

# Объявление события

```
public delegate void SampleEventDelegate(object Sender,  
    string e);
```

```
public event SampleEventDelegate SampleEvent;
```

```
public void CallEvent(string EventParam)  
{  
    if (SampleEvent != null)  
        SampleEvent(this, EventParam);  
}
```

# Обработка события

```
MyClass m = new MyClass();  
    m.SampleEvent += new  
MyClass.SampleEventDelegate(m_SampleEven  
t);
```

```
public void m_SampleEvent(object Sender, string  
e)  
{  
    Console.WriteLine(e);  
}
```

# Иерархия классов

System.Object

System.MarshalByRefObject

System.ComponentModel.Component

System.Windows.Forms.Control

System.Windows.Forms.ButtonBase

System.Windows.Forms.ScrollableControl

System.Windows.Forms.Button

System.Windows.Forms.ScrollableControl

System.Windows.Forms.Form

# Открытие окна

```
Form2 frm = new Form2();  
    frm.Show();
```

```
Form2 frm = new Form2();  
    DialogResult res = frm.ShowDialog();
```

# Добавление элемента управления

```
Button btn = new Button();  
    btn.Left = 100;  
    btn.Top = 100 + Index++ * 30;  
    btn.Width = 200;  
    btn.Click += new  
EventHandler(MyButtons_click);  
    btn.Text = "Новая кнопка " +  
Index.ToString();  
    this.Controls.Add(btn);
```

# Основные события управляющих элементов

- MouseDown
- MouseUp
- MouseClick
- MouseMove
- MouseEnter
- MouseHover
- MouseLeave
- KeyDown
- KeyUp
- KeyPress

*KeyPreview*

# Основные свойства управляющих элементов

- Left
- Top
- Width
- Height
- Location
- Size
- Dock
- Anchor
- Text
- Enabled
- Visible
- Modifiers

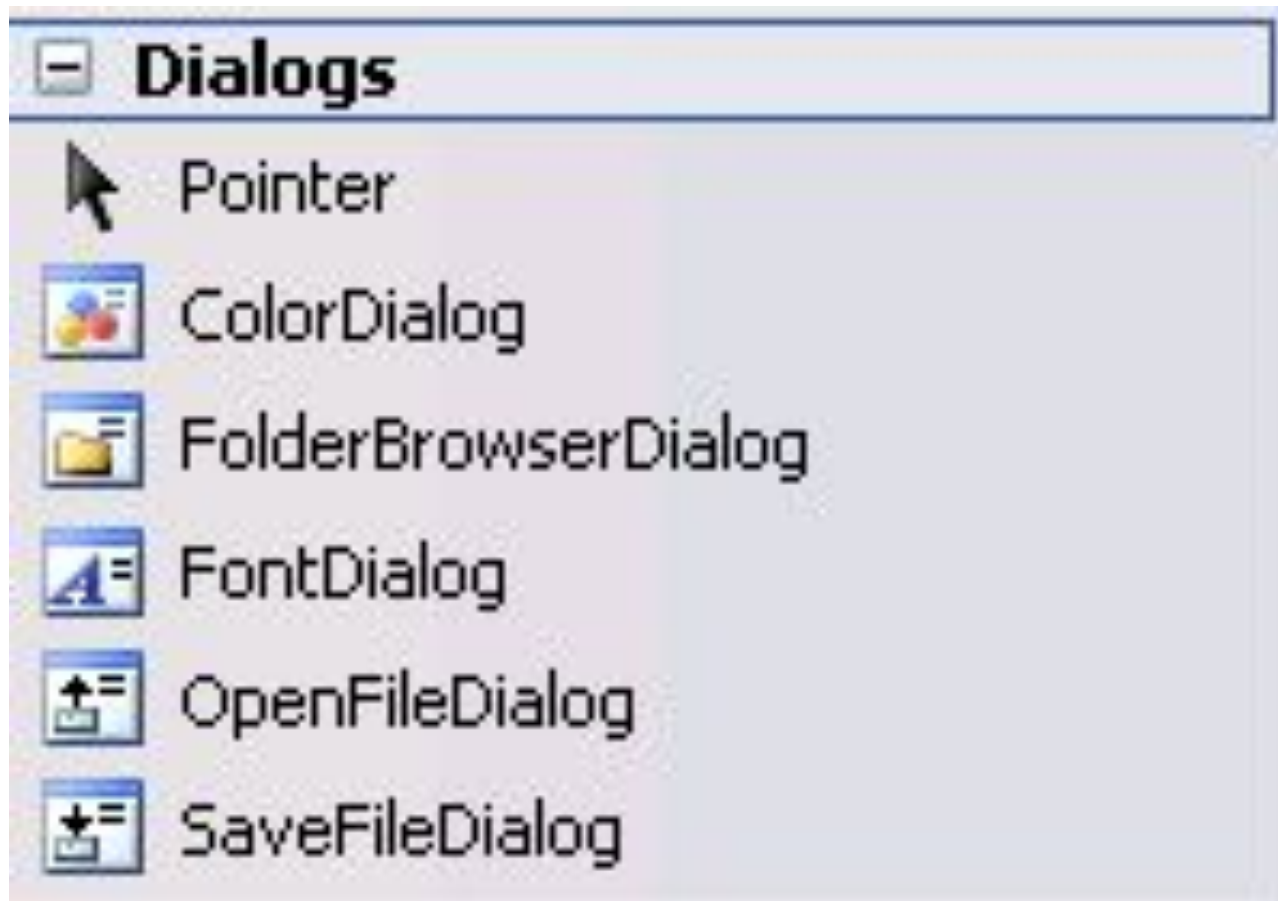
- DesignTime/Runtime
- Дизайнер студии
- Создание элементов в рантайме
- Типичный вид обработчика событий
- Расположение редактора свойств в IDE



# Моменты исполнения

- DesignTime – процесс разработки
- RunTime – время выполнения

# Стандартные диалоги



# Открытие файла

```
OpenFileDialog dlg = new  
    OpenFileDialog();  
    dlg.Filter = "*.txt|текстовые файлы";  
    DialogResult res = dlg.ShowDialog();  
    if (res == DialogResult.OK)  
        MessageBox.Show("Выбран " +  
            dlg.FileName);
```

# Создание своего элемента управления

- Добавить элемент проекта. В дизайнере выбрать UserControl
- Появится класс, наследованный от `System.Windows.Forms.UserControl`
- Разработать как обычную форму
- Добавить интерфейс для взаимодействия

### Dynamic vs. Fixed Properties

- Map the following properties to system settings instead of coding fixed values:
  - Colours
  - Fonts
  - Regional settings
- Do not use dynamic text strings in control labels

### Shortcut Keys

- Show shortcut key combinations in menus to support learning
- Ctrl+A Select All
  - Ctrl+C Copy
  - Ctrl+F Find
  - Ctrl+N New
  - Ctrl+O Open
  - Ctrl+P Print
  - Ctrl+S Save
  - Ctrl+V Paste
  - Ctrl+X Cut
  - Ctrl+Z Undo
  - ESC Cancel
  - F1 Contextual Help

### Reading Direction

- User's task flow should follow normal reading direction
- In right-to-left languages layout may have to be mirrored

### Focus Order

- Input focus movement by the TAB key should follow the reading direction
- ...and the user's task flow
- ...and the process workflow

### Alignment

- By default, use left-alignment for the layout of controls
- Command buttons are right-aligned

### Colours

- Map all colours to system colours
- Fixed colours may have contrast problems, if the user changes Windows colour theme
- Colour should never be the only way to convey information

### System font

- It is recommended to use the system font (default GUI font) instead of any named font
- No italics, no different sizes

### Command buttons



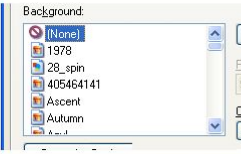
- Default size in Visual Studio: 75 x 23 pixels
- Use this size as the minimum size
- Remember ellipsis (...)

### Option buttons

- After I change display settings:
  - Restart the computer before
  - Apply the new display settir
  - Ask me before applying the

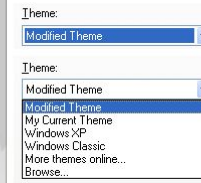
- One is always selected
- Layout of one set is always a vertical stack

### List boxes



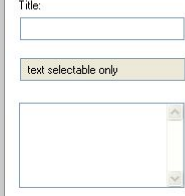
- Make it wide enough to show large enough portion of each choice
- Avoid using horizontal scrollbar

### Dropdown listboxes



- Width should match other dropdown, text or spinboxes in the same group
- List shows a minimum of 3 and maximum of 8 choices

### Text fields



- Background color indicates, if the field is for input or output
- Single line text field width should reflect the expected string length
- Groups of text boxes should have equal lengths

### Toolbars



- Place controls in toolbar in a task-based order
- Group toolbar controls in a logical way

### Rescaling

- Primary windows should be designed rescalable
- Consider window layout during rescale
- Define minimum size and design a usable layout for that size
- Define, which controls move or stretch in a rescale by appropriate Anchor and Dock properties
- Design good default sizes for user-resizable elements

### Toolbar buttons



- Text label is recommended with toolbar buttons

### Statusbar



- Avoid putting interactive controls in the statusbar

### Message Boxes

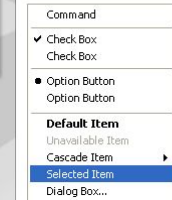


- Centre-aligned at the bottom

### Scroll Bars

- Try to avoid horizontal scrolling
- Add another methods of scrolling:
  - Mouse wheel
  - PgUp and PgDown keys

### Menus



- Unavailable items must not be hidden

### Progress Indicators

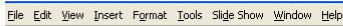


- 0 -> 0.5 second response time - no indicator
- 0.5 -> 5 seconds - Hourglass pointer
- 5 -> n seconds - Progress bar
- If the progress cannot be monitored, use a continuously rotating animation

### Images, Icons and Animations

- Use place-holder files until final graphics are available
- Locations are based on reserved area (bounding box), not visual content

### Common Dropdown Menus



- Application-specific menus go between View and Window menus

### Taskbar Status Area



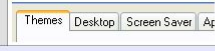
- Contains status icons with:
  - Tooltip for explanation
  - Popup menu for actions
  - Double-click for default action
  - Balloon tip for notification
- Use only to notify user, when he is working with another application

### Sliders



- Best for setting only an approximate relative value between extremes
- Allow additional keyboard control
- Typically up and right arrow increases by one
- Shift + up or right arrow increases by 10

### Tabs



- Keep the number of tabs low to avoid tab label truncation
- Avoid multiple lines of tabs

### Column headings

Font Name	Filename	Size	Modified	Attribu...
Aachen Bold	acb_...pfm	32K	16.10.1997 11:08	A
ACaslon Ornaments	awor_...pfm	68K	16.10.1997 11:48	A
Adventure Normal (Tr...				
Afterchurch Fabric (Tr...				

- Each column heading should have a label
- Alignment: numerical values to the right, text to the left

### Grouping

- Do not use Group Box with only one group
- Consider other grouping options
- Separator lines, extra margins, indentations
- Make the scope of controls clear to the user
- Some controls affect only another control
- Some controls affect the whole process

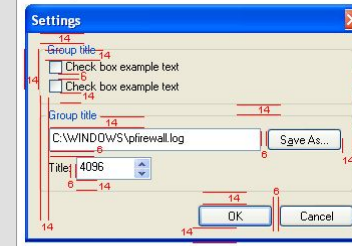
### Text Alignment

- Left-alignment is default in Western languages
- Numerical values in lists are right-aligned (integers, dates) or aligned by the decimal point
- When showing numerical data, make sure that the font has equal-width numerals

### Punctuation

- Add ellipsis (...) in menu items and buttons that require further input before the desired action
- Add colon (:) to the labels of controls
- Not in buttons, tabs or group boxes

### Dialog boxes



- Leave 14 pixels between:
  - Window edges and contents
  - Tabbed page edges and contents
  - Group Box edges and contents
  - Unrelated controls
  - Paragraphs of text
- Leave 6 pixels between:
  - Related controls (controls forming a group)
  - Command buttons stacked or in a row
  - Text label and its associated control
- Dialog buttons should have positive action first (OK, Apply, Cancel)

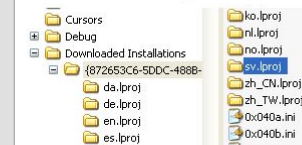
### Split Windows

- Save the split pane state, when the window is closed or minimized

### Internationalisation

- Applications must be localisable without layout redesign
- Reserve at least 50% more space than required for English
- Reserve space for extra lines of text, too
- Placing the label above the control allows more horizontal space for the control and its label
- Avoid language-dependent layout
- E.g. using controls inside a sentence

### Selection and Activity



- Only one active selection set at a time

# Полезные статьи

<http://rsdn.ru/article/dotnet/winformsctrls.xml>

<http://www.optim.su/cs/2004/1/Control/Control.asp>

<http://www.syncfusion.com/FAQ/WinForms/>

<http://www.rsdn.ru/article/gdi/gdiplus1.xml>