

CrystalKiwi Suite

CrystalKiwi Explorer
CrystalKiwi Bursting
CrystalKiwi Scheduler
CrystalKiwi Engine
ServiceManager

User Guide

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1 Common Features

1.1 Introduction to Common Features

The CrystalKiwi suite of utilities includes CrystalKiwi Explorer, CrystalKiwi Bursting, CrystalKiwi Scheduler and the ServiceManager. They share many features and code so this section covers the forms and features shared by these applications.

Note that in many cases if you modify a setting for one application, the same change applies to the other applications.

This section also includes information about installation, email settings, business calendar, time zones, domain shortcuts, history settings and database login settings.

1.2 Getting Started - Installation

There are three install files needed to install the Explorer report viewer, Bursting and/or Scheduling:

Crystal Reports Run Time includes all the Business Objects Run Time files needed to view and process Crystal Reports. Currently we are using the Crystal Reports 2010 run time for Visual Studio as this is the latest version available from SAP. Internally this is version 14. It can process reports written in a later version in most cases. Contact us if you have any questions about version compatibility.

If you are evaluating multiple 3rd party Applications, you may already have the Crystal Reports Run Time files installed on your machine.

Dot Net Framework 4.0 includes all the Microsoft development libraries we used to develop our applications. This may already be included in many recent versions of windows. If there is a later version of the framework on your machine, this install module can be ignored.

Select one of the **three MSI files** available to install this suite. They are the default install file for each application. It could be CrystalKiwi Explorer.msi, CrystalKiwi Bursting.msi or CrystalKiwi Scheduler.msi. Note that CrystalKiwi Bursting includes a menu item for the Explorer and that the Scheduler includes menu items for Report Viewing, Bursting and the Service Manager.

The Service Manager also includes control of some useful settings for the Explorer report viewer, so it is now included as part of the CrystalKiwi Explorer.msi

Make sure any database drivers and ODBC settings are configured on the install machine. Note that 64 bit versions of Windows still require 32 bit ODBC settings. The Crystal Reports run time is 32 bit so requires a 32 bit DSN connection. If that is not directly available on the control panel navigate to C:\Windows\SysWOW64\odbcad32.exe and set up your ODBC connection information there.

A Windows 10 Control Panel upgrade recently expanded to offer both a 32 bit and 64 bit Data Sources on the control panel form. Perhaps Microsoft got tired of people who couldn't find it.

CrystalKiwi Explorer is our report viewer and is also included in the Bursting and Scheduler Installs. Use the viewer to see if you can view a report. If you are prompted for a database login use the menu File/Settings/Database Connection to save the password for the report database. See 1.4 below for details on this.

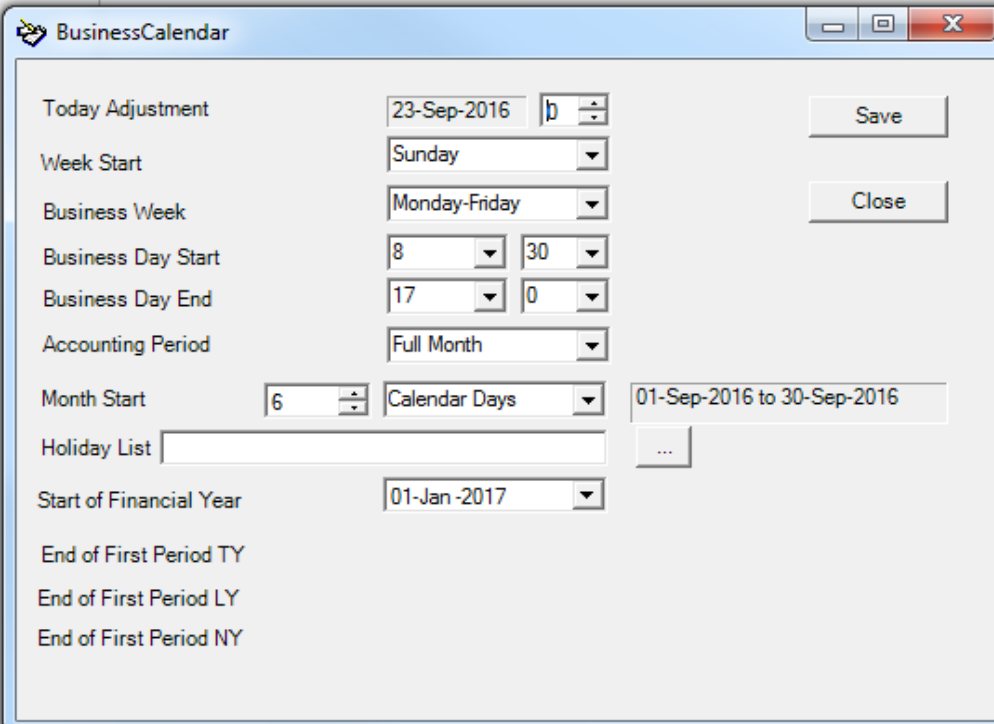
Report Bursting can be run as a stand alone application or integrated into the report scheduler. Select a report on the main form and modify values on the bursting form.

Report Scheduling requires a little more set up. Use the Service Manager to install the CrystalKiwi Engine as a windows service and then you can insert reports into the schedule.

With Report Bursting and Scheduling it is useful to configure the Email Settings and the Business Calendar. The Email settings also apply to the Explorer Report Viewer when you want to email your report to another user.

1.3 Business Calendar

Use the menu item File/Settings/Business Calendar to display the Business Calendar form. This is only used by the Scheduler.



The screenshot shows the 'BusinessCalendar' application window. It contains the following fields and controls:

- Today Adjustment:** A date field set to '23-Sep-2016' and a spinner box set to '0'. A 'Save' button is to the right.
- Week Start:** A dropdown menu set to 'Sunday'.
- Business Week:** A dropdown menu set to 'Monday-Friday'. A 'Close' button is to the right.
- Business Day Start:** Two spinner boxes set to '8' and '30'.
- Business Day End:** Two spinner boxes set to '17' and '0'.
- Accounting Period:** A dropdown menu set to 'Full Month'.
- Month Start:** A spinner box set to '6', a dropdown menu set to 'Calendar Days', and a text field containing '01-Sep-2016 to 30-Sep-2016'.
- Holiday List:** A text input field and a button with three dots '...'.
- Start of Financial Year:** A dropdown menu set to '01-Jan-2017'.
- End of First Period TY**
- End of First Period LY**
- End of First Period NY**

You can set your scheduler so it is always offset by one or more days for all scheduling. The default setting of a Today Adjustment of 0 should work for most sites.

The Week Start and Business Week settings are used in the Business Day frequency for scheduling reports. Reports scheduled for Business Day will skip weekends and public holidays for report processing.

The Business Day Start and End are used with the Business Hour report frequency. A report can run every hour from 8:30am to 5:00pm with the above settings and resume the next day at the next time after 8:30.

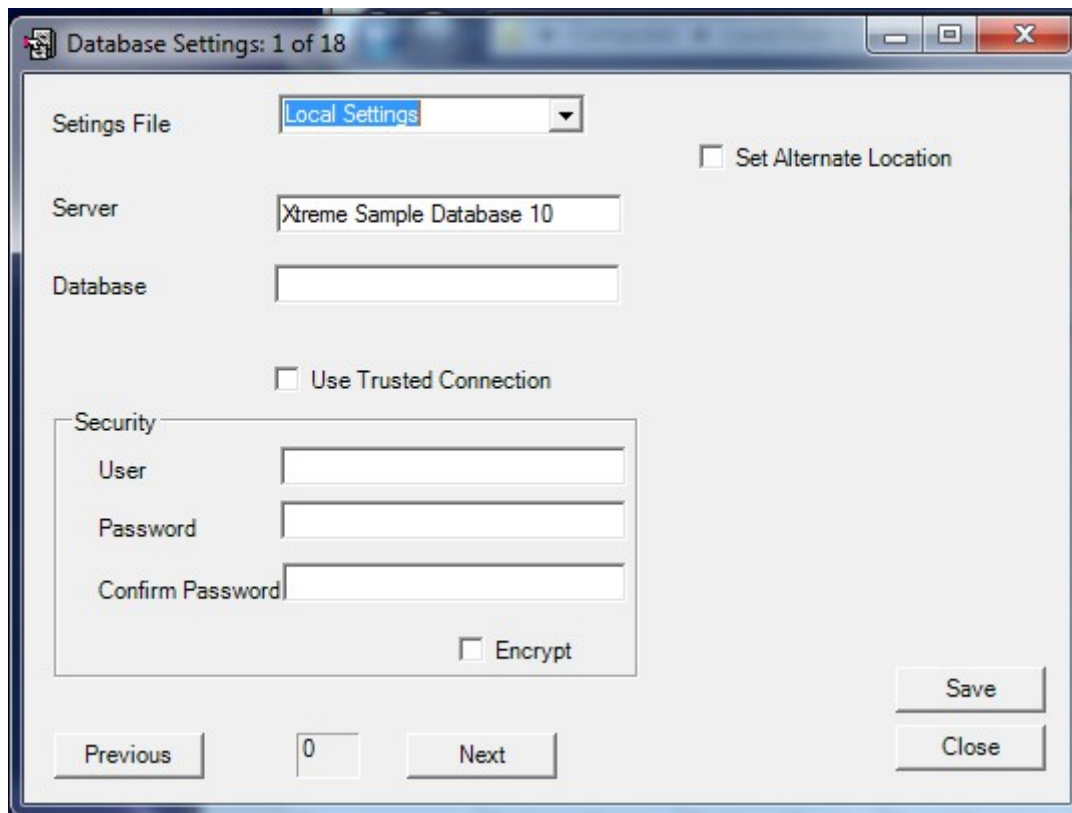
Accounting Period can be Full Month, 4 Weeks or 4-4-5 Weeks. These are used in the date ranges for parameters for Monthly options.

The Month Start Option is useful where you want the scheduler to reserve the first few days of a new month for processing the previous month. The above setting of 6 calendar days means that for the 1st to 6th September, the month for processing will still remain at August. Likewise for subsequent months.

Holiday List requires a file name. This contains a list of public holiday dates to apply to the schedule. The dates in the file must be in UNC format (yyyy/MM/dd – e.g. 2017/04/25 for New Zealand Anzac Day in 2017). Days in the holiday list are processed as a weekend.

Start of Financial Year are set so the Financial Date Ranges can be calculated.

1.4 Database Connection



Use the menu item File/Settings/Database Connection to display the Database form. All three applications save their settings in the same database.xml file in the Shared Folder. This means once you set the password information for a database connection in the report viewer, the same setting is used by scheduling and bursting.

The Settings File option is for a future feature. Ignore at this time.

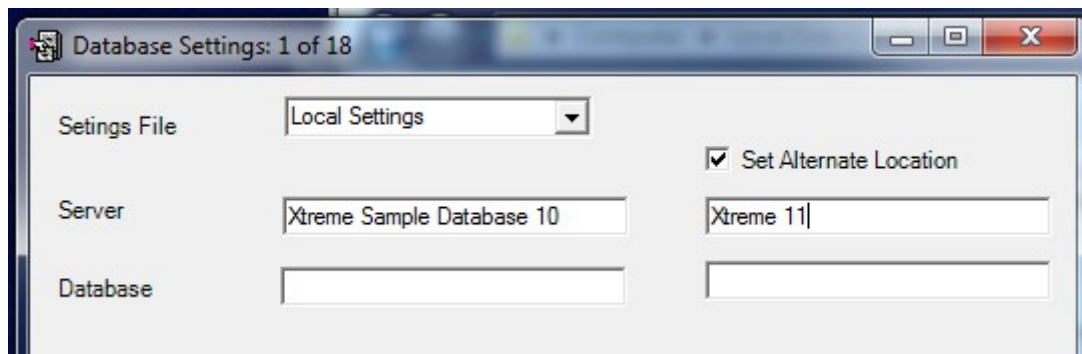
The Server and Database settings are extracted from the report when you process it. You should not change these. Also note that the server and database are case sensitive so you might find the same connection there in slightly different forms as the fields are case sensitive..

When a report is processed against the database, you can authenticate in one of two ways. Click the “Use Trusted Connection” box to tell the report engine to use your windows credentials. This is the default. Some databases encourage this. Note that the

CrystalKiwi Engine runs as a service under its own windows credentials. Make sure the account running the service has valid database connection permissions if you set this option.

Other database connections require a user and password. Enter these and remember to confirm the password. This information is saved as readable text in the database.xml file. If that causes a security concern you can tick the "Encrypt" button to encrypt the password field values that are saved in the database.xml file. The password is encrypted using DES and you cannot undo the Encryption option to recover the password. You can however remove the encryption by manually editing the database.xml file. Then you have to re-enter the unencrypted password.

The Set Alternate Location button allows you to move the database connection when the report runs.



In the above example, any report that uses the "Xtreme Sample Database 10" will be redirected to use a connection called "Xtreme 11". This works great if the Server or Database in the report has moved to a new location.

This feature was originally designed for file based databases where the source report was designed to use "c:\This Folder\My.MDB" and you want report viewing, bursting and scheduling to use "d:\That Folder\your.MDB".

We have extended this feature to now support OLEDB and ODBC connection information.

This setting applies to all reports running on a machine. The connect.xml is shared between viewing, bursting and scheduling, so the thought was if the database has been moved then surely all processing should use the new location.

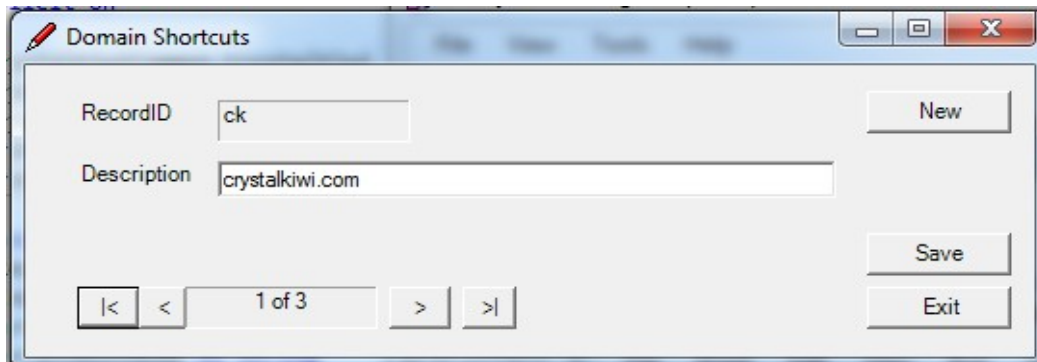
But there is another more complicated requirement we also support. This is available for report viewing via the command line.

You can temporarily set an alternate location via the command line. This could be used where an application supports multiple individual database files for different customers or users. So one command line runs reports using the database files in FolderA while a second command line runs reports using the files in FolderB. It also works with ODBC or OLEDB database connections.

1.5 Domain Shortcuts

This is just a simple feature to make administration life a little easier. One client was getting tired in typing out lots of long domain names for the people getting his reports. Another had a field limit in her database that wouldn't let her enter long email addresses.

Use the menu item File/Settings/Domain Shortcuts to see the form below.



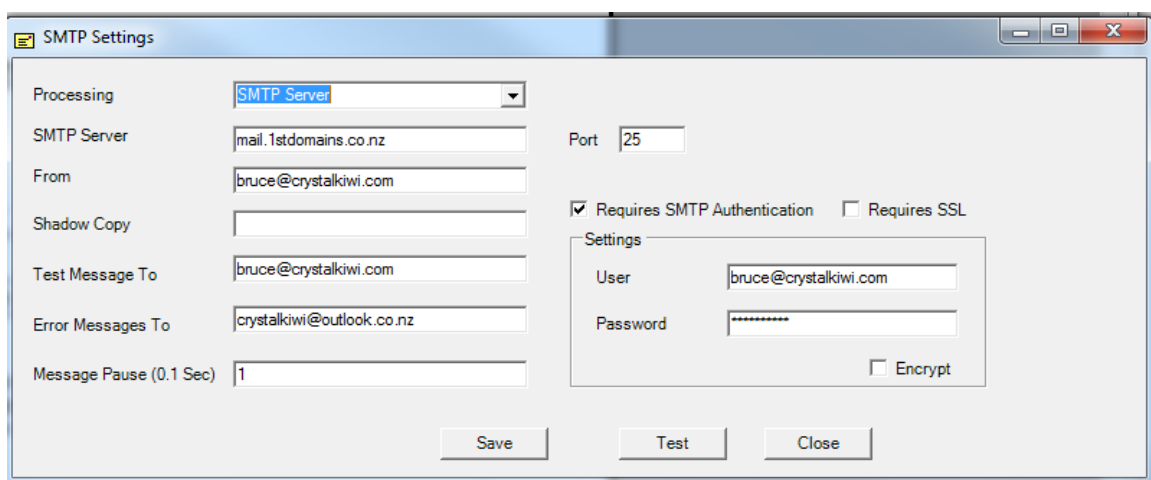
The screenshot shows a dialog box titled "Domain Shortcuts". It contains two text input fields: "RecordID" with the value "ck" and "Description" with the value "crystalkiwi.com". To the right of the "RecordID" field is a "New" button. Below the "Description" field is a "Save" button. At the bottom left, there are navigation buttons: a left arrow, a double left arrow, a page indicator "1 of 3", a double right arrow, and a right arrow. At the bottom right, there is an "Exit" button.

When you click New you will be asked for the shortcut ID. Then you can enter and save the description for that ID.

In report viewing, bursting or scheduling where there is an email account field you can include the shortcut field using `{.code}`. So an address of `bruce@{.ck}` will expand to `bruce@crystalkiwi.com`

1.6 Email Settings

In the old days a developer would create an object inside their application to link to Microsoft Outlook to enable it to send an email message. This is no longer ideal as new security settings within Outlook discourage such activity and Outlook might not even be installed on the machine where you are running our applications. We send email messages with attached report files directly to the mail server using the SMTP protocol..



The screenshot shows a dialog box titled "SMTP Settings". It has several fields and options:

- "Processing" dropdown menu set to "SMTP Server".
- "SMTP Server" text field with "mail.1stdomains.co.nz".
- "Port" text field with "25".
- "From" text field with "bruce@crystalkiwi.com".
- "Shadow Copy" text field (empty).
- "Test Message To" text field with "bruce@crystalkiwi.com".
- "Error Messages To" text field with "crystalkiwi@outlook.co.nz".
- "Message Pause (0.1 Sec)" text field with "1".
- Checkboxes: Requires SMTP Authentication, Requires SSL.
- "Settings" section with:
 - "User" text field with "bruce@crystalkiwi.com".
 - "Password" text field with masked characters "*****".
 - Encrypt checkbox.

At the bottom are "Save", "Test", and "Close" buttons.

Processing can be in one of three states. Production will be set to "SMTP Server" where you specify the other settings.

“Suspended” says do all the other report processing but when it comes to sending an email, skip that step. That is great for testing the scheduling or bursting without sending a bunch of unwanted messages.

A third testing option is available if you select “Use Test Address”. Instead of sending messages to those in the schedule or bursting, the message is sent to your test address.

Remember to set back to SMTP Server when testing is completed. Otherwise no messages will be sent to where they were supposed to go.

SMTP server field is the name or ip address of your mail server. Your mail administrator will be able to tell you this. Some servers are configured to use an alternate port, so you can also specify this. The default SMTP port setting is 25.

From field is a valid sender of messages on that mail server. Some servers support any sending address from their mail domain. Others require a valid user account.

Shadow Copy is a mechanism where all messages have a duplicate sent to another address. This does not appear as a CC or Bcc on the main message. A separate message is sent. Leave blank under normal use.

Test Message To is the Test address. It makes sense to use your own address for this. You should test both with an address in your domain, and an address with an external domain. Some Mail Server security support applications sending to a local address but block external addresses.

Error Messages to can be the same as the test address or another address.

Message Pause is if your mail server doesn't want messages sent too frequently. A large value here will slow down your report processing.

If your mail server requires SMTP authentication, tick the box and the enter the user and password fields. These can be stored in plain text in the smtpsetting.xml file or you can encrypt the fields if you prefer.

Save will save these values to the smptsetting.xml file in the shared folder. Close will close the form without saving the form changes.

Test will send a brief test message to the Test Address. It should arrive within a few minutes. If it doesn't then no production messages will arrive correctly until this is investigated and fixed.

The most common cause of email problems is outside the scope of these applications. By default most mail servers block unwanted mail. So you need to talk nicely to your mail server administrator to “Enable Relay” from the machine you have installed the suite on. In some cases you might need to tell them your ip address so they lock the security to the machine you are running

1.7 History Settings

When you do things with the report viewer, bursting or scheduler, a history is kept in a set of history files. There were problems in the past where these files got quite large, so the history settings help you control this.

The screenshot shows the 'History Settings' dialog box. It includes the following elements:

- Next Processing Date:** A dropdown menu currently showing '01-Mar-2017'.
- Frequency:** A dropdown menu currently showing 'Monthly'.
- Action:** A dropdown menu currently showing 'Delete'.
- Email To:** An empty text input field.
- Right-side controls:** A 'Lock' button, a 'Remove Entries Before' button, and a dropdown menu showing '01-Jan-2017'.
- Central text area:** Contains the text: 'No Previous Processing of History Files', 'History Files Present [C:\ProgramData\CrystalKwi\Shared]', and 'ScheduleHistory.xml'.
- Bottom-right controls:** 'Process Now', 'Save', and 'Close' buttons.
- Bottom-left:** 'Current User: Bruce' label and an empty text box.

The Next Processing Date indicates the next time the history files on this machine will be checked. Note that multiple users on the same machine (such as a Citrix Server allowing multiple users running report viewers) will have personal history files. The scheduler and bursting create their own history files.

Frequency decides how often the history files are processed. Monthly is usually fine, but on large busy sites Daily or Weekly could be useful;

Action is used to decide what you want to do with the History files. You can decide to just delete the history entries and not do anything else with them. You can also move them to another folder for archiving. This can result in lots of files. So on one of your machines set the "Merge" option to combine the history files into one large combined history file.

Why would you want to do this? The history files are all in a structured xml format, so a simple Crystal Report can take that combined file to report on which reports are being run when and by which users.

The Email to form will email a message with the history information to that address. This will be done even if the action is set to "Delete". Use an administrator who would like to see that information.

Lock allows you to set a password on this form. This allows an administrator on a server to set the History Settings for all users and to stop any other user from changing them.

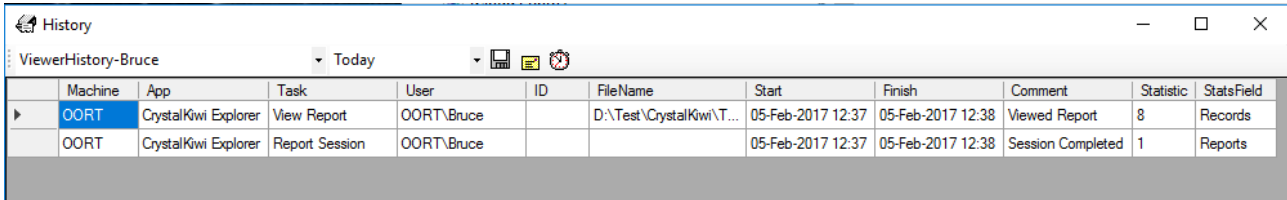
The process now button is to do the history processing now.

Save and Close buttons will work as you would expect.

1.8 View History

What is the point of keeping all that history information if you can't look at it when you need to? The Main forms for Report Viewing, Bursting and Scheduling all include a menu item for "View History".

This displays the View History form.



The screenshot shows a window titled 'History' with a toolbar and a table. The toolbar includes a dropdown menu set to 'Today', a save icon, an email icon, and a settings icon. The table has the following data:

Machine	App	Task	User	ID	FileName	Start	Finish	Comment	Statistic	StatsField
OORT	CrystalKiwi Explorer	View Report	OORT\Bruce		D:\Test\CrystalKiwi\T...	05-Feb-2017 12:37	05-Feb-2017 12:38	Viewed Report	8	Records
OORT	CrystalKiwi Explorer	Report Session	OORT\Bruce			05-Feb-2017 12:37	05-Feb-2017 12:38	Session Completed	1	Reports

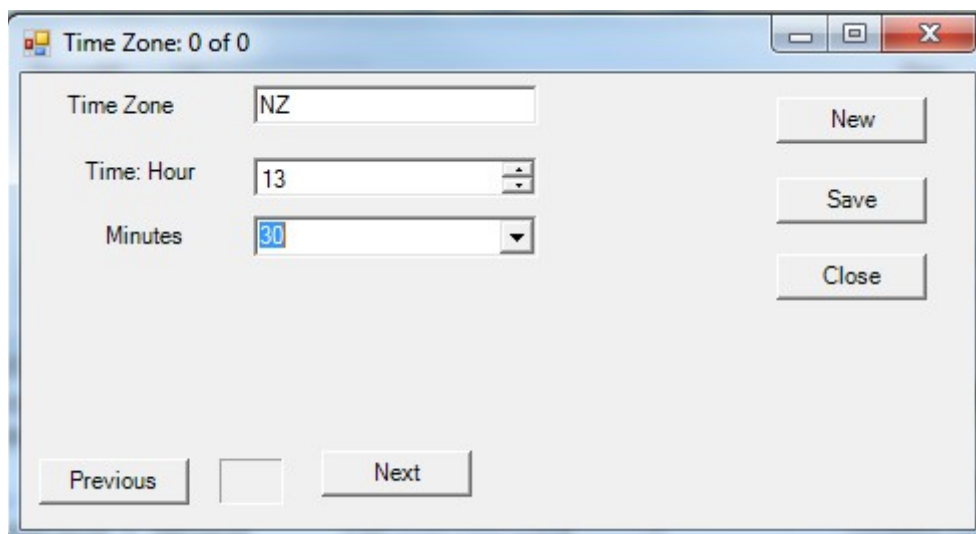
The first combo box lets you select a history file. It will only display the history files that are currently on your machine, so the list will change as different history entries are written to each of the files.

The second combo box will let you select a period. The default is today, but you can also look at yesterday, the previous seven days, This Week (which starts on the previous Sunday) or all history events in that file.

There are three buttons on the toolbar. The first lets you save the Current History view as a csv file. Perhaps you want to view a large history table in Excel, so use this option. The second button will send the history to an email address. The third button will take you to the History Settings form.

1.9 Time Zones

When we look at the clock on the wall or on our iPhone we can discover the local time in our office. The iPhone has a great world clock feature, so we can see the times in different cities around the world. Some countries like the USA have multiple time zones, while others like China have only one.



The screenshot shows a dialog box titled 'Time Zone: 0 of 0'. It contains the following fields and buttons:

- Time Zone: NZ
- Time: Hour: 13
- Minutes: 30
- Buttons: New, Save, Close, Previous, Next

The scheduler uses the local time for processing all reports. You can assign dynamic dates to a parameter value using date fields like today-3 or previousmonth start this year. These are by default based on the local date and time. They will usually calculate the current value at midnight.

The Time Zone feature was specially developed for users with data that came from GPS systems. By default the dynamic dates used for parameter values run from midnight to midnight. So a date value of today-2 would run from 00:00 two days ago to the same time a day later (yesterday). Great for running a daily report with yesterday's data.

GPS satellites are spinning around the world and have to co-ordinate their clocks to a base time. The GPS data arrives with time set to UTC (Universal Time Co-ordinates) which is based in Greenwich, UK. UTC is different for UK users when Daylight Saving Time applies.

A report run in New Zealand on 05-April-2016 for Today-1 would use parameter values of 04-April-2016 00:00 to 05-April-2016 00:00 local time and the GPS data we would get is from midday on the 5th to midday on the 6th (UTC time). What we would need to get yesterday's GPS data would be 03-April-2016 12:00:00 to 04-April-2016 12:00:00 (midday in both cases)..

You can apply a time zone to any report. But this feature only appears once at least one time zone is configured. These are saved in the timezone.xml file in the shared folder.

Create a New Time Zone, enter the hour and minutes you want to apply to the dynamic date. We include a minutes option because there are parts of the world that are not a whole hour offset from London. Check out Adelaide (Australia), Kabul (Afghanistan) or the Chatham Islands (New Zealand) among others.

Remember to adjust the timezone settings if daylight saving time changes occur. We do not currently adjust this automatically.

1.10 Activation Codes

The applications are all installed as a trial version. This is a fully functional application with one restriction. You normally have 30 days to try the software out, and after then it will stop working. If you need a little more time, contact us and we are happy to send an activation code to extend the trial period.

On confirmation of a sale, you will be sent an activation code to unlock the features you have purchased. You can purchase additional features such as additional viewer licenses when needed.

The activation codes are saved in the activation.xml file in the shared folder. You can copy this file to a backup machine if needed. You cannot reset the trial period by deleting the activation.xml file. Doing that will reset back to an expired system.

1.11 Test Settings

We don't know how the machines at your site are configured. The security settings can vary widely and some of these can stop our applications from working properly.

We now have a menu item in each application that will check the settings not getting in the way of optimal processing.

Use the menu item File/Settings/Test Settings. A form will display. Click the "Test Settings" button and the settings will be tested. A log file will be created and emailed to your test address. If that hasn't been set up yet. You can still view the settings on the test form. If there are problems, recommendations will be included in the file. We will be extending this as new issues arise.

1.12 Refresh Options

When you view a report it processes against your data at that point in time. With the report scheduler, you can rerun the report at a regular interval. But there are a couple of other options within the report viewer.

If you have a report displayed in the viewer panel, you can use a menu item or a function key to refresh the report. F5 will refresh using the current parameter values, while F6 will prompt you for new parameter values.

A more advanced option is to set the report to refresh on a regular interval. Use the menu item Refresh/Auto Refresh to set this on. The default timer is every 30 seconds, but this could cause problems if the report takes more than 30 seconds to process. You can use the Refresh Menu to set the default timer to another value.

The report viewer supports multiple forms open against different reports. Each of these can be set to Auto Refresh. Use the menu item Refresh/Set AutoRefresh Local Timer to allow one form to use a different timer value.

If multiple forms are active, the most recent refreshed report will appear on the top of other report forms.

1.13 Shortcuts

You might notice that the CrystalKiwi Explorer.exe appears to be the main Executable for report viewing, bursting and scheduling. Almost true. Shortcuts will have been installed to take you to the main form for viewing, bursting and scheduling

Running CrystalKiwi Explorer.exe will invoke the report viewer main form.

CrystalKiwi Explorer.exe *bursting will open the report bursting form

CrystalKiwi Explorer.exe *schedule will open the main schedule administration form.

CrystalKiwi Explorer.exe * will display the Application Selection form. From here you can select viewing, bursting or scheduling.

There are other executables included in the installs.

Service Manager.exe will open a form to enable you to install the CrystalKiwi Engine service, stop and start it, reset the viewer main form location, redirect the shared folder.

As these are advanced management functions the Service Manager should usually be run as Administrator.

CrystalKiwi Engine.exe is the windows service. Use the Service Manager to install it as a windows service. You can then use the Windows Services application to control the user account the Engine runs under and the Manual/Automatic service setting.

CrystalKiwi Common.dll is a set of standard functions, libraries and forms shared by other applications in the CrystalKiwi Suite.

2 CrystalKiwi Explorer

2.1 Introduction to Report Viewing

The most common way to design a report is to select some fields from tables from your database, join them with the appropriate fields and join types. This makes optimal use of the report design time. The report designer can use parameters to change record selection, modify design elements and export these reports to other formats.

It is a lot more fun to design new reports and modify existing reports than it is to spend the whole day processing production reports for others in your organisation.

There are two approaches to solving this resource issue and making the report designer more productive. It all depends on who is in control. This section talks about the staff member who needs a report with some information to help them with their job, The Scheduling section of this manual has an administrator in control of when a report runs, what parameters it needs, and where the output goes.

Each staff member who wants to view reports needs the CrystalKiwi Explorer report viewer installed on their machine. It is also possible to install the report viewer on a shared resource like a Citrix server or Terminal Server. They can then select a report from a list, and run that report, answer any question the report needs and display the results.

The report will preview on the main form. They can then rerun the report with new parameter values, print the report, or export to other formats.

A full log of their report viewing is stored locally in a personal history file.

The Report Viewer can be invoked from a command line. See later in this section for information about how to do this. The command line feature allows you to select the rpt file, set parameter values and send output.

The CrystalKiwi Explorer Report Viewer can be installed on a Citrix Server. This allows you to have a machine or cluster that all the users in your organisation to view reports without having to install Crystal Reports or a stand alone report viewer on each user machine.

There is a free report viewer available from SAP. The catch is that this application can only view reports with data saved in the rpt file, but cannot refresh that against live data. It also cannot process on demand subreports.

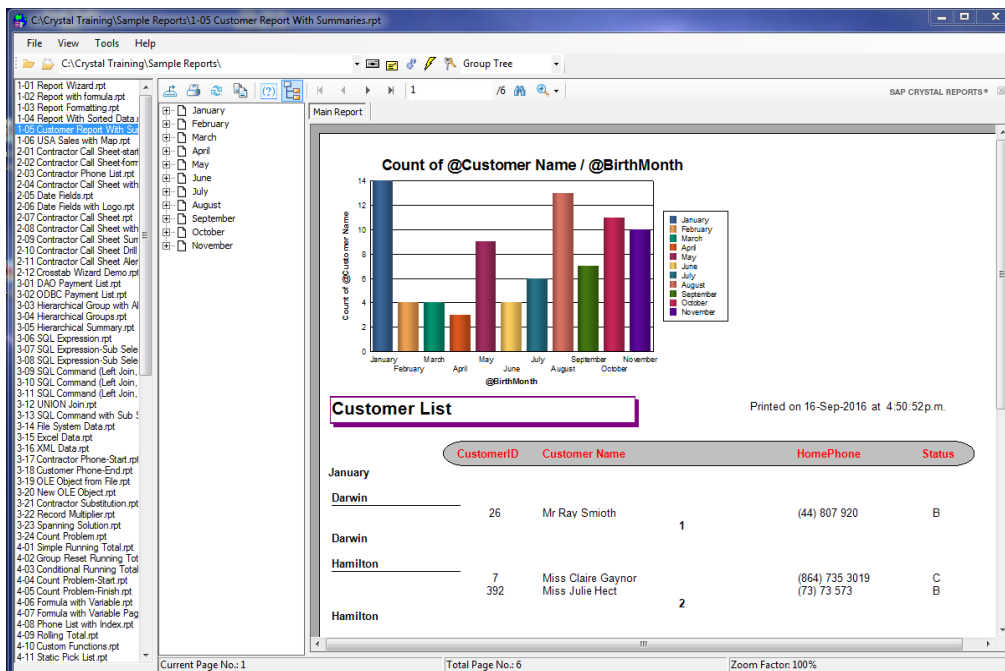
If the rpt file contains saved data our CrystalKiwi Explorer report viewer can display the report with that data. It also can process any on demand subreports in the report against the live database. You can then refresh the report against live data.

We recommend you design your Crystal Reports to NOT include saved data. While it is great to see some real numbers when you open the report, in a few months time those numbers become obsolete.

Another potential use of a rpt file with saved data is to use the CrystalKiwi Scheduler to process the report and export as a Crystal Report to an external user. They can then use CrystalKiwi Explorer to open that as a local rpt file and view, export and drilldown into the

report. They cannot however process on demand subreports as this requires a connection back to the original database.

2.2 Report Viewing – Main Form



The report viewer is designed to be simple to use. It has several design elements on the main viewer form.

There is a menu and toolbar, and several large windows with content. The left most window is the “Report Navigator” - a list of report files in the current folder. If the list is empty, or you require a report file from another folder, use the menu File/Open and navigate to the report file you want to process. You can suppress the display of the Report Navigator window with the menu item View/Report Navigator. This can be toggled on or off.

The remainder of the form is the Crystal Reports viewer window and it contains it's own controls. The Group Tree, Preview Window, Drill Down tabs, and subreport tabs.

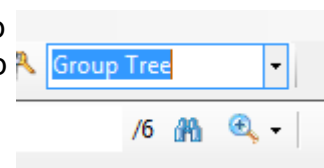
The Group Tree is on the left and displays the groups in the report. If you have multiple levels of groups then this will display as a multi level hierarchy.

There are two ways to control the display of the form: There is a button (see right) on the crystal window that can turn the group tree on or off.



But be careful turning it off totally. The group tree window can display the groups or the parameter values used in the report.

On the main form is a combo control that can select None, Group Tree or Parameters. The None option will also suppress the group tree on the form. Group Tree displays the Groups and Parameters display the report parameters. If there are no parameters then the window will be blank.



2.3 Report Viewer Menu

The Report View has a simple menu with File, View, Tools and Help items on the top line.

The File Menu includes

- Open Report File – use this to select an RPT or RPTR file you have read access to. If the file contains saved data it will display that. Otherwise it will refresh against the live database. Other reports in the folder will display in the navigator window.
- Select Folder – will let you navigate and select a folder. The contents of that folder will display in the Navigator windows
- Refresh displays a submenu where you can refresh the report display or you can set an AutoRefresh. See 1.12 for details
- New Viewer Window – will open another copy of the main form. This lets you display more than one report on your screen at once. Closing the original form will close all subsequent viewer windows.
- Settings will display a sub menu

The Settings Menu includes

- Database Settings will display the database form. Save any connection passwords here. See section 1.4 for more details
- Email will display the Email settings form see 1.6 for details on this
- History Settings will display the History Settings form. See 1.7 for this.
- Save Viewer Settings lets you take the current form location, size, toolbar settings and save them in a Viewer.xml file in the shared folder. Then all users on this machine will start with the same settings. Delete the Viewer.xml file to undo this.
- Dynamic Parameters are really useful, but can have performance overhead. See 2.6 for details on this.
- Test Settings displays the testing form to check your folders and security. This is more useful with Scheduling and Bursting than report viewing.

The View Menu has three menu items

- View Report takes the rpt file selected in the navigator and will process it into the main report part of the form. Double click the pane in the navigator window to do the same thing.
- View History will display the History Form. See 1.8 for details
- View Navigator is a check option. If unchecked, the navigator part of the form that displays other rpt files will disappear. Select again to make it reappear.

The Tools Menu tells you what the folder settings are, and you can reset the form location if it has moved to an awkward location and/or size.

The Help Menu displays the help files, the activation form and version information.

2.4 Report Viewer Toolbar


The report viewer toolbar is there to provide some shortcuts. The full toolbar looks like




To Open a File use 

To Select a Folder use 

The Folder list is designed to navigate the folders on your machine. From the current folder you can move up or down, or select another folder at the current level.

To export the current report to disk or an application use 

To export directly to email use 

To refresh the report objects use 

To go to the database form use 

The combo box displays “Group Tree”, “Parameters” or “None”. This controls the contents of the Group Tree section of the main form.

2.5 Report Security

Some web based report viewers create a complex security mechanism to control who can see what reports. The approach we have taken is that you already have a security mechanism to control the folders and your report files.. So why duplicate that security?

Your site has users and folders and reports in those folders. Use Windows security to control which users can see which report files. Usually this is controlled at folder level.

If you are an application developer, there is considerable intellectual property contained in the design of a report. You can protect this by saving the RPT as a RPTR file. The CrystalKiwi Explorer report viewer can process both report file types.

The main restrictions on an RPTR file are that you cannot open these in the Crystal Reports designer, and you cannot export to a Crystal Report (RPT) format to see how the report was designed.

2.6 Dynamic Parameters

When a report is designed it can be useful to provide a list of values for parameters. This however can quickly become out of date as the original list was saved inside the rpt file.

A dynamic date feature was introduced a few versions ago, but it can be difficult to control. It also requires reports to be designed with that version (or later).

The CrystalKiwi Explorer fully supports the internal static and dynamic pick lists, but there is an additional option that doesn't require an upgrade to Crystal Reports.

When a report is opened the parameter list is examined. Then the viewer software looks for a parametername.prm file in the same folder as the report. It also checks higher level

folders from that base folder. The prm file is then used to reload the pick list for that parameter.

So what does the prm file look like? It is a text file, that is the same format that you would get with a Parameter/Export. Each line has a parameter value and a description field separated by a tab.

One way to interpret this mechanism is that we have automated the Parameter Import/Export inside the viewer.

The major disadvantage of this mechanism is that this additional processing can create a noticeable delay before the report is displayed..

You can turn this feature off by the menu item File/Settings/Dynamic Parameters.

2.7 Command Line Options

Normal installation of the CrystalKiwi Explorer report viewer is to install a menu item to start the application. An administrator can also create a desktop icon to open the report viewer.

If you only ever view one or a couple of reports, you can create a desktop icon to open each report directly. Use a desktop icon that points to

```
"c:\Program Files(x86)\CrystalKiwi\CrystalKiwi Explorer\CrystalKiwi Explorer.exe"  
"D:\Test\My Folder\This.rpt"
```

Note the quotes are needed because the path to the exe and rpt contain a space.

This can be expanded further. We decided the command line was too limited so the next features extends to:

```
"c:\Program Files(x86)\CrystalKiwi\Explorer\Crystal Explorer.exe" "@D:\Test\My  
Folder\This.txt"
```

where This.txt is a text file with command line instructions on separate lines. This.txt can be any file the user has read access to. The @ indicates it is a command file rather than a report file to view.

So could you combine this mechanism with the Windows Task Scheduler to create a quick and easy report automation? Well, yes. You could. But we wouldn't recommend it. Apart from avoiding a purchase of our scheduler, this approach would be far more difficult to manage. Adding new items, modifying existing schedule items and investigating how the reports have processed would be challenging. For that reason we would recommend the CrystalKiwi Scheduler.

2.8 Command File Options

There are many commands you can use in the text file to control the processing.

A command file is invoked using the @ character, followed by the command file name. This is a simple text file with processing commands on separate lines. The commands may be in any sequence and are not case sensitive.

The following commands are supported:

Basic Commands

report=filename (indicates which rpt file you want to process)

comment=description (you can include comments in the file)

logfile=filename (can change the name of the log file)

disk=diskfilename (saves the output to the disk file)

format=fileformat (specify the output file format)

email=emailaddress (sends the output to the email address)

emailcc=emailaddress (you can include a cc address)

emailbcc=emailaddress (can also have a bcc)

emailsubject=subjectline (the subject on the email message)

printer=printername (sends the output to that printer)

output=viewer (select the viewer for output)

burst=burstcontrolfile (processes the report as a bursting run)

There are some restrictions on what combinations are valid. For example you can specify the disk file name as well as the email address to send the file to.

You must have an email to send the message to or the emailcc and emailbcc addresses will be ignored.

Disk and Email output must include a format command line. If no format is specified, the default output is a rpt file with saved data. Valid formats are Crystal Report, RPTR Locked Crystal Report, Excel, Excel Record, Excel Workbook, Acrobat File, Rich Text, Editable Rich Text, CSV File, Tab File, HTML Document, DHTML Document, MS Word and XML

Parameter Values

You can specify a parameter value using the command
{?parametername}=parametervalue

Multiple values can be entered on the line separated by a pipe (|) character.
For Example: {?Region}=Alaska|New York|Oregon

A Range value can be entered on the line using a tilde (~)
{?parameter}=fromvalue~tovalue

Formula Control

You can modify a formula in your report using
{@formulaname}=newformulatext

The new formula must fit on one line. We may extend this in the future.

Table Mapping

You can invoke table mapping using the command
`{:server}=NewServer`

Table Mapping can be used to modify the server or database properties of each table connection. If you need to change both, use a second line.

If this is a new connection, you will need to load the password information on the database connection form.

To assist with getting the spelling correct for the server or database name, the table mapping information is saved to `tablemap.html` in the `Shared\Web` folder. Only the most recently invoked table map will be displayed.

Table mapping will work on both reports and subreports but the mapping must be the same. The source database names and server names are not case sensitive.

3 CrystalKiwi Bursting

3.1 Introduction to Report Bursting

Many years ago one of the users of our report scheduler asked if we could take one report and run it multiple times with different output for each run. Of course the simple approach would be to have the report in the schedule for each output destination, and this would not be too difficult to set up for a few values. But what if there were lots of values? The schedule would become unmanageable and it would be difficult to add, modify and remove instances.

Report bursting was added to the features of the report scheduler and is one of our most widely used and most popular features. Other report schedulers include report bursting using one of two mechanisms.

True Report Bursting takes one large set of pages and splits it into different outputs. This can be difficult to implement as different group values can appear on different pages each time the report is processed.

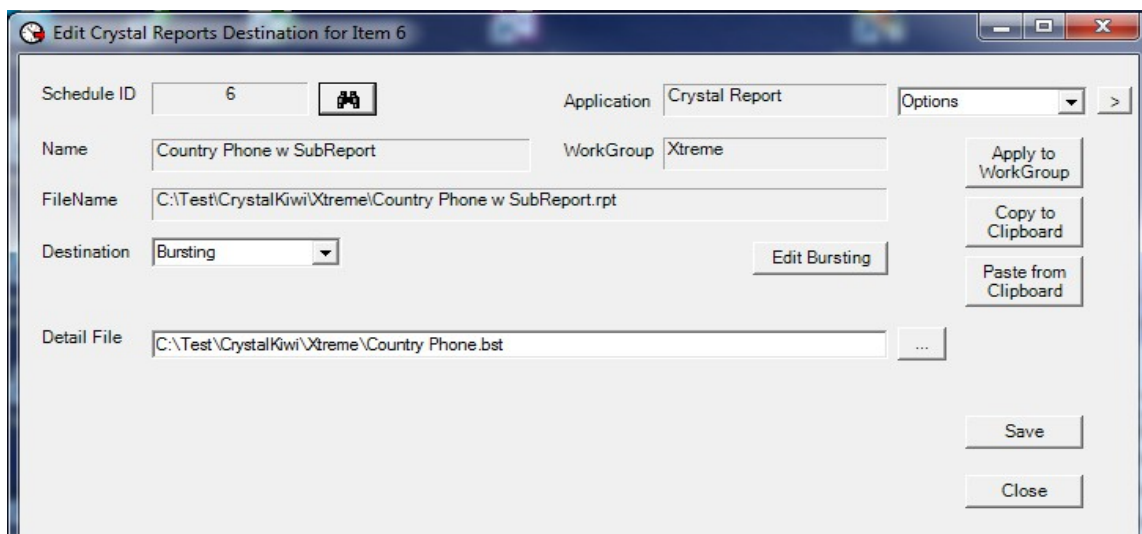
A MultiRun report burst uses a parameter in the report to select the data for one report run. The data is processed and an export file is created.. The report is then rerun with the next parameter value and a new and hopefully different output file is processed.

We support Multi Run Report Bursting as we believe it is easier to implement and control. It is such a useful feature we now offer it as a stand alone feature which operates in much the same way as a scheduled bursting report.

3.2 Scheduled Report Bursting

You can also use bursting within the CrystalKiwi Scheduler. It is simple and easy to implement this powerful feature if you follow some simple steps.

Inside the scheduler main form, use the menu to insert the crystal report you want to burst. Note it must meet the parameter requirements mentioned later in this section. Select the toolbar to specify where the report is to be processed.



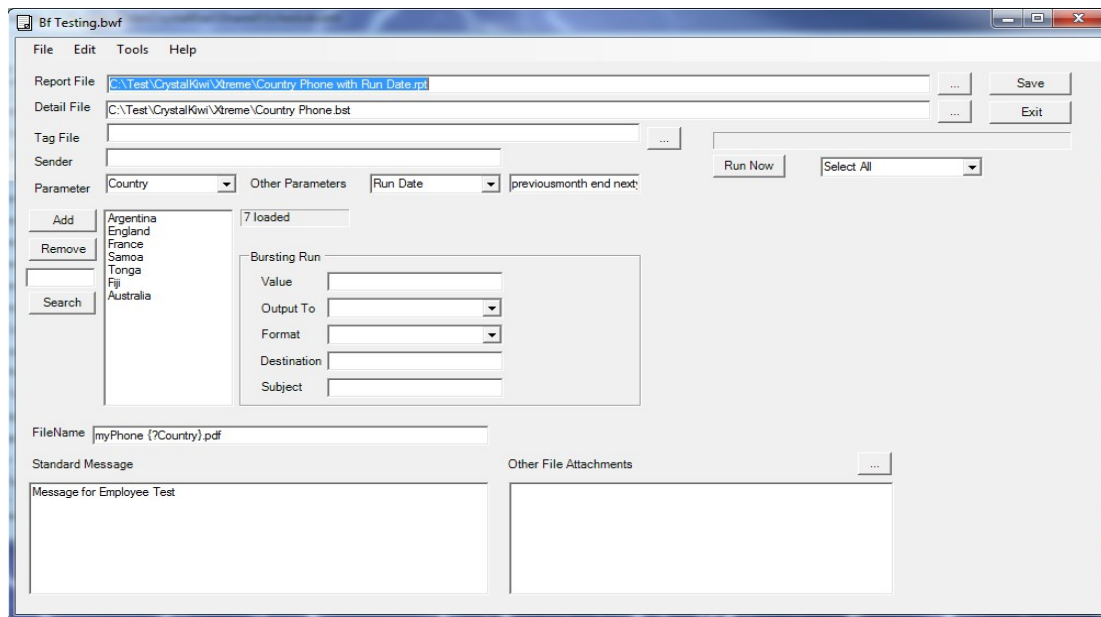
Select Bursting as the destination and you can then click the Edit Bursting button to enter the other settings. The Main Bursting Form will then appear.

You can specify the Control File here, but if you leave it blank, the default value of the folder and report file name with the bst extension will be used.

3.3 Report Bursting Application

The report bursting functionality can be accessed as a stand alone application from the program menu. This is installed as part of the CrystalKiwi Bursting and CrystalKiwi Scheduler applications. It is not available with the CrystalKiwi Explorer report viewer.

You can also access the main Bursting Form via the Tools menu in Scheduler. If your license supports bursting and scheduling the Report Viewer also has a link to the Bursting form.



The Main Form displays Directly inside the application.

3.4 Report Bursting – Main Form

So how can you tell how you got to the form above? Look at the title line of the form. If it says Schedule Item xx then you are controlling the Bursting from the report schedule. If it says filename.bwf then it is a stand alone application with a BWF control file. Think of the BWF control file as a single schedule item you can run on demand.

The settings on the form need to be saved somewhere. The Scheduler saves this stuff along with the other schedule item information in the schedule.xml file. The stand alone application creates a BWF (Bursting Work File) in the same folder as the rpt file. You can save, copy and modify these bwf files to support multiple bursting runs on your machine.

The Report File item specifies the rpt file use to process the bursting. Once you set up a bursting run, you can change this if required.

The Detail file is a bst file that controls the bursting run. It is a 7 column csv file with one line for each run of the burst. The default filename is the report folder and file name with a bst extension. This can be changed if required. It can be useful to have several bursting reports share the same control file.

The detail file is also compatible with the cViewSERVER report scheduler.

Tag files are great if you want to use them, if not, just leave that field on the form blank. A tag file is an xml file with tags and values that you can use in the file name, message or subject of the email, or even as the sender.

If the Sender field is blank the default sender from the Email settings form will be used. At one site we were sending over 2000 monthly customer statements using this bursting application. The poor staff member in accounts was the default sender, so she got all the bounces and reply to messages from those messages. A simple formula inside the report loaded the account managers email address for each statement into the tag file with the tag "Sender". Then when the email processed the email message the {\$Sender} used the tag file rather than the accounts address.

The Parameter combo box has been the cause of some complications, so be careful about changing this. See parameter requirements for more on this

Other Parameters will appear if there are more than one parameter in the report.

The screenshot shows a web-based configuration form. On the left, there is a list of countries: Argentina, England, France, Samoa, Tonga (highlighted), Fiji, and Australia. Above the list are 'Add' and 'Remove' buttons, and below is a 'Search' button. To the right of the list is a '4 of 6' indicator. Further right is a 'Bursting Run' section with the following fields: 'Value' (text input with 'Tonga'), 'Output To' (dropdown menu with 'EMail'), 'Format' (dropdown menu with 'Acrobat File'), 'Email To' (text input with 'bruce@crystalkiwi.com'), and 'Subject' (text input with 'Tonga Report').

The Control File values appear in the above section of the form. Each item in the list is from one line in the control file, and shows the parameter value. Click Add to create a new item, or remove to take an item out of the list. On a long list it can be useful to search for a value. Note the search also searches the email and subject values as well as the parameter values.

In the example above there are 7 items in the list, and we are on line 4. The first item is number zero so sorry for any confusion here. The value for Tonga is to email a report to bruce@crystalkiwi.com with the title "Tonga Report"

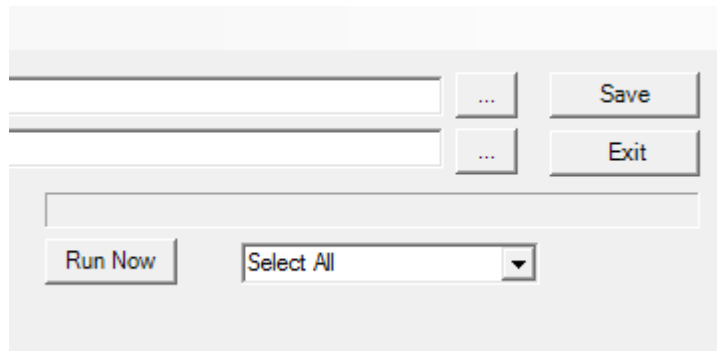
Output can be to Email, Disk or Printer. The format are the usual Crystal export formats including Excel, Excel Data, Acrobat File, CSV, etc.

Filename is the default file of the email attachment. You can, and should include things like date stamps in the file name. Use {!yyyy-MM-dd} to use the current date in the file name in a sortable format. You can also use tags {\$tagname}. If you want to show the parameter value use {?parametername}

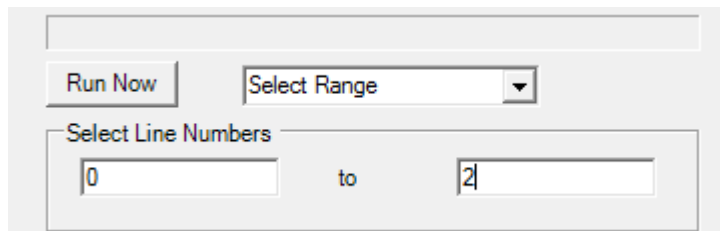
Standard Message is the message to send to each email recipient. You can use tags in the message.

Other File attachments gives you the option to include other attachments to the message. Note that all recipients get the same attachments here, so use it for a Merry Christmas message, invitation to a client function or standard terms and conditions. Do not use it for additional personalised file attachments. Click the ... button to select more files to attach.

On the top right of the form are Save and Exit Buttons. Note if you only click Exit your changes may not be saved.



The Run Now button gives you the option of running the bursting run now. Be careful as if there are thousands of items in the control file, they will all be run before you can stop processing.



You can also select a range of items in the bursting run. Note the first item is numbered 0 This “Select Range” can be used to recover an interrupted bursting run.

Another problem we found on our local site with thousands of customer statements is that the local mail server choked after trying to process 750 or more messages. So we broke the run down to a select range of 0 to 700. After a ten minute break or a pleasant cup of coffee, the next run was for line numbers 701 to 1400 and a final run later in the day to process the final lines.

3.5 Report Bursting Files

There are two main files required to implement report bursting. Stand alone bursting needs a BWF file (Bursting Work File) to store the major report bursting settings. You can have multiple BWF files any where on your machine or network. There is no practical limit.

Scheduled bursting needs to save the same information. It saves these settings in the schedule.xml file which is in the Shared Folder.

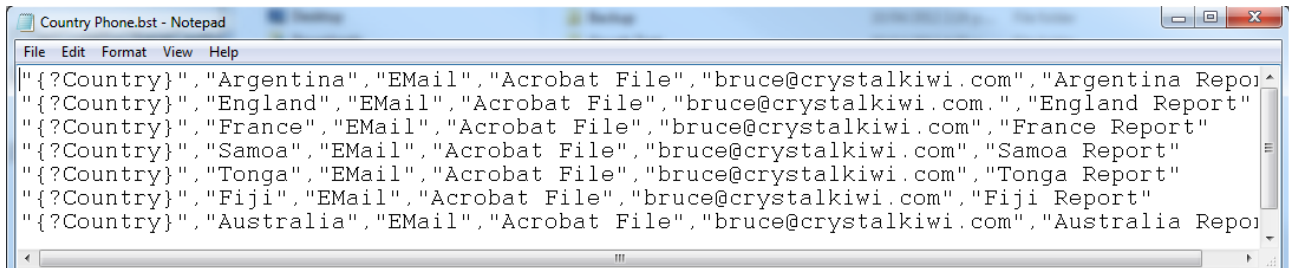
In addition both need a BST Bursting Detail File. See 3.6

3.6 Bursting Detail File

The Bursting Detail file is a simple csv layout file. You can edit this with notepad or use the Schedule Management User Function Library inside a report to automate values. We also had users editing a large file with Excel, manually removing the rows they didn't want to process and then saving back in CSV format.

Note you should not edit the file with NotePad or Excel if you have the Bursting form open. When you save the form, your NotePad changes may be overwritten by the values from the bursting form.

The BST file should look like..



```
Country Phone.bst - Notepad
File Edit Format View Help
" {?Country} ", "Argentina", "EMail", "Acrobat File", "bruce@crystalkiwi.com", "Argentina Report"
" {?Country} ", "England", "EMail", "Acrobat File", "bruce@crystalkiwi.com", "England Report"
" {?Country} ", "France", "EMail", "Acrobat File", "bruce@crystalkiwi.com", "France Report"
" {?Country} ", "Samoa", "EMail", "Acrobat File", "bruce@crystalkiwi.com", "Samoa Report"
" {?Country} ", "Tonga", "EMail", "Acrobat File", "bruce@crystalkiwi.com", "Tonga Report"
" {?Country} ", "Fiji", "EMail", "Acrobat File", "bruce@crystalkiwi.com", "Fiji Report"
" {?Country} ", "Australia", "EMail", "Acrobat File", "bruce@crystalkiwi.com", "Australia Report"
```

The first column is the parameter name with the curly brackets and question mark. This should be the same value on every line.

The second column is the value of the parameter. A single value is easy. If you want one bursting run for a multivalue parameter enter the values on the line separated by pipe (|) characters. So “England|France|Germany” will load those three values into the {?Country} parameter for that run. The parameter must be multivalue for this to work properly.

A range parameter and multivalue range parameter are also supported although not recommended. We think it makes the process and administration confusing. Keep everything simple is a good rule to follow.

Use the tilde (~) for a range and you can combine this with a pipe to support multivalue range. “A~J|P|Q|U~X” will select A to J, P, Q and U to X for the selection.

Date values should be entered in universal date format (yyyy-MM-dd). So use 2018-02-05 to use a date value of 5-Feb-2018.

The third value in the row is the destination. EMail is the most common but we also support Disk and Printer.

The Fourth column is the Format. This matches all the other support export formats.

The fifth and sixth depend on the fourth column. For an Email output these are the recipient and the message subject. Multiple email addresses can be entered with semi colons and no spaces.

For Disk Output, the fifth column is the output file name, and the sixth column is ignored

For Printer Output the fifth column is the printer name and the sixth column is ignored.

3.7 Parameter Requirements for Bursting

Bursting requires a report file with at least one parameter in the main report. It will, not work if the main report file has no parameters. One user tried bursting with a report with six subreports and although the subreports had parameters, the report wouldn't process as bursting.

Bursting and Scheduling ignore subreport parameters as they expect those parameters will be controlled by Links from the main report.

Subreports with parameters are okay, but they must have their values loaded via Linked fields from the main report.

The report cannot include any unused parameters. Inside the code we can see all parameters and will try to load values again them all, but will generate a run time error if it's unused. We have tried to trap this but older versions of the rpt file format are unreliable in reporting if a parameter is used or not.

3.8 Database Requirements for Bursting

It is possible to process a report with Bursting that uses one database in the main report and other database connections in subreports. Make sure you save any connection passwords on the Database Connection form. If you can run the report via CrystalKiwi Explorer report viewing this information will be all set up.

4 CrystalKiwi Scheduler

4.1 Introduction to Report Scheduling

Designing reports can be fun. Running a report for other users in your organisation is a little less fun and becomes tedious if it becomes a regular task. You don't want to spend every Monday or First of the Month running a regular set of reports.

Report Scheduling solves this problem and frees up your time to design more reports.

You create a list of reports in a schedule, when to run them and where to send them. This leaves you more time to improve and extend the reporting at your organisation.

4.2 What can Scheduling do?

Lots of things. You can set up individual reports or clusters of reports to process at specific times in the future. As the machine is running most of the time, it can run reports overnight while you are out of the office.

4.3 Run on Desktop or as a Windows Service

CrystalKiwi Scheduler can run as a desktop application or as a Windows Service.

As a desktop application, the main administration form must be open on the desktop (it can be minimised) and left running on the machine.. The catch is that if you want reports to run overnight, you have to leave the machine running and logged in for reports to process.

For that reason running as a windows service makes more sense. A service is an application that runs in the background. It shows nothing on the desktop. The machine must still be running, but it doesn't need to be logged in. Installing as a service is a little more complicated. There is a "Service Manager.exe" application to help you with this.

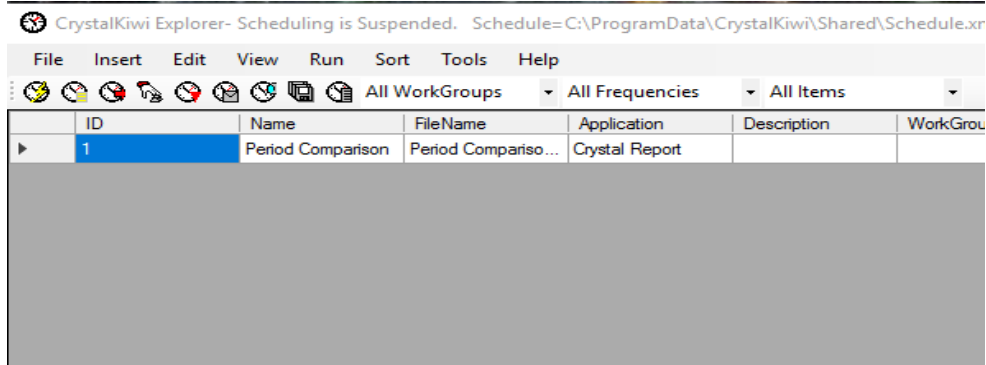
Note that Windows Services run under their own account permissions. Check these if you have any security problems processing reports.

One other important thing to note is that a Windows Service cannot see mapped drives. It can see your local drives but if you want the schedule to run reports from a networked folder you need to address the file via a UNC path (\\server\share\folder) and make sure the account running the CrystalKiwi Engine service has permission to access rpt files in that folder.

Likewise output files can be saved to network folder but must use a UNC path.

4.4 Schedule Administration

The main form in CrystalKiwi Scheduler displays an administration form that has a list of reports and other items. The main form looks like



The columns are all resizable and you can sort and filter the schedule to make it easier to manage.

There is no real limit on how many items you can have in the schedule. However there is a practical limit in that if it takes 30 hours to process your daily reports, then there is not enough time in the day to do this. The solution to that problem is to have more than one scheduler running at your site. Contact us for pricing on this. Alternatively see if you can improve the speed of processing your reports. There are all sorts of interesting ways to do this.

4.5 Schedule Files

The basic schedule information is stored in the schedule.xml file in the shared folder. If your reports have parameters, that information is saved in the parameters.xml file in the same folder.

The history is saved in ScheduleHistory.xml in the shared folder.

4.6 Schedule Menus

The schedule administration form has several menu items.

The File Menu has the following items

- Open Schedule Database lets you temporarily open another schedule master file. As the Engine will still be running the original schedule.xml this is mainly so you can examine a backup database or see how another company has set things up
- Refresh Schedule Database is needed if you are making a bunch of changes while the schedule is busy running reports in the background. The main form does not pick up any changes made by the service so you must manually reload the database.
- Settings displays a sub menu.

The Settings Menu includes

- Business Calendar lets you specify your calendar settings. This includes when your working day and week operate and the start of your financial year. See 1.3
- Database Settings will display the database form. Save any connection passwords here. See section 1.4 for more details
- Domain Shortcuts displays a form where you can specify these. See 1.5
- Email will display the Email settings form see 1.6 for details on this
- TimeZones is where you control your time zone settings. See 1.9
- History Settings will display the History Settings form. See 1.7 for this.
- Test Settings displays the testing form to check your folders and security.

The Insert Menu has some useful items you use to add items to the schedule.

- Insert Crystal Report lets you navigate to find an RPT or RPTR report. It will also load any parameter information from that report.
- Insert Crystal Report Folder will let you bulk load a folder full of reports. You still have to set the other settings of those scheduled items, but this does save a lot of time.
- Insert a Cluster which is a schedule item that contains a group of schedule items. You can then schedule this cluster as one item. See Clusters later for some other things they can do.
- Insert Disk Command lets you schedule file operations to copy, move or delete files.
- Insert Mail Message lets the schedule send out a mail message that isn't directly attached to a report. One use for this is to get the schedule to email you when it stops or restarts.
- Mapped Drives. By default services cannot see mapped drives. This menu item lets you set a temporary mapped drive for a schedule item.

The Edit Menu lets you change item settings.

- Schedule Item takes you to the different forms for that schedule item Note there is also a toolbar icon for most of these.
- Parameters allows you to edit the parameters for that schedule item.
- Remove Item from schedule is the easiest way to permanently remove an item from the schedule.
- You can also edit clusters, manage lists and edit tag files

The View Menu has these items

- View History displays the History Form
- View Statistics/Destination Domains does an analysis of the output destinations of your reports to show where they are going

The Run Menu has the following items

- Run Report Now on Desktop processes the selected report immediately.
- Run Report Now on Server sends a request to the CrystalKiwi Engine to process the report
- These two menu items can be used to identify security issues with the Engine. If a report runs on the Desktop, but not the server then the account running the Engine has some security issues. If neither run then the settings for that report are the cause of the problems.
- There is also an option to “Process Remote Folder”. This is a folder where you can place scheduler commands or email messages. See later for this feature.

The Sort Menu allows you to sort the grid by one of the columns. It can be useful to see the reports by Next Run, Previous Run, etc. This does NOT sort the data in the schedule.xml file. It just changes the record sequence of the rows on the main grid in the Schedule Administration Form.

The Tools menu has some useful administration functions.

- Report Viewer and Report Bursting can be accessed from here. A scheduler license includes one viewer and one stand alone bursting license.
- You can backup and restore the database from this menu
- Suspend and Resume report processing can be used to pause any scheduling. Use this if you plan to make bulk changes to the schedule
- Reset Administrator count is needed if you have been using multiple accounts to administer the schedule.
- Reset Form location is to be used if the report viewer form disappears. This can happen if display settings change and the viewer is on a no longer active second monitor. It is difficult to click on a form if you can't see it.
- Refresh Report is if you have made changes to parameters in the selected report.
- Advance Schedule items is useful if you have left the schedule inactive for a while. Rather than have a bunch of overdue reports suddenly start processing you can bring an individual schedule item, or all schedule items up to the current date.

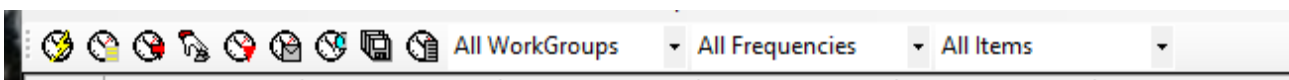
The Help menu displays on line help, this user manual, lets you apply a license code and do some TroubleShooting tasks.


The Help/TroubleShooting menu includes the following:

- Send Test Message will send a test message to your test email address
- Send Files to CrystalKiwi will send your xml files to us. Only do this if we have asked you to. With those files we can help identify problems.
- Set Debug allows you to set a diagnosis code. We will tell you the code needed to work on the problem you have raised.
- Refresh Printer List is used if you have made changes to the printers on your network. By default the printer list is rebuilt every time the scheduler restarts.

4.7 Schedule Toolbars


The Schedule Toolbar is there to provide quick access to some functions



The first toolbar icon is a wizard to take you through each form needed when you load a new report into the scheduler. The icon is 

To Display the Properties form click 

To control Where the schedule is sent click 

To select other Options for the schedule item click 

To Control Record and Group Selection Filters for the schedule item click 

To Control the Notify Messages click 

To Control When the Report runs click 

To See Monthly Statistics click 

To Set Parameter values for the report click 

The three combo boxes on the toolbar help you filter the list of schedule items. The first selects all, or a selected workgroup.

The second applies a filter to a frequency you have applied to schedule items. Perhaps you just want to see the Weekly or Daily Reports. Note the combo box will only show you Frequencies you are currently using in your schedule.

The third combo box will show you reports that have run today, will run later today, have run in the last 7 days, or will run in the next 7 days.

Note if your schedule appears empty, check you haven't set one or more of these filters.

4.8 Properties Form

The Properties Form displays some general information about the schedule item.

The screenshot shows a window titled "Edit Schedule Item 1". At the top, there are navigation buttons for the Schedule ID (1) and an "Application" dropdown set to "Crystal Report". Below this are fields for "Name" (containing "Period Comparison"), "FileName" (containing a UNC path), "Tag File", and "WorkGroup". A large "Description" text area is at the bottom left. On the right side, there are "Save" and "Exit" buttons.

Each schedule item can have a name. By default this is the report file, but if the same report is in the schedule more than once, this can be used to distinguish them

The file name is a pointer to the source RPT or RPTR report. A local drive is recommended, but it can be any folder and file you can access on your network. Note that the service cannot see mapped drives, so use a UNC path for any networked drives.

The Tag file is a mechanism where report specific values can be used in the processing. If a schedule item is in a cluster, then the cluster tag file is applied first, and then the schedule item tag file.

WorkGroup is where you can select a work group for the schedule item. To create a new work group, enter the name of the group into the field. Workgroups enable you to apply bulk changes to your schedule. For example to set all the "Weekly" reports to Monday morning at 5:00 am.

Description is a multi line, general purpose description of the schedule item. Use this as a general notes field for the item. Any special information about processing the report can be entered here.

This form also lets you see the Encryption and TimeZone for the reports. These options will only appear when you create at TimeZone or an Encryption Key. You cannot delete those if a report uses it. To remove the entry set the value to blank.

4.9 Where Form

The Where form is one of the more important schedule settings. This controls where the schedule item goes. The layout will change as different options are selected

The screenshot shows a dialog box titled "Edit Crystal Reports Destination for Item 1". It contains several input fields and buttons. The "Schedule ID" is set to "1". The "Application" is "Crystal Report". The "Name" is "Period Comparison". The "WorkGroup" is empty. The "FileName" is "D:\Test\CrystalKiwi\TCost\Cr2016\Period Comparison.rpt". The "Destination" is set to "Email". The "Format" is "Acrobat File". The "Output" is "C:\ProgramData\CrystalKiwi\Shared\Output\Period Comparison.pdf". There is an "Email Settings" section with fields for "To" (bruce@crystalkiwi.com), "CC", "BCC", "From", "Subject" (Test report for parametes), and "Message". Buttons for "Copy to Clipboard", "Paste from Clipboard", "Save", and "Close" are present on the right side.

Destination can be Email, Disk, Printer or Bursting.

Format is one of the valid export formats. This applies to Disk or Email destinations.

Output is the output file name for the schedule item. Note the file extension will change as you select different formats. The file name applies to Disk and Email destinations.

The Email settings are displayed above. You can select the To, CC, BCC, Subject and Message. You can also control the sender.

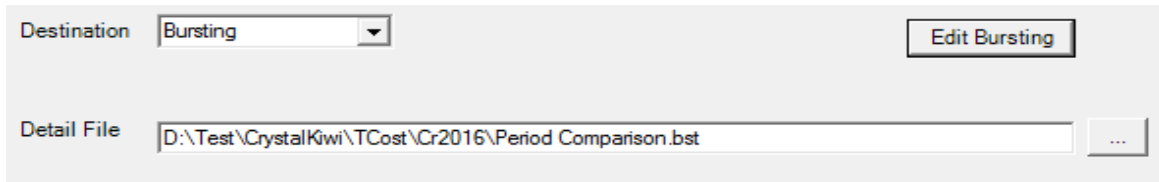
This is a close-up view of the "Destination", "Format", and "Output" fields. The "Destination" dropdown menu is open and shows "Disk" selected. The "Format" dropdown menu is also open and shows "Acrobat File" selected. The "Output" text box contains the file path "C:\ProgramData\CrystalKiwi\Shared\Output\Period Comparison.pdf".

All of these support fields so you can include domain shortcuts, parameter values, date fields and tag file values.

Disk Destination makes the form a little simpler. You just need to specify a Format and Output File Name.



Printer Destination is even briefer. The list of printers is built from the printers currently configured on this machine.

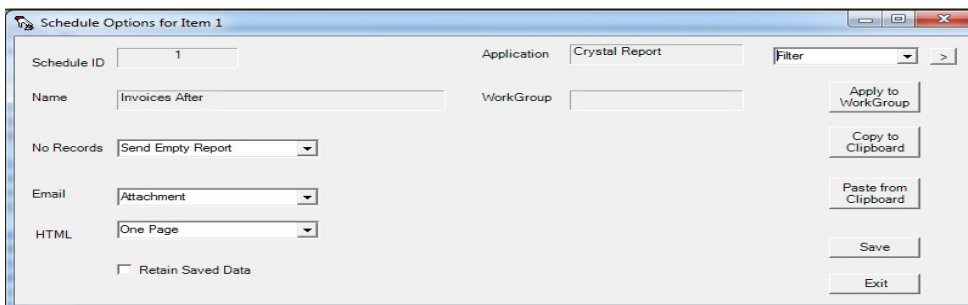


The Bursting destination just needs to know where the detail file is. This is the control file for the bursting run. If you leave the Detail File blank, and click “Edit Bursting”, a default bst file name with the same name as the rpt file will be used.

The Edit Bursting button will take you to the main Bursting Form. See 3.3 for details on this.

4.10 Schedule Options

Schedule Options control how the processing works for some options,



The first option is what to do if no records are processed. The previous default was to send an empty report. Now you can control this.

The default for bursting reports is to NOT send an empty report. You can now control this.

Email reports are normally sent as attachments. For some formats (HTML, Text) we can send the report as the body of the message. This can be very popular with some users, while others block any HTML emails.

HTML reports are normally single page, but they can be split into separate pages.

Retain saved data is a check box. Use this for testing a report. If checked the saved data in the rpt file will be used rather than refreshed against the database.

4.11 Schedule When

CrystalKiwi Scheduler has lots of powerful options about when to run a report.

The screenshot shows the 'Edit Schedule Time Settings Item 1' dialog box. It contains the following fields and controls:

- Schedule ID: 1
- Application: Crystal Report
- Name: Period Comparison
- WorkGroup: (empty)
- FileName: D:\Test\CrystalKiwi\TCost\Cr2016\Period Comparison.rpt
- Run Now: 1 x Week(s)
- Next Run: 16-Feb-2017 06:52
- Previous Run: 11-Jan-2017 13:59
- Buttons: Copy to Clipboard, Paste from Clipboard, Save, Exit
- Processing Completed: - EMail Report to bruce@crystalkiwi.com
- Next Run Dates:
 - 16-Feb-2017 11:52
 - 23-Feb-2017 11:52
 - 02-Mar-2017 11:52
 - 09-Mar-2017 11:52
 - 16-Mar-2017 11:52
 - 23-Mar-2017 11:52

The default is a schedule item with “Not Scheduled”. This means the NextRun field for that item in the schedule is blank.

Set a schedule item to Not Scheduled if you temporarily want to stop processing that item, or if you want to run it manually using one of the “Run Now” menu items. That way all the destination and notify settings are set, but the timer won't set the next run of the report.

Reports are normally set for Daily, Weekly, Monthly or some multiple of that. For example to run a report every two weeks use settings as below:

The close-up shows the following settings:

- Run Now: 2 x Week(s)
- Next Run: 16-Feb-2017 06:52
- Previous Run: 11-Jan-2017 13:59

You can also set the schedule for minutes and hours usually with a multiplier (for example every 30 minutes). If you don't want that to run every half hour overnight, use Business Minutes where you can control the start and end of your Business Day.

There is also a Business Day frequency where the report runs Monday to Friday, and ignores weekends and public holidays. The business day frequency does not use the Business Hour options so you can schedule a Business Day report for 4am with a Business Calendar of 8:30 to 17:00.

Note on the form is the previous completed message and the next 6 dates the report should run. The * button is to refresh those next run dates if you have made a change on the form. The next run dates are always in the future.

Processing Completed: - EMail Report to bruce@crystalkiwi.com	Next Run Dates 16-Feb-2017 06:52 02-Mar-2017 06:52 16-Mar-2017 06:52 30-Mar-2017 06:52 13-Apr-2017 06:52 27-Apr-2017 06:52
--	--

The Next Run date and time can be anything in your calendar, even if not valid for the current frequency (for Example, a Sunday date with a frequency of Business Day). If the next run date and time is in the past, once you have saved the form, the engine will identify an overdue report and process it immediately.

You can also set a report to run "Once". Just set a Next Run date and Time. On completion of processing, the schedule item will revert to "Not Scheduled".

There is a "Scheduler Start" and "Scheduler Stop" frequency. Use this to send you an email every time the scheduler is stopped or restarted. Can be a great administration tool.

There is a useful "Last Day of the Month" option. This currently is for Calendar Last Day of the Month. A recent improvement was to allow "Last Working Day of Month".

Another powerful option is Days of the Week where you select combinations of different days. This will only run once of each of those days at the same time

Days of Week	Next Run	16-Feb-2017	06	52
17 13:59				
g Completed: - EMail Report to ystalkiwi.com	Next Run Dates 16-Feb-2017 06:52 20-Feb-2017 06:52 23-Feb-2017 06:52 27-Feb-2017 06:52 02-Mar-2017 06:52 06-Mar-2017 06:52			
	Select			
	<input type="checkbox"/> Sunday			
	<input checked="" type="checkbox"/> Monday			
	<input type="checkbox"/> Tuesday			
	<input type="checkbox"/> Wednesday			
	<input checked="" type="checkbox"/> Thursday			
	<input type="checkbox"/> Friday			
	<input type="checkbox"/> Saturday			

There is a useful Days of Month option where you specify which days of the month the report should run. The different dates are separated by semi colons. Working Days of the Month works in a similar way.

Days of Month	Next Run	16-Feb-2017	06	52
11-Jan-2017 13:59				
Enter Days of month seperated by a semi colon				
3;12;16				
Processing Completed: - EMail Report to bruce@crystalkiwi.com	Next Run Dates 16-Feb-2017 06:52 03-Mar-2017 06:52 12-Mar-2017 06:52 16-Mar-2017 06:52 03-Apr-2017 06:52 12-Apr-2017 06:52			

4.12 Schedule Filters

Every Crystal Report has some sort of record selection, even if it is NO selection filter. This form enables you to modify the record selection when the scheduled report is run.

The screenshot shows the 'Schedule Filters' dialog box. At the top, there's a 'Report File' field with a file path, a 'ScheduleID' field with the value '1', and a 'Notify' dropdown menu. Below these are 'Created' and 'Modified' date fields, an 'RPTR (Read Only)' checkbox, and an 'Application' field with the value 'Crystal Report'. A 'Comments' section is empty. The 'Record Selection' section contains a SQL filter: `((({GLTrans.TRDate} >= {?Start Month}) AND ({GLTrans.TRDate} <= {?End Month})) OR (({GLTrans.TRDate} >= {?Start Match}) AND ({GLTrans.TRDate} <= {?End Match})))`. There are 'Modify' buttons for Record Selection, Group Selection, and Saved Data. The 'Database Tables' section lists 'GLTrans (Server=TC; Database=TCost)' and 'Customer (Server=TC; Database=TCost)'. At the bottom right, there are 'Save' and 'Close' buttons.

One potential use of this is to insert multiple copies of the same rpt file into the schedule and apply different Schedule Filters to select records for a day, week or month.

Note that if your report is from an old version that doesn't support a Saved Data filter, we can still apply a filter for that data set during processing. While your report may not support Saved Data record selection, the Crystal Run Time inside the scheduler does support this feature.

4.13 Notify Settings

These are used to send an email when the schedule has finished processing an item. You can set notify messages on success, failure and on each item in a Bursting Run.

The message is a great place to use Report Property Fields. Try field values like {=ScheduleID}, {=ScheduleName}, {=LastRun}, {=LastRunMsg} or {=NextRun} in the message.

The screenshot shows a dialog box titled "Edit Schedule Notify Settings for item 1". The dialog contains the following fields and controls:

- Schedule ID:** A numeric field with value "1" and navigation buttons (<|, <, >, >|).
- Application:** A text field with value "Crystal Report" and a "When" dropdown menu.
- Name:** A text field with value "Period Comparison".
- WorkGroup:** An empty text field.
- FileName:** A text field with value "D:\Test\CrystalKiwi\TCost\Cr2016\Period Comparison.rpt".
- On Success:** An empty text field.
- Message:** A large empty text area.
- On Fail:** A text field with value "bruce@crystalkiwi.com" and a text area containing the message: "{=ScheduleName} failed with message of {=LastRunMsg}\n{=LastRun}".
- Bursting Item:** An empty text field.

On the right side of the dialog, there are several action buttons: "Apply to WorkGroup", "Copy to Clipboard", "Paste from Clipboard", "Save", and "Exit".

4.14 Item Statistics

These will build over time, and show a rolling 12 month set of the count and average processing time of the item. Use this to see if and item on the schedule has had a change affect the performance of the item.

4.15 Item Parameters

The scheduler can process reports with built in dynamic record selection. It can also process reports that have parameters. You control parameter values on the Schedule Parameters form.

Screenshot of the "Schedule Parameters for Item 1" form. The form includes fields for Schedule ID (1), WorkGroup, Name (Period Comparison), and FileName (D:\Test\CrystalKiw\TCost\Cr2016\Period Comparison.rpt). A "Refresh List" button is above a list of parameters: Start Month, End Month, Start Match, and End Match. To the right of the list are three dropdown menus: "PreviousMonth Start ThisYear", a numeric spinner set to "0", and a date dropdown set to "01-Jan-2017". "Save" and "Close" buttons are at the bottom right.

The box on the bottom left of the form is a list of the top level parameters in the report. We do not examine the parameters from sub reports. We assume that subreport parameter values will be linked from the main report.

We also do not support parameters that are not used. It is difficult for us to identify those.

Select each parameter in the list and assign a value.

For Date Parameters, our dynamic date feature is recommended, but you can use a hard coded date if you want. Just Select Calendar from the list and a date.

Close-up screenshot of the parameter list and date selection. The "Start Month" parameter is selected in the list. The dropdown menu next to it shows "Calendar" selected. The date dropdown next to it shows "01-Feb-2017" selected.

Because there are so many options for dynamic dates we have split the list. Select "ThisYear", "Next Year", "Last Year" or "Quarter" to see further dates to select.

Multivalues, Ranges and Multi Value Ranges are all supported.

4.16 Number Parameter Values

A new option for number and string parameters was a new feature in version 1.24.

You can use DayNumber, MonthNumber, YearNumber and FinYearNumber to automatically calculate from the current date. If you have used the today adjustment for the business calendar, the adjusted date will be used for the calculation.

For example, with an adjustment of -1, when you select monthnumber on the 1st of November, you will get 10 (October). On the 2nd of November and later dates that month, you will get 11 (November).

The FinYearNumber will use the Business Calendar setting for the start of the financial year. So with a financial year that starts on 1-April, the FinYearNumber will get the current year in April, May, June, etc and remain with that value through January, February and March. It will move to the next year in April.

If you want the year of the end of the financial year it is a minor matter to use "finyearnumber+1".

The keywords to invoke this feature are not case sensitive, YearNumber, yearnumber and YeArNumbER will all work.

You can also adjust these so MonthNumber-1 is the previous month number. These also roll over, so in January that will process as 12.

5 CrystalKiwi Engine

5.1 Service Based Scheduling

The original report scheduler we developed ran on the windows desktop as a simple executable. You could watch it processing each report. The major problem was that it had to be left logged and running. To process reports overnight meant the machine was available to anyone who walked past the machine.

If there was a power outage, the machine might restart, but someone had to log in and restart the program to get the schedule going again.

Services run in the background. The machine needs to be running, but you don't need an active logged in session to have the schedule process. This is a lot more secure.

If there is a power outage, a machine can be configured to restart, and as part of that process, all the services set to "Automatic" on that machine can restart as well.

The Windows Service used by the CrystalKiwi Scheduler is called the CrystalKiwi Engine.

5.2 Installing the service

The CrystalKiwi Engine.exe is included (along with CrystalKiwi Explorer.exe and Service Manager.exe) in the msi files you used for installation. While you can run CrystalKiwi Explorer (and it's Bursting and Scheduling aliases), you cannot run CrystalKiwi Engine directly. It runs as a service, so has no user interface.

We can only watch what is happening via various files in the shared folder.

Use the Service Manager.exe to run the script that installs the CrystalKiwi Engine service. You may need to "Run as Administrator". Yes I know you might think you have full administration rights, but Microsoft still locks some admin functions behind another level of security.

The Engine and the main administration form share schedule information. These are normally stored in xml files in the shared folder.

5.3 Monitoring the service

As we said in the previous section. We cannot directly run the Engine. We can however watch what it does. Most of the activity relates to files in the shared folder.

In the shared folder there are a collection of xml files. Most of these are obvious in what they contain. Schedule.xml contains the main schedule item information. Parameters.xml contains information about the parameters of those items. SMTPSettings contains information needed to send messages to your mail server.

While XML files are readable and you could edit them directly with NotePad we do not recommend. A minor spelling error can freeze the entire system

There is a \Web subfolder in the Shared folder. Every time the Engine does something, it updates one or more of the HTML files in that folder. The first step to see what is happening is to examine those files.

As a report schedule item is processed, the engine also creates a current.xx file in the shared folder.(where xx is the Schedule ID). This doesn't really say much more than the engine is currently busy running xxx.

5.4 CrystalKiwi Engine troubleshooting

This is a small simple executable. All the smart stuff happens in CrystalKiwi Common, a library shared by viewing, bursting and the desktop scheduler. So if a report processes fine using one of those other applications it should also run fine inside the Engine.

But sometimes it doesn't.

There are a couple of major differences between a service executable and a desktop that is supposed to do the same thing.

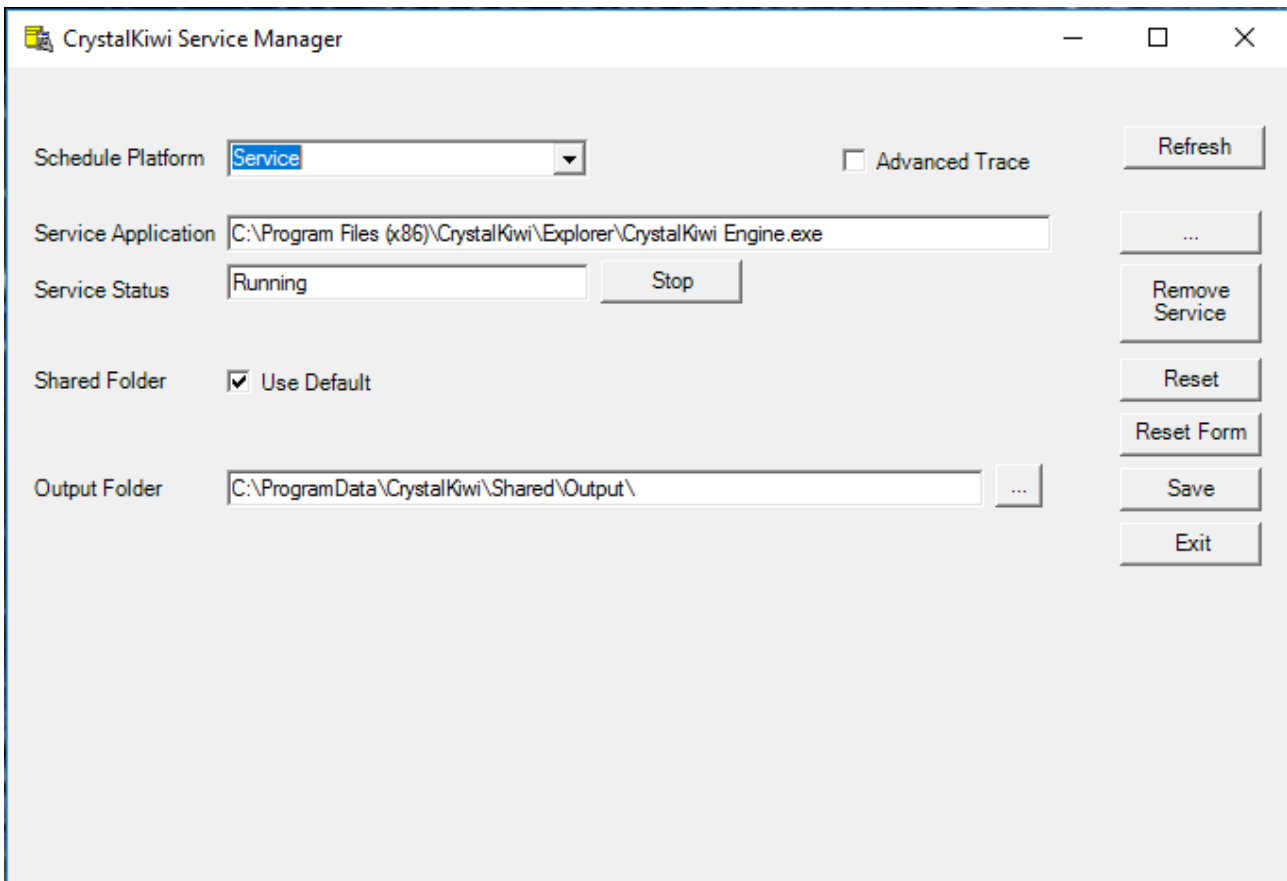
The first is that the service runs under it's own login. You set this up under the Control Panel/Administration Tools/Service and you specify a user and password. Your Desktop user might have permission to access that network folder, while the account running the service can't. That is easy to identify and fix.

Less obvious is that a service cannot see mapped drives. You might keep those reports on "S:\Reports" but the service cannot find that. Instead use a UNC path and point your reference in the schedule to "\\OurServer\Common Files\Reports\". And make sure you have permission to access that folder.

6 Service Manager

There were a few tasks that didn't easily fit into the viewer, bursting or scheduler admin forms. In some cases we needed a way to reset the form location if it wasn't visible on the screen. In other cases special administration permission was needed.

We preferred to keep those tasks into a separate executable. One of the key settings on this form is where the scheduling happens. On this form the "Platform" can be "Supended", "Desktop" or "Service".



The screenshot shows the 'CrystalKiwi Service Manager' window. It features several configuration fields and control buttons:

- Schedule Platform:** A dropdown menu set to 'Service'.
- Advanced Trace:** An unchecked checkbox.
- Refresh:** A button.
- Service Application:** A text box containing 'C:\Program Files (x86)\CrystalKiwi\Explorer\CrystalKiwi Engine.exe'.
- Service Status:** A text box showing 'Running' and a 'Stop' button.
- Shared Folder:** A checked checkbox labeled 'Use Default'.
- Output Folder:** A text box containing 'C:\ProgramData\CrystalKiwi\Shared\Output\'.
- Control Buttons:** A vertical stack of buttons on the right side: '...', 'Remove Service', 'Reset', 'Reset Form', 'Save', and 'Exit'.

See notes later on the Shared Folder. If you don't like the default location, you can change it here. Make sure the folder has full permission to read and write. Remember to stop and restart the service to apply the new settings.



This close-up shows the 'Shared Folder' section where the 'Use Default' checkbox is unchecked. Below it, a text box contains the path 'D:\Scheduler\'.

Also note you can also assign a default output folder. You can fully code the output locations for each schedule item, or you can leave the path blank and use the default Output folder (above). Again check permissions.

6.1 Installing the Service

There are a couple of key things on the form to control the service. The first thing is that you must be able to identify the Application. This is normally CrystallKiwi Engine.exe in the c:\Program Files (x86)\CrystallKiwi\Explorer folder. People sometimes like moving files to other folders and we don't see why we should stop them.

The InstallService Button will run a script to add CrystallKiwi Engine to the list of services. If that has been done the button changes to "Remove Service" (as above).

You can manually start and stop the CrystallKiwi Engine using the Control Panel. Look for Services on the Administration form. You can also set the account running the service here.

From a command line:

```
sc start "CrystallKiwi Engine" or
```

```
sc stop "CrystallKiwi Engineer"
```

will start or stop the service.

7 Field Objects

7.1 Field Objects Overview

Field Objects give you the ability to use dynamic values for file names, parameters and messages in your report scheduling and bursting. Fields are indicated by {name of field}. You can use these in a file name, message subject, message body, parameter value and various other places in your report,

The first character after the bracket indicates what field type it is.

This makes Field Processing very efficient in terms of the processing inside the scheduler or burster.

7.2 Report Properties {=PropertyName}

You can include properties of the scheduled report in the email message or subject. All of the properties of the schedule item are available. Look at the schedule.xml file with notepad to see what properties are available.

If the report property includes any of the fields above, they will also be interpreted.

7.3 Parameter Fields {?xxx}

Parameter Fields can be extracted from the currently processing report. Parameter Fields are indicated by {?parameter name} and display in the default format for that field. Use a Date Mask field to select the format of a date parameter.

7.4 Date Fields {*xxx}

These are all indicated by a {*name of date field}. you may use any of the date fields below. All support the thisyear, nextyear and lastyear keywords. So in the list below, you can use {*today}, {*today lastyear} and {*today nextyear} to pick up the appropriate year. ThisYear is supported for all fields, but is also the default year (so {*today} and {*today thisyear} will return the current date.

They also all support adjustments, so you could use {*today-1} to process with a value for yesterday and {*today+1} for a value equal to tomorrow.

Valid Date Fields are

Date Field Values

today

week start and week end

month start and month end

previousmonth start and previousmonth end

nextmonth start and nextmonth end

calendar year start and calendar year end

financial year start and financial year end

quarter start and quarter end
previousquarter start and previousquarter end
nextquarter start and nextquarter end
firstquarter start and firstquarter end
secondquarter start and secondquarter end
thirdquarter start and thirdquarter end
fourthquarter start and fourthquarter end

Each of these can have a suffix of:
this year, nextyear or lastyear
(if no suffix, then default is "thisyear")

All of these may include a day adjustment

On some forms you do not need to use the {*} format. For example on the bursting form in both CrystalKiwi Scheduler and CrystalKiwi Bursting you can enter a date field as **today** or **previousmonth end lastyear** and the value loaded into the parameter will use the correct value

7.5 Date Field Adjustments

The date fields covered in 7.4 can all be adjusted by several days or more.

{*today-1) will return yesterday
{*today+1} will return tomorrow
{*week start-7} will return the start of the previous week.

By default the parameter form will allow you to adjust the date by plus or minus ten days as we thought that should cover most requirements.

You edit the parameters.xml file manually and that will let you put any integer adjustment against that date. The parameter form will adjust to fit any adjustment made this way. We would prefer if it wasn't too large a number, but any integer value is acceptable.

If you want to enter an adjustment outside the default bounds, you can use the menu item File/Settings/Maximum Adjustment. These settings are saved in the User Registry, so you can remove them if no longer needed.

7.6 Date Mask Fields {!xxx}

A Date Mask Field is used if you want the current date or time as part of the file or folder name. You can also use Date Fields in the subject or message of the emails sent from within CrystalKiwi Explorer.

Rather than give you a cryptic list of shorthand values, we let you use your existing familiarity with crystal reports date formatting. Use {!dd-MMM-yyyy} to display the current date time as 02-Mar-2012, or {!HHmm} to display as 1437 (assuming today is the 2nd or March, 2012 at 2:37pm).

All the standard date field formatting from the ToText function are supported. See the Crystal Reports documentation for details of the formatting masks available.

All Date Mask as at Today/Now. You can use other dates by using an Override date (see next item).

7.7 Date Mask Fields (with override date) {{month start}xxx}

There is a special option within the date mask to include a different date to the current date. You select the Date field from section 7.2 and apply the date formatting from 7.3 (above)

Use {{today-4}dd-MMM-yyyy} to show the date from 4 days ago in that format. You can also use a parameter field value as {{?report param}yyyy-MM}.

7.8 Tag File Fields {\$xxx}

Each report can be allocated a tag file. This is a simple XML file with some xml tags and values. You can extract a field from that file using {\$tag field name}, Tag Fields are specific to each file, so if a value isn't found, a blank is returned and applied to the field, Tag Files can be easily modified from within your report with formulas using the Schedule Management UFL.

If a scheduled item is part of a cluster of reports, the cluster can also be assigned a tag file. In this case, the cluster tag file will be searched first and then the tag file assigned to the schedule item.

You can assign multiple tag files by entering several file names separated by a semi colon. The files will be searched in the order given.

7.9 Use a report to save tag values

Formulas can be included in a report to be used in processing the schedule or a bursting run.

The formula could look like.

```
WhilePrintingRecords;
ScheduleTagClear;
ScheduleTagStore ("Name", {Customer.Customer Name} );
ScheduleTagStore ("City", {Customer.City});
ScheduleTagStore ("LYSales",ToText({Customer.Last Year's Sales},0,"","") );
ScheduleTagSave ("C:\Test\CrystalKiwi\Xtreme\Customer Tags.xml")
```

This could be in the report being processed as all formulas are calculated prior to exporting the first page, or it could be a report processed prior.

The formula above will create a tag file called Customer Tags.xml that looks like

```
<?xml version="1.0" encoding="utf-8"?>
<!-- XML File Created by cruflschedule -->
<TagDoc>
<Name>Clean Air Transportation Co.</Name>
<City>Conshohocken</City>
<LYSales>$23789</LYSales>
</TagDoc>
```

Those tags can then be used by assigning the tag file to the report and selecting the tags using {\$Name}, {\$LYSales} and {\$City}

7.10 Domain Shortcut Fields {**.xxx**}

One of our early users had a lengthy domain name and was getting tired of typing in the full domain name each time he wanted to use a local email address. Another had an email address field in her database that didn't have enough space for clients with long domain names. This field type solves both their problems.

Create a domain shortcut using the menu item File/Settings/Domain Shortcuts. Each domain shortcut has a brief code and then a full description. The code is case sensitive and cannot contain embedded spaces. The full description can be any length but should only be a single line. To be a valid domain the description should not contain any spaces or invalid domain characters, but as a domain shortcut can be used in places like an email message, that isn't a firm requirement.

We've set our test site up to use {**.ck**} to refer to any address at crystalkiwi.com. The {**.**} indicates a domain shortcut is to be used.

Think of domain shortcut as specialized tag file. The domains are saved in the `domain.xml` file in the shared folder.

7.11 List Files {**+xxx**} and {**&xxx**}

There are times when you need to send several reports to a list of people, and the membership of this list can frequently change. In this situation, create a text file of the email addresses, with one address on each line. Use {**+filename**} as the Send To address, and each person on the list will receive the same report. Change an address in the file, and the next time the report runs, the new address will be used.

You can also use this with your email message, where a standard clause needs to be added to the end of each message, or maybe a seasonal message depending on when the report runs. Use {**&filename**} to include the contents of the text file in your message. This should only be used for email messages, as multiline fields are not valid for use elsewhere.

8 Advanced Features

8.1 Shared Folder Location

Most applications need to save some configuration data somewhere. Microsoft keeps changing the rules and then along comes a new version of windows or service pack and the rules and locations change again.

If you are running a recent version of Windows, There should be a hidden folder on your machine called `c:\ProgramData` where `c:` is the root drive. This is where we were told to put our application work files. The install should create a folder of `c:\ProgramData\CrystalKiwi\Shared`.

If you are running an older version of Windows that `ProgramData` folder might be the original `SharedProgramData` folder at

`c:\Documents and Settings\All Users\Application Data\CrystalKiwi\Shared`

Check this folder exists and "Everyone" has "Full Control". You need to be able to read and write the files and subfolders to this folder. The Shared folder is used by users running the Explorer report viewer, Bursting and Scheduler. The Engine service could be running under a different account permissions, so it needs to be able update files in this folder as well.

You can use the `Service Manager.EXE` application to redirect the shared folder to another location. Do not redirect to a network drive as this may impact on performance. A local drive that you control the permissions is ideal.

The Service Manager sets an Environment Variable called "`CrystalKiwi\SharedFolder`" to that folder location. You can manually edit this if you have to.

If your security settings dont support this, there is a third option. You can use a hard coded folder of `c:\CrystalKiwi\Shared` where `c:` is the drive where the applications are installed.

So the logic to identify the shared folder location is:

- `c:\CrystalKiwi\Shared` if present (Where `c:` is the driver where the executables have been installed.)
- Environment Variable "`CrystalKiwi SharedFolder`" set by Service Manager or manually
- Default of `c:\ProgramData\CrystalKiwi\Shared`

8.2 Work Groups

These exist to make life easier. Each schedule item can be assigned to a Work Group. You select the schedule item and on the Properties form you can select any current work group. To create a new Work Group just type the name in the work group field and save the form. That workgroup will now be added to the list.

To remove a workgroup, select each of the items in that work group, and assign it to a blank or another workgroup. A work group with no items will no longer be on the list.

Work Groups are displayed in one of the columns on the main administration form. You can filter the grid on that form to only display one workgroup. This can make management easier.

A second use of Work Groups is that some schedule settings can be saved to all members of the work group. For example, you can set the Next Run Time for all the members of the "Friday" work group.

Work Groups do NOT have any performance overhead. They just create an additional field for each schedule item. They help you manage a large schedule.

8.3 Clipboard

This is a simple feature in the scheduler to make edits easier. On some of the forms is a button to "Save to Clipboard". When you are next on that form for another schedule item, you can "Paste From Clipboard" to assign the same settings.

Clipboard settings are reset when you exit the scheduler admin form.

9 Useful Web Sites

The following Web Sites are useful Resources to help you with your Crystal Reports

www.businessobjects.com

Crystal Reports is now a SAP product, so the product pages for Crystal Reports are now deep within www.sap.com – rather than give you a lengthy URL to find them, we've found that the business objects link works fine.

www.tek-tips.com

This web site is a useful technical forum for many IT users. There are several Crystal Reports forums and a bunch of experts offering free help. This is where you go to see what you can really do.

www.kenhamady.com

Ken is one of the experts on Tek-Tips. He is an instructor based in West Virginia and does training and consulting. He publishes a newsletter and blog. Ken also has an extensive index of 3rd party products that extend what Crystal Reports can do.

www.hammerman.com

Another expert from Tek-Tips, Howard Hammerman is based in Maryland. There are some useful resources available from his site.

www.crystalbook.com

George Peck writes the best Crystal Reports reference book. His web site tells you about the detailed features

www.crystalkiwi.com

This is our web site. Check out the blog and some of the other utilities we have developed.

www.chelseatech.co.nz

This is the company Bruce Ferguson and Mo Naughton set up and they did Crystal Reports Training and Consulting. There is an extensive list of products that help with Report Viewing and Scheduling. Bruce is now at CrystalKiwi (above). The web site went dark in 2016 but should be up and running again in 2019.

www.cortexsystems.com.au

These are Crystal Reports instructors and consultants based in Brisbane Australia. They have a some useful products including Report Analyzer for report documentation and ReportDiff for report comparison.

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