





---

## ◆ Objectives

 **To Understand the technologies leading to Active X**

 **What Are:**      **COM**  
                             **DCOM**  
                             **OOP**  
                             **OLE**  
                             **OPC**

 **Understanding Active X**

 **Use Of Active X In GUS Display Builder**

---

## Objectives

At the end of this module you will be able to do the following:

- Understand the technologies leading up to the use of Active X
- Understand the terms of COM, DCOM, OOP, OLE, OPC.
- Learn how Active X controls are developed.
- Use Active X controls in the Display Builder.

---

## ActiveX



- Microsoft ActiveX Technology

---

### ActiveX Technology

- ActiveX is the centerpiece of Microsoft's overall Internet strategy.
- To accomplish this technology, Microsoft brought together a number of different components.
- This technology will make it easier to integrate and reuse any component.
- Component packaging technology for the Web.
- ActiveX controls are the smaller, faster descendants of VBX (Visual Basic eXtension controls) and OCX (OLE Controls). It provides a way to package COM components and pop them into applications ( particularly Web browsers) and with our case, we will look at its usage in the GUS Display Builder.

---

## ActiveX

### What is ActiveX ?

- A marketing name for a set of technologies and services, all based on the Component Object Model (COM)

---

## ActiveX

- ActiveX is a set of integration technologies.
- ActiveX is NOT a
  - A language
  - A platform
  - An operating system

## What is COM ?

- **Component Object Model (COM)**
  - breaking large complex software applications into a series of pre-built and easily developed, understood, and changed software modules called components.
  - A means to deliver software solutions much more quickly and at a lower price.

---

### **Component Object Model (COM)**

- A framework for creating and using components.
- Makes software easier to write and reuse.
- Provides widest choice in services, tools, languages, and applications
- Controls, tools, and server components

Using COM, major applications can be broken down into smaller components. These pieces behave as a “whole” because of the integration of technologies into a COM framework. For example, Word and PowerPoint are two separate software applications but many of the same tools (or pieces) are used in each -- hence COM technology.

## What is DCOM ?

- Distributed Component Object Model (DCOM)
  - Broader scale of multi-user applications.
  - COM with a longer wire.
  - Best networking technology to extend component technology across the internet.
  - Open technology- runs on multiple platforms.

---

### Distributed Component Object Model (DCOM)

- A framework for creating and using components.
- Makes software easier to write and reuse.
- Provides widest choice in services, tools, languages, and applications
- Controls, tools, and server components

DCOM is, essentially, COM but with a longer reach -- it can be used over a network. An example would be a database in a server can be accessed by many clients due to DCOM technologies.

## What is OOP ?

- Object - Oriented Programming (OOP) is all about objects.
  - A black box which receives and sends messages.
  - Contains code and data.
  - Units of code are called functions.
  - Units of data are called structures.
  - Code and data merged to form an object.

---

### Notes

COM, DCOM and OOP are all similar technologies.

An example of Object-Oriented Programming would be attaching code to a rectangle in the GUS Display Builder. This rectangle object, along with its code and data, now possesses unique characteristics that define its behavior.

## What is OLE ?

- Object Linking and Embedding (OLE)
  - To provide small reusable objects that could be shared between applications on a desktop or across a LAN.
  - Based on COM..

---

### Notes

Object Linking and Embedding (OLE) technology was developed for the purpose of sharing or passing information. An example would be sharing graphics between a Word and Excel document on a PC. Or inserting an Excel spreadsheet into a GUS graphic and creating a link between the two applications which would enable dynamic changes and updates to be passed between the applications.



## What is OPC ?

- OLE for Process Control
  - Defines a set of standard object access interfaces, or methods for developers to use in building industrial automation software applications.
  - Allow software to become a plug and play technology and enable new levels of integration from different vendors.

---

### Notes

OLE for Process Control (OPC) integrates I/O from various vendors into one software framework.

The OPC specifications were developed using OLE and DCOM software standards for communication with industrial devices.

FYI: In the previous sections on GUS Architecture and Data Access we talked extensively about the HOPC server, which “shuttles” information back and forth between the LCN and your GUS graphics. OPC was the basis for Honeywell OLE for Process Control (HOPC).

---

## ActiveX

### OCX and ActiveX

- Enhanced OLE and OCX technologies
- Re-named to ActiveX
- ActiveX redefined these controls making them smaller and more efficient

---

#### Notes

ActiveX allows developers to make reusable application components for any machine, not just a Microsoft container. This new building-block approach for creating controls requires less code because low-level details are now carried out for you by Visual Basic.

## What is an ActiveX Control?

- ActiveX Control, OLE Control, “OCX” are the same thing
- Chunk of reusable functionality
- Coded using OLE Automation
- Run in an OLE container
- GUS display is an OLE Container

---

**Notes**

R120 GUS Display Builder is an OLE container (VB5 compatible).

---

## ActiveX

### ActiveX Control

- Has properties
  - Change properties using its property sheet
  - Change properties at runtime in scripts
- Can handle events
  - Control-specific events
  - Standard GUS runtime events
    - OnDataChange, OnPeriodicUpdate, OnDisplayStartUp, OnDisplayShutdown
- Scripting an ActiveX Control is done in the same way as scripting any other GUS object
  - LCN, DDB, and display parameters can be referenced in the scripts of the ActiveX Control

---

## Notes

## ActiveX Control and Its Container

- Controls communicate with their Container (ex. GUS display) using OLE Automation
- OLE Automation is being enhanced at a rapid rate
  - Containers may not support the newest OLE Automation interfaces and methods that an ActiveX Control does

---

**Notes**

## GUS as an OLE Container

- GUS display was an “old” OLE container
  - GUS is a 3-year-old container
  - Did not support an ActiveX Control as well as the Visual Basic container
- Goal was to make the GUS display on R120 as “robust” as the VB Container

---

**Notes**

## ActiveX Controls and GUS

- Customers, application engineers, and third-parties can extend GUS functionality by building ActiveX Controls
- Can build ActiveX Controls with no knowledge of GUS
- Today, there is no way of “certifying” an OLE Control
  - Must do extensive testing
- Performance is a result of how it was coded
  - No control over performance by reusers

---

**Notes**

## When to Use ActiveX Controls

- No guidelines on when to use an embedded display vs when to use an ActiveX Control
  - Trying to define for GUS R200
- Use common sense

---

**Notes**



---

## ActiveX

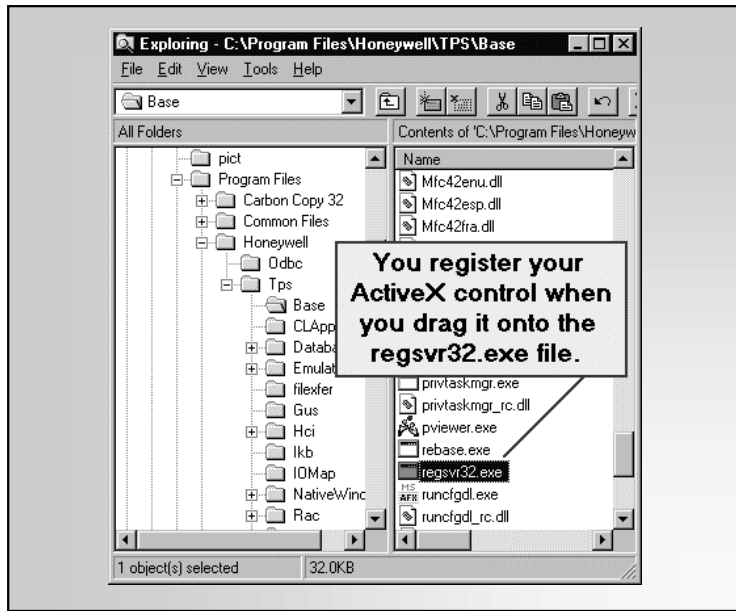
### Authoring ActiveX Controls

- Easy in VB 5.0
- Try it!

---

#### Notes

## Register ActiveX Controls

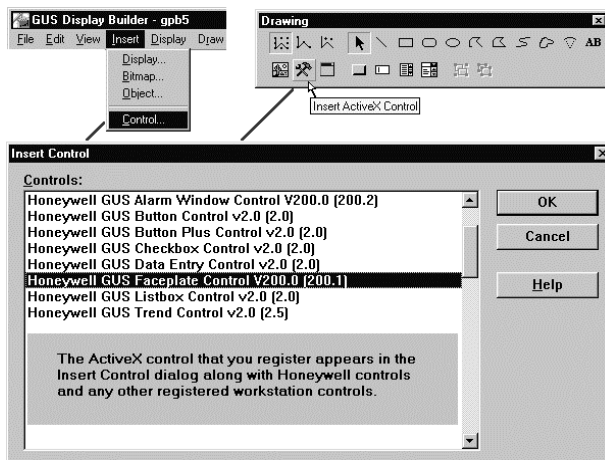


## How to Register ActiveX Controls

### Steps to Register

- Locate the Honeywell Folder on your hard disk
- The correct path is **C:\Program Files\Honeywell\TPS\Base**
- Locate the **Regsvr32.exe** program in the Base folder.
- Open the folder with your ActiveX controls; they will have an OCX extension.
- Drag your ActiveX control to this file and it will be registered.

RESULT: Your Control appears in the Display Builder's Control Menu.



Note: If you developed the ActiveX control on a GUS, then the control is registered automatically.