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Using Active Reports to Create Reports for Interaction Reporter

Developer's Guide

Abstract

This document is a reference to author and integrate reports for Interaction Reporter using ActiveReports 6.1.2814.0.

For the latest version of this document, see the PureConnect Documentation Library at: <http://help.genesys.com/pureconnect>.

For copyright and trademark information, see https://help.genesys.com/pureconnect/desktop/copyright_and_trademark_information.htm.

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Introduction to Active Reports

The *Active Reports Developer's Guide* is a reference to create and integrate reports for Interaction Reporter using ComponentOne ActiveReports 6.1.2814.0.

The guide assumes that you:

- Installed ActiveReports on your development system.
- Are familiar with the basic concepts of report creation as illustrated on the ActiveReports help document installed with the product.

To use this guide, you should be familiar with the following .NET objects:

- `System.Data.DataSet`
- `System.Data.DataTable`

You should also be familiar with these programming concepts in C# .NET objects:

- Inheritance
- Implementing interfaces

Define the Data

The first step in report creation is defining the raw data. The reports in Interaction Reporter retrieve data from the PureConnect database by using stored procedures. The reports also retrieve some data using IceLib calls combined with database data for readability and display purposes.

For a report you create, you can use any method to retrieve data as long as the final object can bind to an `ActiveReports.DataSource` object. You can combine data from multiple sources in any way that you require and display the data in a report. For example, you can use:

- A `DataTable` within a `DataSet`.
- A `DataTable` by itself.
- An array of `DataRow`s returned from a `DataTable.Select()` method.
- Any collection of objects with the object properties bound to the text boxes on the report. This includes a collection that results from a call to a `Linq` expression.

You can refer to ComponentOne documentation for additional object types.

.NET `DataSet` objects can have multiple `DataTable` objects. For example, a stored procedure could execute multiple `SELECT`s, and the report could utilize all of them. A report could present summarized and detailed data on the same report or create a main report that calls a subreport.

Create the Stored Procedures for a Report

You can choose whether to use a stored procedure to source the data for a report. A report typically has the following stored procedures:

- Main procedure to contain all data for the report
- Count procedure to return the number of rows that meet the criteria from the `@WhereClause`. This is the procedure executed when the **Show Count** button is pressed in Interaction Reporter.
- Sample procedure to allow exploring a small set of data from the parameter screen.

When you create stored procedures, consider the following:

- In MS SQL Server, wrap the `SELECT` statement in an `EXEC` command. As a best practice, use `sp_executesql` for better performance and improved security.
- Most shipping reports take `@WhereClause` and `@OrderClause` input parameters that the engine passes to the procedure when the report executes.
- You can configure whatever parameters you require for a custom data as long as you pass the parameters when the report executes.

The following example shows SQL Server stored procedures for the Fax Detail report:

```
-----  
--sprpt_FaxDetail  
-----  
IF EXISTS  
  ( SELECT * FROM sysobjects  
    WHERE id = object_id(N'dbo.[sprpt_FaxDetail]')  
    and OBJECTPROPERTY(id, N'IsProcedure')  
  = 1)  
  DROP PROCEDURE dbo.[sprpt_FaxDetail]  
GO  
CREATE PROCEDURE [dbo].[sprpt_FaxDetail] ( @WhereClause nvarchar(4000),  
  @OrderClause nvarchar(2048) )  
AS  
SET NOCOUNT ON;  
exec(  
/* Fax detail activity: */  
'SELECT  
feh.Siteid,  
Sendername,  
Direction,  
successflag,
```

```

RemoteCSId,
RemoteNumber,
EnvelopeId,
FaxId,
Direction,
Speed,
CallIdKey,
ProcessingDatetime,
ProcessingDatetimeGmt,
FaxTimeStamp,
EnvelopeTimeStamp,
PortNumber,
Duration,
Speed,
PageCount,
FailureType,
LastName,
FirstName
FROM FaxEnvelopeHist feh
left outer join Individual i on i.icuserid = feh.SenderName '
+ @WhereClause + ' ' + @OrderClause)
go

-----
--sprpt_FaxDetail_samp
-----

IF EXISTS
( SELECT * FROM sysobjects
WHERE id = object_id(N'dbo.[sprpt_FaxDetail_samp]')
and OBJECTPROPERTY(id, N'IsProcedure') = 1)
DROP PROCEDURE dbo.[sprpt_FaxDetail_samp]
GO
CREATE PROCEDURE [dbo].[sprpt_FaxDetail_samp] (@ColName varchar(50),
@RecCountSamp integer, @Distinct integer)
AS
SET NOCOUNT ON;
DECLARE @DistinctStr varchar(8)
IF @Distinct = 1
    SET @DistinctStr = 'Distinct'
ELSE
    SET @DistinctStr = ''
exec(
/* Fax detail activity: */
'SELECT ' + @DistinctStr + ' top ' + @RecCountSamp + ' ' + @ColName +
' FROM FaxEnvelopeHist')
go

-----
--sprpt_FaxDetail_count
-----

IF EXISTS
( SELECT * FROM sysobjects
WHERE id = object_id(N'dbo.[sprpt_FaxDetail_count]')
and OBJECTPROPERTY(id, N'IsProcedure') = 1)
DROP PROCEDURE dbo.sprpt_FaxDetail_count
GO
CREATE PROCEDURE [dbo].[sprpt_FaxDetail_count] (@WhereClause
nvarchar(4000))
AS
SET NOCOUNT ON;
exec('SELECT count(*) from FaxEnvelopeHist ' + @WhereClause)
GO

```

The following example shows Oracle stored procedures for the Fax Detail report:

```

-----
--sprpt_FaxDetail
-----

CREATE OR REPLACE PROCEDURE sprpt_FaxDetail
(i_WhereClause IN varchar2
,i_OrderClause IN varchar2
,o_prc          OUT sys_refcursor)

```

```

AS
v_str varchar2(4000) := 'SELECT
feh.Siteid,
Sendername,
Direction,
successflag,
RemoteCSId,
RemoteNumber,
EnvelopeId,
FaxId,
Direction,
Speed,
CallIdKey,
ProcessingDatetime,
ProcessingDatetimeGmt,
FaxTimeStamp,
EnvelopeTimeStamp,
PortNumber,
Duration,
Speed,
PageCount,
FailureType,
LastName,
FirstName
FROM FaxEnvelopeHist feh
left outer join Individual i on i.icuserid = feh.SenderName '
|| i_WhereClause || ' ' || i_OrderClause
;
BEGIN
    dbms_output.put_line(v_str);    open

o_prc for v_str;
    commit;EXCEPTION
    WHEN OTHERS THEN
        DBMS_OUTPUT.PUT_LINE('Error in sprpt_FaxDetail

procedure. ');
        DBMS_OUTPUT.PUT_LINE(sqlerrm);
        RAISE;
END;
/

-----
--sprpt_FaxDetail_samp
-----

create or replace PROCEDURE sprpt_FaxDetail_samp
(i_ColName IN varchar2
,i_RecCount IN integer
,i_Distinct IN integer
,o_prc      OUT sys_refcursor
)
AS
v_DistinctStr varchar2(8);
v_str          varchar2(4000);BEGIN
    IF i_Distinct = 1 THEN
        v_DistinctStr := 'Distinct';
    ELSE
        v_DistinctStr := '';
    END IF;
/* Fax detail activity: */
    v_str := 'SELECT * FROM (SELECT ' || v_DistinctStr ||

' ' ||

```

```

i_ColName ||
' FROM FaxEnvelopeHist) WHERE ROWNUM <= ' || i_RecCount
; dbms_output.put_line(v_str); open

o_prc for v_str;
commit;EXCEPTION
WHEN OTHERS THEN
DBMS_OUTPUT.PUT_LINE('Error in sprpt_FaxDetail_samp
procedure. ');
DBMS_OUTPUT.PUT_LINE(sqlerrm);
RAISE;
END;
/

-----
--sprpt_FaxDetail_count
-----

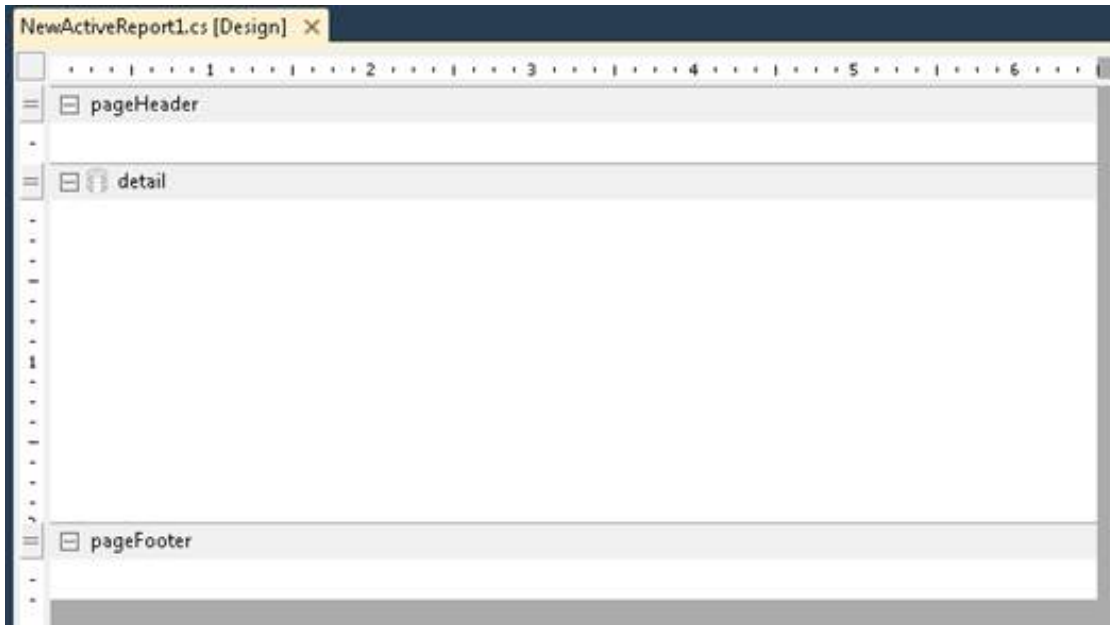
CREATE OR REPLACE PROCEDURE sprpt_FaxDetail_count
(i_WhereClause IN varchar2
,o_Count OUT NUMBER
)
AS
v_str varchar(4000) := 'SELECT count(*) from FaxEnvelopeHist ' ||
i_WhereClause;
BEGIN
dbms_output.put_line(v_str);
execute immediate(v_str) into o_count;
EXCEPTION
WHEN OTHERS THEN
DBMS_OUTPUT.PUT_LINE('Error in sprpt_FaxDetail_count
procedure. ');
DBMS_OUTPUT.PUT_LINE(sqlerrm);
RAISE;
END;
/

```

Create a report

Create a C# Class in Visual Studio

1. Open a new instance of Visual Studio.
2. Add a new item.
3. Select ActiveReports 6 (code-based) and name the report.
4. Click **Add** to add the report to your project and open it in design view. By default, your report contains a page header section, a detail section, and a page footer section.



Conform a Report to Interaction Reporter

Add the following references from the location of your installation of IC Business Manager:

- i3trace_dotnet_reader_interop-w32r-1-2.dll
- i3trace_dotnet_reader_interop-w32r-1-4.dll (If you have it.)
- ININ.Common.dll
- ININ.Reporting.Common.dll
- ININ.Reporting.Historical.Engine.Module.dll
- ININ.Reporting.Historical.Engine.Objects.dll
- ININ.Reporting.Historical.Engine.Reports.dll
- ININ.Reporting.MetadataAPI.dll

You must also complete the following to conform your report to Interaction Reporter:

- In the report's code, inherit from ReportBase to access standard report page header, footer, styles, and several useful utilities (Refer to "Appendix C: Properties and Methods").
- Add the IReport interface to the inheritance chain. Implement at least IReport's GetData to retrieve your data. This method is executed when the report is executed from the parameters page.
- If you would like to override the GetCount and GetSample methods, you can. These methods are implemented in ReportBase using information from the report metadata you enter in Interaction Administrator.

Because the ReportBase is a master report, you cannot change the report header, page header, report footer, or page footer sections. By definition of a master report in ActiveReports, a custom report is the detail and additional groups you add between these sections. The following properties on ReportBase have controls that you can change:

- PHeader is the DataDynamics.ActiveReports.PageHeader with get and set capability.
- GetReportHeader1 returns the DataDynamics.ActiveReports.ReportHeader section. You can override the title by using this property:

```
GetReportHeader1.Controls["txtReportTitle"].Text  
  
= "My Custom title";  
GetReportHeader1.Controls["txtSubtitle"].Text  
  
= "My Custom title";
```

The following example is code from the Fax report. In this example, the:

- GetSQLFragment() is the method to return the WHERE clause as a string based on the ParameterValue data stored in the GetReportData instance of ReportData.
- ReportTransaction is a class located in ININ.Reporting.Historical.Engine.Objects that wraps the methods to retrieve data from the database.
- StartQueryTimer() method and StopQueryTimer() method start and stop the timer and log this metric in the ICBusinessManager log file.

Design the Layout

To design the layout of a report, you can:

- [Place the Query Results in the Detail Section](#)
- [Add a Group Break to a Report](#)
- [Add a Group Summary](#)
- [Specify Additional Properties for Report Groups](#)
- [Add a Subreport](#)

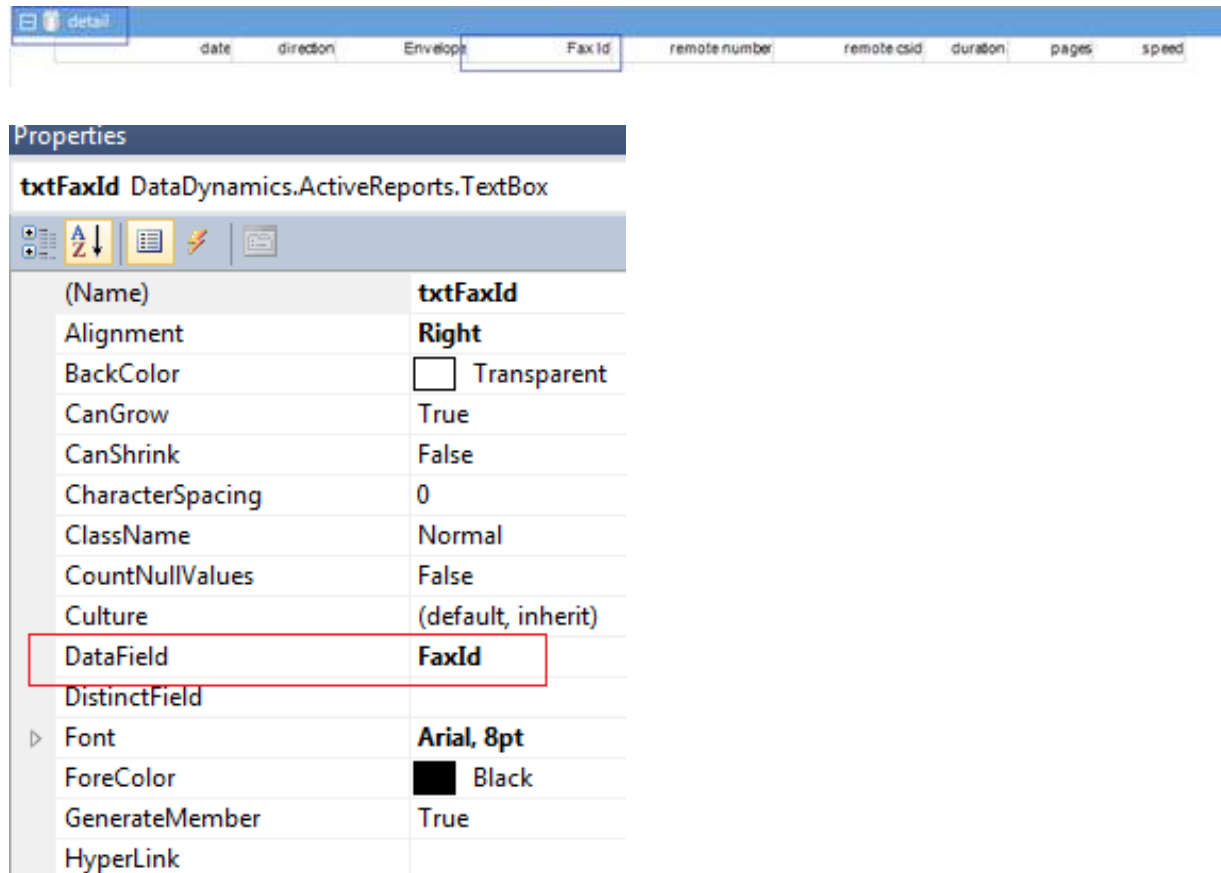
Place the Query Results in the Detail Section

Every column returned by your query is added to the `ActiveReport.Fields` collection. You can add custom data to this field collection that could serve you later to create complex calculations or just to handle a better layout.

Select the data from your query or from your custom data that you would like to display in the body of the report. The data generates one instance of the Detail section for each record from your query.

Place textboxes in the detail section to map to each Field. Select the **Datafield** property of the textbox. Enter the exact name or alias of the column from your query result that you want to display.

The following illustration shows adding the **Faxid** column as a **Datafield** property.



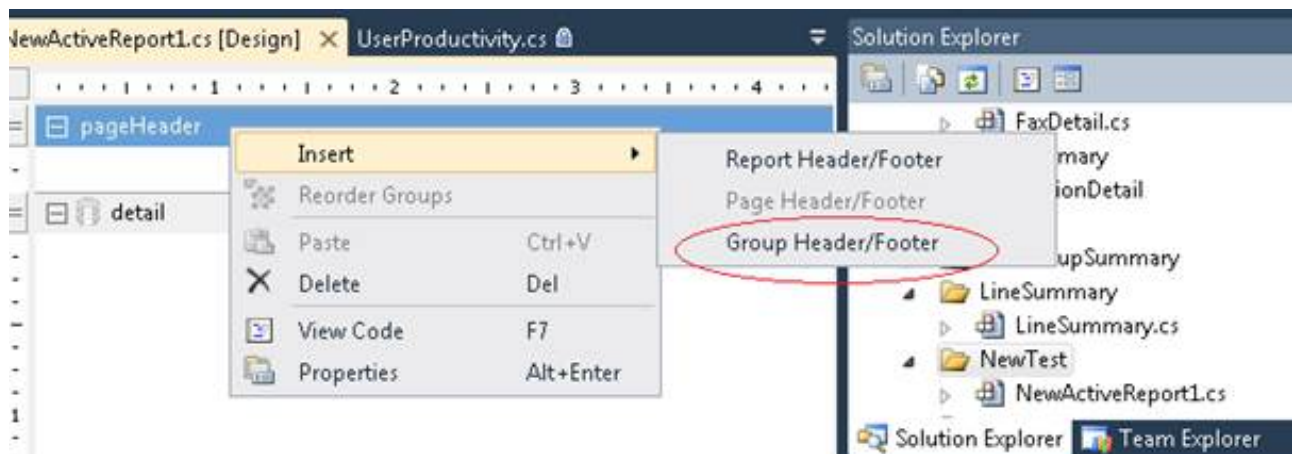
The screenshot shows a report design view with a table containing columns: date, direction, Envelope, FaxId, remote number, remote csid, duration, pages, and speed. Below the design view is the Properties window for a `txtFaxId` `DataDynamics.ActiveReports.TextBox`. The `DataField` property is highlighted with a red box and set to `FaxId`.

(Name)	txtFaxId
Alignment	Right
BackColor	<input type="checkbox"/> Transparent
CanGrow	True
CanShrink	False
CharacterSpacing	0
ClassName	Normal
CountNullValues	False
Culture	(default, inherit)
DataField	FaxId
DistinctField	
Font	Arial, 8pt
ForeColor	<input type="checkbox"/> Black
GenerateMember	True
HyperLink	

Add a Group Break to a Report

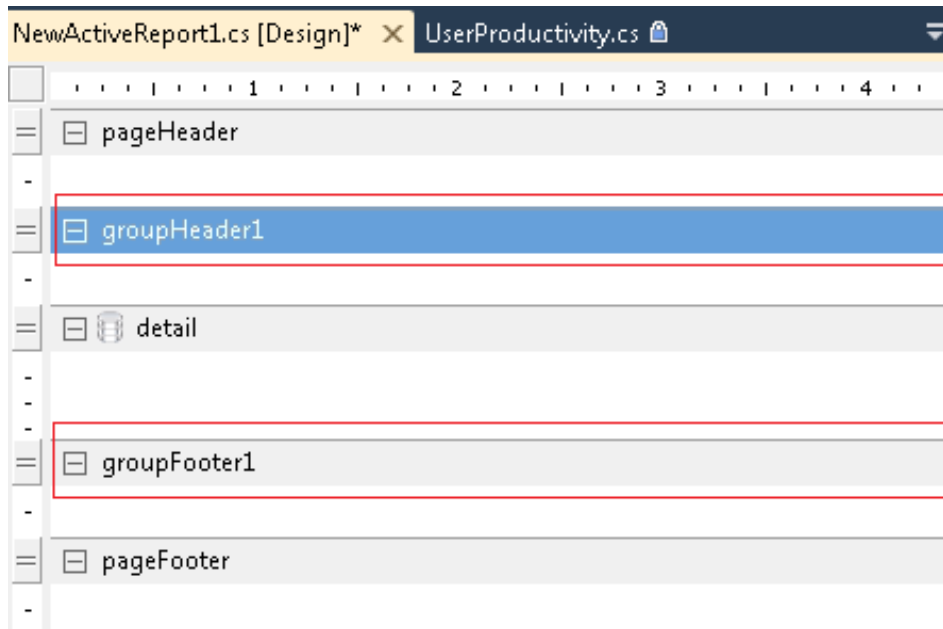
Add a group break to a report as needed. A group break uses a field from the query.

1. Select any section on the report. Right-click and select **Insert > Group Header/Footer**.

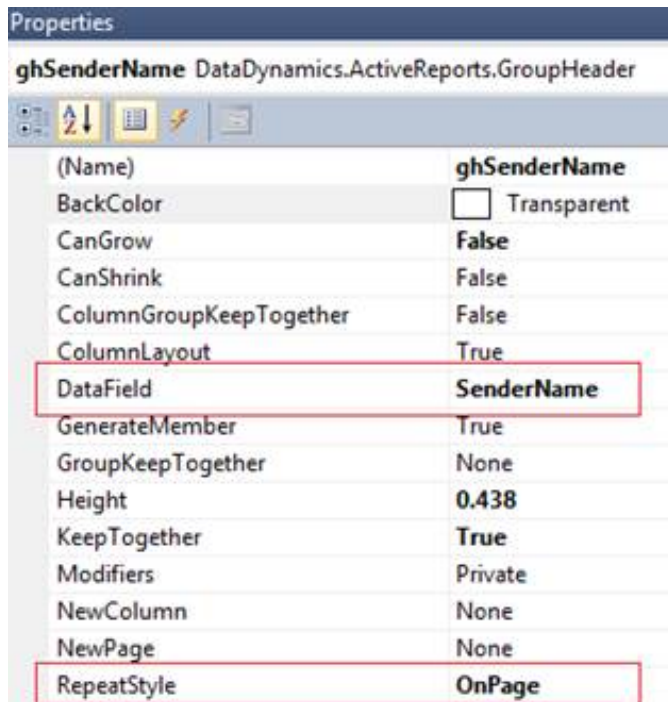


The screenshot shows a report design view with a context menu open over the `detail` section. The `Insert > Group Header/Footer` option is highlighted with a red circle. The Solution Explorer on the right shows the project structure, including `FaxDetail.cs`, `LineSummary`, and `NewActiveReport1.cs`.

Two new sections appear on the layout that correspond to the header and footer of the new group.



2. Select the group header, right-click and select **Properties**. Name the group and set the **DataField** property to map the column from your data that drives the group breaks in the report. Set the **RepeatStyle** property to **OnPage** to repeat all elements in this section on each page.



3. Add elements (for example, labels or textboxes) to the group header. In the FaxDetail report example, the **SenderName** group contains labels that serve as titles for each column in the detail section.

The screenshot shows a report design tool interface for 'FaxDetail.cs [Design]'. The report is divided into several sections:

- reportHeader1:** Contains a logo and the text 'Title' and 'SubTitle'. A 'debug info' label is visible in the top right.
- pageHeader:** A blank header section.
- gHSiteld:** A blank section.
- ghSenderName:** Displays 'Sender: sender' and 'Site ID:'.
- ghSenderName2:** A table with columns: Processing Date, Direction, Envelope, Fax ID, Remote Number, Remote CSId, Duration, Pages, Speed.
- detail:** A table with columns: date, direction, Envelope, Fax ID, remote number, remote csid, duration, pages, speed.
- gfSenderName2:** A blank section.
- ghSenderName:** A summary table:

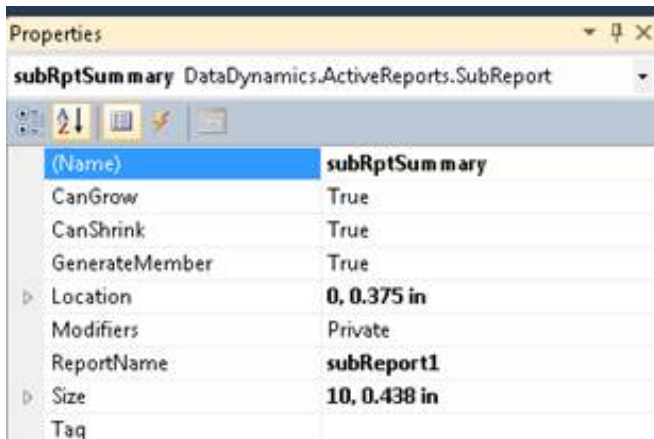
	Succeeded	Failed	Total	Duration	Avg_Duration
Total Inbound	is	if	countIn	durationIn	durationIn
Total Outbound	os	is	countOut	durationOut	durationIn
Total	ts	tf	tc	td	ta
- gfSiteld:** A blank section.
- pageFooter:** Contains 'Date', 'Category', 'Title footer', and 'reportInfoPages'.
- reportFooter1:** A blank footer section with a 'debug info' label in the bottom right.

4. Continue to add as many group breaks as the report requires. For example, create a group break for **Siteld**, **Userld**, and **Date**.

Add a Subreport

You can add one or more subreports to the main report. Limit the use of subreports in a repeating section because this consumes memory and can result in an Out of Memory error. To use a subreport in a repeating section, instantiate the subreport in the ReportStart event.

1. From the toolbox, drag a subreport object into the main report and use the name subRptSummary.



2. Add an ActiveReports class to the main report folder and use the name SubReportSummary.
3. In the main report, declare the constructor.

```
SubReportSummary _SumSubRpt = null;
```

4. In the ReportStart event of the Main report, initialize the subreport.

```
//Initialize subreport
if ( _SumSubRpt == null)
{
    _SumSubRpt = new SubReportSummary();
    this.subRptSummary.Report = _SumSubRpt;
}
```

5. In the Format event of the section where you place the subreport, set the data source for the subreport. Use a table from the GetData method of the main report that corresponds to the data to display on the subreport. You can use a complete table or part of a table based on the current value currently being iterated in the main report.

The following example uses a complete table for the subreport:

```
string filter = String.Format("InteractionID = '{0}'", ReportDataSet.Tables[ReportCommonConstants.FIRST_TABLE_INDEX].Rows[0]["InteractionID"].ToString());
subDetail.Report.DataSource = ReportDataSet.Tables["Events"].Select(filter, "serverutc");
```

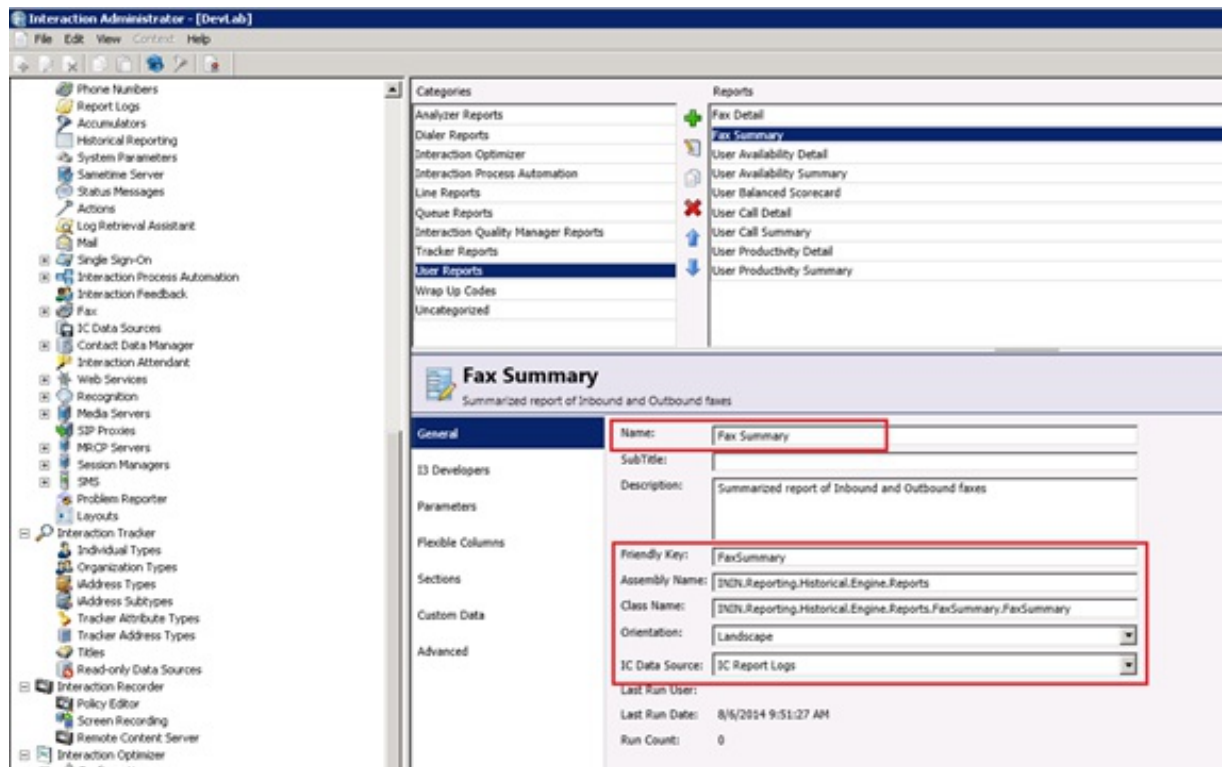
Configure a Report to Appear and Run in IC Business Manager

You configure a report in Interaction Administrator so that you can run the custom report from Interaction Reporter in IC Business Manager. You can add the report to an existing category or create a category in Interaction Administrator. After you add the report to a category, you can:

- Specify general report and data source information
- Add stored procedure information, if your report requires a stored procedure
- Add and configure parameters
- Set access control

General and data source information

The following illustration shows the general report information and the data source information for the Fax Summary report.



Stored procedure information

The following illustration shows the stored procedure information for the Fax Summary report.

Fax Summary
Summarized report of Inbound and Outbound faxes

General
13 Developers
Parameters
Flexible Columns
Sections
Custom Data
Advanced

Report Visible:

Report Type: Active Report

Stored Procedure: sprpt_FaxDetail

Stored Procedure Count: sprpt_FaxDetail_count

Stored Procedure Samp: sprpt_FaxDetail_samp

Linked Report Friendly Key:

Allow Edit Params:

Allow Count Button:

Require ACL:

Report Timeout Period (in seconds): 1800

Notes:

Parameters

A report can filter data by using parameters (for example, a date range). Interaction Reporter provides parameters that you can add to a report.

You can create a parameter based on classes. For example, to create a Date or a Time parameter, use the following class: `ININ.Reporting.HistoricalEngine.Module.Parameters.DateTimeRange`.

The following illustration shows the Assembly Name and the Class Name for the Date parameter in the Fax Summary report.

Fax Summary
Summarized report of Inbound and Outbound faxes

General
13 Developers
Parameters
Flexible Columns
Sections
Custom Data
Advanced

Date

Remote number
Sender Name

General | Data | Custom Data | Miscellaneous | SQL Table Columns

Name: Date

Name Resource: DATE

Description:

Description Resource:

Friendly Key: Date1

Assembly Name: ININ.Reporting.Historical.Engine.Module

Class Name: ININ.Reporting.Historical.Engine.Module.Parameters.ViewModels.DateTimeRange

Required:

License: _NO_LICENSE_REQUIRED_

The following illustration shows the User Control Assembly Name and the User Control Class Name for the Date parameter in the Fax Summary report.

Fax Summary

Summarized report of Inbound and Outbound faxes

General

13 Developers

Parameters

Flexible Columns

Sections

Custom Data

Advanced

Date

Remote number

Sender Name

General

Data

Custom Data

Miscellaneous

SQL Table Columns

Allow Sample:

Allow Or:

Allow And:

Parameter Type: SQL Filter

Visible:

User Control Assembly Name: ININ.Reporting.Historical.Engine.Module

User Control Class Name: ININ.Reporting.Historical.Engine.Module.Parameters.Views.DateTimeRange

The following table lists the assembly names and class names for parameters available in Interaction Reporter.

Name	class_name	user_control_class_name
Group Order	...ViewModels.AnalyzerKeywordSections	...Views.DualListSelector
Interval	...ViewModels.AnalyzerScoringInterval	...Views.ComboBoxParameter
Group Order	...ViewModels.AnalyzerScoringSections	...Views.DualListSelector
ACD Logged In	...ViewModels.Boolean	...Views.ComboBoxParameter
Group Report by	...ViewModels.CalibrationGroupBy	...Views.ComboBoxParameter
Calibration Only	...ViewModels.CalibrationOnlyYesNo	...Views.ComboBoxParameter
Call Type	...ViewModels.CallType	...Views.ComboBoxParameter
Date Time Range	...ViewModels.DateTimeRange	...Views.DateTimeRange
Period Type	...ViewModels.DialerInterval	...Views.ComboBoxParameter
Workgroup Queue	...ViewModels.DistributionQueue	...Views.TextBoxParameter
Call Duration	...ViewModels.Duration	...Views.Duration
Display Legends	...ViewModels.FormattingYesNo	...Views.ComboBoxParameter
Interaction Direction	...ViewModels.InteractionDirection	...Views.ComboBoxParameter
Media Type	...ViewModels.InteractionType	...Views.MediaType
Process	...ViewModels.IpaProcess	...Views.DualListSelector
Process Status	...ViewModels.IpaProcessStatus	...Views.ComboBoxParameter
Line	...ViewModels.LineComboBox	...Views.ComboBoxParameter
Subtotal By	...ViewModels.LineGroupBy	...Views.MultiCheckbox
Line Group	...ViewModels.LineGroupComboBox	...Views.ComboBoxParameter
Media Type	...ViewModels.MediaType	...Views.MediaType
Top N Results	...ViewModels.NumericUpDownBase	...Views.NumericUpDown
Date Range	...ViewModels.OptimizerDateRange	...Views.OptimizerDateRangeYear

Date Time	...ViewModels.OptimizerDateRangeMonth	...Views.OptimizerDateRangeMonth
exception	...ViewModels.OptimizerFilterViewModel	...Views.OptimizerFilterView
GroupBy	...ViewModels.OptimizerGroupByComboBox	...Views.ComboBoxParameter
Interval	...ViewModels.OptimizerIntervalComboBox	...Views.ComboBoxParameter
Order By	...ViewModels.OptimizerOrderByViewModel	...Views.OptimizerOrderByView
Target	...ViewModels.OptimizerTargetViewModel	...Views.NumericUpDown
Time zone	...ViewModels.OptimizerTimeZoneComboBox	...Views.ComboBoxParameter
Target Answered Service Level Percentage	...ViewModels.Percentage	...Views.NumericUpDown
Questionnaire Name	...ViewModels.QuestionnaireName	...Views.DataDrivenSelection
Interval Configuration	...ViewModels.QueueInterval	...Views.ComboBoxParameter
Group Order	...ViewModels.QueueSections	...Views.DualListSelector
Media Type	...ViewModels.RecorderMediaType	...Views.MediaType
Scheduling Unit	...ViewModels.SchedulingUnitViewModel	...Views.SchedulingUnitView
Service Level Format	...ViewModels.ServiceLevelFormat	...Views.ComboBoxParameter
Status	...ViewModels.Status	...Views.ComboBoxParameter
Report Flag	...ViewModels.StringParameter	...Views.TextBoxParameter
Target Service Level Calculation	...ViewModels.TargetAnsweredCalc	...Views.ComboBoxParameter
User	...ViewModels.User	...Views.AutoCompleteComboBox
Last Name	...ViewModels.UserLastName	...Views.AutoCompleteComboBox
Recorded IC User	...ViewModels.UserList	...Views.UserList
Group Order	...ViewModels.WrapUpSections	...Views.DualListSelector
Contacted	...ViewModels.YesNo	...Views.ComboBoxParameter

For the parameters listed in the above table:

- Use `ININ.Reporting.Historical.Engine.Module` as the assembly name.
- Replace ... in the `class_name` and `user_control_class_name` with `ININ.Reporting.Historical.Engine.Module.Parameters`.

Access control

You can set the report to use access control. The access control for a report follows the same rules that Interaction Administrator uses for access control in other products.

The following illustration shows that the Fax Summary report requires access control.

Fax Summary

Summarized report of Inbound and Outbound faxes

General	Report Visible	<input checked="" type="checkbox"/>
13 Developers	Report Type:	Active Report
Parameters	Stored Procedure:	sprpt_FaxDetail
Flexible Columns	Stored Procedure Count:	sprpt_FaxDetail_count
Sections	Stored Procedure Samp:	sprpt_FaxDetail_samp
Custom Data	Linked Report Friendly Key:	
Advanced	Allow Edit Params:	<input checked="" type="checkbox"/>
	Allow Count Button:	<input checked="" type="checkbox"/>
	Require ACL:	<input checked="" type="checkbox"/>
	Report Timeout Period (in seconds):	1800
	Notes:	

The following illustration shows access control for Interaction Reporter reports in Interaction Administrator.

Access Control

Category: <All> Search: report Clear

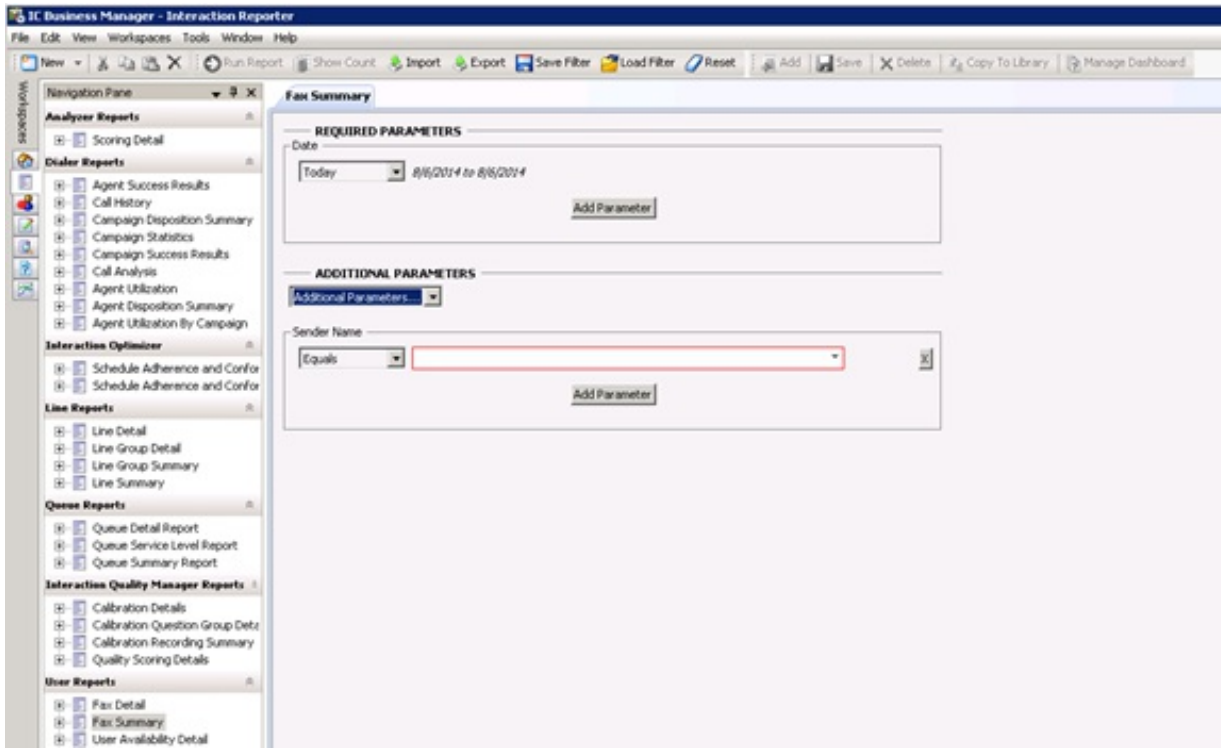
Show only selected items and groups

Name	View	Modify	Monitor	Search	Delete	Create	Statistic
Interaction Reporter Reports							
*[All]	<input checked="" type="checkbox"/>						
Analyzer Scoring Detail	<input type="checkbox"/>						
Calibration Details	<input type="checkbox"/>						
Calibration Question Group Details	<input type="checkbox"/>						
Calibration Recording Summary	<input type="checkbox"/>						
Dialer Agent Disposition	<input type="checkbox"/>						
Dialer Agent Success	<input type="checkbox"/>						
Dialer Agent Utilization By Campaign	<input type="checkbox"/>						
Dialer Agent Utilization Results	<input type="checkbox"/>						
Dialer Call Analysis Results	<input type="checkbox"/>						
Dialer Call History	<input type="checkbox"/>						
Dialer Campaign Disposition	<input type="checkbox"/>						
Dialer Campaign Statistics	<input type="checkbox"/>						

Run a Report

You can visualize, save filters, and export a report to different formations. Once you configure a report in Interaction Administrator, you can launch the report for Interaction Reporter in IC Business Manager.

The following illustration shows the Fax Summary report running in IC Business Manager.



Appendix A: Order of ActiveReport Events

Events typically occur in the following order:

- **ReportStart Event:** Execution begins and validates any change made to the report structure.
- **DataInitialize Event:** Any access to data source properties could raise this event. Data source is opened.
- **FetchData Event:** This event occurs just after each row is read from the Data Source but before it goes to the report. If no data is returned from your procedure, the NoData event is raised.

Important!

The DataInitialize and FetchData events are the only events in which the Fields collection should ever be referenced. On the DataInitialize event, you can add new fields to the collection. On the FetchData event, you can add the custom data to your field.

Depending on the type of fields or properties set on the report, certain pages might not render completely until all data is available. For example, a summary field located on a group header. ActiveReports delays rendering this particular group header until all data is available for the calculation.

- **Section Events**

- **Format Event:** This event occurs after the data is loaded and bound to the controls within the section. Use this event to set or change the properties of a control or load subreport controls with subreports.

When CanGrow or CanShrink properties are set to true, the growing and shrinking of controls contained in this section, and the section itself, takes place in this event. Thus, the height of a control or section cannot be obtained in this event.

- **BeforePrint Event:** This event occurs just before ActiveReports renders the section to the canvas. Use this event to resize a control or get an accurate height of the section or control. You may resize a control in this event but you cannot resize the section itself.

Appendix B: Creating Group Breaks Based on Unbound Data

In Interaction Reporter, the page header is inherited from the ReportBase and is not accessible while designing your report. You can add an additional page header by creating a group break based on data that is common to the entire report. You can create this common data by adding a custom field to the Fields collection.

On the DataInitialize event, add a new field called customPageHeader to the Fields collection as follows:

```
private void UserProductivity_DataInitialize(object sender, EventArgs e)
{
    this.Fields.Add("customPageHeader");
}
```

On the FetchData event, add the data to this field. The idea is to have the same data for every row so that we can create a break group on this common data and create a level that serves as another page header.

```
private void UserProductivity_FetchData(object sender, FetchEventArgs eArgs)
{
    //For each row, add data to the CustomPageHeader field
    this.Fields["customPageHeader"].Value = "pageheadergrouping";
}
```

In this example, in addition to the fields that map each column returned by your query, the Fields collection now includes the CustomPageHeader field. The data for each row stored in the CustomPageHeader field is the pageheadergrouping string. You can now create a group break based on this unbound data.

Appendix C: Properties and Methods

The following table lists some of the properties of ReportBase that you will find useful. The ReportBase inherits from DataDynamics.ActiveReports.ActiveReport.

Property Name	Scope	Returns	Description
SessionService	public, get	ININ.Cafe.Interface.Connection.IICSessionService	Provides access to CIC session variable, which is necessary to make other IceLib calls
GetReportData	public, get, set	ININ.Reporting.Historical.Engine.Objects.ReportData	The ReportData object with parameters completed from the Parameters page
WhereClause	public, get, set	String	String that can be used to hold the result of ReportData.GetSQLFragment()
ReportDataSet	public, get, set	System.Data.DataSet	Used to house the results of whatever method is used to get data for the report.
GetReportRecordCount	public, get	int	Returns the count of the records in the primary table in the ActiveReport's DataSource property
HasRecords	public, get	bool	Returns true or false depending if the results from GetReportRecordCount > 0
LinkedReport	protected	ININ.Reporting.Historical.Engine.Objects.ReportData	The ReportData object for a report linked to the main report via a hypertext link.
GetPageFooter	public, get	DataDynamics.ActiveReports.Section	Access to the PageFooter, pageFooter, and the controls within it
GetPageHeader	public, get	DataDynamics.ActiveReports.Section	Access to the PageHeader, pageHeader, and the controls within it
GetReportHeader1	public, get	DataDynamics.ActiveReports.Section	Access to the ReportHeader, reportHeader1 and the controls within it
ElapsedQueryTime	public, get	System.TimeSpan	Holds the time the query took to execute

The following table lists some of the methods of ReportBase that you will find useful. You can override almost all of these methods.

Name	Scope	Returns	Parameters	Description
UpdateProgress	protected	void	None or increment	Updates the progress bar as the report runs. Should be called from the Detail section, typically
StartQueryTimer	protected	void	None	Starts the query timer
StopQueryTimer	protected	void	None	Stops the query timer
FixHeights	protected	void	Array of DataDynamics.ActiveReports.ARControl	Iterates through the controls passed and adjusts each one's height to the tallest control in the collection.

The following table contains some of the utilities that you will find useful in ININ.Reporting.Common.ReportCommonUtils. These utilities are all `public static` so they can be called without an instantiated object reference.

Name	Parameters	Returns	Description
ToString	object	String	A safe conversion of any object to a string; accounts for null values
FixSQLString	String	String	Corrects illegal strings found in SQL statements before processing them
IsNumeric	Object	bool	Determines if a value can be safely converted to a number; accounts for null values
SafeConvertToInt32	Object	Int32	Safely converts any object to a Int32 value; accounts for null values
SafeConvertToInt64	Object	Int32	Safely converts any object to a Int64 value; accounts for null values
SafeConvertToDouble	Object	Double	Safely converts any object to a Double value; accounts for null values
SafeConvertToDateTime	Object	DateTi me	Safely converts any object to a DateTime value; accounts for null values
ConvertFromGMT	Object	DateTi me	Checks for a valid date then returns the date converted from GMT to the local client machine's time

The following table contains some of the utilities that you will find useful in `ININ.Reporting.Historical.Engine.Objects.ReportEngineUtils`. These utilities are all `public static` so they can be called without an instantiated object reference.

Name	Parameters	Returns	Description
GetParameterValuesByFriendlyKey	ReportData, string	IEnumerable<Param eterValueDataBase >	Gets the parameter entered by the user on the Parameters screen based on the FriendlyKey of the parameter
MillisecondsToHHMMSS	Object, bool (include milliseconds or not)	String	Takes the total millisecond and returns a string in the format: HH:MM:SS
GetSubtraction	Object (first addend), object (second addend)	Double	Safely subtracts values; null values accounted for
GetDivision	Object (numerator), object (denominator)	Double	Safely performs a division; null values, invalid strings and division-by-zero accounted for
NegativeDisplay	Object	String	Safely formats a number to display as a negative number; null values and invalid strings accounted for

Change Log

The following table lists the changes to the *Active Reports Developer's Guide* since its initial release.

Change Log Date	Changed...
01-August-2014	Initial version.
01-January-2015	Corrected title from Interactive Reporter to Interaction Reporter. Updated copyright and trademark information.
14-July-2015	Updated cover page and screen shots for rebranding.
23-January-2018	Conversion to HTML.
08-February-2018	Rebranding terminology.
18-June-2019	Reorganized the content only, which included combining some topics and deleting others that just had an introductory sentence such as, "In this section..."