**Part 7 - KnownType attribute in WCF**

If we have classes related by inheritance, the wcf service generally accepts and returns the base type. If you expect the service to accept and return inherited types, then use KnownType attribute.  
  
There are other ways of associating known types, which we will discuss in next video session.

**Code used in the demo:**  
**SQL:**  
Alter table tblEmployee Add   
EmployeeType int, AnnualSalary int, HourlyPay int, HoursWorked int  
  
Alter procedure spGetEmployee    
@Id int    
as    
Begin    
 Select Id, Name, Gender, DateOfBirth,   
 EmployeeType, AnnualSalary, HourlyPay,   
 HoursWorked    
 from tblEmployee where Id = @Id    
End  
  
Alter procedure spSaveEmployee    
@Id int,    
@Name nvarchar(50),    
@Gender nvarchar(50),    
@DateOfBirth DateTime,  
@EmployeeType int,  
@AnnualSalary int = null,  
@HourlyPay int = null,  
@HoursWorked int = null  
as    
Begin    
 Insert into tblEmployee    
 values (@Id, @Name, @Gender, @DateOfBirth,   
 @EmployeeType, @AnnualSalary, @HourlyPay,   
 @HoursWorked)    
End  
  
**FullTimeEmployee.cs**  
namespace EmployeeService  
{  
    public class FullTimeEmployee : Employee  
    {  
        public int AnnualSalary { get; set; }  
    }  
}  
  
**PartTimeEmployee.cs**  
namespace EmployeeService  
{  
    public class PartTimeEmployee : Employee  
    {  
        public int HourlyPay { get; set; }  
        public int HoursWorked { get; set; }  
    }  
}  
  
**Employee.cs**  
using System;  
using System.Runtime.Serialization;  
  
namespace EmployeeService  
{  
    [KnownType(typeof(FullTimeEmployee))]  
    [KnownType(typeof(PartTimeEmployee))]  
    [DataContract(Namespace = "http://pragimtech.com/Employee")]  
    public class Employee  
    {  
        private int \_id;  
        private string \_name;  
        private string \_gender;  
        private DateTime \_dateOfBirth;  
  
        [DataMember(Order = 1)]  
        public int Id  
        {  
            get { return \_id; }  
            set { \_id = value; }  
        }  
  
        [DataMember(Order = 2)]  
        public string Name  
        {  
            get { return \_name; }  
            set { \_name = value; }  
        }  
  
        [DataMember(Order = 3)]  
        public string Gender  
        {  
            get { return \_gender; }  
            set { \_gender = value; }  
        }  
  
        [DataMember(Order = 4)]  
        public DateTime DateOfBirth  
        {  
            get { return \_dateOfBirth; }  
            set { \_dateOfBirth = value; }  
        }  
  
        [DataMember(Order = 5)]  
        public EmployeeType Type { get; set; }  
    }  
  
    public enum EmployeeType  
    {  
        FullTimeEmployee = 1,  
        PartTimeEmployee = 2  
    }  
}  
  
**EmployeeService.cs**  
using System;  
using System.Data;  
using System.Data.SqlClient;  
using System.Configuration;  
  
namespace EmployeeService  
{  
    public class EmployeeService : IEmployeeService  
    {  
        public Employee GetEmployee(int Id)  
        {  
            Employee employee = null;  
            string cs = ConfigurationManager.ConnectionStrings["DBCS"].ConnectionString;  
            using (SqlConnection con = new SqlConnection(cs))  
            {  
                SqlCommand cmd = new SqlCommand("spGetEmployee", con);  
                cmd.CommandType = CommandType.StoredProcedure;  
                SqlParameter parameterId = new SqlParameter();  
                parameterId.ParameterName = "@Id";  
                parameterId.Value = Id;  
                cmd.Parameters.Add(parameterId);  
                con.Open();  
                SqlDataReader reader = cmd.ExecuteReader();  
                while (reader.Read())  
                {  
                    if ((EmployeeType)reader["EmployeeType"] == EmployeeType.FullTimeEmployee)  
                    {  
                        employee = new FullTimeEmployee  
                        {  
                            Id = Convert.ToInt32(reader["Id"]),  
                            Name = reader["Name"].ToString(),  
                            Gender = reader["Gender"].ToString(),  
                            DateOfBirth = Convert.ToDateTime(reader["DateOfBirth"]),  
                            Type = EmployeeType.FullTimeEmployee,  
                            AnnualSalary = Convert.ToInt32(reader["AnnualSalary"])  
                        };  
                    }  
                    else  
                    {  
                        employee = new PartTimeEmployee  
                        {  
                            Id = Convert.ToInt32(reader["Id"]),  
                            Name = reader["Name"].ToString(),  
                            Gender = reader["Gender"].ToString(),  
                            DateOfBirth = Convert.ToDateTime(reader["DateOfBirth"]),  
                            Type = EmployeeType.PartTimeEmployee,  
                            HourlyPay = Convert.ToInt32(reader["HourlyPay"]),  
                            HoursWorked = Convert.ToInt32(reader["HoursWorked"]),  
                        };  
                    }  
                }  
            }  
            return employee;  
        }  
  
        public void SaveEmployee(Employee employee)  
        {  
            string cs = ConfigurationManager.ConnectionStrings["DBCS"].ConnectionString;  
            using (SqlConnection con = new SqlConnection(cs))  
            {  
                SqlCommand cmd = new SqlCommand("spSaveEmployee", con);  
                cmd.CommandType = CommandType.StoredProcedure;  
                SqlParameter parameterId = new SqlParameter  
                {  
                    ParameterName = "@Id",  
                    Value = employee.Id  
                };  
                cmd.Parameters.Add(parameterId);  
  
                SqlParameter parameterName = new SqlParameter  
                {  
                    ParameterName = "@Name",  
                    Value = employee.Name  
                };  
                cmd.Parameters.Add(parameterName);  
  
                SqlParameter parameterGender = new SqlParameter  
                {  
                    ParameterName = "@Gender",  
                    Value = employee.Gender  
                };  
                cmd.Parameters.Add(parameterGender);  
  
                SqlParameter parameterDateOfBirth = new SqlParameter  
                {  
                    ParameterName = "@DateOfBirth",  
                    Value = employee.DateOfBirth  
                };  
                cmd.Parameters.Add(parameterDateOfBirth);  
  
                SqlParameter parameterEmployeeType = new SqlParameter  
                {  
                    ParameterName = "@EmployeeType",  
                    Value = employee.Type  
                };  
                cmd.Parameters.Add(parameterEmployeeType);  
  
                if (employee.GetType() == typeof(FullTimeEmployee))  
                {  
                    SqlParameter parameterAnnualSalary = new SqlParameter  
                    {  
                        ParameterName = "@AnnualSalary",  
                        Value = ((FullTimeEmployee)employee).AnnualSalary  
                    };  
                    cmd.Parameters.Add(parameterAnnualSalary);  
                }  
                else  
                {  
                    SqlParameter parameterHourlyPay = new SqlParameter  
                    {  
                        ParameterName = "@HourlyPay",  
                        Value = ((PartTimeEmployee)employee).HourlyPay,  
                    };  
                    cmd.Parameters.Add(parameterHourlyPay);  
  
                    SqlParameter parameterHoursWorked = new SqlParameter  
                    {  
                        ParameterName = "@HoursWorked",  
                        Value = ((PartTimeEmployee)employee).HoursWorked  
                    };  
                    cmd.Parameters.Add(parameterHoursWorked);  
                }  
  
                con.Open();  
                cmd.ExecuteNonQuery();  
            }  
        }  
    }  
}  
  
**WebForm1.aspx**  
<table style="font-family: Arial; border: 1px solid black;">  
    <tr>  
        <td>  
            <b>ID</b>  
        </td>  
        <td>  
            <asp:TextBox ID="txtID" runat="server">  
            </asp:TextBox>  
        </td>  
    </tr>  
    <tr>  
        <td>  
            <b>Name</b>  
        </td>  
        <td>  
            <asp:TextBox ID="txtName" runat="server">  
            </asp:TextBox>  
        </td>  
    </tr>  
    <tr>  
        <td>  
            <b>Gender</b>  
        </td>  
        <td>  
            <asp:TextBox ID="txtGender" runat="server">  
            </asp:TextBox>  
        </td>  
    </tr>  
    <tr>  
        <td>  
            <b>Date Of Birth</b>  
        </td>  
        <td>  
            <asp:TextBox ID="txtDateOfBirth" runat="server">  
            </asp:TextBox>  
        </td>  
    </tr>  
    <tr>  
        <td>  
            <b>Employee Type</b>  
        </td>  
        <td>  
            <asp:DropDownList ID="ddlEmployeeType" runat="server"   
                OnSelectedIndexChanged="ddlEmployeeType\_SelectedIndexChanged"  
                AutoPostBack="True">  
                <asp:ListItem Text="Select Employee Type" Value="-1">  
                </asp:ListItem>  
                <asp:ListItem Text="Full Time Employee" Value="1">  
                </asp:ListItem>  
                <asp:ListItem Text="Part Time Employee" Value="2">  
                </asp:ListItem>  
            </asp:DropDownList>  
        </td>  
    </tr>  
    <tr id="trAnnualSalary" runat="server" visible="false">  
        <td>  
            <b>Annual Salary</b>  
        </td>  
        <td>  
            <asp:TextBox ID="txtAnnualSalary" runat="server">  
            </asp:TextBox>  
        </td>  
    </tr>  
    <tr id="trHourlPay" runat="server" visible="false">  
        <td>  
            <b>Hourly Pay</b>  
        </td>  
        <td>  
            <asp:TextBox ID="txtHourlyPay" runat="server">  
            </asp:TextBox>  
        </td>  
    </tr>  
    <tr id="trHoursWorked" runat="server" visible="false">  
        <td>  
            <b>Hours worked</b>  
        </td>  
        <td>  
            <asp:TextBox ID="txtHoursWorked" runat="server">  
            </asp:TextBox>  
        </td>  
    </tr>  
    <tr>  
        <td>  
            <asp:Button ID="btnGetEmployee" runat="server"   
            Text="Get Employee" OnClick="btnGetEmployee\_Click" />  
        </td>  
        <td>  
            <asp:Button ID="btnSave" runat="server"   
            Text="Save Employee" OnClick="btnSave\_Click" />  
        </td>  
    </tr>  
    <tr>  
        <td colspan="2">  
            <asp:Label ID="lblMessage" runat="server"   
                ForeColor="Green" Font-Bold="true">  
            </asp:Label>  
        </td>  
    </tr>  
</table>  
  
**WebForm1.aspx.cs**  
protected void btnGetEmployee\_Click(object sender, EventArgs e)  
{  
    EmployeeService.EmployeeServiceClient client =   
        new EmployeeService.EmployeeServiceClient();  
    EmployeeService.Employee employee =   
        client.GetEmployee(Convert.ToInt32(txtID.Text));  
  
    if (employee.Type == EmployeeService.EmployeeType.FullTimeEmployee)  
    {  
        txtAnnualSalary.Text =   
            ((EmployeeService.FullTimeEmployee)employee).AnnualSalary.ToString();  
        trAnnualSalary.Visible = true;  
        trHourlPay.Visible = false;  
        trHoursWorked.Visible = false;  
    }  
    else  
    {  
        txtHourlyPay.Text =   
            ((EmployeeService.PartTimeEmployee)employee).HourlyPay.ToString();  
        txtHoursWorked.Text =   
            ((EmployeeService.PartTimeEmployee)employee).HoursWorked.ToString();  
        trAnnualSalary.Visible = false;  
        trHourlPay.Visible = true;  
        trHoursWorked.Visible = true;  
    }  
    ddlEmployeeType.SelectedValue = ((int)employee.Type).ToString();  
  
              
              
    txtName.Text = employee.Name;  
    txtGender.Text = employee.Gender;  
    txtDateOfBirth.Text = employee.DateOfBirth.ToShortDateString();  
    lblMessage.Text = "Employee retrieved";  
}  
  
protected void btnSave\_Click(object sender, EventArgs e)  
{  
    EmployeeService.EmployeeServiceClient client = new   
        EmployeeService.EmployeeServiceClient();  
    EmployeeService.Employee employee = null;  
  
    if (((EmployeeService.EmployeeType)Convert.ToInt32(ddlEmployeeType.SelectedValue))   
        == EmployeeService.EmployeeType.FullTimeEmployee)  
    {  
        employee = new EmployeeService.FullTimeEmployee  
        {  
            Id = Convert.ToInt32(txtID.Text),  
            Name = txtName.Text,  
            Gender = txtGender.Text,  
            DateOfBirth = Convert.ToDateTime(txtDateOfBirth.Text),  
            Type = EmployeeService.EmployeeType.FullTimeEmployee,

            AnnualSalary = Convert.ToInt32(txtAnnualSalary.Text),  
        };  
        client.SaveEmployee(employee);  
        lblMessage.Text = "Employee saved";  
    }  
    else if (((EmployeeService.EmployeeType)Convert.ToInt32(ddlEmployeeType.SelectedValue))   
        == EmployeeService.EmployeeType.PartTimeEmployee)  
    {  
        employee = new EmployeeService.PartTimeEmployee  
        {  
            Id = Convert.ToInt32(txtID.Text),  
            Name = txtName.Text,  
            Gender = txtGender.Text,  
            DateOfBirth = Convert.ToDateTime(txtDateOfBirth.Text),  
            Type = EmployeeService.EmployeeType.PartTimeEmployee,  
            HourlyPay = Convert.ToInt32(txtHourlyPay.Text),  
            HoursWorked = Convert.ToInt32(txtHoursWorked.Text),  
        };  
        client.SaveEmployee(employee);  
        lblMessage.Text = "Employee saved";  
    }  
    else  
    {  
        lblMessage.Text = "Please select Employee Type";  
    }  
}  
  
protected void ddlEmployeeType\_SelectedIndexChanged  
    (object sender, EventArgs e)  
{  
    if (ddlEmployeeType.SelectedValue == "-1")  
    {  
        trAnnualSalary.Visible = false;  
        trHourlPay.Visible = false;  
        trHoursWorked.Visible = false;  
    }  
    else if (ddlEmployeeType.SelectedValue == "1")  
    {  
        trAnnualSalary.Visible = true;  
        trHourlPay.Visible = false;  
        trHoursWorked.Visible = false;  
    }  
    else  
    {  
        trAnnualSalary.Visible = false;  
        trHourlPay.Visible = true;  
        trHoursWorked.Visible = true;  
    }  
}