

GDI Plus

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Windows programming

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In this talk

- ❑ GDI Plus overview
- ❑ Usage

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What is GDI Plus

- ❑ Class-based API for working with video display & printer
- ❑ Latest redistributable download
 - <http://go.microsoft.com/fwlink/?LinkID=20993>
- ❑ Available since Windows XP, successor to GDI

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Three parts of GDI+

- **2D vector graphics**

- Lines, curves, figures...

- **Imaging**

- **Typography**

- Subpixel antialiasing (smoother text rendering)

40 classes 50 enumerations

6 structures

How to use

```
#include <ObjIdl.h>
#include <gdiplus.h>
#pragma comment(lib, "gdiplus.lib")
using namespace Gdiplus;
```

```
GdiPlusStartup();
GdiPlusShutdown();
```

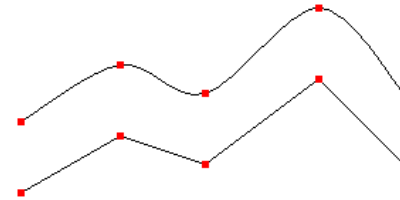
Main class: **Graphics**

Lines, Curves, Figures, Images & Text

Exciting features

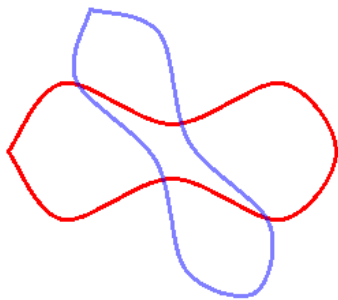


Gradient brushes

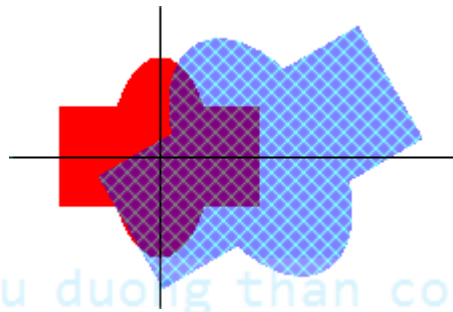


Cardinal splines

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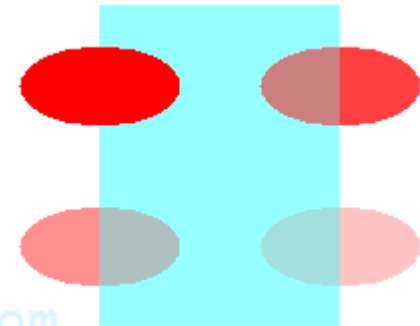


Matrix transformation



Scalable regions

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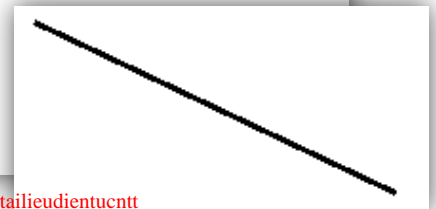
Alpha blending

❑ Supported image formats: PNG, ICON, JPEG, GIF..

Programming model

- ❑ No handles, no device context! Opaque opacity trans
- ❑ Just

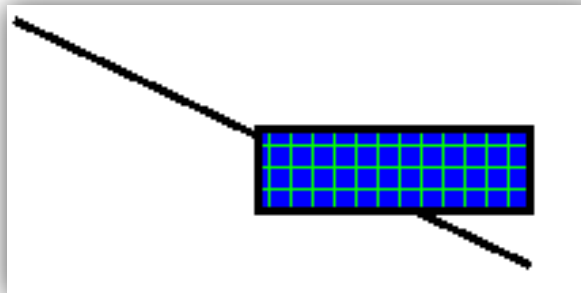
```
PAINTSTRUCT ps;  
HDC hdc = BeginPaint(hWnd, &ps);  
  
Graphics* graphics = new Graphics(hdc);  
int lineWidth = 3;  
Pen* pen = new Pen(Color(255, 0, 0, 0), lineWidth);  
  
graphics->DrawLine(pen, 10, 10, 200, 100);  
                                left, top, width, height  
  
delete pen;  
delete graphics;  
EndPaint(hWnd, &ps);
```



Drawing & Filling

```
HatchBrush* myHatchBrush = new HatchBrush(  
    HatchStyleCross,  
    Color(255, 0, 255, 0),  
    Color(255, 0, 0, 255));  
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graphics->FillRectangle(myHatchBrush, 100, 50, 100, 30);
```

```
// ! Seperation drawing & filling  
graphics->DrawRectangle(pen, 100, 50, 100, 30);  
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```

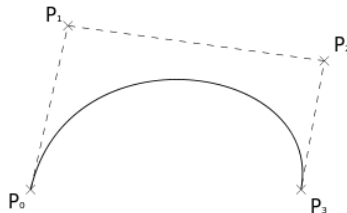


Lines, Curves & Shapes

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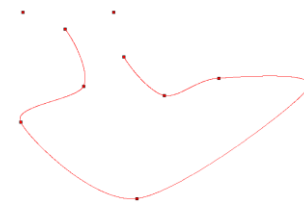
Drawing basic shapes

- ❑ **DrawLine** (s)
- ❑ **DrawRectangle** (s)
- ❑ **DrawEllipse**
- ❑ **DrawPolygon**
- ❑ **DrawArc** – part of ellipse
- ❑ **DrawCurve** (cardinal splines) - **DrawClosedCurve**
- ❑ **DrawBezier** (s)



Bezier curve with 2 control points

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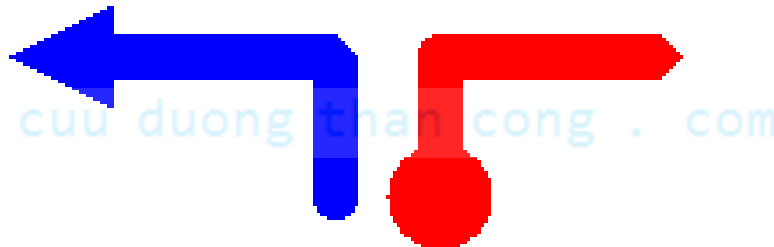


Cardinal splines

<https://fb.com/tailieudientuctn>

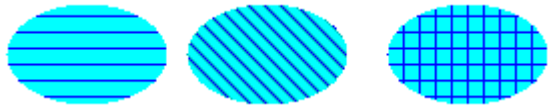
Pen

- ❑ **SetDashStyle**
- ❑ **SetStartCap**
- ❑ **SetEndCap**
- ❑ **SetLineJoin** (connected lines are mitered – sharp corners, beveled, rounded, clipped)

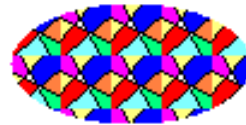


Brushes

□ SolidBrush



HatchBrush



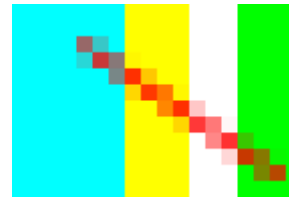
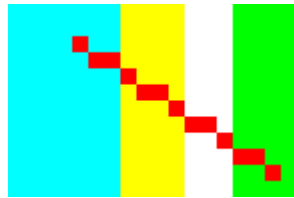
TextureBrush



GradientBrush

```
LinearGradientBrush myLinearGradientBrush(  
    myRect,  
    Color(255, 0, 0, 255),  
    Color(255, 0, 255, 0),  
    LinearGradientModeHorizontal);  
myGraphics.FillEllipse(&myLinearGradientBrush, myRect);
```

Anti Alias



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```
myGraphics.SetSmoothingMode(SmoothingModeAntiAlias);  
myGraphics.DrawLine(&myPen, 0, 0, 12, 8);
```

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Images

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Drawing



```
Image myImage(L"Climber.jpg");  
myGraphics.DrawImage(&myImage, 10, 10);
```

Cropping



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```
Bitmap* originalBitmap = new Bitmap(L"Spiral.png");
RectF sourceRect(
    0.0f,
    0.0f,
    (REAL)(originalBitmap->GetWidth()),
    (REAL)(originalBitmap->GetHeight())/2.0f);

Bitmap* secondBitmap = originalBitmap->Clone(sourceRect, PixelFormatDontCare);

myGraphics.DrawImage(originalBitmap, 10, 10);
myGraphics.DrawImage(secondBitmap, 100, 10);
```


Scaling



```
Bitmap myBitmap(L"Spiral.png");  
Rect expansionRect(80, 10, 2 * myBitmap.GetWidth(), myBitmap.GetHeight());  
Rect compressionRect(210, 10, myBitmap.GetWidth() / 2,  
    myBitmap.GetHeight() / 2);  
  
myGraphics.DrawImage(&myBitmap, 10, 10);  
myGraphics.DrawImage(&myBitmap, expansionRect);  
myGraphics.DrawImage(&myBitmap, compressionRect);
```

Font & Text

```
FontFamily fontFamily(L"Times New Roman");  
Font      font(&fontFamily, 24, FontStyleRegular, UnitPixel);  
PointF    pointF(30.0f, 10.0f);  
SolidBrush solidBrush(Color(255, 0, 0, 255));  
  
graphics.DrawString(L"Hello", -1, &font, pointF, &solidBrush);  
TextOut
```

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