Window Presentation Foundation

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·Inhalt

- Einführung WPF
- Layouts
- C# Sprache
- Dialog-Elemente, Menüs
- **2D- / 3D-Grafik, Audio, Video, Animation**
- Routet Events, Dependency Properties, Command
- Textdarstellung (Flow-FixedDocuments)
- Datenbanken
- Navigation / Browser
- Eigene Komponenten

Ebenen und Klassen der 2D-Grafikelemente

- Shapes
  - Rectangle, Line, Ellipse, Polyline, Polygon, Path
  - Eigenschaften: Height, Width, Fill, Stroke, StrokeThickness
  - Keine Attribute à la Top und Left
  - **Einfach zu erstellen mittels XAML**
- Visual Layers
  - Unterste Ebene
  - DrawEllipse, DrawRectangle, DrawRoundedRectangle, DrawLine, DrawDrawing, DrawGeometry, DrawGlyphRun, DrawImage, DrawText, DrawVideo,
  - PushClip, PushEffect, PushGuidelineSet, PushOpacity, PushopacityMask, PushTransform, Pop
  - Programmieren:
    - Ableiten von UIElement, überschreiben onRender
    - Oder Erstellen eines DrawingVisualDrawing-Objektes. Direktes Aufrufen der onRender-Methode

Ebenen und Klassen der 2D-Grafikelemente

- Geometry, abstrakte Klasse
- Einfache Methoden
  - Rectangle, Line, Ellipse,
  - Eigenschaften: Height, Width, Fill, Stroke, StrokeThickness
  - Haben Top und Left
  - Einfach zu erstellen mittels XAML
- Komplexere Methoden
  - StreamGeometry — Byte-Code
  - CombinedGeometries
  - GeometryGroup — Gruppen
  - PathGeometry — Komplexe Figuren

    Path, Path.Data, PathGeometry, PathFigure

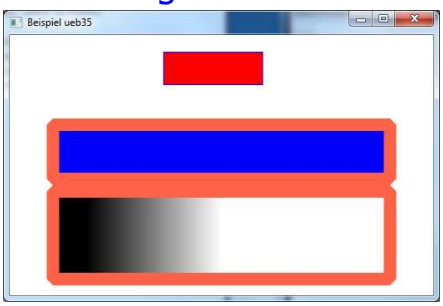
Shapes, abstrakte Klasse

- Shapes haben eine zweidimensionale Form
- Atrtribute:
  - Width
  - Height
  - Kein Top/Left, aber Margin
- **Sub-Klassen:**
  - Rectangle
  - Ellipse
  - Line
  - Polyline
  - Polygon
  - Path

Shapes: Attribute von Rectangle

- Fill
- Width
- Height
- Stroke Linienfarbe
- RadiusX und RadiusY Abrundung
- StrokeDashArray, StrokeDashCap, StrokeDashOffset
- StrokeEndLineCap, StrokeLineJoin, StrokeMiterLimit
- StrokeStartLineCap, StrokeThickness
- MinHeight, MaxHeight, MinWidth, MaxWidth
- Stretch {Fill, None, Uniform, UniformToFill}
- HorizontalAlignment / VerticalAlignment
- Visibility

Beispiel eines Rectangle: ueb35



- <Rectangle Fill="Red" Width="120" Height="40" Stroke="Blue"
  Margin="10 20 30 40"/>
- <Rectangle Fill="Blue" Width="420" Height="160" Stroke="Tomato"
  Margin="0 0 0 0" StrokeDashCap="Round"
  StrokeEndLineCap="Triangle" StrokeLineJoin="Bevel"
  StrokeMiterLimit="10" StrokeStartLineCap="Triangle"
  StrokeThickness="15" Stretch="Fill" />

Beispiel des dritten Rectangles

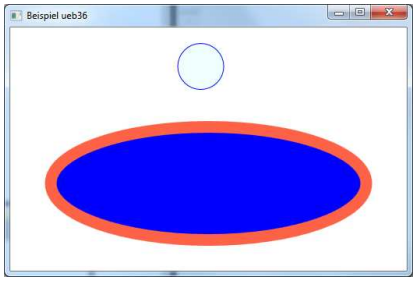
```
<Rectangle  Width="420"  Height="120"  Stroke="Tomato"
  StrokeDashCap="Round" StrokeEndLineCap="Triangle"
  StrokeLineJoin="Bevel"   StrokeMiterLimit="10"
  StrokeStartLineCap="Triangle" StrokeThickness="15"
  Stretch="Fill" >
 <Rectangle.Fill>
   <LinearGradientBrush StartPoint="0.1, 0" EndPoint="0.5, 0">
     <GradientStop Color="Black" Offset="0"/>
     <GradientStop Color="White" Offset="1"/>
   </LinearGradientBrush>
 </Rectangle.Fill>
</Rectangle>
```

Offset: Ruft die Position des Farbverlaufsunterbrechungspunkts innerhalb des Farbverlaufsvektors ab.

Shapes: Attribute von Ellipse

- Fill
- Width Width=Height=> Kreis
- Height
- Stroke Linienfarbe
- StrokeDashArray, StrokeDashCap, StrokeDashOffset
- StrokeEndLineCap, StrokeLineJoin, StrokeMiterLimit
- StrokeStartLineCap, StrokeThickness
- MinHeight, MaxHeight, MinWidth, MaxWidth
- Stretch {Fill, None, Uniform, UniformToFill}
- HorizontalAlignment / VerticalAlignment
- Visibility

Ellipse ueb36:

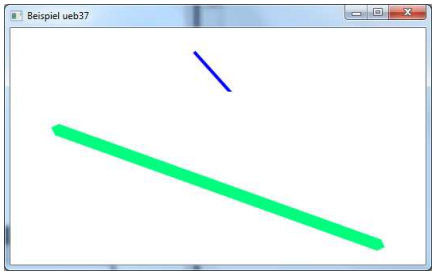


- <Ellipse Fill="Azure" Width="60" Height="60" Stroke="Blue"
  Margin="10 20 30 40" />
- <Ellipse Fill="Blue" Width="420" Height="160"
  Stroke="Tomato" Margin="0 0 0 0"
  StrokeDashCap="Round" StrokeEndLineCap="Triangle"
  StrokeLineJoin="Bevel" StrokeMiterLimit="10"
  StrokeStartLineCap="Triangle" StrokeThickness="15"
  Stretch="Fill" />

Shapes: Attribute von Line

- X1, Y1, X2, Y2 Bestimmen die Linie
- Fill Verzerrt mit Height und Width(optional)
- Width, Height
- Stroke Linienfarbe
- StrokeDashArray, StrokeDashCap, StrokeDashOffset
- StrokeEndLineCap, StrokeLineJoin, StrokeMiterLimit
- StrokeStartLineCap, StrokeThickness
- MinHeight, MaxHeight, MinWidth, MaxWidth
- Stretch {Fill, None, Uniform, UniformToFill}
- HorizontalAlignment / VerticalAlignment
- Visibility

Line ueb37



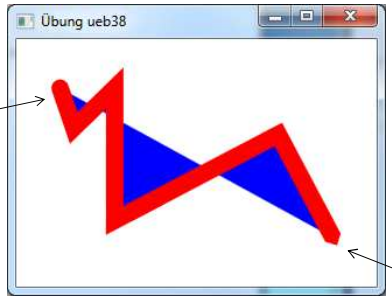

```
<Line X1="10" Y1="10"   X2="100" Y2="110" Width="60"
  Height="60"  Stretch="None" Stroke="Blue"
  Margin="10 20 30 40" StrokeThickness="4" />
```

```
<Line X1="10" Y1="10"   X2="100" Y2="110"  Width="420"
  Height="160"  Stroke="SpringGreen" StrokeDashCap="Round"
  StrokeEndLineCap="Triangle"   StrokeLineJoin="Bevel"
  StrokeMiterLimit="10"   StrokeStartLineCap="Triangle"
  StrokeThickness="15" Stretch="Fill" />
```

Shapes: Attribute von Polyline

- Points — Array von Punkten
- Fill — Verzerrt mit Height und Width(optional)
- Width, Height
- Stroke — Linienfarbe
- StrokeDashArray, StrokeDashCap, StrokeDashOffset
- StrokeEndLineCap, StrokeLineJoin, StrokeMiterLimit
- StrokeStartLineCap, StrokeThickness
- MinHeight, MaxHeight, MinWidth, MaxWidth
- Stretch {Fill, None, Uniform, UniformToFill}
- HorizontalAlignment / VerticalAlignment
- Visibility

Polyline ueb38

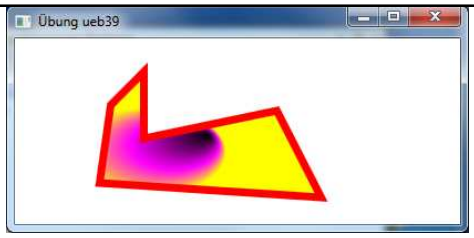



```
<Polyline Points="10,10, 20,40, 50,10, 50,110, 170,45, 210, 123"
   Width="249"  Height="143"  Stretch="Fill" Stroke="Red"
   StrokeThickness="15" StrokeDashCap="Flat" StrokeEndLineCap="Triangle"
   StrokeLineJoin="Miter"   StrokeMiterLimit="40" StrokeStartLineCap="Round"
     Fill="Blue"
     VerticalAlignment="Stretch"      HorizontalAlignment="Stretch"
/>
```

Shapes: Attribute von Polygon

- Points — Array von Punkten, Immer geschlossen
- Fill — Verzerrt mit Height und Width(optional)
- Width, Height
- Stroke — Linienfarbe
- StrokeDashArray, StrokeDashCap, StrokeDashOffset
- StrokeEndLineCap, StrokeLineJoin, StrokeMiterLimit
- StrokeStartLineCap, StrokeThickness
- MinHeight, MaxHeight, MinWidth, MaxWidth
- Stretch {Fill, None, Uniform, UniformToFill}
- HorizontalAlignment / VerticalAlignment
- Visibility

Polygon: ueb39




```
<Polygon Points="10,110, 20,40, 50,10, 50,70, 170,45, 210, 123"
    Width="249"  Height="143"  Stretch="None" Stroke="Red"
    Margin="10 20 30 40" StrokeThickness="7" >
     <Polygon.Fill>
         <RadialGradientBrush Center="0.1, 0.7">
             <GradientStop Color="Black" Offset="0"/>
             <GradientStop Color="Magenta" Offset="0.4"/>
              <GradientStop Color="Yellow" Offset="0.7"/>
          </RadialGradientBrush>
      </Polygon.Fill>
 </Polygon>
```

Pen: Attribute

- LineCaps, Zeichnen an beiden Enden
  - Flat, ohne
  - Square, gerader Rand
  - Round
  - Triangle
- StrokeDashArray
  - Dot 1,1
  - Dash 4,1
  - Dash,Dot 4,1,1,1
  - Dash,Dot,Dot 4,1,1,1,1,1
  - Dash,Dot, Space 4,1,1

Pen: Attribute

- StrokeLineJoin, wie werden Linien verbunden
  - Miter, eckig
  - Bevel, Trapez
  - Round
- StrokeMiterLimit
  - Länge der „Pfeilspitze“

Visual Layers

- DrawingContext
  - DrawEllipse
  - DrawRectangle
  - DrawRoundedRectangle
  - DrawLine
  - DrawGeometry
  - DrawGlyphRun
  - DrawImage
  - DrawText
  - DrawVideo
- DrawingContext
  - PushClip
  - PushEffect
  - PushGuidelineSet
  - PushOpacity
  - PushopacityMask
  - PushTransform
  - Pop

Parameter der Methoden

- DrawEllipse(brush, pen, x, y, radiusX, radiusY)
- DrawRectangle(brush, pen, x, y, radiusX, radiusY)
- DrawRoundedRectangle(brush, pen,new Rect(x1, y1, width, height), radiusX, radiusY);
- DrawLine(pen, new Point(x1, y1), new Point(x2, y2))
- DrawLine(pen, new Point(x1, y1), new Point(x2, y2))

Parameter der Methoden

- DrawImage(ImageSource, rect); // abstrakte Klasse
  - System.Windows.Interop.D3DImage
  - System.Windows.Media.DrawingImage
  - System.Windows.Media.Imaging.BitmapSource

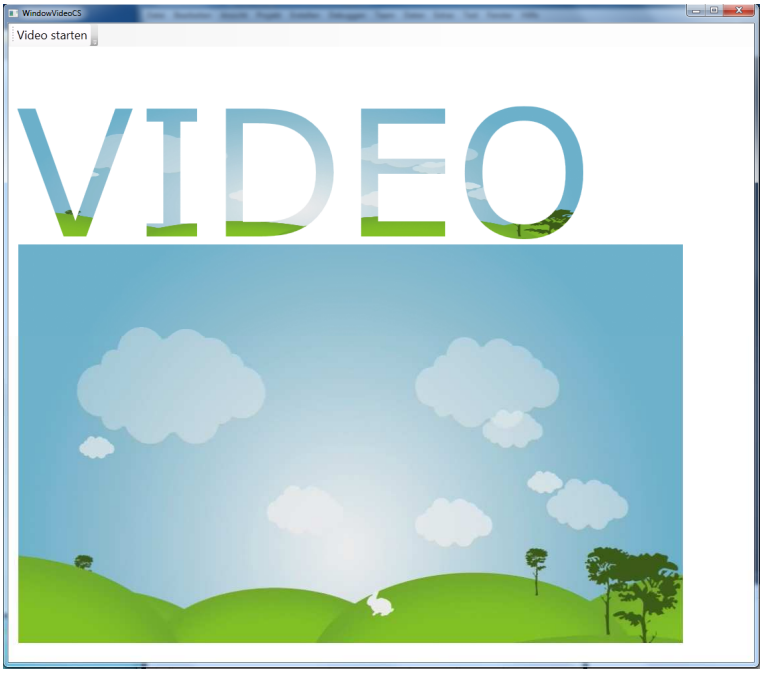
```
BitmapImage bi = new BitmapImage();
bi.BeginInit();
bi.UriSource = new Uri("test.jpg", UriKind.RelativeOrAbsolute);
bi.EndInit();
dc.DrawImage(bi, new Rect(55, 77, 200, 300));
dc.DrawImage(bi, new Rect(55, 77, bi.Width, bi.Height));
```


Parameter der Methoden

- **DrawVideo**(MediaPlayer, rect);

```
MediaPlayer pl = new MediaPlayer();

pl.Open(new Uri("video.wmv", UriKind.Relative));

dc.DrawVideo(pl, new Rect(315, 17, 1000,600) );
pl.Play();
```

- C#


WindowVideoCS
Video starten
VIDEO

XAML

WindowVideoXAML
VIDEO

```
<StackPanel >
  <TextBox FontSize="200" Text="VIDEO" Background="Yellow">
    <TextBlock.Foreground>
      <DrawingBrush>
        <DrawingBrush.Drawing>
          <GeometryDrawing Brush="MediumBlue">
            <GeometryDrawing.Geometry>
              <GeometryGroup>
                <EllipseGeometry RadiusX="20" RadiusY="45" Center="50,50" />
                <EllipseGeometry RadiusX="45" RadiusY="20" Center="50,50" />
              </GeometryGroup>
            </GeometryDrawing.Geometry>
          </GeometryDrawing>
        </DrawingBrush.Drawing>
      </DrawingBrush>
    </TextBlock.Foreground>
  </TextBox>
</StackPanel>
```


Video: ueb41 a) C# mit MyCanvas

```
protected override void OnRender(DrawingContext dc)  {
        MediaPlayer pl = new MediaPlayer();
        pl.Open(new Uri("video.wmv", UriKind.Relative));
        dc.DrawVideo(pl, new Rect(15, 297, 1000, 600));
        pl.Play();

        VideoDrawing vd = new VideoDrawing();
        vd.Player = pl;
        vd.Rect = new Rect(0, 0, 600, 600);
        DrawingBrush brushVideo = new DrawingBrush(vd);
        FormattedText formattedText=..., 264, brushVideo);
        dc.DrawText(formattedText, new Point(10, 20));
    }
```

```
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
<TextBox FontSize="200" Text="VIDEO" Background= "Red" FontWeight="ExtraBold">
    <TextBlock.Foreground>
      <DrawingBrush>
        <DrawingBrush.Drawing>
          <VideoDrawing >
            <VideoDrawing.Player >
              <MediaPlayer x:Name="meinplayer" />
            </VideoDrawing.Player>
            <VideoDrawing.Rect>
              0,0,600, 600
            </VideoDrawing.Rect>
          </VideoDrawing>

        </DrawingBrush.Drawing>
      </DrawingBrush>
    </TextBlock.Foreground>
  </TextBox>
```


Visual Layers: DrawText

- int x=10;
- Int y=110;
- FormattedText formattedText =

```
  new FormattedText(text.Text,
        CultureInfo.GetCultureInfo("DE-de"),
        FlowDirection.LeftToRight,
        new Typeface("Verdana"),
        16,  Brushes.Red );
```

- DrawText(formattedText, new Point(x, y));
- Height, Width, WidthIncludingTrailingWhitespace
- TextAlignment: TextAlignment.Center, Right, Left, Justify

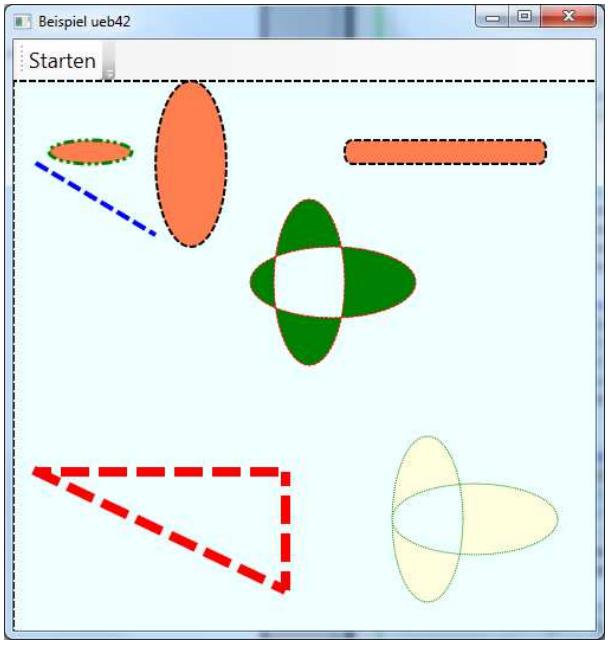
Visual Layers: DrawText, senkrecht

```
int x=10;
Int y=110;
FormattedText formattedText =
        new FormattedText(sText,
            CultureInfo.GetCultureInfo("DE-de"),
            FlowDirection.LeftToRight,
            new Typeface("Verdana"),
            24, new SolidColorBrush( Colors.Red ));
RotateTransform rt = new RotateTransform(-90, x, y);
dc.PushTransform(rt);
dc.DrawText(formattedText, new Point(x, y));
dc.Pop();
```


Parameter der Geometry-Klassen

- DrawGeometry(brush, pen, geometry)
- **Geometry: vielfältige Flächenabfragen (Point in Area, etc.)**
  - LineGeometry(Point start, Point end);
  - RectangleGeometry(new Rect(x,y,width, height), radiusX, radiusY);
  - EllipseGeometry(new Rect(x,y,width, height));
  - CombinedGeometry(Point start, Point end);
    - Union, Intersect, Xor, Exclude=Minus
  - GeometryGroup .Add(…)
  - PathGeometry, Container von bel. Objekten
    - Path.Data, PathGeometry, PathFigure
  - StreamGeometry, wie oben, aber als Byte-Code

Beispiel ueb42



Beispiel ueb42

```
LineGeometry geometry =
        new LineGeometry(new Point(120, 130), new Point(20, 70));
dc.DrawGeometry(Brushes.Coral, pen2, geometry);

EllipseGeometry geometry2 = new EllipseGeometry(new Rect(30, 50, 70, 20));
dc.DrawGeometry(Brushes.Coral, pen2, geometry2);

EllipseGeometry geometry3 = new EllipseGeometry(new Point(150, 70), 30, 70);
dc.DrawGeometry(Brushes.Coral, pen2, geometry3);

RectangleGeometry geometry4 =
        new RectangleGeometry(new Rect(280, 50, 170, 20),  6, 8);
dc.DrawGeometry(Brushes.Coral, pen2, geometry4);
```

Beispiel ueb42

```
Pen pen8 = new Pen(Brushes.Red, 1);
pen8.DashStyle = DashStyles.Dash;
EllipseGeometry geo1 =
        new EllipseGeometry(new Point(250, 170), 30, 70);
EllipseGeometry geo2 =
        new EllipseGeometry(new Point(270, 170), 70, 30);

CombinedGeometry combgeo = new
CombinedGeometry(GeometryCombineMode.Xor, geo1, geo2);

dc.DrawGeometry(Brushes.Green, pen8, combgeo);
```

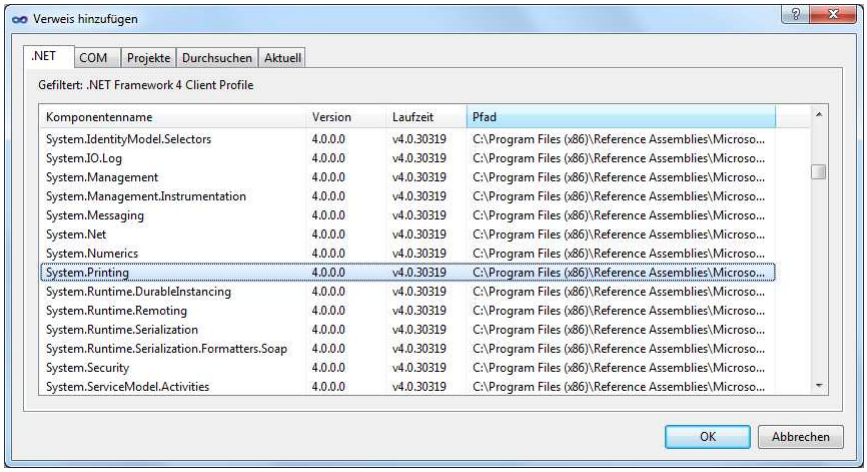

Beispiel ueb42

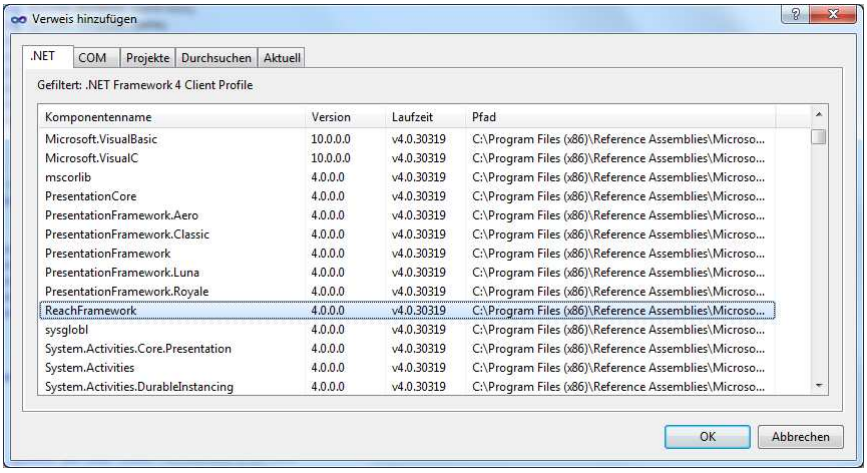
```
EllipseGeometry geo3 =
        new EllipseGeometry(new Point(350, 370), 30, 70);
EllipseGeometry geo4 =
        new EllipseGeometry(new Point(390, 370), 70, 30);
PathGeometry pathgeo = new PathGeometry();
pathgeo.AddGeometry(geo3);
pathgeo.AddGeometry(geo4);

BezierSegment bez =
        new BezierSegment(new Point(300, 320), new Point(350,
        400), new Point(450, 370), true);

dc.DrawGeometry(Brushes.LightYellow, pen9, pathgeo);
```

Beispiel ueb42

```
<Path Stroke="Black" StrokeThickness="2">
 <Path.Data>
  <PathGeometry>
   <PathFigure StartPoint="50,0">
    <BezierSegment Point1="0,50" Point2="200,50"  Point3="150,0"/>
   </PathFigure>

   <PathFigure StartPoint="50,60">
    <BezierSegment Point1="200,110"Point2="0,110"  Point3="150,60"/>
   </PathFigure>
  </PathGeometry>
 </Path.Data>
</Path>
```


Drucken




Verweis hinzufügen
.NET
COM
Projekte
Durchsuchen
Aktuell
Gefiltert: .NET Framework 4 Client Profile
Komponentenname
Version
Laufzeit
Pfad
Microsoft.VisualBasic 10.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
Microsoft.VisualC 10.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
mscorlib 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
PresentationCore 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
PresentationFramework.Aero 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
PresentationFramework.Classic 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
PresentationFramework 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
PresentationFramework.Luna 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
PresentationFramework.Royale 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
ReachFramework 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
sysglobl 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
System.Activities.Core.Presentation 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
System.Activities 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
System.Activities.DurableInstancing 4.0.0.0 v4.0.30319 C:\Program Files (x86)\Reference Assemblies\Microso...
OK
Abbrechen