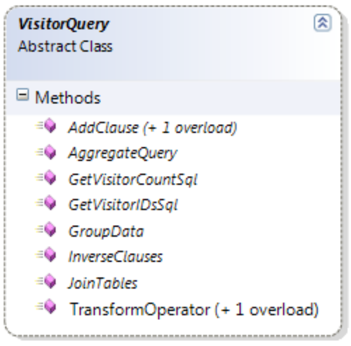
The following sections present the classes that exist in the `DataAdapters` namespace. This namespace is part of the Engagement Analytics API. However, you should use it to create the Segment Builder rules.

Sitecore.Analytics.Data.DataAccess.DataAdapters.VisitorQuery

`VisitorQuery` is an abstract class that contains the main methods that manipulate the visitor's query. It contains the methods that are invoked by the rule implementations to construct the condition query. This query that is executed on the Analytics database.

You can use it to:

- Aggregate the criteria to select the visitors and group them in a segment. This is done using the methods: `AddClause`, `AggregateQuery`, and `JoinTables`.
- Generate SQL statements that are based on the aggregated criteria. You can execute these statements in the Analytics database. For example, you can:
    - Use `GetVisitorCountSql` to get the SQL statement that is executed in the DBMS to get the number of visitors
    - Use `GetVisitorIDsSql` to get the SQL statement that is executed in the DBMS to get a list of the visitor IDs.



The following table describes the methods of the `VisitorQuery` class:

Method	Description

`void AddClause(`
`    ClauseBase left,`
`    ClauseBase right,`
`    ClauseOption option,`
`    string group)`
	Takes the left and right operands of the clause, the logical operator, the group name, and adds the clause to the query.
	The `group` parameter is a unique name for the query that is generated by every rule. All the queries that have the same group name are combined using parenthesis.
	
	Example:
	`AddClause("a=b", "c=d", "and" , "group1");`
	`AddClause("e=f", "g=h", "and" , "group2");`
	
	In this example, you have different groups. Therefore, the SQL query is:
	`Select…`
	`from…`
	`where (a=b and c=d) or (e=f and g=h)`
	
	Example:
	`AddClause("a=b", "c=d", "and" , "group1");`
	`AddClause("e=f", "g=h", "and" , "group1");`
	
	In this example, you have the same groups. Therefore, the SQL query is:
	`Select…`
	`from…`
	`where (a=b and c=d or e=f and g=h)`

`void AddClause(`
`    ClauseBase clause,`
`    string group)`
	Takes the clause, the group name, and adds the clause.

`void AggregateQuery(`
`    VisitorQuery query,`
`    ClauseOption option)`
	Takes the visitor query clauses, logical operator and generates a clause that contains all the registered clauses associated with the operation.

`string`
`GetVisitorCountSql(`
`    out object[]`
`    parameters)`
	Takes the parameter `parameters` and returns the SQL statement that counts the visitors.
	`Parameters` is an array of parameters that are passed with the SQL statement to the database to get the result.

`string GetVisitorIDsSql(`
`    out object[]`
`    parameters)`
	Takes the parameters and returns a string that contains an SQL statement.
	This SQL statement returns a list of Visitor IDs. These Visitor IDs match the criteria that is aggregated according to the specified rules.

`void GroupData(`
`    AnalyticsTable table,`
`    string column)`
	Takes the analytics table, column name, and groups data by this column name.

Method	**Description**
`void InverseClauses()`	Takes all clauses that are added to the `VisitorQuery` object, aggregates them and then negates them. Inversing means negating or adding the logical operator `Not`. Example: Suppose you have the letters: `A`, `B`, `C`, `D` and the clause `letter > B` that returns `C` and `D`. The inverted clause is then: `Not(letter > B)` or `letter <= B` and consequently returns `A` and `B`. Example: Suppose you have the same letters: `A`, `B`, `C`, `D`, and the clause: `letter = A OR letter > C.` The inverted clause is then: `Not(letter = A OR letter > C)` and consequently returns `B` and `C`. This is used when you have the `except where` rule. For example, `except where visitor from UK` The previous rule means *NOT (user from UK)*.

`void JoinTables(`
`AnalyticsTable`
`tableLeft,`
`string columnLeft,`
`AnalyticsTable`
`tableRight,`
`string columnRight)`
	Takes the analytics left table, left column, analytics right table, right column, and joins the tables.

`QueryConditionOperator`
`TransformOperator(`
`ConditionOperator`
`@operator)`
	Takes the rule related logical operator and transforms it into an operator that `VisitorQuery` supports.
	
	For example, the rules engine supports two types of logical operators:
	`greater` and `equal`

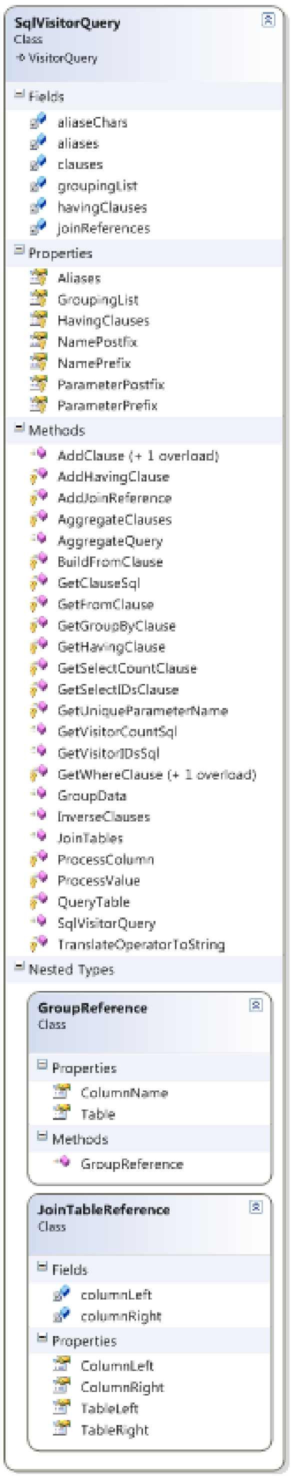
`QueryConditionOperator`
`TransformOperator(`
`StringConditionOperator`
`@operator)`
	Takes the rule engine related string operator and transforms it into an operator that `VisitorQuery` supports.
	For example, the rules engine supports two types of string operators:
	`contains` and `startwith`.
	The developers use this method if they are writing their own conditions and need to convert the operators that are selected in the rules into query operations.

Sitecore.Analytics.Data.DataAccess.DataAdapters.Sql.SqlVisitorQuery

You can use the `SqlVisitorQuery` class to generate queries as SQL statement.

Since the base class `VisitorQuery` is abstract, you always will work with `SqlVisitorQuery` or `OracleVisitorQuery`.

The `OracleVisitorQuery` class has the same functionality as `SqlVisitorQuery` but for Oracle databases.

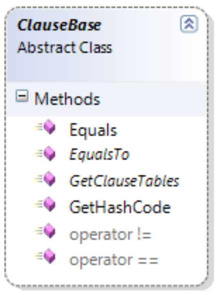


The properties of the `SqlVisitorQuery` class are private and read-only.

The methods of this class are described in the `VisitorQuery` class description section.

Sitecore.Analytics.Data.DataAccess.DataAdapters.ClauseBase

This is the base class for all the classes that handle the rule clause. It defines the common methods and properties of the clause.



The following table describes the methods of the `ClauseBase` class:

Method	Description
`bool Equals( object obj)`	Is the regular C# `Equal` method and it determines whether or not the specified clause object is equal to that of the current clause.
`bool EqualsTo( ClauseBase clause)`	Determines whether or not the specified clause is equal to the current clause. It is a special version of the previous method that only compares `ClauseBase` objects.
`AnalyticsTable[] GetClauseTables()`	Returns the array of tables that are used in the clause.
`int GetHashCode()`	Returns the hash code for the current clause. This hash code is suitable for hashing algorithms and data structures in a hash table.

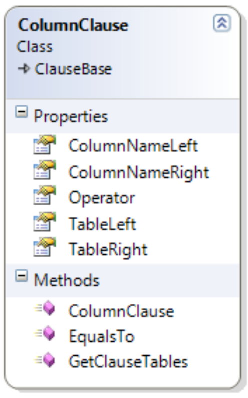
Sitecore.Analytics.Data.DataAccess.DataAdapters.ColumnClause

You can use the `ColumnClause` clause in a query that compares two columns of two tables.

For example:

```
      Viritors.VisitorId = AutomationStates.VisitorId
```

This class works with two operands *left* and *right* that represent the table columns and the conditional operator.



The following table describes the properties of the `ColumnClause` class:

Property	Description
`string ColumnNameLeft`	Represents the column name in the left operand of the clause. In the previous example, `ColumnNameLeft` is assigned to `VisitorId`
`string ColumnNameRight`	Represents the column name in the right operand of the clause.
`QueryConditionOperator Operator`	Represents the logical operator.
`AnalyticsTable TableLeft`	Represents the table name in the left operand. In the previous example, `TableLeft` is assigned to `Visitors`
`AnalyticsTable TableRight`	Represents the table name in the right operand.

The following table describes the methods of the `ColumnClause` class:

Method	Description
`ColumnClause( AnalyticsTable tableLeft, string columnNameLeft, AnalyticsTable tableRight, string columnNameRight, QueryConditionOperator @operator)`	Initializes a new instance of the `ColumnClause` class.
`bool EqualsTo( ClauseBase obj)`	Determines whether or not the clauses are the same. **Note** You should not use this method. It is reserved for the internal logic.
`AnalyticsTable[] GetClauseTables()`	Returns an array of the tables that are used in the clause.

Sitecore.Analytics.Data.DataAccess.DataAdapters.ComplexClause

A complex clause is a clause that contains two or more logical expressions that are associated with a logical operator, such as `and` and `or`.

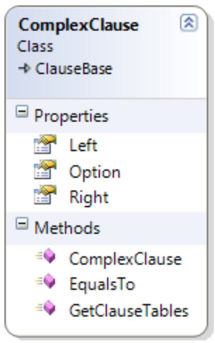
For example:

```
select VisitorId from Visitors as v where v.ExternalUser= 'someuser' and v.Value > 5
```

This query consists of two clauses associated by the `and` operator. To construct the complex clause in this query, you should use the following code snippet:

```
var clauseLeft = new ValueClause(AnalyticsTable.Visitors, “ExternalUser”, “someuser”,
QueryConditionOperator.Equal);
var clauseRight = new ValueClause(AnalyticsTable.Visitors, “Value”, 5,
QueryConditionOperator.GreaterThan);
var clause = new ComplexClause(clauseLeft, ClauseOption.And, clauseRight);
query.AddClause(clause, “somegroupname”);
```

This is an example and you can also use the `AddClause` method in the `VisitorQuery` class that accepts two clauses and an operator.



The following table describes the properties of the `ComplexClause` class:

Property	Description
`ClauseBase Left`	Represents the left clause of the statement.
`ClauseOption Option`	Represents the logical operator that is used to aggregate the clause.
`ClauseBase Right`	Represents the right clause of the statement.

The following table describes the methods of the `ComplexClause` class:

Method	Description
`ComplexClause( ClauseBase left, ClauseBase right, ClauseOption option)`	Takes the left and right clauses, logical operator and initializes the complex clause.

Method	Description
`bool EqualsTo( ClauseBase obj)`	Determines if the specified clause is equal to the current complex clause. **Note** You should not use this method. It is reserved for the internal logic.
`AnalyticsTable[] GetClauseTables()`	Returns an array of the tables that are used in the complex clause.

Sitecore.Analytics.Data.DataAccess.DataAdapters.HavingClause

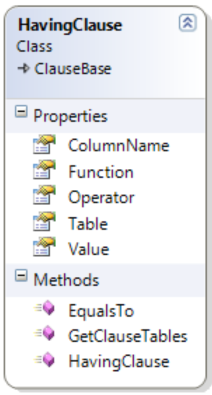
You can use this clause in your query to describe the `Having` clause. For more information, see the article Having (Transact-SQL) in the Microsoft Developer Network.

The `Having` clause has the following format:

`HAVING <AggregateFunction>(<ColumnName>) <QueryConditionOperator> <Value>`

For example:

```
        HAVING Count(LineTotal) > 100
```



The following table describes the properties of the `HavingClause` class:

Property	Description
`string ColumnName`	Represents the name of the column that is used in the `Having` clause.
`AggregateFunction Function`	Represents the function that is used in the `Having` clause. **Note** `AggregateFunction` currently supports `Count` and `DistinctCount`.
`QueryConditionOperator Operator`	The operator that is used in the `Having` clause.
`AnalyticsTable Table`	The table that is used in the `Having` clause.
`object Value`	The value to compare the function value with.

The following table describes the methods of the `HavingClause` class:

Method	Description
`bool EqualsTo( ClauseBase obj)`	Determines if the clause object is equal to the current `Having` clause. **Note** You should not use this method. It is reserved for the internal logic.
`AnalyticsTable[] GetClauseTables()`	Returns an array of the tables that are used in the `Having` clause.

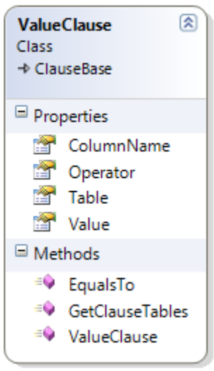
Method	Description
`HavingClause( AnalyticsTable table, string columnName, AggregateFunction function, object value, QueryConditionOperator @operator)`	Initializes a new instance of the `HavingClause` class.

Sitecore.Analytics.Data.DataAccess.DataAdapters.ValueClause

You should use this clause in the query that compares a table column with a value.

For example:

```
      Visitors.VisitorNumber = 5
```



The following table describes the properties of the `ValueClause` class:

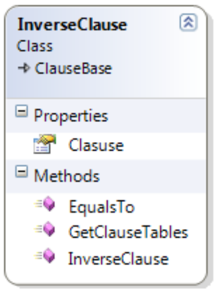
Property	Description
`string ColumnName`	The column name to compare the value with.
`QueryConditionOperator Operator`	The comparison operator.
`AnalyticsTable Table`	The table that the column belongs to.
`object Value`	The value to compare the column with.

The following table describes the methods of the `ValueClause` class:

Method	Description
`bool EqualsTo( ClauseBase obj)`	Determines whether or not the clause object is equal to the current value clause. **Note** You should not use this method. It is reserved for the internal logic.
`AnalyticsTable[] GetClauseTables()`	Gets an array of the tables that are used in the value clause.
`public ValueClause( AnalyticsTable table, string columnName, object value, QueryConditionOperator @operator)`	Initializes a new instance of the `ValueClause` class.

Sitecore.Analytics.Data.DataAccess.DataAdapters.InverseClause

You can use the `InverseClause` class to negate the specified clause, you should use the.



The following table describes the only property of the `InverseClause` class:

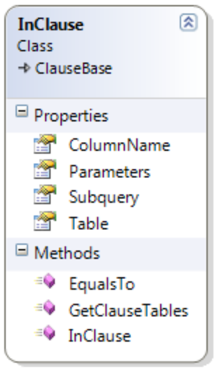
Property	Description
`ClauseBase Clause`	The clause object to be negated.

The following table describes the methods of the `InverseClause` class:

Method	Description
`bool EqualsTo( ClauseBase obj)`	Determines whether or not the clause object is equal to the current `inverse` clause. **Note** You should not use this method. It is reserved for the internal logic.
`AnalyticsTable[] GetClauseTables()`	Gets an array of the tables that are used in the clause.
`InverseClause( ClauseBase clause)`	Initializes a new instance of the `InverseClause` class.

Sitecore.Analytics.Data.DataAccess.DataAdapters.InClause

You can use this clause in your query to describe the `IN` clause. For more information, see the article In (Transact-SQL) in the Microsoft Developer Network.



The following table describes the properties of the `InClause` class:

Property	Description
`string ColumnName`	The name of the column to use as a left operand of `IN` clause.
`object[] Parameters`	The parameters of `subquery`.
`string Subquery`	The `subquery` that is used as a right operand of `IN` clause.
`AnalyticsTable Table`	The table that the `ColumName` column belongs to.

The following table describes the methods of the `InClause` class:

Method	Description
`bool EqualsTo( ClauseBase obj)`	Determines whether or not the clause object is equal to the current `IN` clause. **Note** You should not use this method. It is reserved for the internal logic.
`AnalyticsTable[] GetClauseTables()`	Gets an array of the tables that are used in the clause.

Method	Description
`InClause( AnalyticsTable table, string columnName, string subquery, object[] parameters)`	Initializes a new instance of the `InClause` class.

Creating a Segment Builder Rule as a Class

This section describes how to use the API of the Segment Builder to create a rule. This rule selects all the visitors who belong to a specific country.

The input parameters are:

- The name of the country.
- The string comparison operators — you can create a rule to specify an operator from a list.

Note
The Segment Builder supports all of the existing types of the rules operators.
These operators are defined in the Master database. To navigate to these rules in the content tree:
`/sitecore/system/Settings/Rules/Common/Operators` and
`/sitecore/system/Settings/Rules/Common/String Operators`

In the **Content Editor**, the creation the Segment Builder rules is the same as the creation of the regular Sitecore rules and not covered in this document.

Creating a Visitors Query

To implement a rule class, you should know the format that your SQL statement should follow. You should know which columns and tables to use.

For example, you can use the following SQL to search for certain visitors:

```
select v.VisitorId
from Visitors as v left join Visits as vi on v.VisitorId=vi.VisitorId
where vi.Country group by v.VisitorId
```

You should not worry about the `select` clause and the aliases because they are automatically created by the `VisitorQuery` class. You should only specify the tables and columns.

Creating the Rule Class

The rule that you are creating checks on the string value of the country name and supports the choice of the comparison operator. The rule class should be derived from the `Sitecore.Rules.Conditions.StringOperatorCondition<T>` class, where `T` is the rule's context:

```
public class CountryCondition<T> : StringOperatorCondition<T> where T :
VisitorRuleContext
{
}
```

The `StringOperatorCondition` class contains the `GetQueryOperator` method that returns the comparison operator of type `StringConditionOperator`. This comparison operator should be then converted to `QueryConditionOperator`.

Creating the Rule Parameter

You must represent the rule parameter by a property in the rule class.

```
        public string Value
        {
          get;
          set;
        }
```

You can specify `Country` as the rule parameter item and add it as a clause in the rule.

```
        string value = this.GetValue(ruleContext);
             var clause = new ValueClause(AnalyticsTable.Visits, "Country", value, @operator);
             ruleContext.VisitorQuery.AddClause(clause,
             ruleContext.GetUniqueConditionGroupName("CountryCondition"));
```

Creating the Rule Logic

In the `CountryCondition<T>` rule class, you must override the `Execute` method that is based on `StringOperatorCondition<T>`.

You must override the `Execute` method to implement the rule logic:

```
        protected override bool Execute([NotNull] T ruleContext)
        {
          Assert.ArgumentNotNull(ruleContext, "ruleContext");
        }
```

Putting it All Together

Now, you already know the requirements of creating a class to represent a Segment Builder rule.

This rule creates a query as an SQL statement.

The following class:

1. Converts the comparison operator of type `StringConditionOperator` to an operator of type `QueryConditionOperator`.
2. Gets the country name and pass it as a rule parameter.
3. Creates the new query context and the appropriate clause.
4. Add the created clause to the query.

```
         public class CountryCondition<T> : StringOperatorCondition<T> where T :
         VisitorRuleContext
         {
           public string Value { get; set; }
           protected override bool Execute([NotNull] T ruleContext)
           {
             Assert.ArgumentNotNull(ruleContext, "ruleContext");
             //converting string operator to query one.
             QueryConditionOperator @operator = this.GetQueryOperator(ruleContext);
             if (@operator == QueryConditionOperator.Unknown)
             {
               Log.Warn("Cannot evaluate visit condition. Condition operator is not defined.",
               this);
               return true;
             }

             //creating rule context with clause
             var innerContext = VisitorRuleContext.Create(ruleContext.Item) as T;
             Assert.IsNotNull(innerContext, "right context");
             //join the necessary tables
             innerContext.VisitorQuery.JoinTables(AnalyticsTable.Visitors, "VisitorId",
             AnalyticsTable.Visits, "VisitorId");
             //grouping data by the visitor's ID.
             innerContext.VisitorQuery.GroupData(AnalyticsTable.Visitors, "VisitorId");
             //Add the country clause.
```

```
          this.AddClause(innerContext);
          object[] parameters;
          //Retrieving the SQL from the temporary query. This is a part of the method and
          should be the same for almost any rule. The final version of the SQL should look
          like "select VisitorId from Visitors where VisitorId IN (<select SQL from rule1>)
          AND VisitorId IN (<select SQL from rule2>) ...". In this way, you ensure that you
          don't break the whole statement by our rule.
          string subquery = innerContext.VisitorQuery.GetVisitorIDsSql(out parameters);
          var inClause = new InClause(AnalyticsTable.Visitors, "VisitorId", subquery,
          parameters);
          ruleContext.VisitorQuery.AddClause(inClause,
          ruleContext.GetUniqueConditionGroupName("VisitCondition"));
          //return "true" at the end of the rule. This tells to the system that everything
          is fine and your rule should be considered.
          return true;
        }

        protected virtual void AddClause([NotNull] T ruleContext)
        {
          Assert.ArgumentNotNull(ruleContext, "ruleContext");
          QueryConditionOperator @operator = this.GetQueryOperator(ruleContext);
          if (@operator == QueryConditionOperator.Unknown)
          {
            Log.Warn("Cannot evaluate country condition. Condition operator is not
            defined.", this);
            return;
          }
          string value = this.GetValue(ruleContext);
          var clause = new ValueClause(AnalyticsTable.Visits, "Country", value, @operator);
          ruleContext.VisitorQuery.AddClause(clause,
          ruleContext.GetUniqueConditionGroupName("CountryCondition"));
        }

        protected virtual QueryConditionOperator GetQueryOperator([NotNull] T ruleContext)
        {
          Assert.ArgumentNotNull(ruleContext, "ruleContext");
          StringConditionOperator stringOprtator = this.GetOperator();
          return ruleContext.VisitorQuery.TransformOperator(stringOprtator);
        }

        protected virtual string GetValue([NotNull] T ruleContext)
        {
          Assert.ArgumentNotNull(ruleContext, "ruleContext");
          return this.Value ?? string.Empty;
        }
    }
```