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TMS TreeView for FireMonkey DEVELOPERS GUIDE

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Index

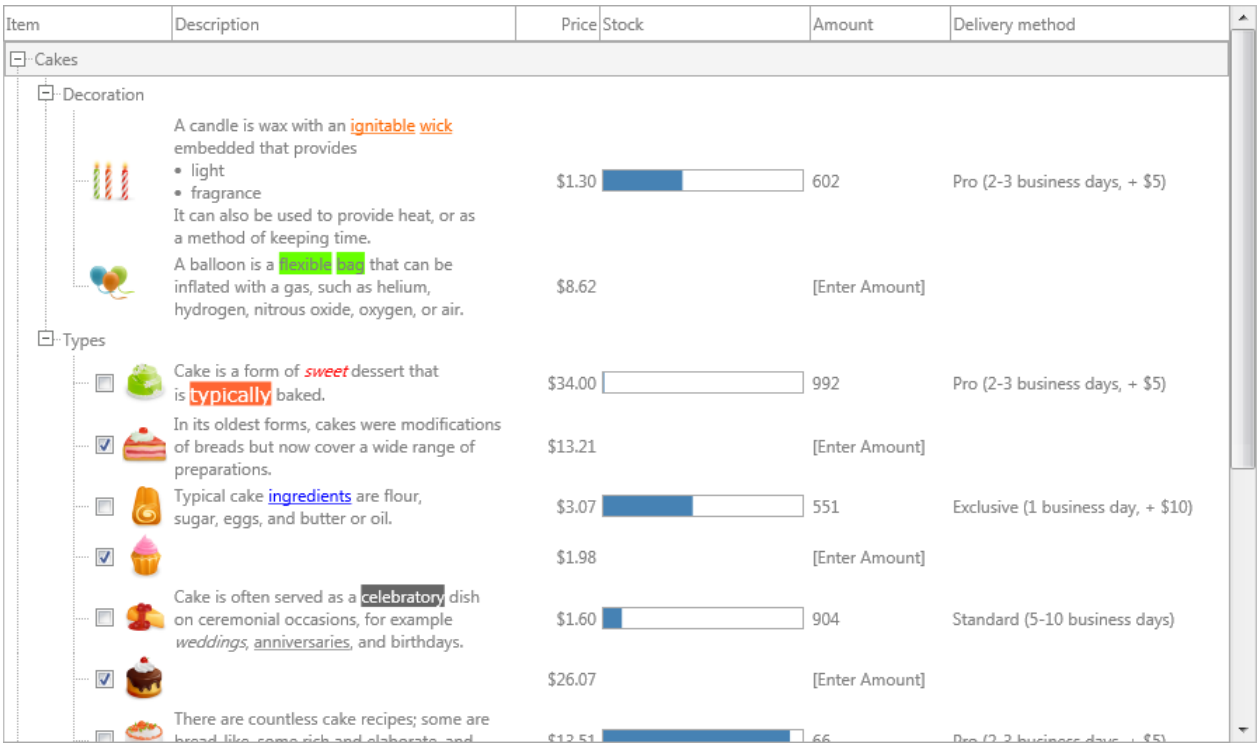
Introduction 3
Organization 5
Modes 6
  Virtual 6
  Collection-based 9
Columns 11
  Configuration / Appearance 11
  Autosizing and stretching 13
Groups 17
  Configuration 17
  Appearance 18
Nodes 20
  Configuration / Appearance 20
  Adding, inserting and removing nodes 20
  Fixed vs variable node height 23
  Checkbox / Radiobutton support 28
  Extended nodes 30
Interaction 32
Editing 32
  Custom Editor 34
Customization 36
Styling 38
Demos 39
  Overview 39
  Directory 39
Properties 41
  Public Properties 49
Events 52
Procedures and functions 55
TTMSFMXDirectoryTreeView and TTMSFMXCheckedTreeView 63
General FireMonkey component usage guidelines 64
  Visual part 64
  Non-visual part 64
  Naming convention 64
  Styling 65
  Components 69
TMS Mini HTML rendering engine 70

Introduction

The TMS TreeView for FireMonkey offers a wide range of features to enhance your applications.

- High performance virtual and collection-based mode able to easily deal with millions of nodes
- Multi-line HTML formatted text
- Various built-in column editors
- Multi-column support
- Fixed and variable node height and node auto sizing
- Support for FireMonkey styles
- Multiple events for custom drawing and customization of default drawing
- Multiple events for all kinds of interactions such as editing, expand / collapse and selection
- Auto-sizing and stretching of columns
- Mouse and keyboard interaction
- Nodes with checkbox, radiobutton, image, disabled nodes
- Nodes extending over multiple columns
- TTMSFMXCheckedTreeView & TTMSFMXDirectoryTreeView

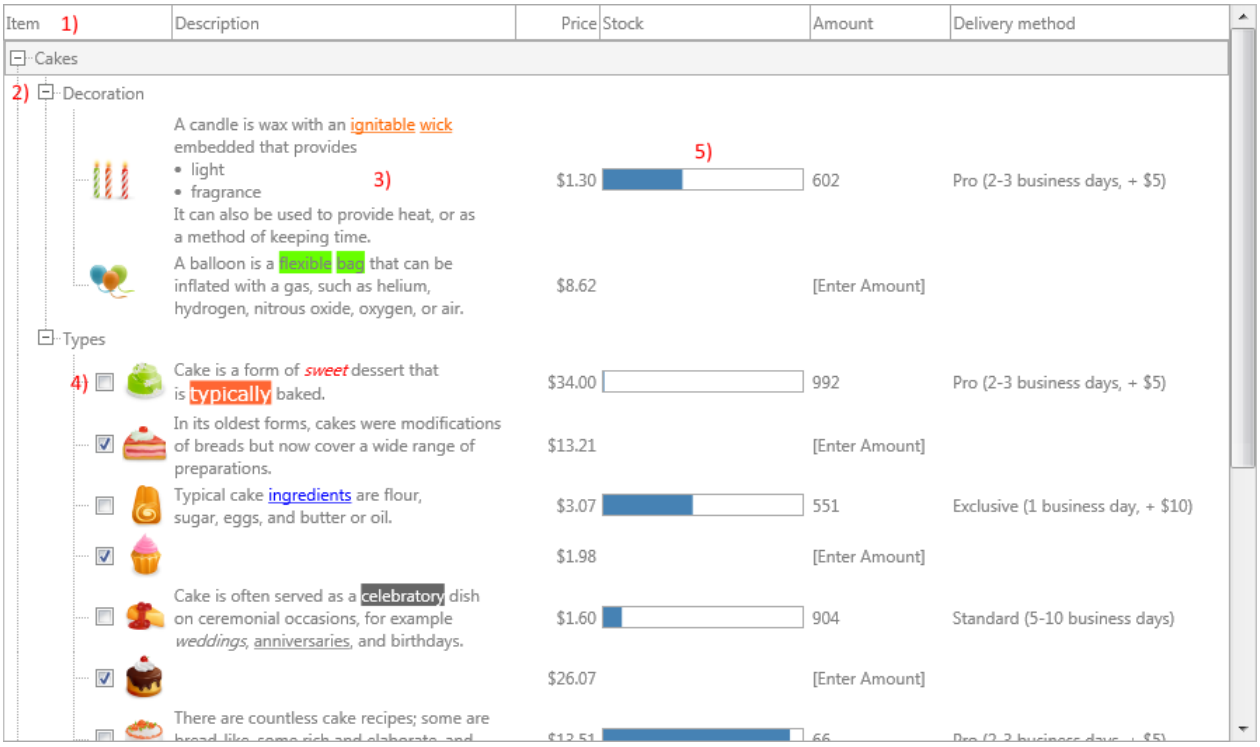
The TMS TreeView for FireMonkey is designed for use with Win32, Win64, Mac OS-X, iOS and Android operating systems.



IMPORTANT NOTICE:
If the FireMonkey framework is new to you, please see the chapter “General FireMonkey component usage guidelines” that offers an introduction that is recommended to read before you start working with the TMS TreeView for FireMonkey. Another interesting source of information is
http://docwiki.embarcadero.com/RADStudio/en/FireMonkey_Application_Platform

Organization

Below is a quick overview of the most important elements in the TreeView. This guide will cover all elements in different chapters.



1) Columns / Column groups, which are added through the Columns / Groups collection. Columns based settings can override the default appearance for nodes. Via Columns a header and configure text alignment, wordwrapping and appearance can be specified.

2) Nodes: Holds a set of values such as the text, icon and check state that are represented in each column. Nodes can have child nodes and when child nodes are added, an expand/collapse icon is shown.

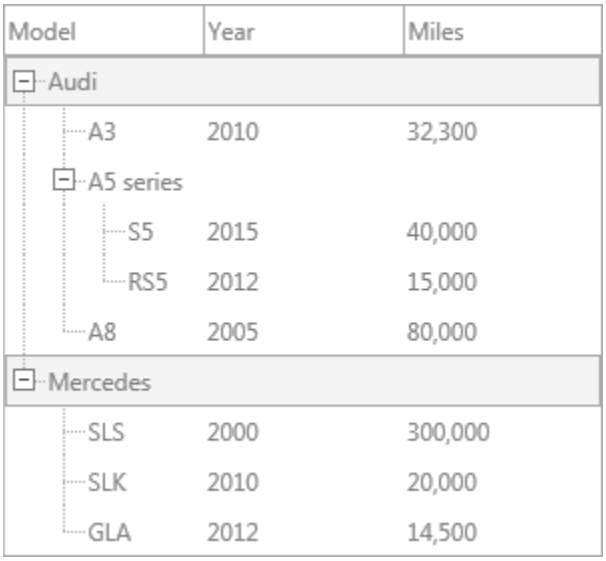
3) HTML formatted text: The node can display HTML formatted text for each column. Simply add the supported HTML tags and the TreeView will automatically switch to HTML.

4) Checkbox / Radiobutton support is added for each column
Additionally an icon can be specified for each column as well.

5) Customization: Each element in the TreeView can be fully customized. In the above sample a progressbar is drawn to indicate a certain level of stock instead of text.

Modes

The TreeView supports a collection-based and a virtual mode. Both modes will be explained in this chapter together with a small sample. You will notice that each programmatic call to manipulate / interact with nodes has a virtual and a collection-based version of the node. By default a collection-based TreeView is used. Below is a screenshot on how a default TTMSFMXTreeView instance looks like when dropped on the form.



Virtual

The TreeView will retrieve its values for each column and the number of nodes/child nodes through events. Each event that retrieves the node values passes an ANode parameter of type TTMSFMXTreeViewVirtualNode. The most important event to start with is the OnGetNumberOfNodes event. This event retrieves the number of nodes during creation of the TreeView. The event is also called for child nodes after successfully retrieving the child count for each node. The first level of nodes is -1 (under root) which is the initial display of nodes and can be accessed with the ANode parameter in the OnGetNumberOfNodes event. Below is a sample that demonstrates this.

```
procedure TForm1.TMSFMXTreeView1GetNumberOfNodes(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; var ANumberOfNodes: Integer);
begin
  if ANode.Level = -1 then
```

```
    ANumberOfNodes := 10;
end;
```

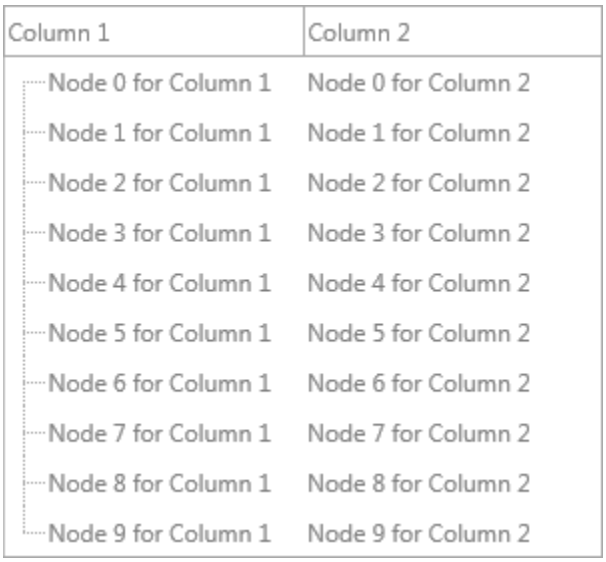


Note that this sample code is executed on a default TTMSFMXTreeView instance dropped on the form without any properties changed. As you will notice, the default columns are still used while the nodes (i.e. default collection based) are removed.

When continuing with our virtual mode based TreeView you will notice that the text of the nodes is missing. To further define the setup of the TreeView, we will remove the default columns and add new columns to the TreeView. Additionally we will specify text for each node through the OnGetNodeText event.

```
TMSFMXTreeView1.BeginUpdate;
TMSFMXTreeView1.Columns.Clear;
TMSFMXTreeView1.Columns.Add.Text := 'Column 1';
TMSFMXTreeView1.Columns.Add.Text := 'Column 2';
TMSFMXTreeView1.EndUpdate;

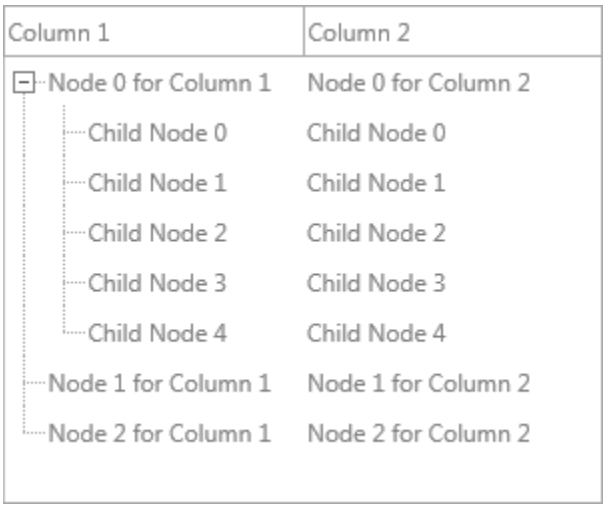
procedure TForm1.TMSFMXTreeView1GetNodeText(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer;
  AMode: TTMSFMXTreeViewNodeTextMode; var AText: string);
begin
  AText := 'Node ' + inttostr(ANode.Index) + ' for ' +
TMSFMXTreeView1.Columns[AColumn].Text;
end;
```



To add child nodes for each node the level of the nodes is identified with the level property on the ANode parameter. Note from the first sample that the level is -1 for the root nodes. For all root child nodes that are added the level is 0 or larger. Each node has an Index parameter and a Row parameter to uniquely identify each node. The following sample adds 3 root nodes and adds 5 child nodes for the first root node.

```
procedure TForm1.TMSFMXTreeView1GetNumberOfNodes(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; var ANumberOfNodes: Integer);
begin
  if ANode.Level = -1 then
    ANumberOfNodes := 3
  else if (ANode.Level = 0) and (ANode.Index = 0) then
    ANumberOfNodes := 5;
end;

procedure TForm1.TMSFMXTreeView1GetNodeText(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer;
  AMode: TTMSFMXTreeViewNodeTextMode; var AText: string);
begin
  if ANode.Level = 0 then
    AText := 'Node ' + inttostr(ANode.Index) + ' for ' +
TMSFMXTreeView1.Columns[AColumn].Text
  else
    AText := 'Child Node ' + inttostr(ANode.Index)
end;
```



Each property that affects the node text, icon, check state, … can be configured through the OnGetNode* events. Alternatively a collection-based approach can be used which is explained below. When using a virtual TreeView all virtual procedures, functions and properties need to be used. Below is a sample that expands all nodes in a virtual TreeView.

```
TMSFMXTreeView1.ExpandAllVirtual;
```

Collection-based

A collection-based TreeView uses nodes from the Nodes collection property. Each node represents a set of values for each column that can be accessed through the Values property. Below is the same sample as in the Virtual mode, but then created through the Nodes collection.

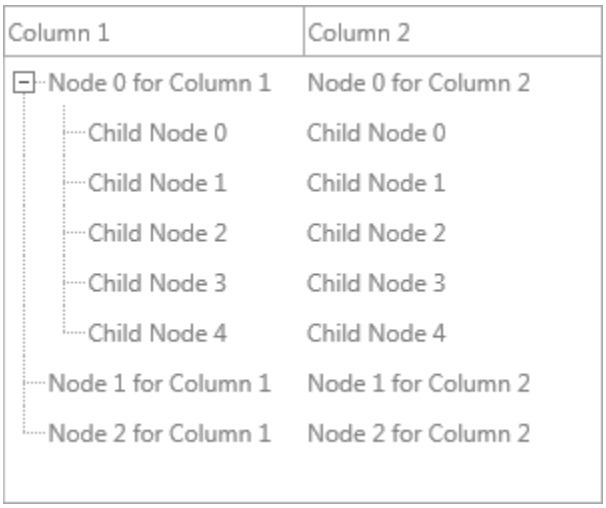
```
var
  I: Integer;
  C: Integer;
  K: Integer;
  pn: TTMSFMXTreeViewNode;
begin
  TMSFMXTreeView1.BeginUpdate;
  TMSFMXTreeView1.ClearColumns;
  TMSFMXTreeView1.ClearNodes;
  TMSFMXTreeView1.Columns.Add.Text := 'Column 1';
  TMSFMXTreeView1.Columns.Add.Text := 'Column 2';

  for I := 0 to 2 do
```

```
  begin
    pn := TMSFMXTreeView1.AddNode;
    for C := 0 to TMSFMXTreeView1.Columns.Count - 1 do
      pn.Text[C] := 'Node ' + inttostr(I) + ' for ' +
TMSFMXTreeView1.Columns[C].Text;

    if I = 0 then
    begin
      for K := 0 to 4 do
      begin
        childn := TMSFMXTreeView1.AddNode(pn);
        for C := 0 to TMSFMXTreeView1.Columns.Count - 1 do
          childn.Text[C] := 'Child Node ' + inttostr(K);
      end;
    end;
  end;

  TMSFMXTreeView1.EndUpdate;
end;
```



When using a collection-based TreeView the information of each node such as the position, height, level, ... is stored in the TTMSFMXTreeViewVirtualNode object which is the same object being used in the virtual mode. Each collection-based node has a reference to the virtual node through the VirtualNode property. When using a collection-based TreeView the non-virtual procedures / functions an properties need to be used. Below is a sample that expands all nodes in a collection-based TreeView.

```
TMSFMXTreeView1.ExpandAll;
```

Columns

Configuration / Appearance

The columns are configured through the Columns collection. Each column displays a set of values for each node such as the text, icon and check state. The most important property for a column is the UseDefaultAppearance property which is used to switch between the properties set at ColumnsAppearance level or the properties on the column collection item level for controlling the appearance of a column. Per column, horizontal, vertical text alignment as well as trimming and word wrapping can be configured. Fine-tuning is possible through a variety of events. Below is a sample that explains the difference between using the default appearance and customizing the appearance with the UseDefaultAppearance = false property per column.

In the following sample, we want to customize the font color and size of the header of the column and the font color of the nodes. For this we need to set the ColumnsAppearance.TopFontColor, the ColumnsAppearance.TopFont and the NodesAppearance.FontColor properties. Note that the NodesAppearance covers the nodes area while the ColumnsAppearance covers the columns area.

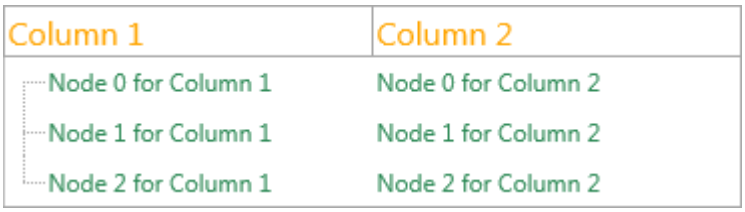
```
var
  n: TTMSFMXTreeViewNode;
begin
  TMSFMXTreeView1.BeginUpdate;
  TMSFMXTreeView1.Nodes.Clear;
  TMSFMXTreeView1.Columns.Clear;

  TMSFMXTreeView1.Columns.Add.Text := 'Column 1';
  TMSFMXTreeView1.Columns.Add.Text := 'Column 2';
  n := TMSFMXTreeView1.AddNode;
  n.Text[0] := 'Node 0 for Column 1';
  n.Text[1] := 'Node 0 for Column 2';
  n := TMSFMXTreeView1.AddNode;
  n.Text[0] := 'Node 1 for Column 1';
  n.Text[1] := 'Node 1 for Column 2';
  n := TMSFMXTreeView1.AddNode;
  n.Text[0] := 'Node 2 for Column 1';
  n.Text[1] := 'Node 2 for Column 2';

  TMSFMXTreeView1.ColumnsAppearance.TopFont.Size := 16;
```

```
  TMSFMXTreeView1.ColumnsAppearance.TopFontColor := claOrange;
  TMSFMXTreeView1.NodesAppearance.FontColor := claSeagreen;

  TMSFMXTreeView1.EndUpdate;
end;
```



Let's say we add a third column, and don't want to take on the default appearance, but instead use a different color for the header and nodes text and we don't change the font size. Additionally we also apply trimming. Below is a sample that demonstrates this.

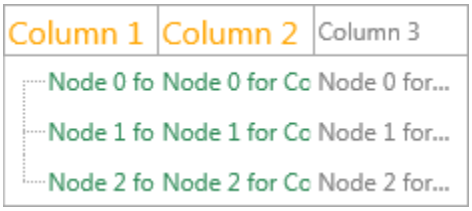
```
var
  n: TTMSFMXTreeViewNode;
begin
  TMSFMXTreeView1.BeginUpdate;
  TMSFMXTreeView1.Nodes.Clear;
  TMSFMXTreeView1.Columns.Clear;

  TMSFMXTreeView1.Columns.Add.Text := 'Column 1';
  TMSFMXTreeView1.Columns.Add.Text := 'Column 2';
  TMSFMXTreeView1.Columns.Add.Text := 'Column 3';
  TMSFMXTreeView1.Columns[2].UseDefaultAppearance := False;
  TMSFMXTreeView1.Columns[2].Trimming := tvttWord;

  n := TMSFMXTreeView1.AddNode;
  n.Text[0] := 'Node 0 for Column 1';
  n.Text[1] := 'Node 0 for Column 2';
  n.Text[2] := 'Node 0 for Column 3';
  n := TMSFMXTreeView1.AddNode;
  n.Text[0] := 'Node 1 for Column 1';
  n.Text[1] := 'Node 1 for Column 2';
  n.Text[2] := 'Node 1 for Column 3';
  n := TMSFMXTreeView1.AddNode;
  n.Text[0] := 'Node 2 for Column 1';
  n.Text[1] := 'Node 2 for Column 2';
  n.Text[2] := 'Node 2 for Column 3';
```

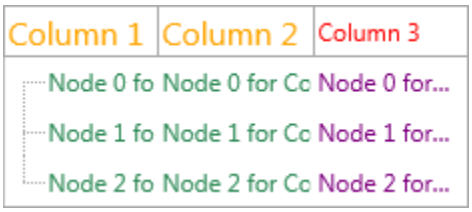
```
  TMSFMXTreeView1.ColumnsAppearance.TopFontColor := claOrange;
  TMSFMXTreeView1.ColumnsAppearance.TopFont.Size := 16;
  TMSFMXTreeView1.NodesAppearance.FontColor := claSeagreen;

  TMSFMXTreeView1.EndUpdate;
end;
```



As you will notice, the default font color for both the header and the nodes is gray which can be set on column level with the properties Column[Index].TopFontColor and Column[Index].FontColor. The following sample adds 2 additional lines to the previous sample to configure this.

```
TMSFMXTreeView1.Columns[2].TopFontColor := claRed;
TMSFMXTreeView1.Columns[2].FontColor := claPurple;
```

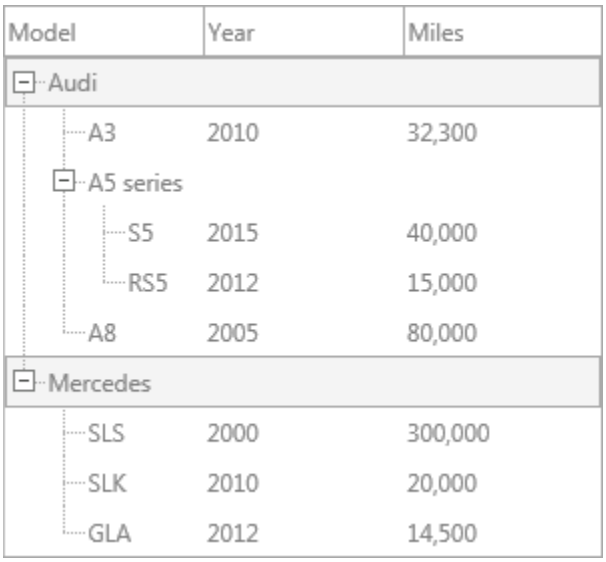


Autosizing and stretching

When dropping a TreeView instance on the form, you will notice that it already has three columns and has default behavior of stretching those columns to fit the width of the control. The TreeView exposes the ability to stretch all columns, or a specific column. When turning off stretching completely each column has its own Width property that can be used to set a fixed width for a column.

Below is a sample of the default TreeView and a sample after the width of the TreeView has been changed.

default



width changed



As explained, the default behavior of the columns is to stretch. Below is a sample that turns off stretching for all columns except for a specific column and instead automatically uses the leftover width.

```
TMSFMXTreeView1.ColumnsAppearance.StretchAll := False;
TMSFMXTreeView1.ColumnsAppearance.StretchColumn := 1;
```



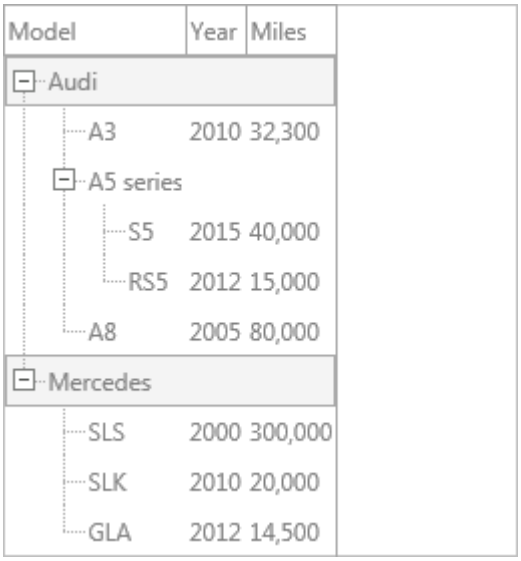
Turning off stretching completely with the Stretch property will allow the TreeView to fall back on the width property of each column which is 100 by default.

```
TMSFMXTreeView1.ColumnsAppearance.Stretch := False;
```



Autosizing can be done only when the Stretch property is set to false. The ability is included to autosize on double-click on the column header splitter line, but this feature is explained in the Interaction chapter. When programmatically autosizing the visible nodes, column header for top and bottom layouts are take into calculation to determine the width for a column. Below is a sample that applies autosizing on all three columns, after turning off stretching.

```
var
  I: Integer;
begin
  TMSFMXTreeView1.ColumnsAppearance.Stretch := False;
  for I := 0 to TMSFMXTreeView1.Columns.Count - 1 do
    TMSFMXTreeView1.AutoSizeColumn(I);
end;
```



Note that autosizing is only applied to the visible nodes, so collapsed nodes and nodes that fall outside the visible region will not be taken into calculation. To support autosizing on expand/collapse and scrolling, events can be used to accomplish this.

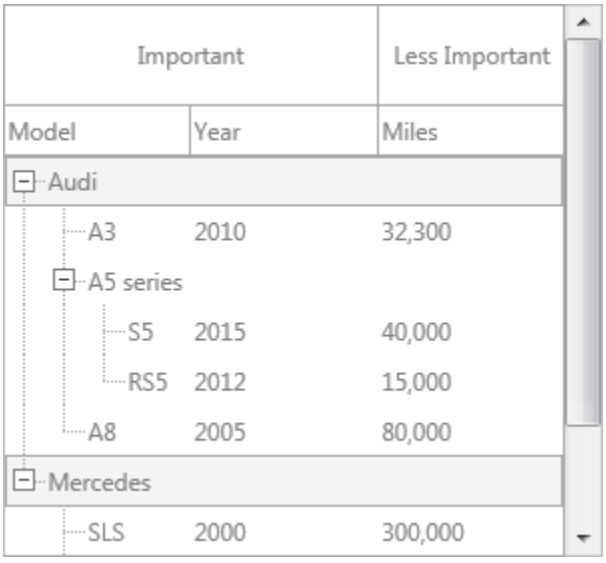
Groups

Configuration

Groups are used to add additional information to columns. They can be added to multiple columns or simply cover one column. Below is a sample that adds 2 groups for 3 columns, one group that is used for the first column and a group that stretches of the last 2 columns.

```
var
  grp: TTMSFMXTreeViewGroup;
begin
  grp := TMSFMXTreeView1.Groups.Add;
  grp.StartColumn := 0;
  grp.EndColumn := 1;
  grp.Text := 'Important';

  grp := TMSFMXTreeView1.Groups.Add;
  grp.StartColumn := 2;
  grp.EndColumn := 3;
  grp.Text := 'Less Important';
end;
```



Note that in this case, the additional groups decrease the available space for nodes so a vertical scrollbar is needed to make sure all nodes are reachable.

Appearance

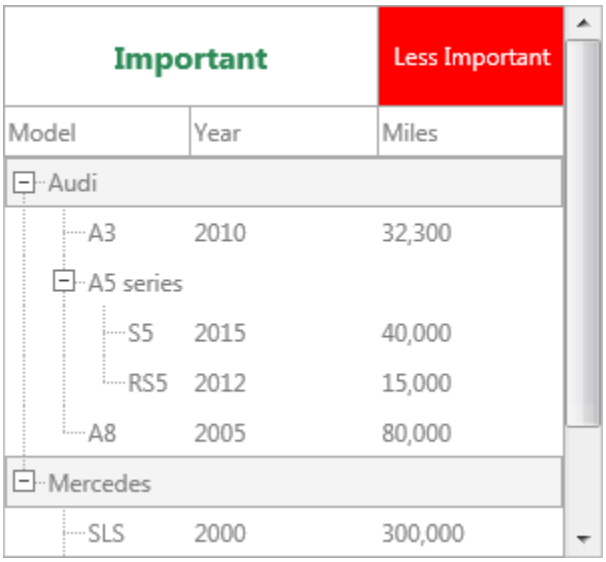
As with the columns, the groups have their own appearance control. The default appearance is stored under the GroupsAppearance property and can be overridden with the UseDefaultAppearance property per group. Below is a sample that demonstrates this.

```
var
  grp: TTMSFMXTreeViewGroup;
begin
  TMSFMXTreeView1.BeginUpdate;
  grp := TMSFMXTreeView1.Groups.Add;
  grp.StartColumn := 0;
  grp.EndColumn := 1;
  grp.Text := 'Important';

  grp := TMSFMXTreeView1.Groups.Add;
  grp.StartColumn := 2;
  grp.EndColumn := 3;
  grp.Text := 'Less Important';
  grp.UseDefaultAppearance := False;
  grp.TopFill.Color := claRed;
  grp.TopFill.Kind := TBrushKind.Solid;
  grp.TopFontColor := claWhite;

  TMSFMXTreeView1.GroupsAppearance.TopFont.Size := 16;
  TMSFMXTreeView1.GroupsAppearance.TopFont.Style :=
[TFontStyle.fsBold];
  TMSFMXTreeView1.GroupsAppearance.TopFontColor := claSeagreen;

  TMSFMXTreeView1.EndUpdate;
end;
```


Important
Less Important
Model
Year
Miles
Audi
A3 2010 32,300
A5 series
S5 2015 40,000
RS5 2012 15,000
A8 2005 80,000
Mercedes
SLS 2000 300,000

Nodes

Configuration / Appearance

Nodes are the core data structure for the TreeView and as already explained in the Modes chapter, the TreeView can use a collection-based and virtual mode for displaying nodes. The virtual mode always starts by implementing the OnGetNumberOfNodes event and the collection-based mode starts with the Nodes collection property. Each collection-based node automatically generates a virtual node to hold the most important information such as the Index, Row, Level, Children and TotalChildren. For each event that is triggered, the virtual node is passed as a parameter, because when using only a virtual based TreeView, the values represented in each column need to be returned through events. When a collection-based TreeView is used, and events need to be implemented, each virtual node holds a reference to the collection item node (TTMSFMXTreeViewVirtualNode.Node) that is used and vice versa (TTMSFMXTreeViewNode.VirtualNode). Only when using a virtual TreeView the TTMSFMXTreeViewVirtualNode .Node property will be nil.

Important to know is that each procedure, function and property has a collection-based and a virtual implementation. Generally, the procedures, functions and properties without virtual in the name are used for a collection-based TreeView.

The appearance of the nodes is configured through the NodesAppearance property. As explained in the columns chapter, the nodes appearance can be overridden per column with setting UseDefaultAppearance = false.

Adding, inserting and removing nodes

Adding, inserting and removing nodes are supported in both collection-based and virtual mode. As already explained, each mode has its own procedures, methods and events. In this chapter we start with an empty TreeView, so all nodes are removed from the collection which are added at designtime. Both collection-based and virtual add, insert and remove node methods will be explained here.

Each TreeView, whether it's collection-based or virtual will start without nodes and with a single column. The code to accomplish this is demonstrated below.

```
TMSFMXTreeView1.BeginUpdate(True);
TMSFMXTreeView1.ClearColumns;
TMSFMXTreeView1.ClearNodes;
```

```
TMSFMXTreeView1.Columns.Add.Text := 'Column 1';
TMSFMXTreeView1.EndUpdate;
```

Additionally for the virtual TreeView implementation the OnGetNumberOfNodes always needs to be implemented and return at least one node. With virtual mode the text is empty by default, so the OnGetNodeText event needs to be implemented as well. The code below demonstrates this. Please note that the code below is only added in case a virtual TreeView mode is chosen.

```
procedure TForm1.TMSFMXTreeView1GetNodeText(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer;
  AMode: TTMSFMXTreeViewNodeTextMode; var AText: string);
begin
  AText := 'Node ' + inttostr(ANode.Index);
end;

procedure TForm1.TMSFMXTreeView1GetNumberOfNodes(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; var ANumberOfNodes: Integer);
begin
  if ANode.Level = -1 then
    ANumberOfNodes := 1;
end;
```

Adding a new node (virtual)

A new node is added with the code `TMSFMXTreeView1.AddVirtualNode;`. Note that the OnGetNodeText will be called returning a different text for the newly added node.

Adding a new node (collection-based)

In a collection-based TreeView, a node is added directly to the Nodes collection, or with the helper method `TMSFMXTreeView1.AddNode;`. To get the same result as with the virtual implementation, we need to add 2 nodes, because in the virtual mode, the first node was added through the OnGetNumberOfNodes, which isn't used in a collection-based TreeView.



Adding child nodes (virtual)

Child nodes can be added with the same function, but instead passing the parent node as a parameter. The following sample demonstrates how to add a child node to the second root node added with the AddVirtualNode method. Additionally, the parent node that is added together with the child node is expanded to visually the newly added child node.

```
var
  pn, n: TTMSFMXTreeViewVirtualNode;
begin
  pn := TMSFMXTreeView1.AddVirtualNode;
  n := TMSFMXTreeView1.AddVirtualNode(pn);
  TMSFMXTreeView1.ExpandVirtualNode(pn);
end;
```

Adding child nodes (collection-based)

Child nodes can be added the same way as in the virtual mode, but with different method names. When we copy the above code and remove the Virtual keyword in the method name, the result output will be identical if we keep in mind that an additional node needs to be added in the collection to match the virtual node added with the OnGetNumberOfNodes.

```
var
  pn, n: TTMSFMXTreeViewNode;
begin
  pn := TMSFMXTreeView1.AddNode;
  pn.Text[0] := 'Node 0';
  pn := TMSFMXTreeView1.AddNode;
  pn.Text[0] := 'Node 1';
  n := TMSFMXTreeView1.AddNode(pn);
  n.Text[0] := 'Node 0';
  TMSFMXTreeView1.ExpandNode(pn);
end;
```



Inserting a new node

Inserting nodes is done in the same way as adding nodes, but an additional parameter can be passed specifying the insert position of the new node. In virtual mode, there isn't any difference between inserting and adding new nodes because the OnGetNodeText will return text based on the index of the node.

Additionally, in a collection-based TreeView, the index parameter of the collection item node can be used to switch positions with an already existing node, creating a move node functionality.

Removing an existing node (virtual)

Removing an existing node can be done with the RemoveVirtualNode method. The parameter to pass is an existing node. The following sample retrieves the focused node and removes it.

```
TMSFMXTreeView1.RemoveVirtualNode(TMSFMXTreeView1.FocusedVirtualNode);
```

Removing an existing node (collection-based)

In a collection-based TreeView, removing a node can be done in a similar way but without the Virtual keyword in the method name. Additionally a node can also be removed by freeing the collection item. Below code output is identical and removes the focused node on both cases.

```
TMSFMXTreeView1.RemoveNode(TMSFMXTreeView1.FocusedNode);

TMSFMXTreeView1.FocusedNode.Free;
```

Fixed vs variable node height

A key feature of the TreeView in both collection-based and virtual mode is support for fixed and variable node height. The simplest configuration is the fixed node height where each node has the same height, based on the NodesAppearance.FixedHeight property. Word wrapping the text of a node or specifying a node icon will be based on the fixed height and thus exceeding the node bounds when the height of the text or the node icon is larger than the fixed height.

To support auto-sizing of nodes, based on the node icon or text, the NodesAppearance.HeightMode property needs to change to tnhmVariable. The NodesAppearance.VariableMinimumHeight property is used to specify a minimum height for each node, so to initial total height for displaying a scrollbar can be calculated. The default value for this property is 25. Keep in mind that the TreeView needs to perform additional calculations during startup and during scrolling. Below is a sample that demonstrates the difference between a fixed and variable node height TreeView configuration. Both samples are demonstrated in a virtual TreeView implementation.

Fixed

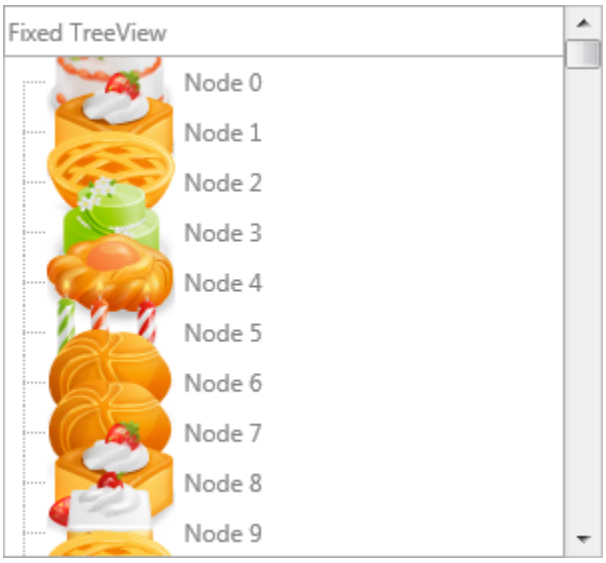
```
TMSFMXTreeView1.BeginUpdate(True);
TMSFMXTreeView1.ClearNodes;
TMSFMXTreeView1.ClearColumns;
TMSFMXTreeView1.Columns.Add.Text := 'Fixed TreeView';
TMSFMXTreeView1.EndUpdate;

procedure TForm1.TMSFMXTreeView1GetNodeText(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer;
  AMode: TTMSFMXTreeViewNodeTextMode; var AText: string);
begin
  AText := 'Node ' + inttostr(ANode.Index);
end;

procedure TForm1.TMSFMXTreeView1GetNumberOfNodes(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; var ANumberOfNodes: Integer);
begin
  if ANode.Level = -1 then
    ANumberOfNodes := 1000000;
end;

procedure TForm1.TMSFMXTreeView1GetNodeIcon(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer; ALarge:
Boolean;
  var AIcon: TBitmap);
```

```
begin
  AIcon :=
TMSFMXBitmapContainer1.Items[Random(TMSFMXBitmapContainer1.Items.Count
)].Bitmap;
end;
```



Note that the icons specified through the OnGetNodeIcon event are too large to fit inside the fixed node height. The solution can be to specify a larger fixed height through the NodesAppearance.FixedHeight property, but when the values that need to be loaded are unknown, the fixed height approach is no longer valid. When switching to a variable row height mode you will notice that the node height will automatically take on the size of the icons.

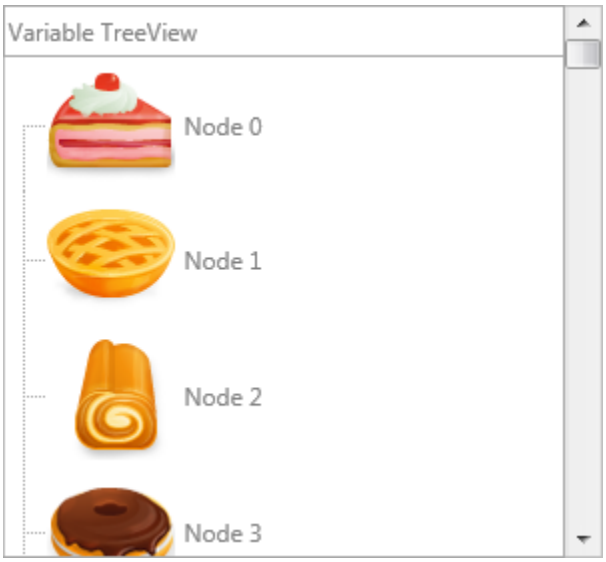
```
TMSFMXTreeView1.BeginUpdate(True);
TMSFMXTreeView1.NodesAppearance.HeightMode := tnhmVariable;
TMSFMXTreeView1.ClearNodes;
TMSFMXTreeView1.ClearColumns;
TMSFMXTreeView1.Columns.Add.Text := 'Variable TreeView';
TMSFMXTreeView1.EndUpdate;

procedure TForm1.TMSFMXTreeView1GetNodeIcon(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer; ALarge:
Boolean;
  var AIcon: TBitmap);
begin
```

```
  AIcon :=
TMSFMXBitmapContainer1.Items[Random(TMSFMXBitmapContainer1.Items.Count
)].Bitmap;
end;

procedure TForm1.TMSFMXTreeView1GetNodeText(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer;
  AMode: TTMSFMXTreeViewNodeTextMode; var AText: string);
begin
  AText := 'Node ' + inttostr(ANode.Index);
end;

procedure TForm1.TMSFMXTreeView1GetNumberOfNodes(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; var ANumberOfNodes: Integer);
begin
  if ANode.Level = -1 then
    ANumberOfNodes := 1000000;
end;
```



In case the text is larger than the node icon, the node height will automatically adapt as shown in the sample below.

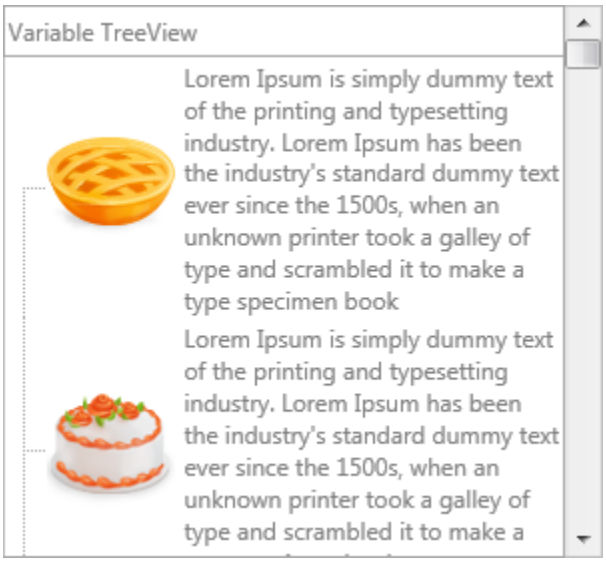
```
TMSFMXTreeView1.BeginUpdate(True);
TMSFMXTreeView1.NodesAppearance.HeightMode := tnhmVariable;
TMSFMXTreeView1.ClearNodes;
TMSFMXTreeView1.ClearColumns;
```

```
TMSFMXTreeView1.Columns.Add.Text := 'Variable TreeView';
TMSFMXTreeView1.Columns[0].WordWrapping := True;
TMSFMXTreeView1.EndUpdate;

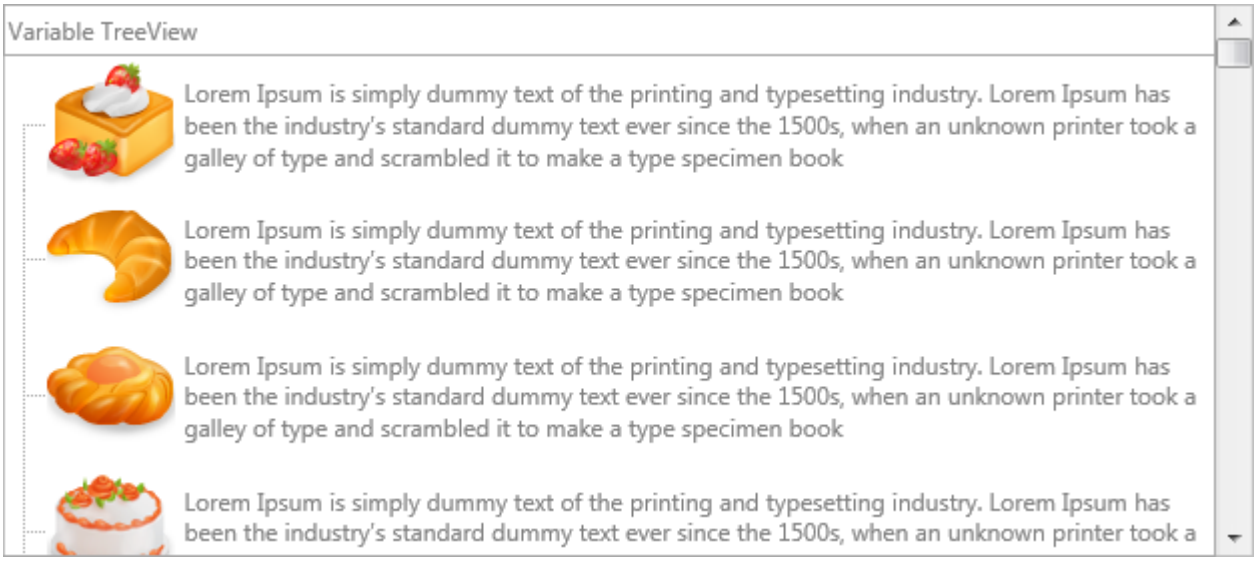
procedure TForm1.TMSFMXTreeView1GetNodeIcon(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer; ALarge:
Boolean;
  var AIcon: TBitmap);
begin
  AIcon :=
TMSFMXBitmapContainer1.Items[Random(TMSFMXBitmapContainer1.Items.Count
)].Bitmap;
end;

procedure TForm1.TMSFMXTreeView1GetNodeText(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer;
  AMode: TTMSFMXTreeViewNodeTextMode; var AText: string);
begin
  AText := 'Lorem Ipsum is simply dummy text of the printing and
typesetting industry. Lorem Ipsum has been the industry''s standard
dummy text ever since the 1500s, when an unknown printer took a galley
of type and scrambled it to make a type specimen book';
end;

procedure TForm1.TMSFMXTreeView1GetNumberOfNodes(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; var ANumberOfNodes: Integer);
begin
  if ANode.Level = -1 then
    ANumberOfNodes := 1000000;
end;
```



When resizing, the node heights will be recalculated, giving more space for the text, and thus decreasing the necessary height for a node to display all the contents.



Checkbox / Radiobutton support

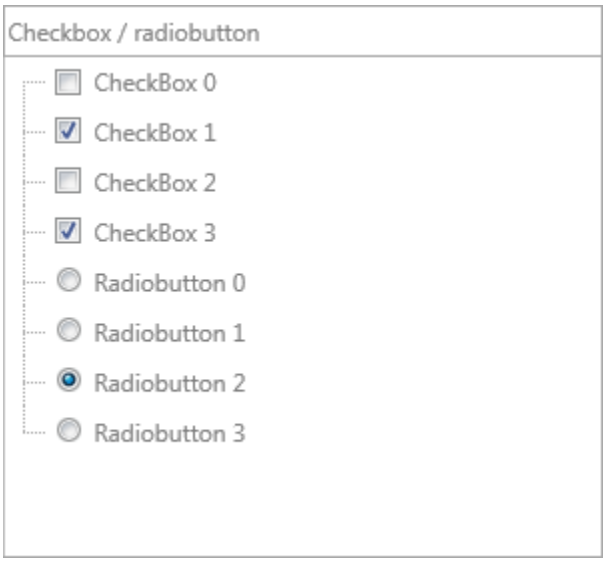
The TreeView has radiobutton and checkbox support. When specifying a check type through the OnGetNodeCheckType event or through the collection-based property CheckTypes at node level a checkbox or radiobutto will be displayed. More information on interaction will be explained at the Interaction chapter.

```
var
```

```
  n: TTMSFMXTreeViewNode;
  I: Integer;
begin
  TMSFMXTreeView1.BeginUpdate(True);
  TMSFMXTreeView1.ClearNodes;
  TMSFMXTreeView1.ClearColumns;
  TMSFMXTreeView1.Columns.Add.Text := 'Checkbox / radiobutton';
  for I := 0 to 3 do
  begin
    n := TMSFMXTreeView1.Nodes.Add;
    n.Text[0] := 'CheckBox ' + IntToStr(I);
    n.CheckTypes[0] := tvntCheckBox;
    if Odd(I) then
      n.Checked[0] := True;
  end;

  for I := 0 to 3 do
  begin
    n := TMSFMXTreeView1.Nodes.Add;
    n.Text[0] := 'Radiobutton ' + IntToStr(I);
    n.CheckTypes[0] := tvntRadioButton;
    if I = 2 then
      n.Checked[0] := True;
  end;

  TMSFMXTreeView1.EndUpdate;
end;
```



Extended nodes

Extended nodes are nodes that are stretched over all columns and takes on the text of the first column. It is also styled with a different set of properties under NodesAppearance. An extended node is not editable and selectable by default. This behavior can be overriden in the Interaction property. To create an extended node, set the Extended property to true on a collection-based TreeView collection item node, or return True in the OnIsNodeExtended event. Below is a sample that demonstrates this.

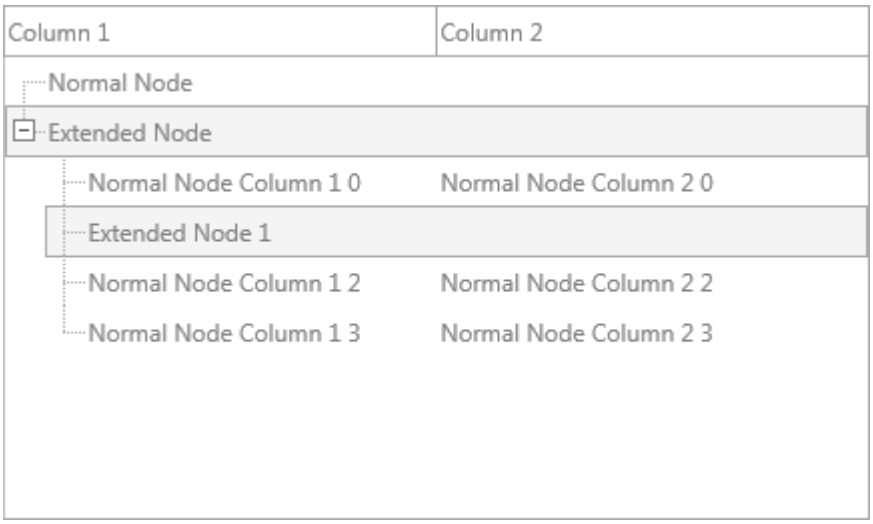
```
var
  n, pn: TTMSFMXTreeViewNode;
  I: Integer;
begin
  TMSFMXTreeView1.BeginUpdate(True);
  TMSFMXTreeView1.ClearNodes;
  TMSFMXTreeView1.ClearColumns;
  TMSFMXTreeView1.Columns.Add.Text := 'Column 1';
  TMSFMXTreeView1.Columns.Add.Text := 'Column 2';
  pn := TMSFMXTreeView1.Nodes.Add;
  pn.Text[0] := 'Normal Node';

  pn := TMSFMXTreeView1.Nodes.Add;
  pn.Text[0] := 'Extended Node';
  pn.Extended := True;

  for I := 0 to 3 do
```

```
  begin
    n := TMSFMXTreeView1.AddNode(pn);
    if I = 1 then
    begin
      n.Text[0] := 'Extended Node ' + IntToStr(I);
      n.Extended := True;
    end
    else
    begin
      n.Text[0] := 'Normal Node Column 1 ' + IntToStr(I);
      n.Text[1] := 'Normal Node Column 2 ' + IntToStr(I);
    end;
  end;

  TMSFMXTreeView1.EndUpdate;
end;
```



Interaction

The TreeView supports interaction through mouse and keyboard. When clicking on a node that is selectable, the node is selected. When navigating with the keys up, down, home, end, page up or page down the selected node will be changed. Extended / disabled nodes are not selectable by default. The behaviour can be changed by changing the ExtendedSelectable and ExtendedEditable properties.

When the property MultiSelect is true, multiple nodes can be selected with the CTRL and SHIFT key with either the mouse or keyboard. The selected nodes can be retrieved with the SelectedNodeCount function and SelectedNodes property. Selection of nodes can be done with the SelectNode or SelectNodes method. The SelectNodes method takes an array of nodes. The above methods apply to a collection-based TreeView, but the same methods with the virtual method name are available for the virtual TreeView implementation.

When a node has children the left / right keys can expand or collapse the node and visualize or hide the children. Clicking on the expand / collapse node icon with the left mouse button will perform the same operation.

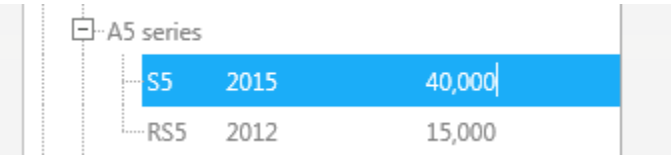
The keyboard and mouse can be used to edit the node text for each column when the column is configured to support editing. Editing is explained in the next chapter.

Editing

The TreeView supports inplace editing of nodes per column. Each column has the ability to specify an editor through the EditorType property. When editing is started, either by clicking on the text, or by pressing F2 on the keyboard the OnGetNodeText event is called to retrieve the text that needs to be placed inside the editor. To know if the OnGetNodeText event is called for drawing/calculation or for editing the AMode parameter can be used. If the OnGetNodeText event isn't used to return a different text when editing, the text of the node is used.

Below is a sample that demonstrates this. (Note that the code above is applied on a default TreeView instance)

```
TMSFMXTreeView1.Columns[2].EditorType := tcetEdit;
```



When the editing is started, the OnGetNodeText event is called with a different mode. To initialize the editor with a different text the following code provides a sample to achieve this.

```
procedure TForm1.TMSFMXTreeView1GetNodeText(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer;
  AMode: TTMSFMXTreeViewNodeTextMode; var AText: string);
begin
  case AMode of
    tntmEditing: AText := 'Editor Started !';
  end;
end;
```



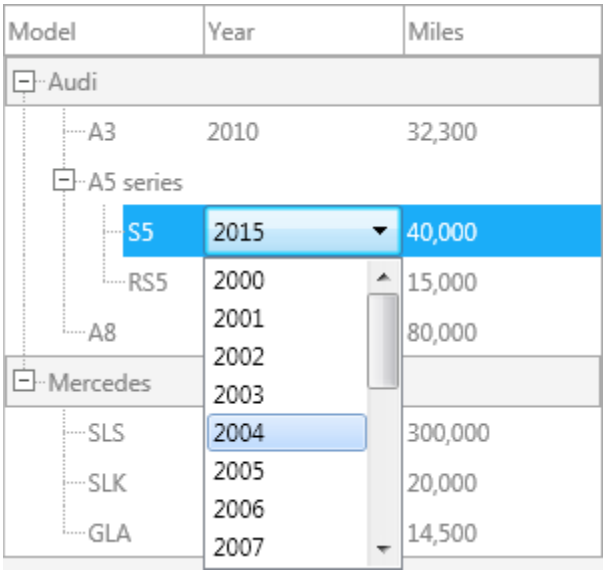
After editing is finished, the OnBeforeUpdateNode is called to allow making changes to the edited text or block updating the node if necessary. Additionally the OnCloseInplaceEditor event can be used to stop the editor from closing if the requirements of the text are not met.

Note that when editing is allowed on multiple columns, starting to edit a node will always start with the first not read-only column and then the tab key will jump to the next editable column.

Other than the default TEdit editor, a TMemo or TComboBox can be chosen to allow editing. A TMemo is typically used to allow a multi-line editor and a TComboBox to have a choice menu in case multiple values are possible. A sample that shows how to use the TComboBox as an inplace editor is shown in the sample below.

```
var
  I: Integer;
begin
  TMSFMXTreeView1.Columns[1].EditorType := tcetComboBox;
  for I := 0 to 19 do
    TMSFMXTreeView1.Columns[1].EditorItems.Add(IntToStr(2000 + I));
```

```
end;
```



If the built-in editors are not sufficient, the TreeView supports using a custom editor as well, by setting the CustomEditor property to true.

Custom Editor

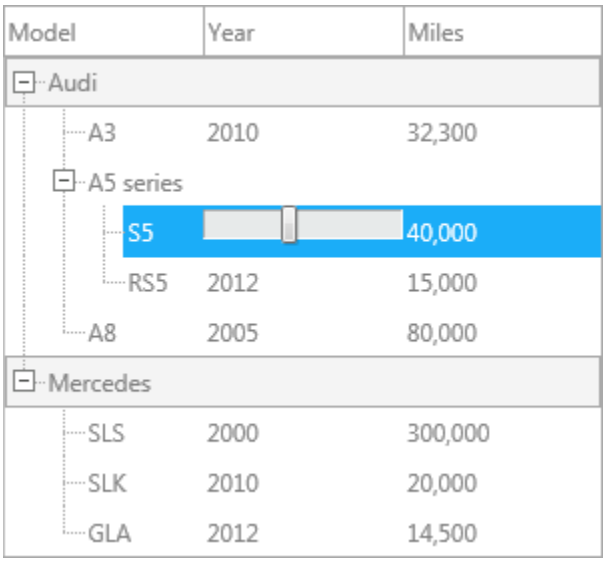
The code below demonstrates how to use a custom editor, in this case a TTrackBar.

```
TMSFMXTreeView1.Columns[1].CustomEditor := True;

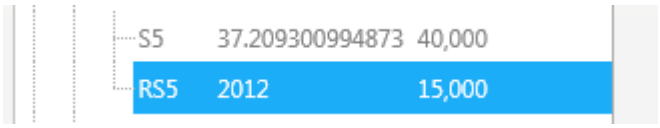
procedure TForm1.TMSFMXTreeView1BeforeUpdateNode(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer; var AText:
string;
  var ACanUpdate: Boolean);
begin
  AText := FloatToStr((TMSFMXTreeView1.GetInplaceEditor as
TTrackBar).Value);
end;

procedure TForm1.TMSFMXTreeView1GetInplaceEditor(Sender: TObject;
  ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer;
  var ATransparent: Boolean;
  var AInplaceEditorClass: TTMSFMXTreeViewInplaceEditorClass);
begin
```

```
  AInplaceEditorClass := TTrackBar;
end;
```



After changing the value, the OnBeforeUpdateNode event is triggered which sets the value of the node text to the value of the trackbar.

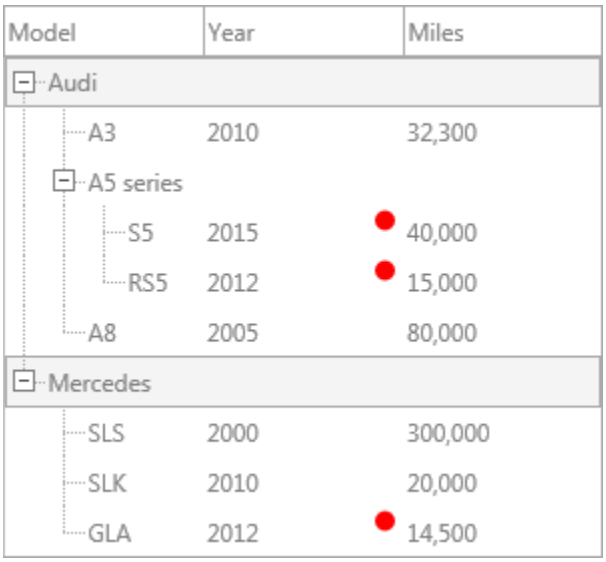


Customization

The TreeView supports a wide range of customization possibilities. Below is a sample how to implement the correct events for custom node drawing. Note that this sample starts from a default TreeView with nodes already added to the collection.

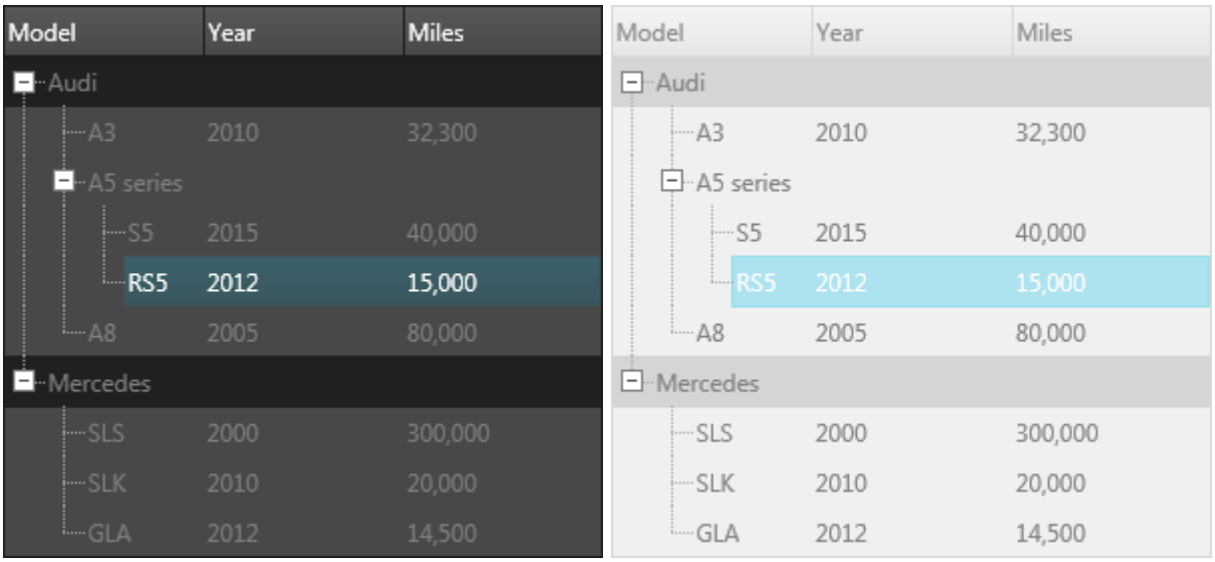
In the sample below the second column contains information on the build year of the car. To identify cars that are built in 2012 or later we want to draw a red ellipse in the top right corner of the text area for the year column.

```
procedure TForm1.TMSFMXTreeView1AfterDrawNodeText(Sender: TObject;
  ACanvas: TCanvas; ARect: TRectF; AColumn: Integer;
  ANode: TTMSFMXTreeViewVirtualNode; AText: string);
var
  v: Integer;
begin
  if TryStrToInt(AText, v) then
  begin
    if (AColumn = 1) and (v >= 2012) then
    begin
      ACanvas.Fill.Kind := TBrushKind.Solid;
      ACanvas.Fill.Color := claRed;
      ACanvas.FillEllipse(RectF(ARect.Right - 12, ARect.Top + 12,
ARect.Right - 2, ARect.Top + 2), 1);
    end;
  end;
end;
```


Model
Year
Miles
Audi
A3
2010
32,300
A5 series
S5
2015
40,000
RS5
2012
15,000
A8
2005
80,000
Mercedes
SLS
2000
300,000
SLK
2010
20,000
GLA
2012
14,500

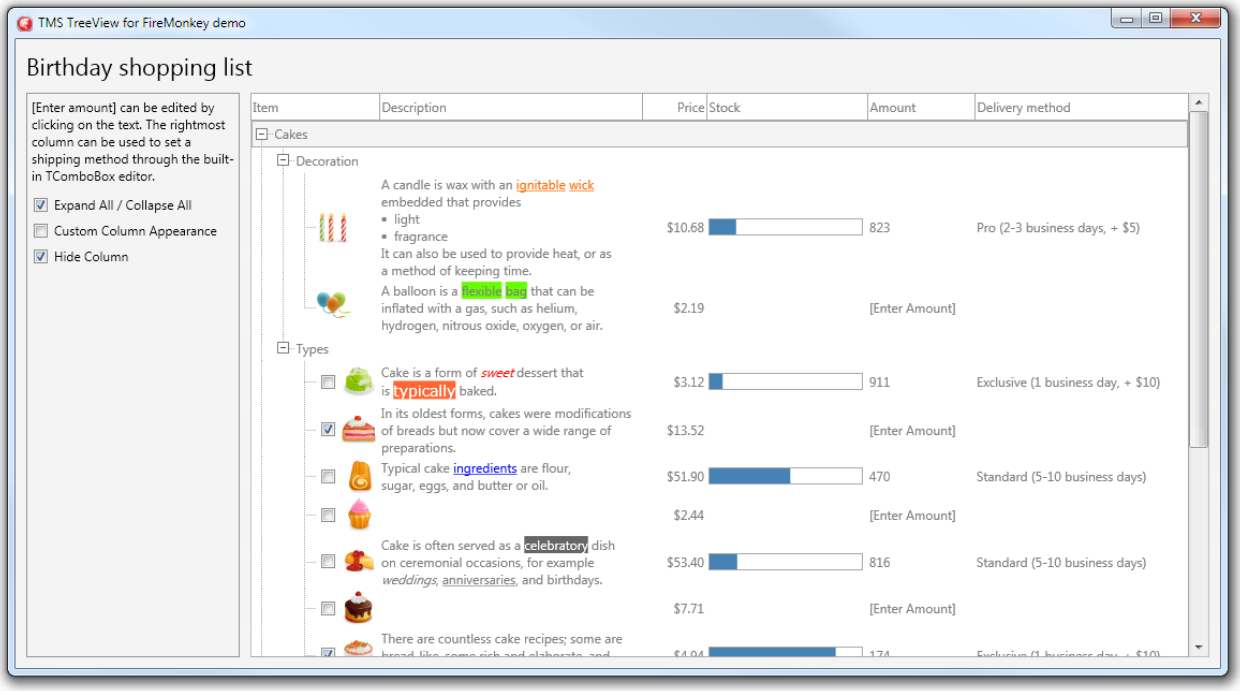
Styling

The TreeView supports FireMonkey Styles. Simply put a StyleBook one the form and load on of the default or premium FireMonkey Styles. After assigning the StyleBook to the form, the AdaptToStyle property will then automatically adapt to the style loaded in the StyleBook. Below are 2 samples of styles that are applied to the TreeView.



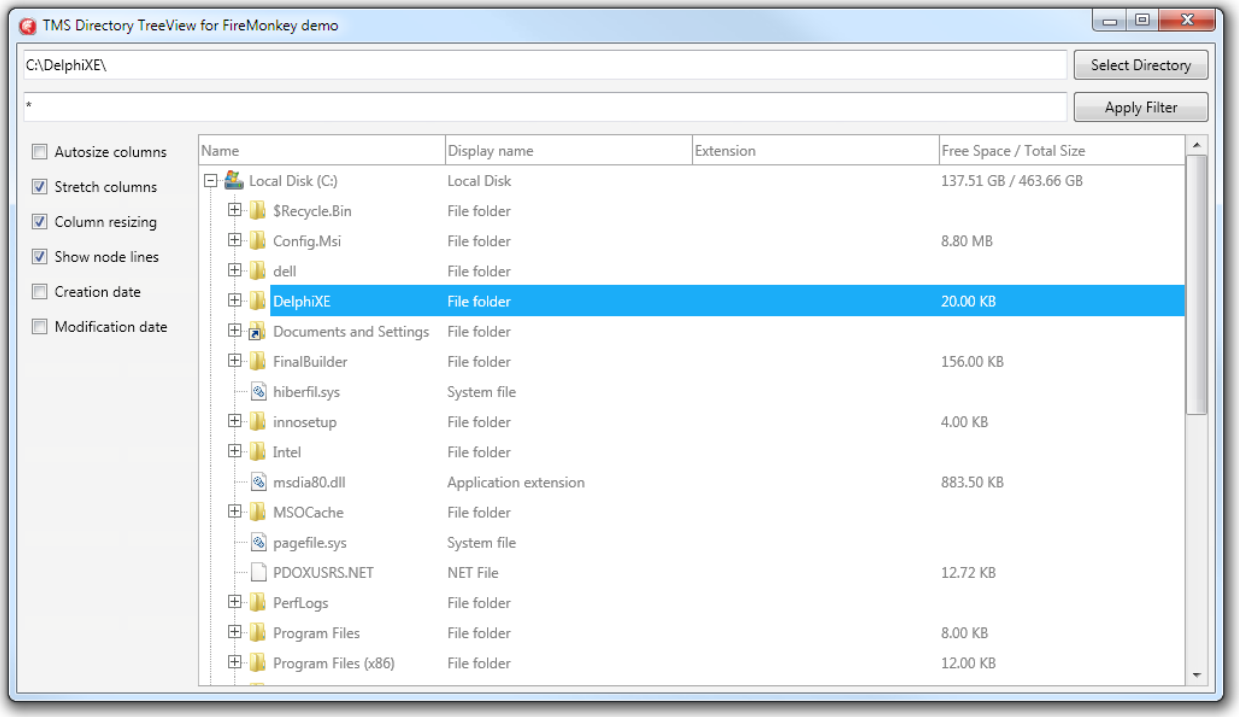
Demos

Overview



The overview demo demonstrates variable node heights, programmatically expand and collapse as well as custom column appearance and toggling column visibility. The node text in the description column is HTML formatted and a progressbar is custom drawn inside the stock column. The last 2 columns amount and delivery method show the capabilities of editing through TEdit and TComboBox.

Directory



The Directory treeview demo uses the TTMSFMXDirectoryTreeView component that is capable of loading a drive, or a folder and apply a filter. Additionally the column sizing, auto sizing of columns and stretching is demonstrated.

Properties

AdaptToStyle	When true, the component automatically adapts to the FMX Style loaded inside a StyleBook connected to the form.
BitmapContainer	Support for adding icons to nodes and to support image tags inside HTML formatted text.
Columns	The collection of columns. Please note that each property that affects appearance is not applied unless UseDefaultAppearance is set to False.
Columns[Index] → BottomFill	The fill of the column when the Layout property is set to include tclBottom.
Columns[Index] → BottomFont	The font of the column text when the Layout property is set to include tclBottom.
Columns[Index] → BottomFontColor	The color of the font of the column text when the Layout property is set to include tclBottom.
Columns[Index] → BottomStroke	The stroke of the column when the Layout property is set to include tclBottom.
Columns[Index] → CustomEditor	Allows for a custom editor to be returned through the OnGetInplaceEditor event.
Columns[Index] → DisabledFontColor	The color of the font of the nodes in disabled state.
Columns[Index] → EditorItems	The items of the editor when using the tcetComboBox editor type.
Columns[Index] → EditorType	The type of editor to use for each node in a column. The editor can be customized per node.
Columns[Index] → Fill	The fill of a column.
Columns[Index] → Font	The font of the nodes of a column.
Columns[Index] → FontColor	The color of the font of the nodes of a column.

Columns[Index] → HorizontalTextAlign	The alignment of the text of the nodes of a column.
Columns[Index] → Name	The name of the column.
Columns[Index] → SelectedFontColor	The color of the font of the nodes in selected state.
Columns[Index] → Stroke	The stroke of the column.
Columns[Index] → TopFill	The fill of the column when the Layout property is set to include tclTop.
Columns[Index] → TopFont	The font of the column text when the Layout property is set to include tclTop.
Columns[Index] → TopFontColor	The color of the font of the column text when the Layout property is set to include tclTop.
Columns[Index] → TopStroke	The stroke of the column when the Layout property is set to include tclTop.
Columns[Index] → Trimming	The trimming of nodes of a column.
Columns[Index] → UseDefaultAppearance	Allows overriding the default appearance of columns/nodes.
Columns[Index] → VerticalTextAlign	The vertical text alignment of nodes.
Columns[Index] → Visible	Sets the column visible / invisible.
Columns[Index] → Width	The width of the column.
Columns[Index] → WordWrapping	The word wrapping of nodes of a column.
ColumnsAppearance	The overall appearance of columns. Note that these properties are applied to all columns unless UseDefaultAppearance is set to False for a column.
ColumnsAppearance → BottomFill	The fill of the column when the Layout property is set to include tclBottom.
ColumnsAppearance → BottomFont	The font of the column text when the Layout property is set to include tclBottom.
ColumnsAppearance → BottomSize	The size of the bottom columns.
ColumnsAppearance → BottomStroke	The stroke of the column when the Layout property is set to include

	tclBottom.
ColumnsAppearance → BottomVerticalText	Allows displaying vertical text in the columns bottom layout.
ColumnsAppearance → FillEmptySpaces	Allows filling empty spaces at the right side of the columns when the StretchScrollBars property is set to False.
ColumnsAppearance → Layouts	The layout of the columns which include tclTop and tclBottom.
ColumnsAppearance → Stretch	Allows stretching of columns.
ColumnsAppearance → StretchAll	Stretches all columns.
ColumnsAppearance → StretchColumn	Calculates all columns except for the column that matches this property. The StretchColumn is automatically given the leftover width after calculation.
ColumnsAppearance → TopFill	The fill of the column when the Layout property is set to include tclTop.
ColumnsAppearance → TopFont	The font of the column text when the Layout property is set to include tclTop.
ColumnsAppearance → TopSize	The size of the top columns.
ColumnsAppearance → TopStroke	The stroke of the column when the Layout property is set to include tclTop.
ColumnsAppearance → TopVerticalText	Allows displaying vertical text in the columns top layout.
ColumnStroke	The stroke between columns of a specific column.
Groups	The collection of groups. Please note that each property that affects appearance is not applied unless UseDefaultAppearance is set to False.
Groups[Index] → BottomFill	The fill of the group when the Layout property is set to include tglBottom.
Groups[Index] → BottomFont	The font of the group text when the Layout property is set to include tglBottom.
Groups[Index] → BottomFontColor	The color of the font of the group text

	when the Layout property is set to include tglBottom.
Groups[Index] → BottomStroke	The stroke of the group when the Layout property is set to include tglBottom.
Groups[Index] → EndColumn	The column on which the group ends. Multiple groups can be added that cover multiple columns.
Groups[Index] → Name	The name of the group.
Groups[Index] → StartColumn	The column on which the group starts.
Groups[Index] → Text	The text of the group.
Groups[Index] → TopFill	The fill of the group when the Layout property is set to include tglTop.
Groups[Index] → TopFont	The font of the group text when the Layout property is set to include tglTop.
Groups[Index] → TopFontColor	The color of the font of the group text when the Layout property is set to include tglTop.
Groups[Index] → TopStroke	The stroke of the group when the Layout property is set to include tglTop.
Groups[Index] → UseDefaultAppearance	Allows overriding the default appearance of groups.
GroupsAppearance	The overall appearance of groups. Note that these properties are applied to all groups unless UseDefaultAppearance is set to False for a group.
GroupsAppearance → BottomFill	The fill of the group when the Layout property is set to include tglBottom.
GroupsAppearance → BottomFont	The font of the group text when the Layout property is set to include tglBottom.
GroupsAppearance → BottomFontColor	The color of the font of the group text when the Layout property is set to include tglBottom.
GroupsAppearance → BottomHorizontalTextAlign	The horizontal alignment of the group text when the Layout property is set to include tglBottom.

GroupsAppearance → BottomSize	The size of the bottom columns.
GroupsAppearance → BottomStroke	The stroke of the column when the Layout property is set to include tclBottom.
GroupsAppearance → BottomVerticalText	Allows displaying vertical text in the columns bottom layout.
GroupsAppearance → BottomVerticalTextAlign	The vertical alignment of the group text when the Layout property is set to include tglBottom.
GroupsAppearance → FillEmptySpaces	Allows filling empty spaces at the right side of the columns when the StretchScrollBars property is set to False.
GroupsAppearance → Layouts	The layout of the groups which include tglTop and tglBottom.
GroupsAppearance → TopFill	The fill of the group when the Layout property is set to include tglTop.
GroupsAppearance → TopFont	The font of the group text when the Layout property is set to include tglTop.
GroupsAppearance → TopFontColor	The color of the font of the group text when the Layout property is set to include tglTop.
GroupsAppearance → TopHorizontalTextAlign	The horizontal alignment of the group text when the Layout property is set to include tglTop.
GroupsAppearance → TopSize	The size of the top columns.
GroupsAppearance → TopStroke	The stroke of the column when the Layout property is set to include tglTop.
GroupsAppearance → TopVerticalText	Allows displaying vertical text in the columns top layout.
GroupsAppearance → TopVerticalTextAlign	The vertical alignment of the group text when the Layout property is set to include tglTop.
Interaction	Set of properties for configuring mouse and keyboard interaction.
Interaction → ColumnAutoSizeOnDblClick	Allows auto sizing of a column on double-click. Please note that this will only apply auto sizing on the visible

	nodes.
Interaction → ColumnSizing	Allows for column sizing.
Interaction → ExtendedEditable	Allows extended nodes to be editable.
Interaction → ExtendedSelectable	Allows extended nodes to be selectable.
Interaction → KeyboardEdit	Allows keyboard editing when editing is supported.
Interaction → MouseEditMode	Sets the mouse edit mode when editing is supported.
Interaction → MultiSelect	Allows for multiple node selection with mouse and keyboard.
Interaction → ReadOnly	Sets the TreeView in readonly mode, which disables node editing on all columns.
Interaction → TouchScrolling	Allows/disallows touch scrolling. When True, scrolling can be done by flicking the mouse (finger) up / down on the TreeView.
Nodes	The nodes collection when a collection-based TreeView is being used.
Nodes[Index] → Enabled	When False, disables editing and selection.
Nodes[Index] → Expanded	When True and the node has children, expands the child nodes. When False, collapses the child nodes.
Nodes[Index] → Extended	When True, applies the extended properties under NodesAppearance and only uses and stretches the first column text over the number of columns.
Nodes[Index] → Nodes	The child nodes collection.
Nodes[Index] → Values	The values collection that is represented in a column for each node.
Nodes[Index] → Values[Index] → Checked	Sets whether the node value for a specific column is checked.
Nodes[Index] → Values[Index] → CheckType	Specifies the check type of a node value. The type can be a radiobutton or a checkbox.

Nodes[Index] → Values[Index] → CollapsedIcon	The icon in collapsed state.
Nodes[Index] → Values[Index] → CollapsedIconLarge	The icon in collapsed state for high DPI / retina screens.
Nodes[Index] → Values[Index] → CollapsedIconLargeName	The icon name linked to a BitmapContainer in collapsed state for high DPI / retina screens.
Nodes[Index] → Values[Index] → CollapseIconName	The icon name linked to a BitmapContainer in collapsed state.
Nodes[Index] → Values[Index] → ExpandedIcon	The icon in expanded state.
Nodes[Index] → Values[Index] → ExpandedIconLarge	The icon in expanded state for high DPI / retina screens.
Nodes[Index] → Values[Index] → ExpandedIconLargeName	The icon name linked to a BitmapContainer in expanded state for high DPI / retina screens.
Nodes[Index] → Values[Index] → ExpandedIconName	The icon name linked to a BitmapContainer in expanded state.
Nodes[Index] → Values[Index] → Text	The Text of a node.
NodesAppearance	The appearance for each node.
NodesAppearance → CollapseNodeIcon	The icon for the ExpandColumn in collapsed state.
NodesAppearance → CollapseNodeIconLarge	The icon for the ExpandColumn in collapsed state for high DPI / retina screens.
NodesAppearance → ColumnStroke	The stroke between columns.
NodesAppearance → DisabledFill	The fill of a node in disabled state.
NodesAppearance → DisabledFontColor	The color of the font of a node in disabled state.
NodesAppearance → DisabledStroke	The stroke of a node in disabled state.
NodesAppearance → ExpandColumn	The column that shows the expand / collapse node icons and is used to expand / collapse the nodes.
NodesAppearance → ExpandHeight	The height of the expand / collapse node icon area.
NodesAppearance → ExpandNodeIcon	The icon for the ExpandColumn in expanded state.
NodesAppearance → ExpandNodeIconLarge	The icon for the ExpandColumn in expanded state.
NodesAppearance → ExpandWidth	The width of the expand / collapse node icon area.
NodesAppearance → ExtendedDisabledFill	The fill of an extended node in

	disabled state.
NodesAppearance → ExtendedDisabledFontColor	The color of the font of an extended node in disabled state.
NodesAppearance → ExtendedDisabledStroke	The stroke of an extended node in disabled state.
NodesAppearance → ExtendedFill	The fill of an extended node.
NodesAppearance → ExtendedFont	The font of an extended node.
NodesAppearance → ExtendedFontColor	The color of the font of an extended node.
NodesAppearance → ExtendedSelectedFill	The fill of an extended node in selected state.
NodesAppearance → ExtendedSelectedFontColor	The color of the font of an extended node in selected state.
NodesAppearance → ExtendedSelectedStroke	The stroke of an extended node in selected state.
NodesAppearance → ExtendedStroke	The stroke of an extended node.
NodesAppearance → Fill	The fill of a node in normal state.
NodesAppearance → FixedHeight	The height of each node in case the HeightMode property is set to tnhmFixed.
NodesAppearance → Font	The font of a node.
NodesAppearance → FontColor	The color of the font of a node in normal state.
NodesAppearance → HeightMode	The HeightMode of the nodes. In case the HeightMode property is set to tnhmFixed, the FixedHeight property is used to determine a fixed height for each node. When the HeightMode property is set to tnhmVariable, the minimum height of a node is 25 and depending on the text calculation and properties such as wordwrapping / trimming and alignment the treeview automatically calculates the real node height on the fly. Mode information can be found in the chapter Fixed vs variable node height under Nodes.
NodesAppearance → LevelIndent	The size of the indenting used for different node levels (child nodes).
NodesAppearance → LineStroke	The stroke of the line used when

	ShowLines is true.
NodesAppearance → SelectedFill	The fill of a node in selected state.
NodesAppearance → SelectedFontColor	The color of the font of a node in selected state.
NodesAppearance → SelectedStroke	The stroke of a node in selected state.
NodesAppearance → SelectionArea	The area of selection indication. The selection area can be limited to the text only, include the icon and level indenting as well.
NodesAppearance → ShowFocus	Shows a focus border on the focused node.
NodesAppearance → ShowLines	Shows node and child node lines.
NodesAppearance → Stroke	The stroke of a node in normal state.
StretchScrollBars	Allows stretching of scrollbars to enable a more integrated look and feel.

Public Properties

TreeView

FocusedNode: TTMSFMXTreeViewNode	Returns the focused node (collection-based).
FocusedVirtualNode: TTMSFMXTreeViewVirtualNode	Returns the focused node (virtual).
SelectedNodes[AIndex: Integer]: TTMSFMXTreeViewNode	Gives access to the selected nodes based on the SelectedNodeCount property (collection-based).
SelectedVirtualNodes[AIndex: Integer]: TTMSFMXTreeViewVirtualNode	Gives access to the selected nodes based on the SelectedVirtualNodeCount property (virtual).

Node (Virtual)

BitmapRects	An array of rectangles for node icons for each column.
Calculated	When the HeightMode is tnhmVariable, this property is set to true whenever a node height is calculated. The Height property contains the height of the node.
CheckRects	An array of rectangles for node check types for each column.
CheckStates	An array of Booleans for node check states for

	each column.
Children	The count of children of a node.
Expanded	Determines if the node is expanded / collapsed.
ExpandRects	An array of rectangles for expand / collapse node icons for each column.
Extended	Determines if the node is extended / normal.
Height	The height of the node.
Index	The index of the node relative to its parent.
Level	The level of the node.
Node	A reference to the collection-based node if a collection-based TreeView is used.
ParentNode	The row index of the parent node.
Row	The index of the node relative to the TreeView.
TextRects	An array of rectangles for the text of each column.
TotalChildren	The total count of children of a node. The total count includes the count of all levels of child nodes.

Important notice: When using one of the array properties, the length of the array will always be the same as the column count, yet the values that are included will only be valid if the width & height are larger than 0. When using one of those array properties for custom drawing keep in mind that drawing is only valid when the above criteria is met.

Node (Collection-Based)

Checked[AColumn: Integer]: Boolean	Property to set the checked state of a node for a specific column.
CheckTypes[AColumn: Integer]: TTMSFMXTreeViewNodeCheckType	Property to set the check type of a node for a specific column. The check type of a node can be a radiobutton or a checkbox.
CollapsedIconNames[AColumn: Integer ALarge: Boolean]: String	The name of the icon in collapsed state of a node for a specific column.
CollapsedIcons[AColumn: Integer ALarge: Boolean]: TTMSFMXTreeViewBitmap	The icon in collapsed state of a node for a specific column.
ExpandedIconNames[AColumn: Integer ALarge: Boolean]: String	The name of the icon in expanded state of a node for a specific column.
ExpandedIcons[AColumn: Integer ALarge: Boolean]: TTMSFMXTreeViewBitmap	The icon in expanded state of a node for a specific column.
Text[AColumn: Integer]: String	The text of a node for a specific column.

VirtualNode: TTMSFMXTreeViewVirtualNode	A reference to the virtual node.

Events

Note that for each event, the TTMSFMXTreeViewVirtualNode is being passed as a parameter. This class is used in virtual mode and in collection-based mode but has a property Node to easily access the collection item in case a collection-based TreeView is used.

OnAfterCheckNode	Event called after a node check state is changed.
OnAfterCollapseNode	Event called after a node is collapsed.
OnAfterDrawColumn	Event called after a column is drawn.
OnAfterDrawColumnEmptySpace	Event called after an empty space next to the columns area is drawn.
OnAfterDrawColumnHeader	Event called after the header area of a column is drawn.
OnAfterDrawColumnText	Event called after the text of a column is drawn.
OnAfterDrawGroup	Event called after the group is drawn.
OnAfterDrawGroupEmptySpace	Event called after the empty space next to the groups area is drawn.
OnAfterDrawGroupText	Event called after the group text is drawn.
OnAfterDrawNode	Event called after a node is drawn.
OnAfterDrawNodeCheck	Event called after the check area of a node is drawn.
OnAfterDrawNodeColumn	Event called after the column area of the nodes is drawn.
OnAfterDrawNodeExpand	Event called after the expand / collapse area of a node is drawn.
OnAfterDrawNodeIcon	Event called after the icon of a node is drawn.
OnAfterDrawNodeText	Event called after the text of a node is drawn.
OnAfterExpandNode	Event called after a node is expanded.
OnAfterOpenInplaceEditor	Event called after the inplace editor is opened.
OnAfterSelectNode	Event called after a node is selected.
OnAfterSizeColumn	Event called after a column is sized.
OnAfterUnCheckNode	Event called after a node is UnChecked.
OnAfterUnSelectNode	Event called after a node is UnSelected.
OnAfterUpdateNode	Event called after a node is updated after editing.
OnBeforeCheckNode	Event called before a node check state is changed.
OnBeforeCollapseNode	Event called before a node is collapsed.
OnBeforeDrawColumn	Event called before a column is drawn.

OnBeforeDrawColumnEmptySpace	Event called before an empty space next to the columns area is drawn.
OnBeforeDrawColumnHeader	Event called before the header area of a column is drawn.
OnBeforeDrawColumnText	Event called before the text of a column is drawn.
OnBeforeDrawGroup	Event called before the group is drawn.
OnBeforeDrawGroupEmptySpace	Event called before the empty space next to the groups area is drawn.
OnBeforeDrawGroupText	Event called before the group text is drawn.
OnBeforeDrawNode	Event called before a node is drawn.
OnBeforeDrawNodeCheck	Event called before the check area of a node is drawn.
OnBeforeDrawNodeColumn	Event called before the column area of the nodes is drawn.
OnBeforeDrawNodeExpand	Event called before the expand / collapse area of a node is drawn.
OnBeforeDrawNodeIcon	Event called before the icon of a node is drawn.
OnBeforeDrawNodeText	Event called before the text of a node is drawn.
OnBeforeExpandNode	Event called before a node is expanded.
OnBeforeOpenInplaceEditor	Event called before the inplace editor is opened.
OnBeforeSelectNode	Event called before a node is selected.
OnBeforeSizeColumn	Event called before a column is sized.
OnBeforeUnCheckNode	Event called before a node is UnChecked.
OnBeforeUnSelectNode	Event called before a node is UnSelected.
OnBeforeUpdateNode	Event called before a node is updated after editing.
OnCloseInplaceEditor	Event called when the inplace editor is closed.
OnCustomizeInplaceEditor	Event for customization of the inplace editor after it has been created.
OnGetColumnHorizontalTextAlign	Event called to get the horizontal alignment of the text in a column.
OnGetColumnText	Event called to get the text of a column.
OnGetColumnTrimming	Event called to get the trimming of the text in a column.
OnGetColumnVerticalTextAlign	Event called to get the vertical alignment of the text in a column.
OnGetColumnWordWrapping	Event called to get the word wrapping of the text in a column.
OnGetGroupText	Event called to get the text for a specific group.

OnGetInplaceEditor	Event called to use a custom inplace editor.
OnGetInplaceEditorRect	Event called to get the inplace editor rectangle.
OnGetNodeCheckType	Event called to get the check type of a node.
OnGetNodeColor	Event called to get the color of a node in normal state.
OnGetNodeDisabledColor	Event called to get the color of a node in disabled state.
OnGetNodeDisabledTextColor	Event called to get the color of the text of a node in disabled state.
OnGetNodeHeight	Event called to get the height of a node in case the NodesAppearance.HeightMode is set to tnhmVariable.
OnGetNodeHorizontalTextAlign	Event called to get the horizontal text alignment of a node.
OnGetNodeIcon	Event called to get the icon of a node.
OnGetNodeSelectedColor	Event called to get the color of a node in selected state.
OnGetNodeSelectedTextColor	Event called to get the text color of a node in selected state.
OnGetNodeText	Event called to get the text of a node.
OnGetNodeTextColor	Event called to get the color of the text of a node.
OnGetNodeTrimming	Event called to get the trimming of the text of a node.
OnGetNodeVerticalTextAlign	Event called to get the vertical text alignment of a node.
OnGetNodeWordWrapping	Event called to get the word wrapping of the text of a node.
OnGetNumberOfNodes	Event called to get the number of nodes.
OnHScroll	Event called when the TreeView scrolls horizontally.
OnIsNodeChecked	Event called to determine if a node is checked or not.
OnIsNodeEnabled	Event called to determine if a node is enabled or not.
OnIsNodeExpanded	Event called to determine if a node is expanded or not.
OnIsNodeExtended	Event called to determine if a node is extended or not.
OnNodeAnchorClick	Event called when an anchor is clicked in the HTML formatted text of a node.
OnNodeChanged	Event called when the node is changed after editing.
OnNodeClick	Event called when a node is clicked.

OnNodeDblClick	Event called when a node is double clicked.
OnVScroll	Event called when the TreeView scrolls vertically.

Procedures and functions

TreeView

AddNode(AParentNode: TTMSFMXTreeViewNode = nil): TTMSFMXTreeViewNode	Adds a node to the node collection (collection-based). An optional parent node parameter can be passed to add the node as a child node.
AddVirtualNode(AParentNode: TTMSFMXTreeViewVirtualNode = nil): TTMSFMXTreeViewVirtualNode	Adds a node to the virtual node list (virtual). An optional parent node parameter can be passed to add the node as a child node.
AutoSizeColumn(ACol: Integer)	Autosizes a column.
BeginUpdate(AClearNodeList: Boolean = False)	Blocks all updates to increase performance. An optional parameter can be passed to completely clear the internal node list to make sure all changes to existing nodes or added and remove nodes are reflected. Must be paired with an EndUpdate.
CancelEditing	Cancels editing when editing is active.
CheckNode(ANode: TTMSFMXTreeViewNode; AColumn: Integer; ARecurse: Boolean = False)	Checks the node for a specific column (collection-based).
CheckVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer; ARecurse: Boolean = False)	Checks the node for a specific column (virtual).
ClearColumns	Removes all columns.
ClearNodeList	Clears the internal node list. (virtual)
ClearNodes	Removes all nodes from the node collection (collection-based).
CollapseAll	Collapses all nodes and child nodes (collection-based).
CollapseAllVirtual	Collapsed all nodes and child nodes (virtual).
CollapseNode(ANode: TTMSFMXTreeViewNode; ARecurse: Boolean = False)	Collapses a specific node (collection-based).
CollapseVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; ARecurse: Boolean = False)	Collapse a specific node (virtual).
EditNode(ANode: TTMSFMXTreeViewNode; AColumn:	Starts editing a specific node (collection-based).

Integer)	
EditVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer)	Starts editing a specific node (virtual).
EndUpdate	Bundles all updates into one update for performance. Needs to be paired with a BeginUpdate.
ExpandAll	Expands all nodes (collection-based).
ExpandAllVirtual	Expands all nodes (virtual).
ExpandNode(ANode: TTMSFMXTreeViewNode; ARecurse: Boolean = False)	Expands a specific node (collection-based).
ExpandVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; ARecurse: Boolean = False)	Expands a specific node (virtual).
FindColumnByName(AName: String): TTMSFMXTreeViewColumn	Finds a column with a specific name.
FindColumnIndexByName(AName: String): Integer	Finds a column index with a specific name.
FindGroupByName(AName: String): TTMSFMXTreeViewGroup	Finds a group with a specific name.
FindGroupIndexByName(AName: String): Integer	Finds a group index with a specific name.
GetFirstChildNode(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the first child node of a node (collection-based).
GetFirstChildVirtualNode(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the first child node of a node (virtual).
GetFirstRootNode: TTMSFMXTreeViewNode	Returns the first root node (collection-based).
GetFirstRootVirtualNode: TTMSFMXTreeViewVirtualNode	Returns the first root node (virtual).
GetHorizontalScrollPosition: Double	Returns the horizontal scroll position.
GetInplaceEditor: TTMSFMXTreeViewInplaceEditor	Returns the inplace editor when active. The GetInplaceEditor function will return nil when the editor is not active.
GetLastChildNode(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the last child node of a node (collection-based).
GetLastChildVirtualNode(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the last child node of a node (virtual).

GetLastNode: TTMSFMXTreeViewNode	Returns the last node (collection-based).
GetLastRootNode: TTMSFMXTreeViewNode	Returns the last root node (collection-based).
GetLastRootVirtualNode: TTMSFMXTreeViewVirtualNode	Returns the last root node (virtual).
GetLastVirtualNode: TTMSFMXTreeViewVirtualNode	Returns the last node (virtual).
GetNextChildNode(ANode: TTMSFMXTreeViewNode; AStartNode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the next child node starting from a parent node and the previous node (collection-based).
GetNextChildVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; AStartNode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the next child node starting from a parent node and the previous node (virtual).
GetNextNode(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the next node starting from a node (collection-based).
GetNextSiblingNode(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the next sibling node starting from a node (collection-based).
GetNextSiblingVirtualNode(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the next sibling node starting from a node (virtual).
GetNextVirtualNode(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the next node starting from the previous node (virtual).
GetNodeChildCount(ANode: TTMSFMXTreeViewNode): Integer	Returns the child count for a specific node (collection-based).
GetParentNode(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the parent node for a specific node (collection-based).
GetParentVirtualNode(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the parent node for a specific node (virtual).
GetPreviousChildNode(ANode: TTMSFMXTreeViewNode; AStartNode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the previous child node starting from a parent node and the previous node (collection-based).

GetPreviousChildVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; AStartNode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the previous child node starting from a parent node and the previous node (virtual).
GetPreviousNode(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the previous node starting from a node (collection-based).
GetPreviousSiblingNode(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the previous sibling starting from a node (collection-based).
GetPreviousSiblingVirtualNode(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the previous sibling starting from a node (virtual).
GetPreviousVirtualNode(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the previous node starting from a node (virtual).
GetRootNodeByIndex(AIndex: Integer): TTMSFMXTreeViewNode	Returns a root node by a specific index (collection-based).
GetRootVirtualNodeByIndex(AIndex: Integer): TTMSFMXTreeViewVirtualNode	Returns a root node by a specific index (virtual).
GetTotalColumnWidth: Double	Returns the total column width.
GetTotalRowHeight: Double	Returns the total row height.
GetVerticalScrollPosition: Double	Returns the vertical scroll position.
GetVirtualNodeChildCount(ANode: TTMSFMXTreeViewVirtualNode): Integer	Returns the child count of a specific node (virtual).
HorizontalScrollBar: TScrollBar	Returns the horizontal scrollbar.
InitSample	Initializes a sample (the same sample initialized at designtime when dropping a new instance of TTMSFMXTreeView).
InsertNode(AIndex: Integer; AParentNode: TTMSFMXTreeViewNode = nil): TTMSFMXTreeViewNode	Inserts a new node on a specific index and parent node (collection based).
InsertVirtualNode(AIndex: Integer; AParentNode: TTMSFMXTreeViewVirtualNode = nil): TTMSFMXTreeViewVirtualNode	Inserts a new node on a specific index and parent node (virtual).
IsColumnVisible(ACol: Integer): Boolean	Returns if the specified column is visible or hidden.

IsEditing: Boolean	Returns if editing is active.
IsNodeSelectable(ANode: TTMSFMXTreeViewNode): Boolean	Returns if a node is selectable (collection-based).
IsNodeSelected(ANode: TTMSFMXTreeViewNode): Boolean	Returns if a node is selected (collection-based).
IsVirtualNodeSelectable(ANode: TTMSFMXTreeViewVirtualNode): Boolean	Returns if a node is selectable (virtual).
IsVirtualNodeSelected(ANode: TTMSFMXTreeViewVirtualNode): Boolean	Returns if a node is selected (virtual).
RemoveNodeChildren(ANode: TTMSFMXTreeViewNode)	Removes all children of a specific node (collection-based).
RemoveSelectedNodes	Removes all selected nodes (collection-based).
RemoveSelectedVirtualNodes	Removes all selected nodes (virtual).
RemoveVirtualNode(ANode: TTMSFMXTreeViewVirtualNode)	Removes a node (virtual).
RemoveVirtualNodeChildren(ANode: TTMSFMXTreeViewVirtualNode)	Removes all children of a specific node (virtual).
RestoreScrollPosition	Restores scroll position after it has been saved with SaveScrollPosition.
SaveScrollPosition	Saves the scroll position. Restoring the scroll position is done with RestoreScrollPosition.
ScrollToNode(ANode: TTMSFMXTreeViewNode; AScrollIfNotVisible: Boolean = False; AScrollPosition: TTMSFMXTreeViewNodeScrollPosition = tvnspTop)	Scrolls to a specific node. Additional parameters can be passed to scroll only if not visible, and the scroll position when the node is found (collection-based).
ScrollToVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; AScrollIfNotVisible: Boolean = False; AScrollPosition: TTMSFMXTreeViewNodeScrollPosition = tvnspTop)	Scrolls to a specific node. Additional parameters can be passed to scroll only if not visible, and the scroll position when the node is found (virtual).
SelectAllNodes	Selects all nodes (collection-based).
SelectAllVirtualNodes	Selects alls nodes (virtual).
SelectedNodeCount: Integer	Selected node count (collection-based).
SelectedVirtualNodeCount: Integer	Selected node count (virtual).
SelectNode(ANode: TTMSFMXTreeViewNode)	Selects a specific node (collection-based).
SelectNodes(ANodes: TTMSFMXTreeViewNodeArray)	Selects an array of nodes (collection-based).
SelectVirtualNode(ANode:	Selects a specific node (virtual).

TTMSFMXTreeViewVirtualNode)	
SelectVirtualNodes(ANodes: TTMSFMXTreeViewVirtualNodeArray)	Selects an array of nodes (virtual).
StopEditing	Stops editing.
ToggleCheckNode(ANode: TTMSFMXTreeViewNode; AColumn: Integer; ARecurse: Boolean = False)	Toggles the state of a checkbox or radiobutton when used in a node column (collection-based).
ToggleCheckVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer; ARecurse: Boolean = False)	Toggles the state of a checkbox or radiobutton when used in a node column (virtual).
ToggleVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; ARecurse: Boolean = False)	Toggles the expand/collapse state of a node (virtual).
UnCheckNode(ANode: TTMSFMXTreeViewNode; AColumn: Integer; ARecurse: Boolean = False)	Unchecks a node (collection-based).
UnCheckVirtualNode(ANode: TTMSFMXTreeViewVirtualNode; AColumn: Integer; ARecurse: Boolean = False)	Unchecks a node (virtual).
UnSelectAllNodes	Unselects all nodes (collection-based).
UnSelectAllVirtualNodes	Unselects all nodes (virtual).
UnSelectNode(ANode: TTMSFMXTreeViewNode)	Unselects a specific node (collection-based).
UnSelectNodes(ANodes: TTMSFMXTreeViewNodeArray)	Unselects an array of nodes (collection-based).
UnSelectVirtualNode(ANode: TTMSFMXTreeViewVirtualNode)	Unselects a specific node (virtual).
UnSelectVirtualNodes(ANodes: TTMSFMXTreeViewVirtualNodeArray)	Unselects an array of nodes (virtual).
VerticalScrollBar: TScrollBar	Returns the vertical scrollbar.
XYToColumnSize(X, Y: Single): Integer	Returns a column index at a specific X and Y coordinate.
XYToNode(X, Y: Double): TTMSFMXTreeViewVirtualNode	Returns a node at a specific X and Y coordinate (virtual).
XYToNodeAnchor(ANode: TTMSFMXTreeViewVirtualNode; X, Y: Single): TTMSFMXTreeViewNodeAnchor	Returns a node anchor at a specific X and Y coordinate.
XYToNodeCheck(ANode: TTMSFMXTreeViewVirtualNode; X, Y: Single): TTMSFMXTreeViewNodeCheck	Returns a node checkbox or radiobutton area at a specific X and Y coordinate.
XYToNodeExpand(ANode: TTMSFMXTreeViewVirtualNode; X, Y:	Returns a node expand / collapse area at a specific X and Y coordinate.

Single): Boolean	
XYToNodeTextColumn(ANode: TTMSFMXTreeViewVirtualNode; X, Y: Single): Integer	Returns the column of the text of a specific node at a specific X and Y coordinate.

Node (Virtual)

Collapse(ARecurse: Boolean = False)	Collapses the child nodes.
Expand(ARecurse: Boolean = False)	Expands the child nodes.
GetChildCount: Integer	Returns the count of child nodes.
GetFirstChild: TTMSFMXTreeViewVirtualNode	Returns the first child node.
GetLastChild: TTMSFMXTreeViewVirtualNode	Returns the last child node.
GetNext: TTMSFMXTreeViewVirtualNode	Returns the next node.
GetNextChild(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the next child node.
GetNextSibling: TTMSFMXTreeViewVirtualNode	Returns the next sibling node.
GetParent: TTMSFMXTreeViewVirtualNode	Returns the parent node.
GetPrevious: TTMSFMXTreeViewVirtualNode	Returns the previous node.
GetPreviousChild(ANode: TTMSFMXTreeViewVirtualNode): TTMSFMXTreeViewVirtualNode	Returns the previous child node.
GetPreviousSibling: TTMSFMXTreeViewVirtualNode	Returns the previous sibling node.
RemoveChildren	Removes all children.

Node (Collection-Based)

Collapse(ARecurse: Boolean = False)	Collapses the child nodes.
Expand(ARecurse: Boolean = False)	Expands the child nodes.
GetChildCount: Integer	Returns the count of child nodes.
GetFirstChild: TTMSFMXTreeViewNode	Returns the first child node.
GetLastChild: TTMSFMXTreeViewNode	Returns the last child node.
GetNext: TTMSFMXTreeViewNode	Returns the next node.
GetNextChild(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the next child node.

GetNextSibling: TTMSFMXTreeViewNode	Returns the next sibling node.
GetParent: TTMSFMXTreeViewNode	Returns the parent node.
GetPrevious: TTMSFMXTreeViewNode	Returns the previous node.
GetPreviousChild(ANode: TTMSFMXTreeViewNode): TTMSFMXTreeViewNode	Returns the previous child node.
GetPreviousSibling: TTMSFMXTreeViewNode	Returns the previous sibling node.
RemoveChildren	Removes all children.

TTMSFMXDirectoryTreeView and TTMSFMXCheckedTreeView

The TTMSFMXDirectoryTreeView and the TTMSFMXCheckedTreeView both inherit from TTMSFMXTreeView and add additional functionality.

TTMSFMXDirectoryTreeView

The TTMSFMXDirectoryTreeView is capable of displaying drives, folders and files. There are three important methods to load this information: LoadDrives, LoadDrive and LoadDirectory. Additionally a filter can be applied for further fine-tuning.

By default there is only one column added which is the name of the file / folder or drive. When more information is needed, there are additional columns supported such as the creation date, modification date and the free space, total space in case of a drive. These columns can be added with the AddColumn function. The directory demo that is included in the distribution demonstrates this component.

TTMSFMXCheckedTreeView

The TTMSFMXCheckedTreeView adds a checkbox for each node by default. The behaviour is identical to the TTMSFMXTreeView but saves the code for adding a checkbox to each node.

General FireMonkey component usage guidelines

With the new FireMonkey framework, the methodology to create and use components has dramatically changed. A component now exists of 2 parts.

Visual part

The visual part is stored in a .style file, which is compiled to a .res file through an .rc file. The .rc file is included in the package and must be recompiled whenever a change is made to the .style file. For each component in this set you will find a .style file. In this file, the default layout of the component is stored.

You will notice different elements, basic elements such as an arc, ellipse, rectangle … The elements combine and define the layout of a control. The basic elements are called shapes, and are already available by default. The TMS Instrumentation Workshop for FireMonkey takes this new way of styling one step further: custom shapes. In several components you will find custom shapes registered and useable in a new application, and used in the component by default.

Each shape or element can have a StyleName, which is used in the non-visual part of the control for interaction. This name is key in the relationship or “style-contract” between style resource and component code.

Non-visual part

The non-visual part of the component interacts with the shapes defined in the .style file. This is a normal .pas unit file as was used for VCL component, yet little to no painting is done in code. As explained above, the visual part is already defined by the style.

The component defined in this unit needs to inherit from the TStyledControl class, which can be styled at designtime. This is the base class for all styleable controls, just like the TCustomControl class was the base class for most controls in the VCL framework.

Naming convention

It is always good practice to handle a consistent naming convention, therefore all .rc, .pas files and .style files should start with the FireMonkey unit scope name “FMX.”, such as the units: FMX.Types, FMX.Dialogs, FMX.Objects …

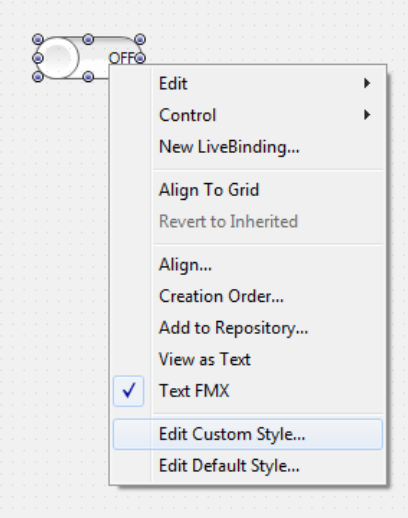
Inside the style file each element can have a StyleName, which can be used in the non-visual part to address the resource. Make sure each element has a unique StyleName to avoid mistakes when interacting with the component. All combinations of elements must be encapsulated within a rectangle element that is invisible by default (through the Fill.Kind and Stroke.Kind = bkNone), and has the StyleName of the component.

If you have a component named TFMXMyFirstControl, the the StyleName of the rectangle encapsulating all other elements must be set to FMXMyFirstControlStyle. The “T” is removed and “Style” is added.

Styling

Each component inherits from TTMSFMXBaseControl which implements a basic Fill and Stroke, and handles the style resource files that define the default layout of the component. To change the visuals of the component you no longer have corresponding properties in the object inspector. Right-clicking on the component provides two extra menu items that can be used to edit the style of the component.

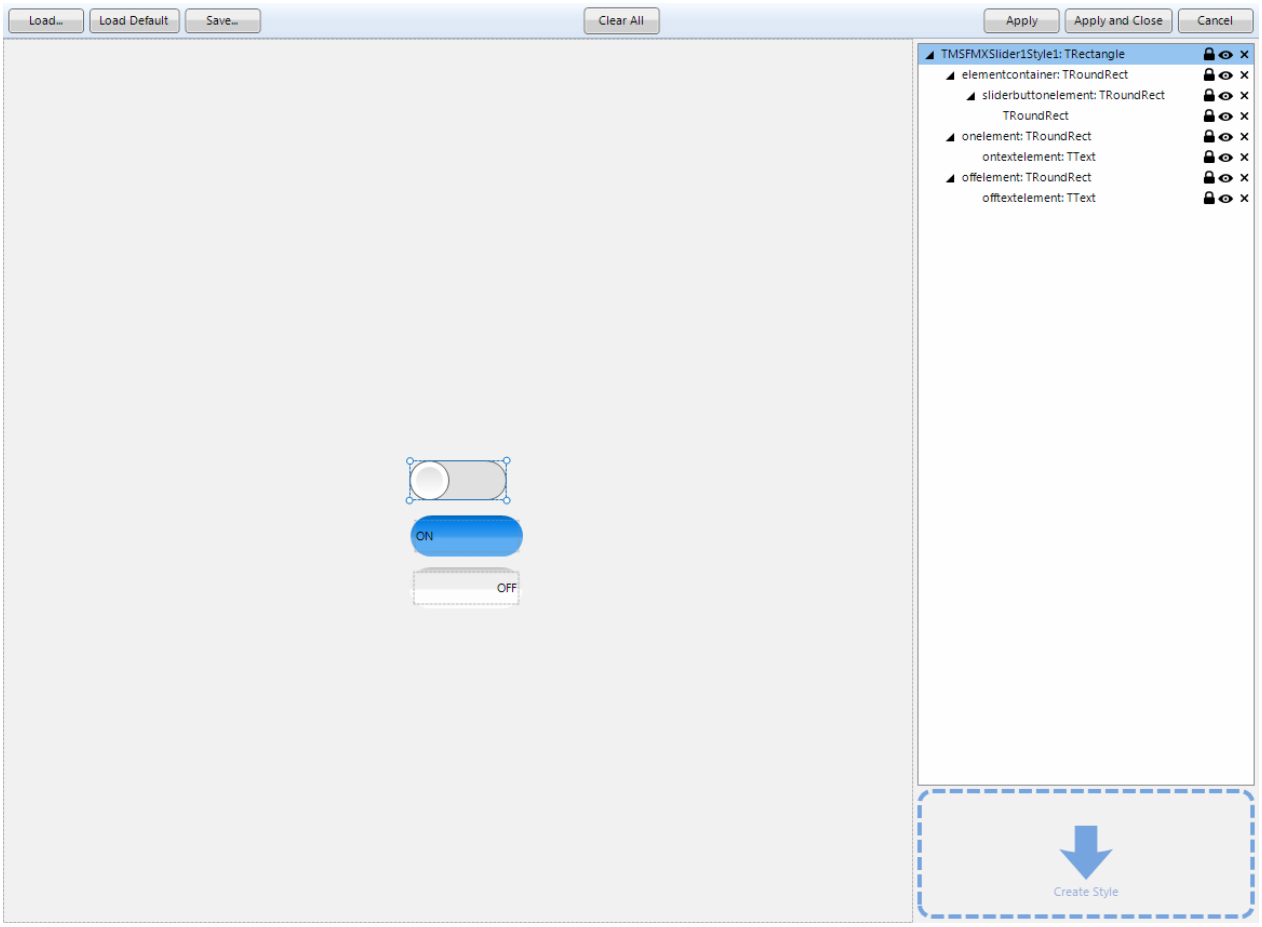
Clicking either of these items will automatically drop a StyleBook component on the form when there is not yet one available. A StyleBook holds custom and default styles. When the default style is changed, dropping a new component of the same class will automatically get this changed style as defined in the default style.



- Edit Custom Style: Clicking on this item starts the IDE style editor and copies the default style of the component. The name of the style is set to the component name on the form and appended with ‘Style1’. After changing properties through the editor,

the style is then applied to the component. You will notice that the StyleLookUp property is set to the name of the custom style in the stylebook.

- Edit Default Style: Clicking on this item starts the IDE style editor and uses the default style of the component. As with the Edit Custom Style option, the name of that style is set. The difference between these 2 options is that the default style has a generic name and is applied to all new instances of the component that are dropped on the form. The StyleLoopup property is not set.

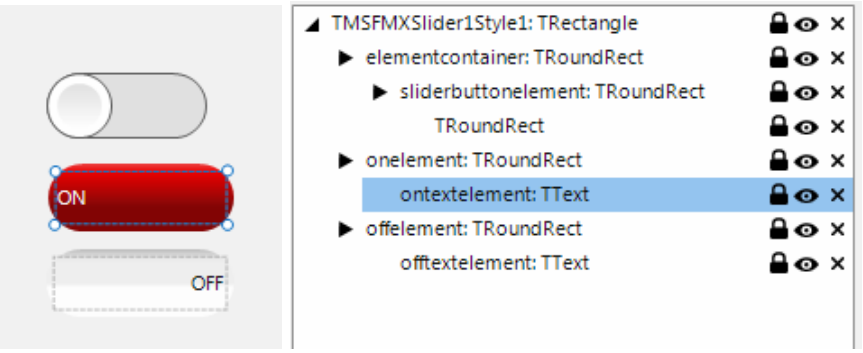


The IDE style editor can be started with these 2 options, or by double-clicking on the StyleBook editor icon on the form. In this example we have a TTMSFMXSlider component that will be altered with a custom style. Notice the TMSFMXSlider1Style1 name that is used for this style. When applying this style, you will also notice the StyleLookup property is set to TMSFMXSlider1Style1.

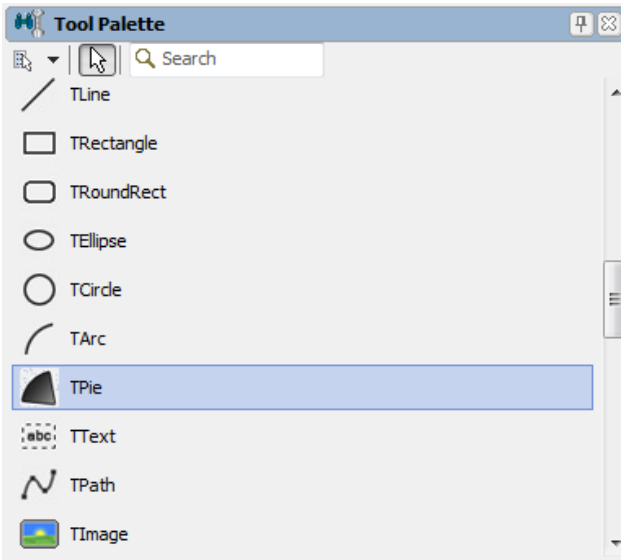
State	ssOff
StyleLookup	**TMSFMXSlider1Style1**
StyleName	
TabOrder	**8**
Tag	0
Visible	True
Width	**75**



Each component exists of different styleable elements. Simple click on an element in the editor to change the appearance.



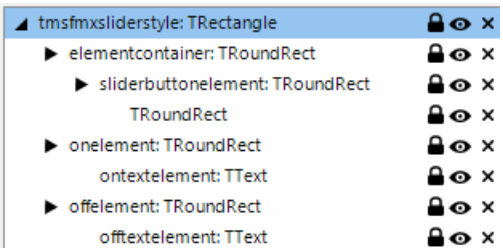
You can also add new elements from the Tool palette.



After applying the Style, the component will have the new custom style.



Dropping a new TTMSFMXSlider component on the form will not adopt this custom style and will have the default style applied. Editing the default style is done in the same way, yet the name of the style differs and each new instance of the TTMSFMXSlider adopts the edited default style.



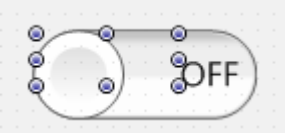
General component properties that do not directly define a visual appearance of the component are still displayed in the Object Inspector. Note though that some properties will affect what is available in the style editor! For example, if a component provides a collection of visible items displayed in the control and it is desirable that the visual appearance of each item can be customized, style elements (shapes) will be dynamically added or removed and be available in the IDE style editor.
In other cases, it is desirable that the appearance for a given type of items in a control is identical. This can be represented as a single style element in the style editor. The component will then internally copy the settings of the style element and apply it to each item displayed in the control.

Components

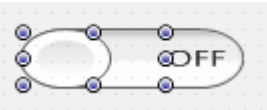
Most of the components in the FireMonkey framework can be scaled and rotated without loss of functionality and quality. As our base control implementation inherits from a base class which supports these features, all of the controls inside the TMS Instrumentation WorkShop set support scaling and rotation.

Scaling: With the Scale property you can specify how large the component must be. The default value of the X and Y property of the Scale is 1. This means that the default component layout is set at one, if you have a component which has 100 pixels width and height dimensions, setting the scale X and Y properties to 1.5 will automatically increase the width and height to 150 pixels. Below are some examples at designtime, which shows the capability of this property.

Scale 1.5



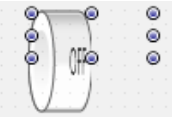
Scale X 1.5 Y 1



Scale 0.5

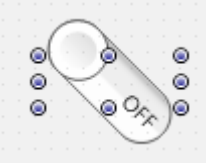
Scale X 0.5 Y 2





Rotation: The rotation property rotates the component around the center by default, which can be changed with the rotationcenter property. Rotating the component does not limit interaction capabilities and functionality.

45°



TMS Mini HTML rendering engine

Another core technology used among many components is a small fast & lightweight HTML rendering engine. This engine implements a childset of the HTML standard to display formatted text. It supports following tags :

B : Bold tag
<B> : start bold text
</B> : end bold text

Example : This is a <B>test</B>

U : Underline tag
<U> : start underlined text
</U> : end underlined text

Example : This is a <U>test</U>

I : Italic tag
<I> : start italic text
</I> : end italic text

Example : This is a <I>test</I>

S : Strikeout tag

<S> : start strike-through text
</S> : end strike-through text

Example : This is a <S>test</S>

A : anchor tag
<A href="value"> : text after tag is an anchor. The 'value' after the href identifier is the anchor. This can be an URL (with ftp,http,mailto,file identifier) or any text.
If the value is an URL, the shellexecute function is called, otherwise, the anchor value can be found in the OnAnchorClick event </A> : end of anchor

Examples : This is a <A href= "mailto:myemail@mail.com ">test</A>
This is a <A href="http://www.tmssoftware.com">test</A>
This is a <A href="somevalue">test</A>

FONT : font specifier tag
<FONT face='facevalue' size='sizevalue' color='colorvalue' bgcolor='colorvalue'> : specifies font of text after tag.
with

- face : name of the font
- size : HTML style size if smaller than 5, otherwise pointsize of the font
- color : font color with either hexidecimal color specification or color constant name, ie claRed,claYellow,claWhite ... etc
- bgcolor : background color with either hexidecimal color specification or color constant name </FONT> : ends font setting

Examples : This is a <FONT face="Arial" size="12" color="clared">test</FONT>
This is a <FONT face="Arial" size="12" color="#FF0000">test</FONT>

P : paragraph
<P align="alignvalue" [bgcolor="colorvalue"] [bgcolorto="colorvalue"]> : starts a new paragraph, with left, right or center alignment. The paragraph background color is set by the optional bgcolor parameter. If bgcolor and bgcolorto are specified,
a gradient is displayed ranging from begin to end color.
</P> : end of paragraph

Example : <P align="right">This is a test</P>
Example : <P align="center">This is a test</P>
Example : <P align="left" bgcolor="#ff0000">This has a red background</P>
Example : <P align="right" bgcolor="claYellow">This has a yellow background</P>
Example : <P align="right" bgcolor="claYellow" bgcolorto="clared">This has a gradient

background</P>*

HR : horizontal line
<HR> : inserts linebreak with horizontal line

BR : linebreak

 : inserts a linebreak

BODY : body color / background specifier
<BODY bgcolor="colorvalue" [bgcolorto="colorvalue"] [dir="v|h"] background="imagefile specifier"> : sets the background color of the HTML text or the background bitmap file

Example : <BODY bgcolor="claYellow"> : sets background color to yellow
<BODY background="file://c:\test.bmp"> : sets tiled background to file test.bmp
<BODY bgcolor="claYellow" bgcolorto="claWhite" dir="v"> : sets a vertical gradient from yellow to white

IND : indent tag
This is not part of the standard HTML tags but can be used to easily create multicolumn text
<IND x="indent"> : indents with "indent" pixels

Example :
This will be <IND x="75">indented 75 pixels.

IMG : image tag
<IMG src="specifier:name" [align="specifier"] [width="width"] [height="height"] [alt="specifier:name"] > : inserts an image at the location

specifier can be: name of image in a BitmapContainer

Optionally, an alignment tag can be included. If no alignment is included, the text alignment with respect to the image is bottom. Other possibilities are: align="top" and align="middle"

The width & height to render the image can be specified as well. If the image is embedded in anchor tags, a different image can be displayed when the mouse is in the image area through the Alt attribute.

Examples :
This is an image <IMG src="name">

CHILD : childscript tag

<CHILD> : start childscript text
</CHILD> : end childscript text

Example : This is ⁹/<CHILD>16</CHILD> looks like 9/16

SUP : superscript tag
<SUP> : start superscript text
</SUP> : end superscript text

UL : list tag
<UL> : start unordered list tag
</UL> : end unordered list

Example : <UL>
<LI>List item 1
<LI>List item 2
<UL>
<LI> Child list item A
<LI> Child list item B
</UL>
<LI>List item 3
</UL>

LI : list item
<LI [type="specifier"] [color="color"] [name="imagename"]>: new list item specifier can be "square", "circle" or "image" bullet. Color sets the color of the square or circle bullet. Imagename sets the PictureContainer image name for image to use as bullet

SHAD : text with shadow
<SHAD> : start text with shadow
</SHAD> : end text with shadow

Z : hidden text
<Z> : start hidden text
</Z> : end hidden text

Special characters
Following standard HTML special characters are supported :
< : less than : <

> : greater than : >
& : &
" : "
  : non breaking space
™ : trademark symbol
€ : euro symbol
§ : section symbol
© : copyright symbol
¶ : paragraph symbol