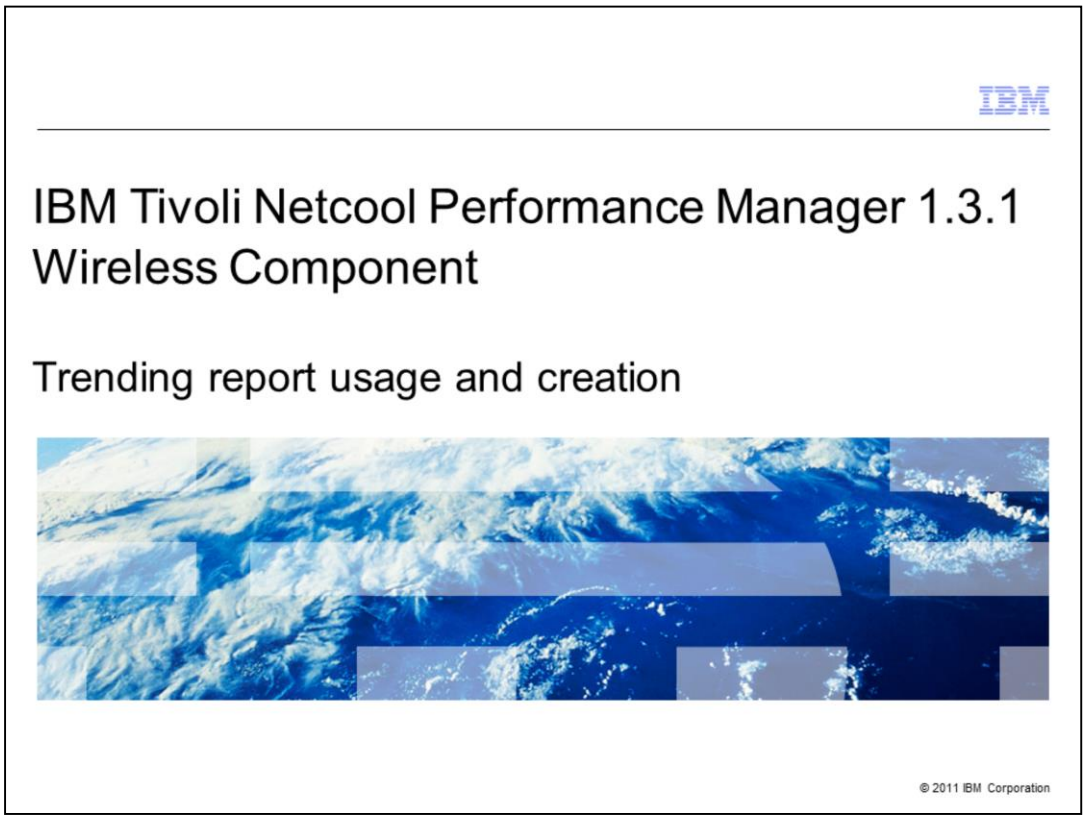
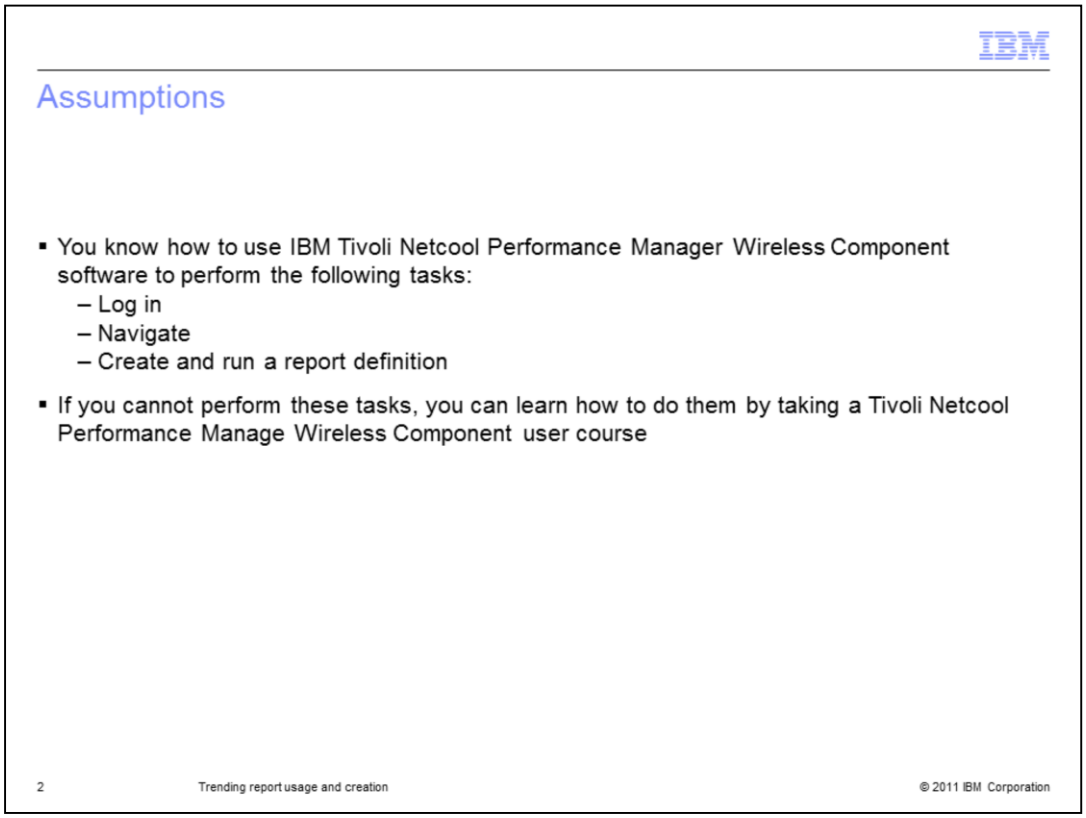


IBM Tivoli® Netcool® Performance Manager 1.3.1 Wireless Component: Trending Report Usage and Creation



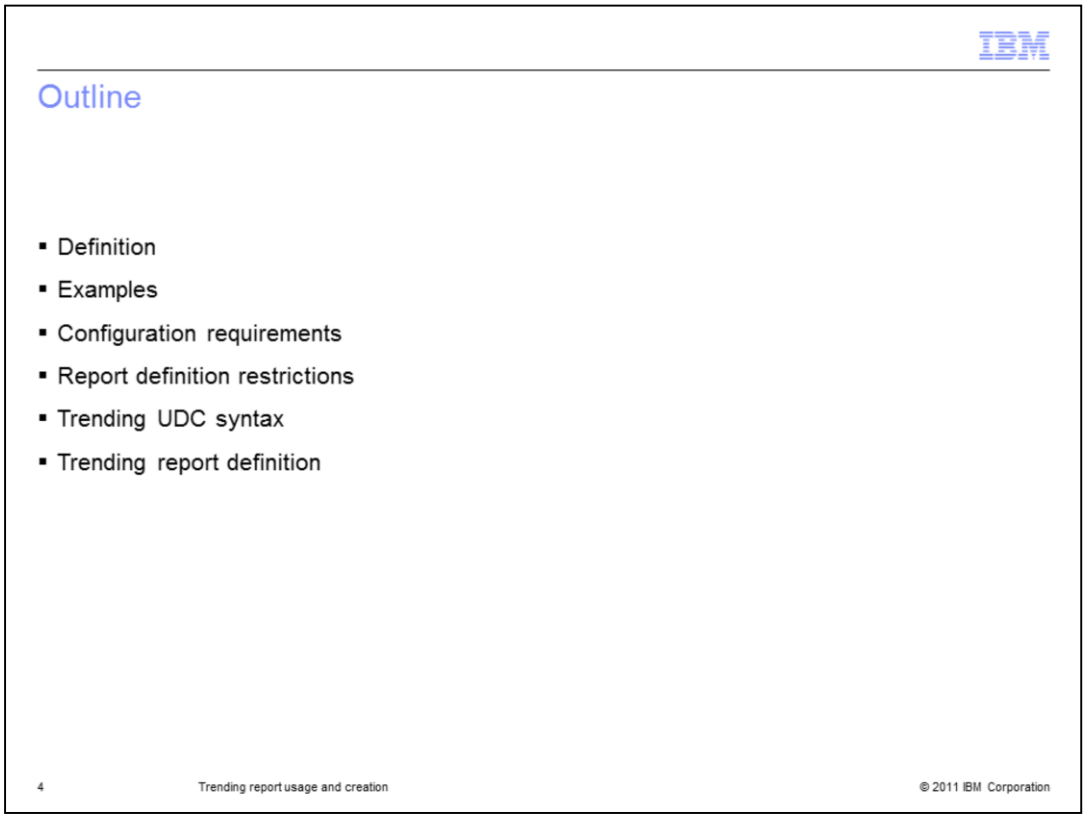
Assumptions.

You know how to use IBM Tivoli Netcool Performance Manager Wireless Component software to perform the following tasks: Log in, Navigate, and Create and run a report definition. If you cannot perform these tasks, you can learn how to do them by taking a Tivoli Netcool Performance Manage Wireless Component user course.

Objectives.

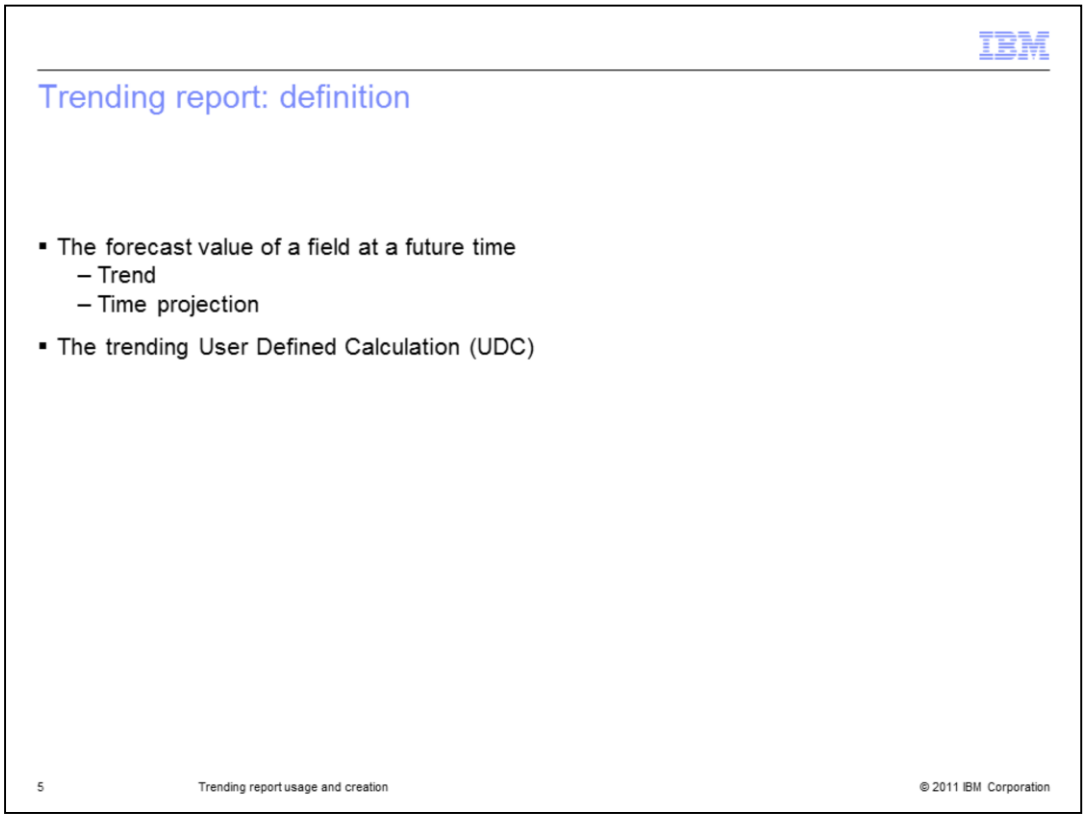
When you complete this module, you can perform the following tasks:

- Define trending report types
- Define configuration requirements before creating a trend report
- Create a trending report



Outline.

This module presents information on running and viewing a trending report. The module outline is definition, samples, configuration requirements, report definition restrictions, trending UDC (user-defined calculation) syntax, and trending report definition.



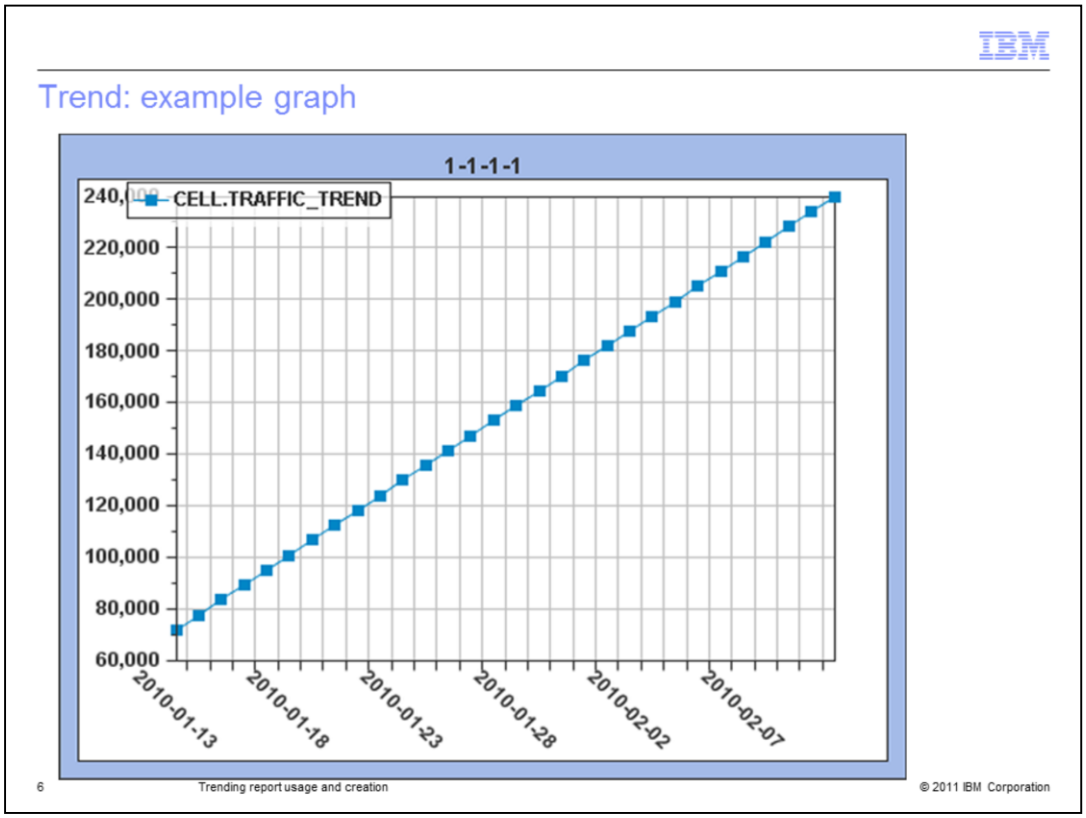
Trending report: definition.

Use trending reports to forecast the value of a field (peg counter, UDC, and so on) at a future time based on a historical set of busy hour values. Stored busy hour data is used because complete performance data (raw data) might be deleted after a few months and stored busy hour data is usually kept for many months. The system uses historical busy hour values to create a regression line. Using this regression line, you can forecast future values.

You can perform two kinds of trending analysis: Trend and project time.

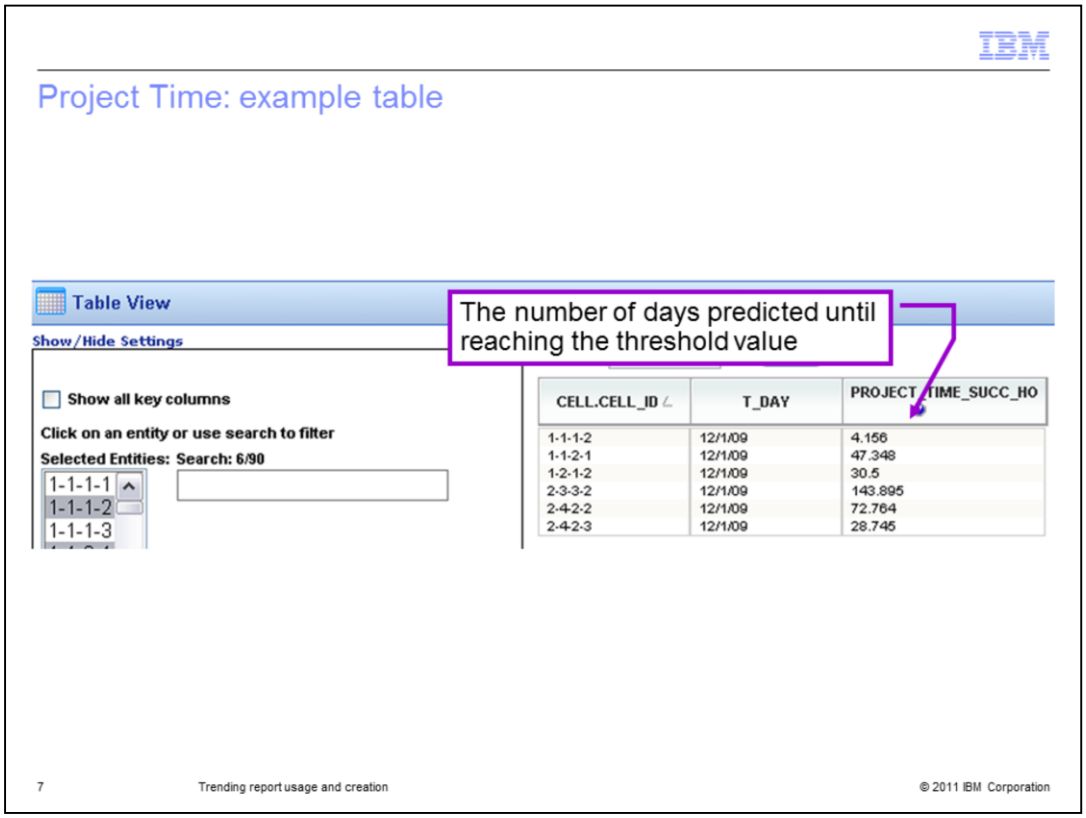
The software creates a regression line when you use the trend function in the forecasting UDC. The software can predict how many days before a field might reach a particular limit using the projectTime function. When you create a forecasting UDC, you specify for the software to use linear, logarithmic, or exponential regression for the calculation.

It is up to you to know your data and determine which regression type is the most suitable. The next two slides show an example output of the two available functions.



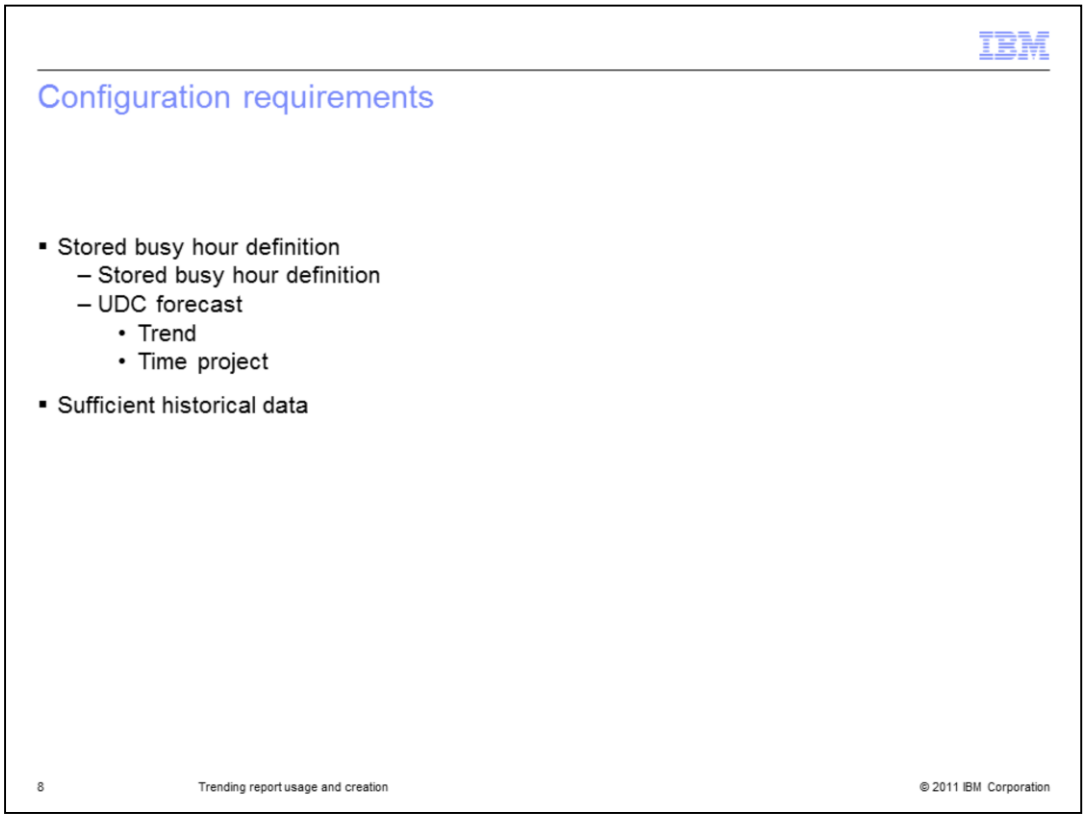
Trend: example graph.

The image is an example of a trend graph illustrating the counter trend over a future time period.



Project Time: example table.

The image is an example of a time projection forecast. The start date is in the column T_DAY. Adjacent the start date are the predicted number of days until the threshold might be reached. The entity ID is the default attribute listed in the output. You can select alternative entity attributes to display in the report if required.

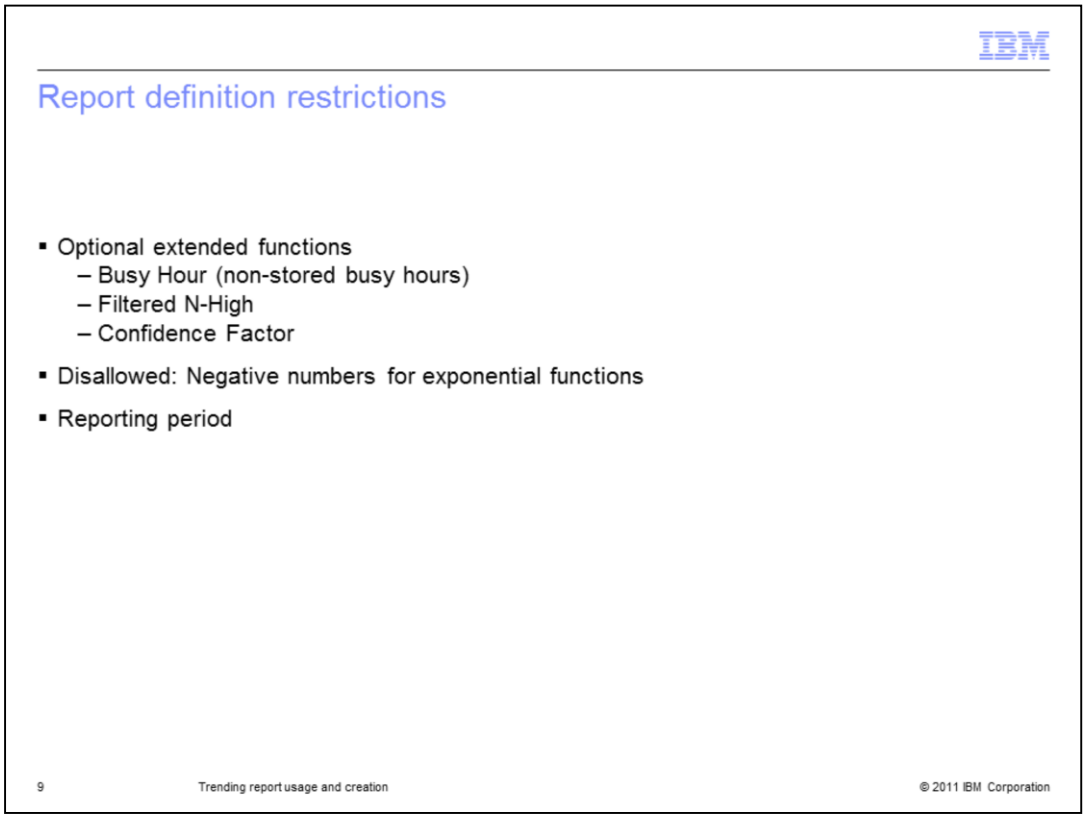


Configuration requirements.

To create a trend report definition, two things require preparation in a particular sequence. First, a stored busy hour definition must be created. This might already exist on your server. Second, the forecasting UDC must be created. The two forecasting UDC types are trend and projectTime.

A forecasting UDC must be created for the type of forecasting report you want to run. The report definition uses only one of the two forecasting UDC types. When these items have been created, you can create a trend report definition.

Sufficient historical data for the fields used in the report must be collected before a trend report should be run. It might be necessary to create a new stored busy hour definition. If so, the system administrator can run the stored busy hour calculations for existing raw data that is stored on the system.

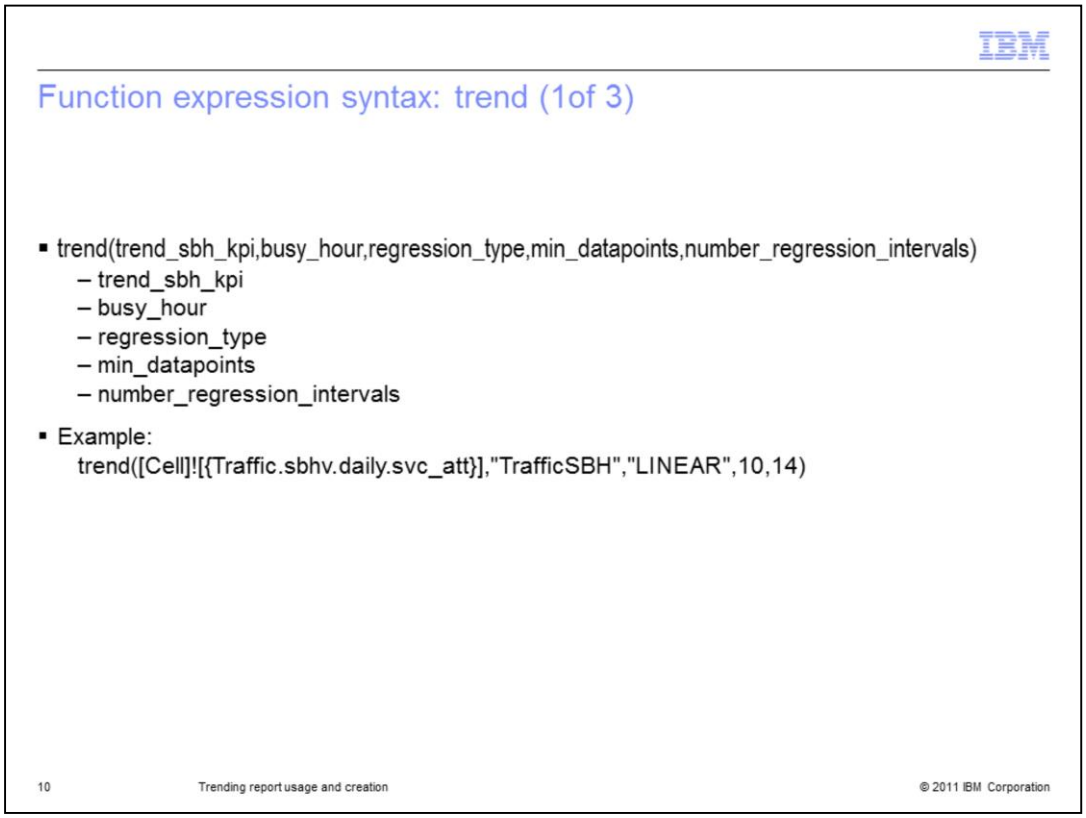


Report definition restrictions.

When creating a trend report definition there are several parts of the definition that are not used. In the Optional Extended Functions area, Busy Hour (non stored busy hours), Filtered N-High, and Confidence Factor are not used in a trend report definition.

Reports that use an exponential function in the UDC cannot contain negative values, including the limit. When both negative and positive values are present, the negative values are ignored. A trend is calculated on the positive values if the data points exceed the minimum value.

To prevent a null return, the number of days of historical stored busy hour data must meet or exceed the min_datapoint value specified in the trend UDC.



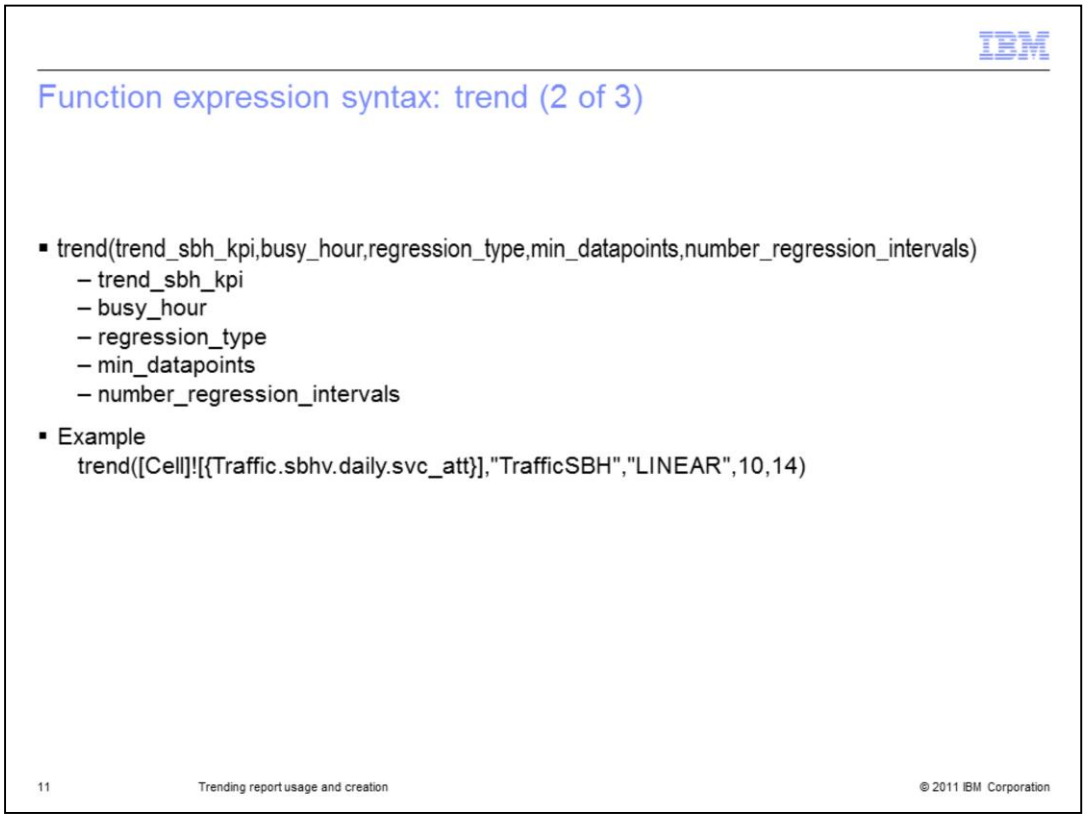
The trend function uses the syntax as follows:

trend(trend_sbh_kpi,busy_hour,regression_type,min_datapoints,number_regression_intervals)

where:

trend_sbh_kpi is the stored busy hour field to use. Only a stored busy hour field at the focal entity can be used. A stored busy hour (SBH) field is the field the trend is to be calculated against. When you select a stored busy hour, KPI fields trend_sbh and busy_hour are entered for the expression.

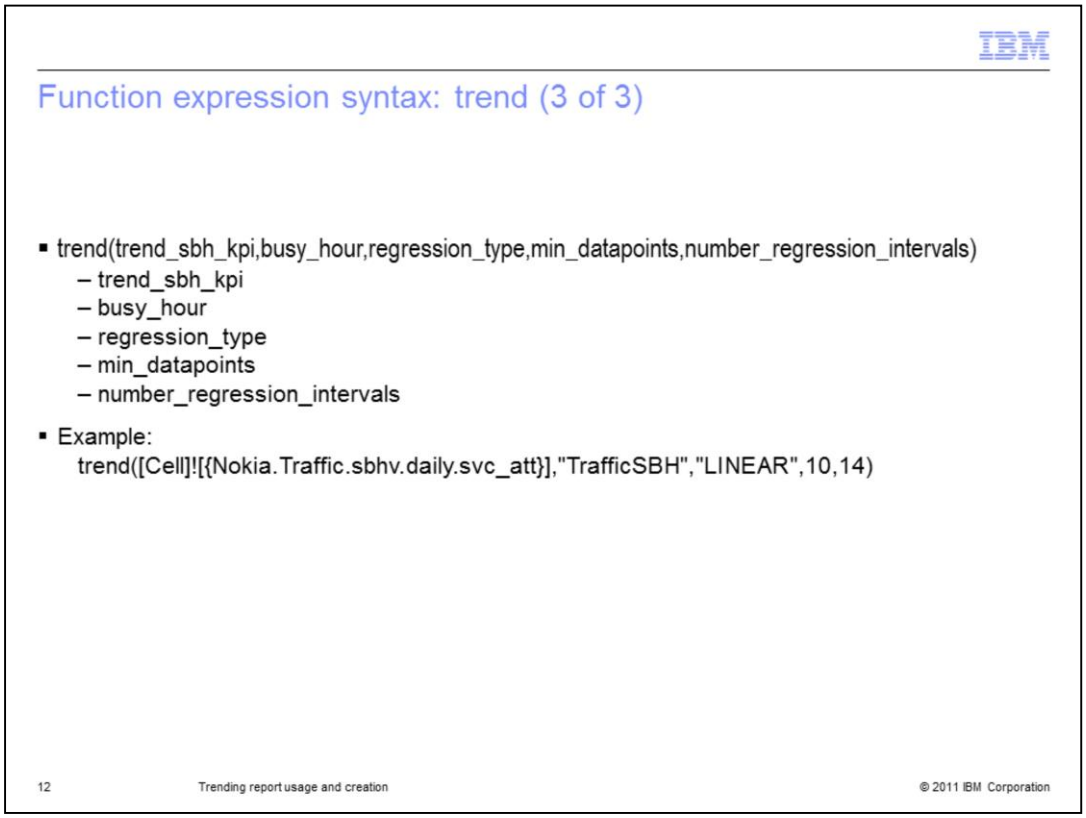
busy_hour is the busy hour definition used to determine the busy hour for the SBH field. This value is enclosed by quotation marks.



regression_type is the regression algorithm to use: LINEAR, LOGARITHMIC, EXPONENTIAL. The regression type must be spelled as shown in all uppercase letters and enclosed by quotation marks. Each regression type uses a method to correlate data. It is possible that the data set for a trending report contains values that should be excluded before regression is calculated. Some values could be from bursty, erroneous, or bad data in the set. These values (outliers) are excluded by using correlation coefficients. A Pearson correlation is used where there is a linear relationship. A Spearman correlation is used where the growth of the value over time is not linear, such as Erlang calculations.

min_datapoint is an integer value representing the minimum number of time periods that must be available for a trend calculation. This integer value represents the minimum number of stored busy hour values that must be available for the trend to be calculated and considered valid.

num_regression_intervals is an integer value representing the number of historical periods of the interval to use when calculating the trend. The period used is determined by the busy hour interval, either day, week, or month.



Example of trend function expression syntax:

trend([Cell]![{Nokia.Traffic.sbhv.daily.svc_att}],"TrafficSBH","LINEAR",10,14)

Trend the Traffic.sbhv.daily.svc_att field for the focal entity cell based on the past 14 days of historical stored busy hour data. Do not trend for any cell instances where the number of stored busy hour data points available is fewer than 10. This means that at least 10 stored busy hours must be available for the trend calculation. None of the integers and field entries have quotation marks. Quotation marks are required before and after each string entry.

Function expression syntax: projectTime.

The syntax for the projectTime function is the same as that of the trend function with an additional limit parameter at the end of the statement.

The value to project the trend against is the ***limit***.

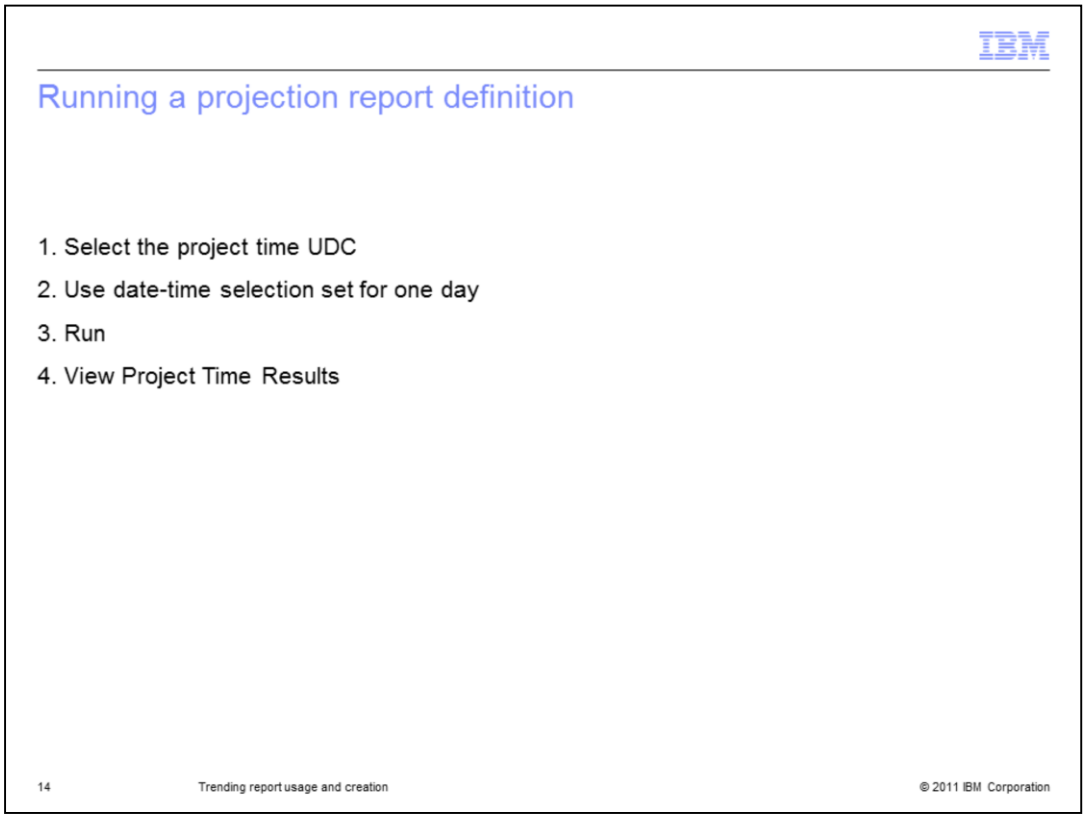
A UDC using the projectTime function is required and must be configured as a float value, not an integer. It is used to calculate the number of days between the current trend and the limit. The limit value can be a constant or a traffic field, such as peg count or UDC. Use of a UDC has several restrictions. See the product user guide for additional details.

Example of projectTime function expression syntax:

projectTime([Cell]![{Traffic.sbhv.daily.svc_%_block}],"TrafficSBH","LINEAR",10,14,2.0)

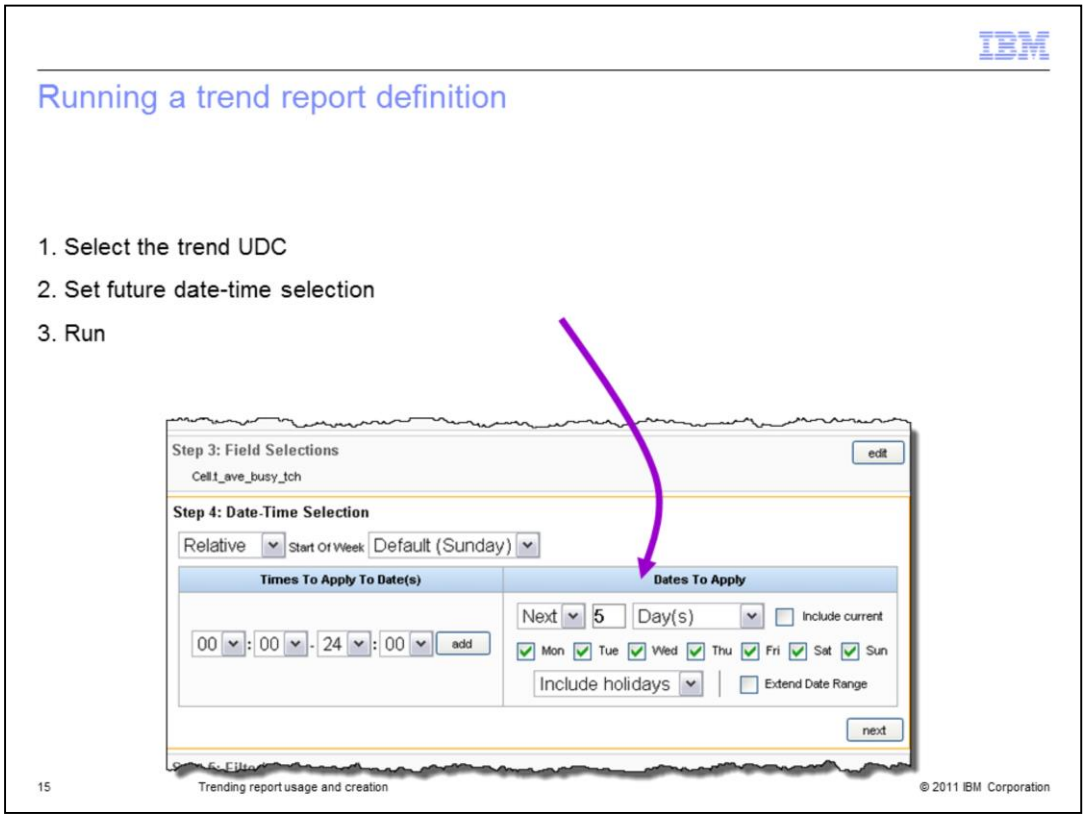
Trend the Traffic.sbhv.daily.svc_%_block KPI for the focal entity cell based on the past 14 days of stored busy hour data. Do not trend for any *cell* instances where the number of stored busy hour data points available is fewer than 10. This means that at least 10 stored busy hours must be available for the calculation. Project the number of days until the Traffic.sbhv.daily.svc_%_block field will reach the value matching the constant 2.0.

The limit is not in quotation marks.



Project time report definitions are similar to comprehensive report definitions with the exception of the restrictions presented earlier. Build and run the report definition by selecting the project time UDC in the field selection step. Because the project time UDC indicates the number of days to look back for the trend data, you can run the report for one day.

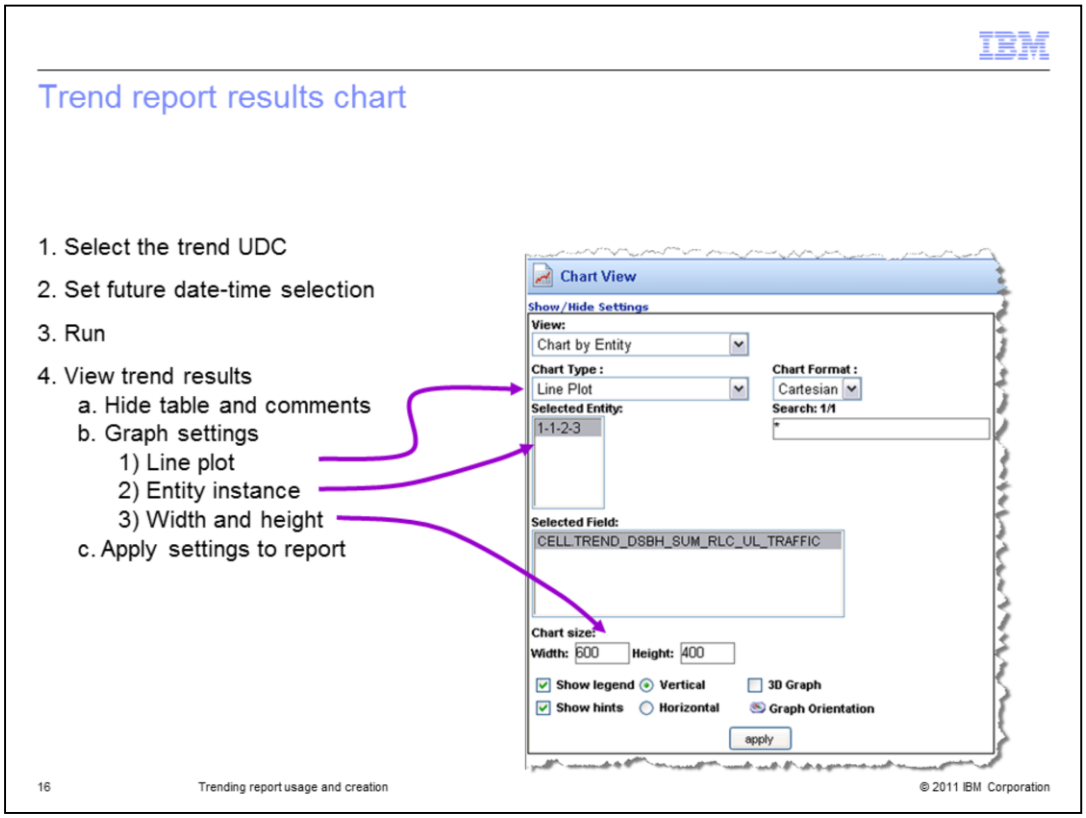
When you view the results for a project time report, the chart displays the projected number of days until the limit is met.



Running a trend report definition.

Trend report definitions are similar to comprehensive report definitions with the exception of the restrictions presented earlier. Build and run the report definition by selecting the trend UDC in the field selection step.

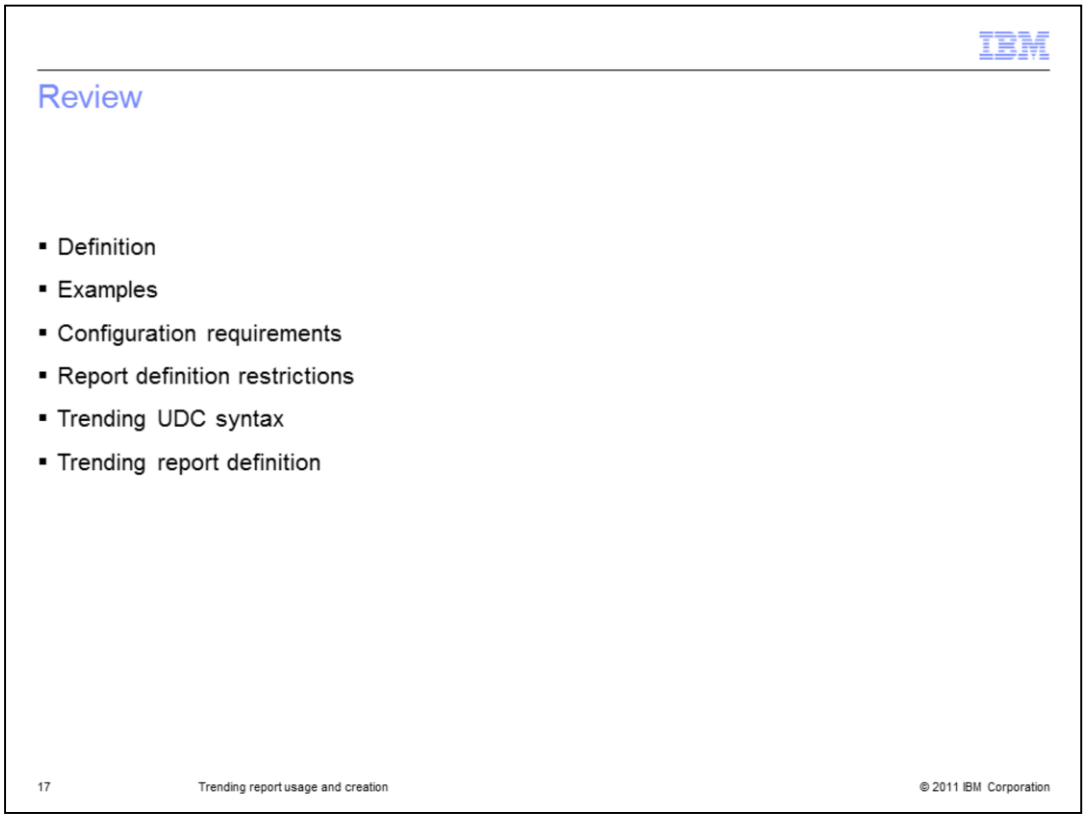
Additional report definition considerations: For a trend report using a trend UDC, you can use the relative option to select the future dates to present in the trend graph.



Trend report viewing recommendations:

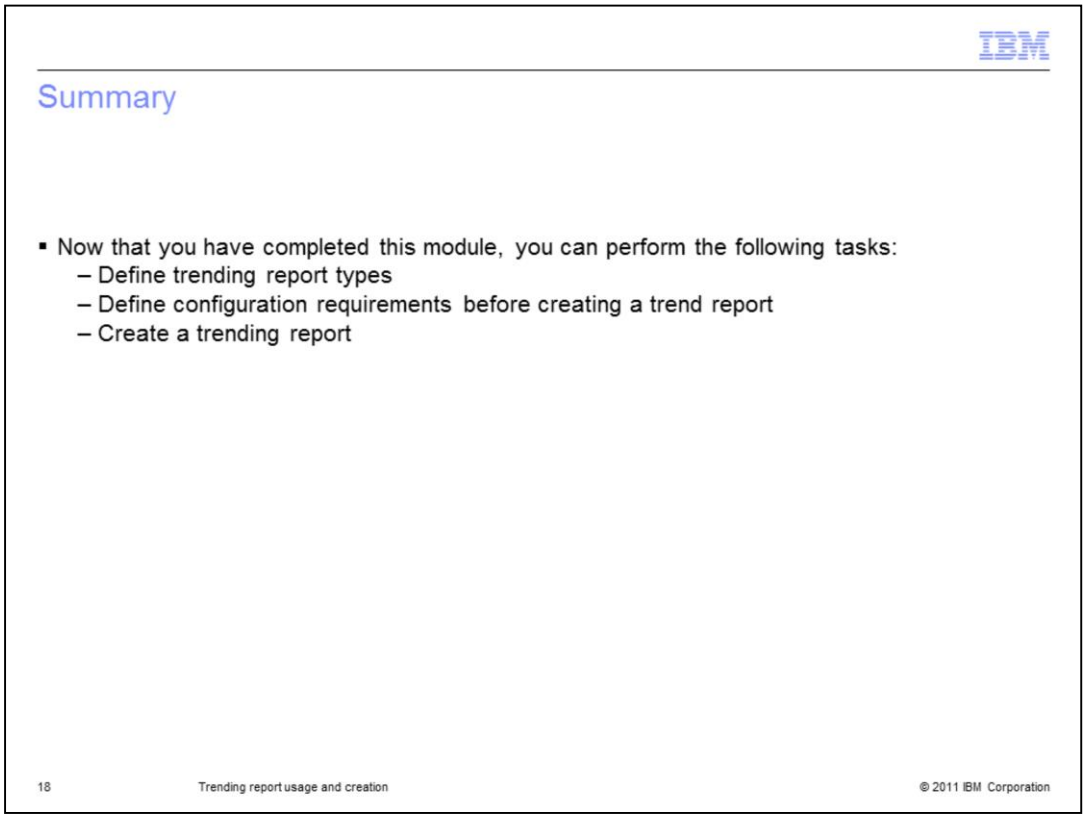
When you view the report results for a trend report, you can hide the default table and comment sections to make it easier to manipulate the graph settings. The example graphs shown in this module use the ***Line Plot*** **Chart Type**. You can adjust the chart size width and height parameters.

When you finish configuring the report results, click the **Apply** button to save the configuration preferences.



Review.

This module presented information on running and viewing a trending report. You now know about the two types of trending reports and forecasting function UDC. You have seen examples of their outputs. You understand how each of the two forecast function UDC are created and how to put them into a report definition. You understand a trending report definition has some restrictions, especially if lacking sufficient stored busy hour data point for making trending UDC calculations. Finally, you know that the report results chart view needs to be configured to display the results in a meaningful format for a trend report. The projectTime report displays the number of days until the threshold might be reached in the results chart.



Summary.

Now that you have completed this module, you can perform the following tasks:

- Define trending report types
- Define configuration requirements before creating a trend report
- Create a trending report

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