



Developing Python Add-ins for ArcGIS for Desktop

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What are add-ins?

- **New model for ArcGIS Desktop application customization**
 - Collection of tools on a toolbar
 - Perform action in response to application event
- **Easy to build, install, and share**
 - No Component Object Model (COM) registration
 - Loaded from well-known folders
 - Authored in .NET, Java, or Python (10.1)

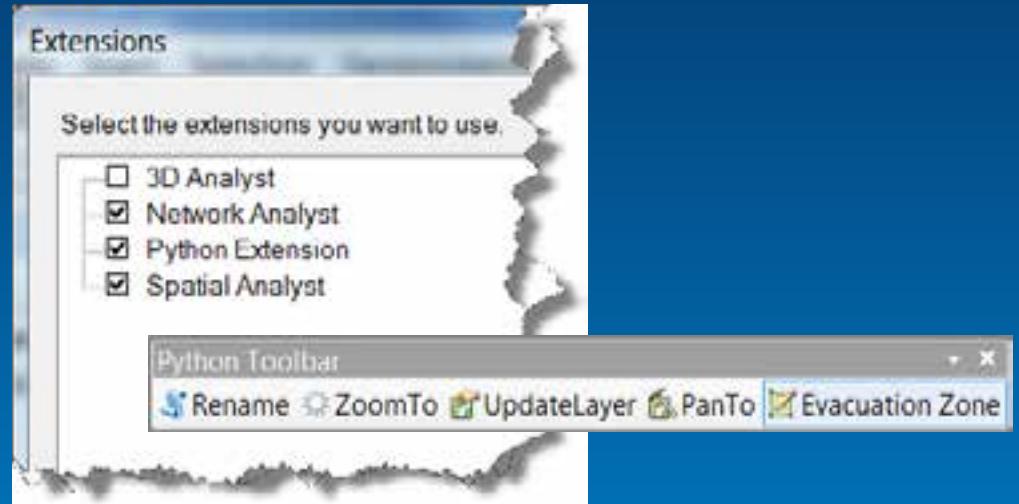
Why use Python?

```
IMapDocument mxd = new MapDocumentClass();
mxd.Open(@"C:\Data\MyMap.mxd", null);
IMap map = mxd.get_Map(0);
ILayer lyr = map.get_Layer(0);
IFeatureLayer featureLyr = (IFeatureLayer)lyr;
IWorkspaceFactory workspaceFactory = new FileGDBWorkspaceFactoryClass();
IWorkspace wksp = workspaceFactory.OpenFromFile(@"C:\Data\New.gdb", 0);
IFeatureWorkspace featureWorkspace = (IFeatureWorkspace)wksp;
IFeatureClass newFC = featureWorkspace.OpenFeatureClass("cities");
featureLyr.FeatureClass = newFC;
mxd.Save(false, false);
```

```
mxd = arcpy.mapping.MapDocument(r"C:\Data\MyMap.mxd")
lyr = arcpy.mapping.ListLayers(mxd)[0]
lyr.replaceDataSource(r"C:\Data\New.gdb", "FILEGDB_WORKSPACE", "cities")
mxd.save()
```

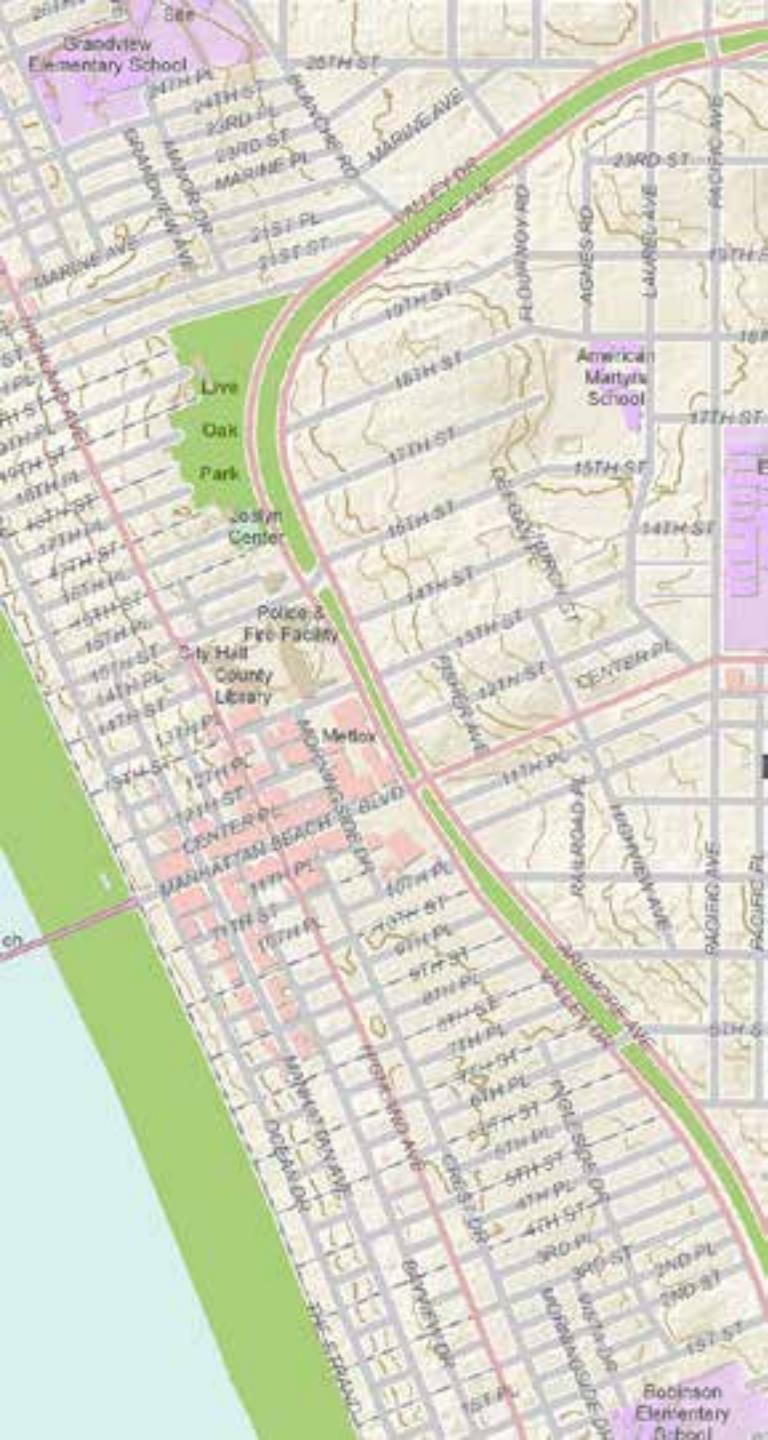
Supported add-in types

- Buttons and tools
- Toolbars
- Tool palettes
- Combo boxes
- Menus
- Extensions



- Dockable windows are not supported
- No custom UI support

Using Python add-ins



Python Add-In Wizard

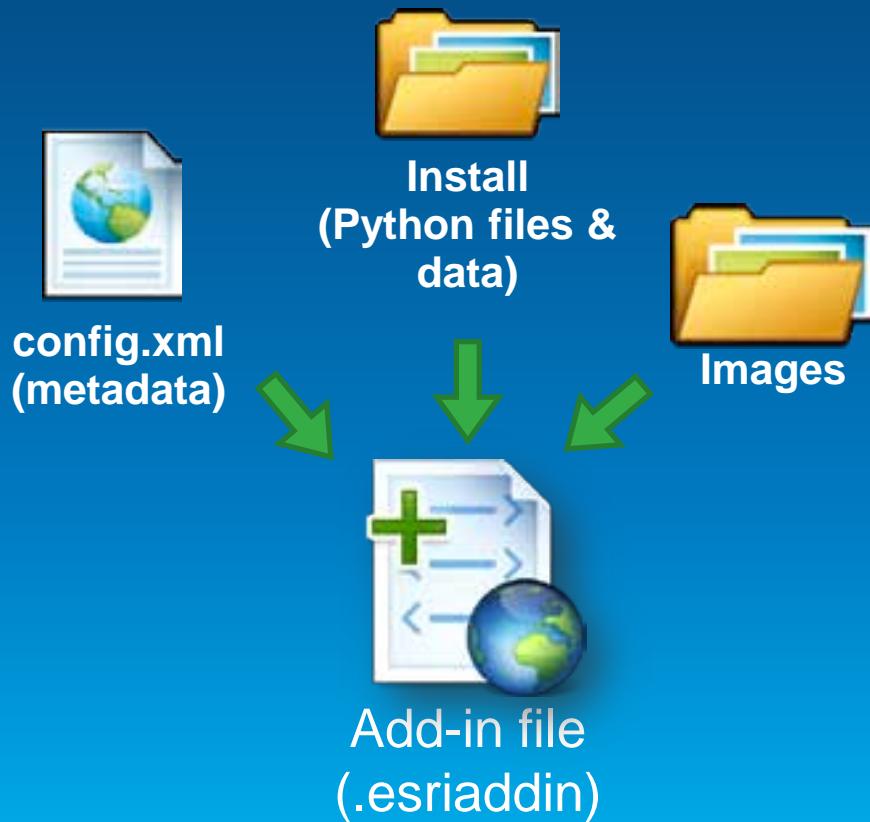
```
<Commands>
<Tool id="CreateMapPackage_addin.mpktool"
      class="CreateMPKTool"
      tip="Create Map Package"
      caption="Create Map Package"
      category="Create Map Package Tool"
      image="Images\MapDocumentPackageFile16.png"/>
</Commands>
<Toolbars>
<ToolBar caption="Map Package" showInitially="true"
          id="CreateMapPackage_addin.mpktoolbar">
  <Items>
    <Button refID="CreateMapPackage_addin.mpktool"/>
  </Items>
</ToolBar>
</Toolbars>
```

Add business logic

```
class CreateMPKTool(object):
    """Implementation for CreateMapPackage_addin.mpktool (Tool)"""
    def __init__(self):
        self.enabled = True
        self.shape = "NONE"
    def onMouseDown(self, x, y, button, shift):
        pass
    def onMouseDownMap(self, x, y, button, shift):
        pass
    def onMouseUp(self, x, y, button, shift):
        pass
    def onMouseUpMap(self, x, y, button, shift):
        pass
    def onMouseMove(self, x, y, button, shift):
        pass
    def onMouseMoveMap(self, x, y, button, shift):
        pass
```

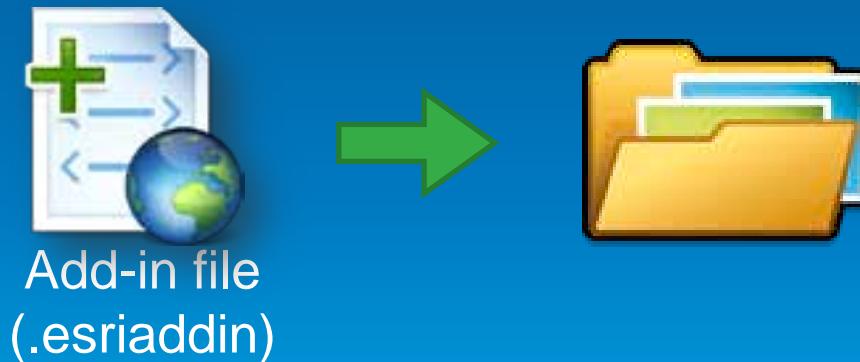
Make and install add-in

- Run `makeaddin.py` to create `.esriaddin` file



Make and install add-in

- Run `makeaddin.py` to create `.esriaddin` file
- Double-click `.esriaddin` to open installation utility
- Installer copies add-in file to default add-in folder



Pythonaddins module

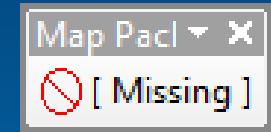
- **Includes functions for supporting Python add-ins**
 - Get selected layer or data frame
 - Open geoprocessing tool
 - Open and Save dialog boxes
 - Message box

Creating Python add-ins



Debugging add-ins

- Missing buttons indicate syntax error
 - Use IDE to check syntax
- Use print statements
 - Information printed to Python window
- Exceptions printed to Python window



Add-In File Discovery & Sharing



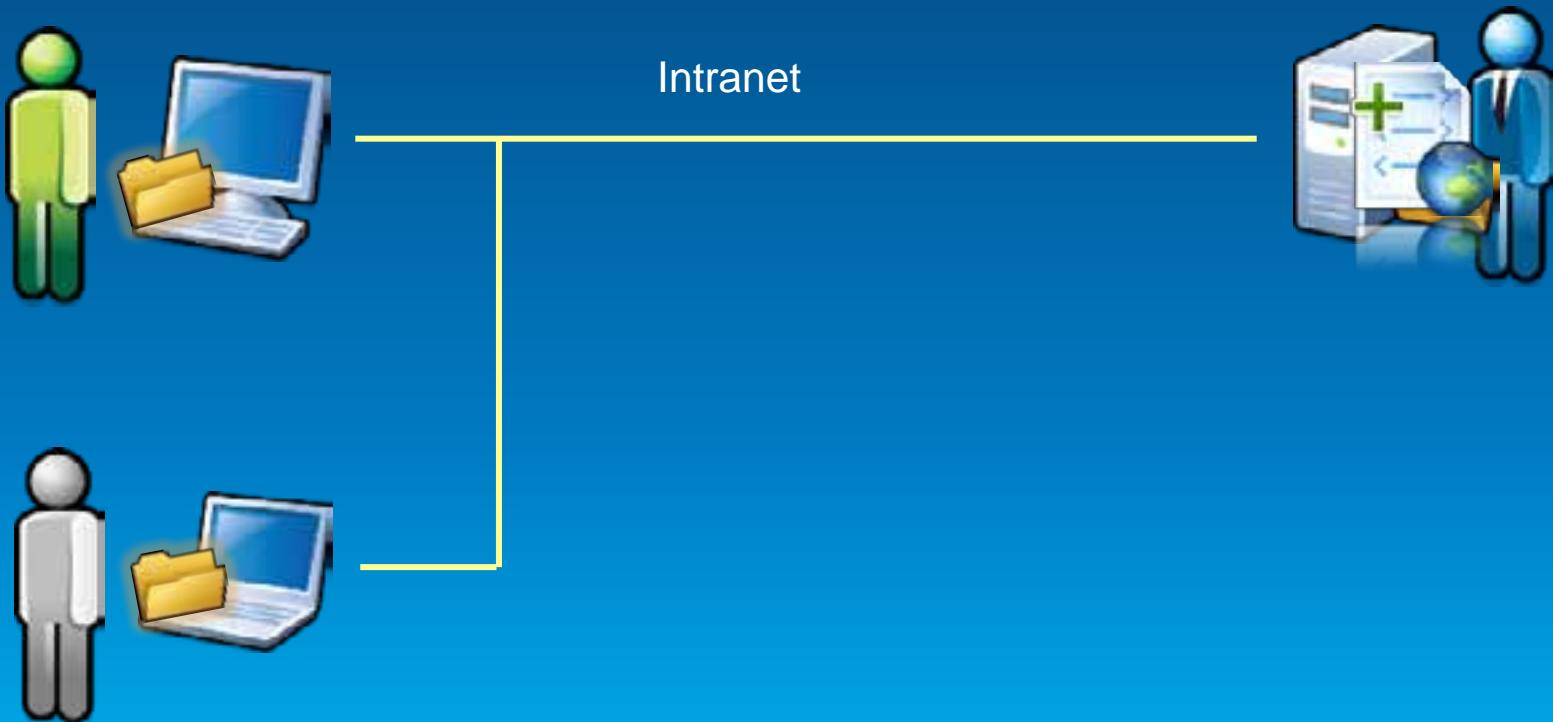
- Add-In files are automatically discovered in well known local folders and incorporated into the Desktop applications at runtime.

- Folders are per user and per ArcGIS version

`%UserProfile%\My Documents\ArcGIS\AddIns\Desktop10.1`

Add-In File Discovery & Sharing

- Administered network shares
- Simplifies Updates



Digitally Signing Add-Ins

- Trust
 - Source Traceability
 - Tampering
- **ESRISignAddin Utility**



Test and share Python add-ins



For more information

- Help
 - *ArcGIS Desktop Python Add-ins Guide Book*
- Web training
 - *Basics of Python (for ArcGIS 10)*
 - *Python Scripting for Map Automation in ArcGIS 10*
- Instructor-led training
 - *Introduction to Geoprocessing Scripts Using Python (10.0)*

- Thank you for attending
- Have fun at the Developer Summit
- Please fill out the evaluation: **Offering ID 384**
- Questions?



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Understanding our world.