# Tech Note 756
# Configuring the MBTCP DAServer for Redundancy



Topic#: 002534
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## Introduction

DASMBTCP 2.0 provides the ability to assign redundant devices for fail-over in the event of device failure. Two identical devices are expected to be configured in the DAServer Manager having identical item syntax, connected to the same DAServer.

This *Tech Note* describes the configuration necessary to implement redundancy at the DAServer level.

**Note:** This *Tech Note* assumes you have a basic understanding of DAServers.

## Redundancy Runtime Behavior

The DAS Engine will switch to the standby device when the active device fails to communicate.

The value of the **$SYS$Status** attribute determines the communication failure. The value of the **$SYS$Status** of the *standby* device must be TRUE in order to switch over to the standby device. Otherwise, a failover cannot occur.

When **$SYS$Status** shows a FALSE value at both active and standby devices, the DAS Engine will consider a complete communication failure and mark all the items subscribed to the redundancy device hierarchy with the current time and the appropriate OPC quality. The DAS Engine will activate the slow-poll mechanism to retry the communication to both devices until either one of the Ping Items returns to a good quality and updates its **$SYS$Status** item value to TRUE.

When the DAS Engine switches to the standby device, the standby device becomes active and the originally active device becomes the standby.

When the active device becomes the standby device the Ping Item is not deleted from the standby device. This ensures the standby can recover the communication again. The Ping Item must be a valid item in the controller for the failover to function properly.

The DAServer logs any failover activities. All other functionality such as diagnostics, enable/disable, and reset is performed exactly the same as it is performed for any other hierarchy node.

## Create the Primary and Secondary PLC Objects

1. Start the System Management Console (SMC).
2. Expand **ArchestrA.DASMBTCP.2**.
3. Select **Configuration**.
4. Right-click **Configuration** then select **Add TCPIP_PORT Object**. Rename this object if desired.

5. Select, then right-click on the newly created port object then select **Add ModbusPLC Object**. Rename this object if desired and configure the object to access the **Primary PLC**.

6. Select, then right-click on the port object again and click **Add ModbusPLC Object**. Rename this object if desired and configure the object to access the **Secondary PLC**.

Figures 1 - 3 (below) show a sample Redundancy configuration.

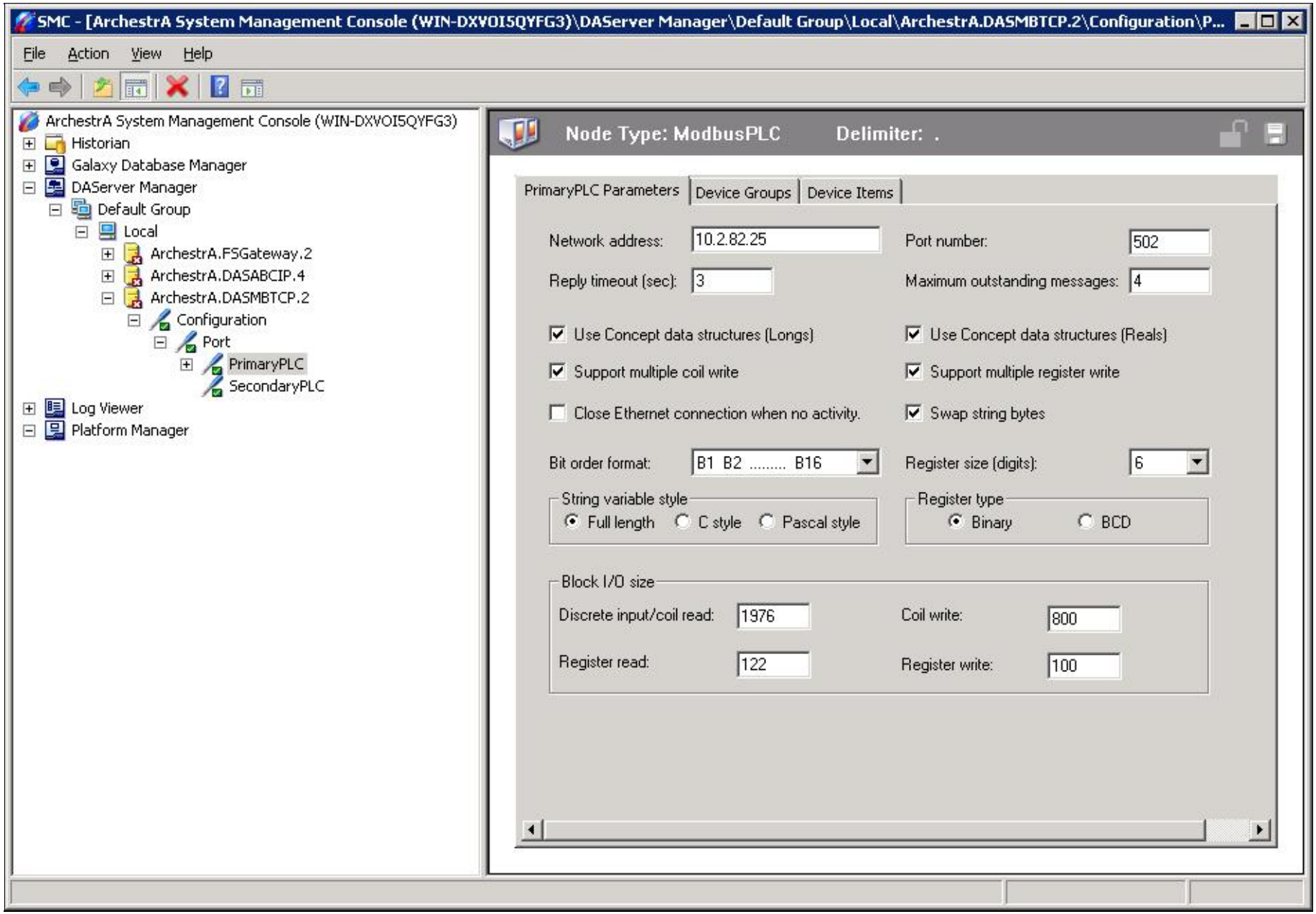

**FIGURE 1: PLC CONFIGURATION**

## Create and Configure the Redundant Device Object

1. Select, then right-click on **Configure**.
2. Click **Add REDUNDANT_DEVICE Object**. Rename this object if desired.
3. In the Redundant Device Object configuration window, click the Elipsis button ( **...** ) next to the **Primary Device** field.

   Use the **Device Browser** to find the **PrimaryPLC** object.
4. Select this object then click **OK**.

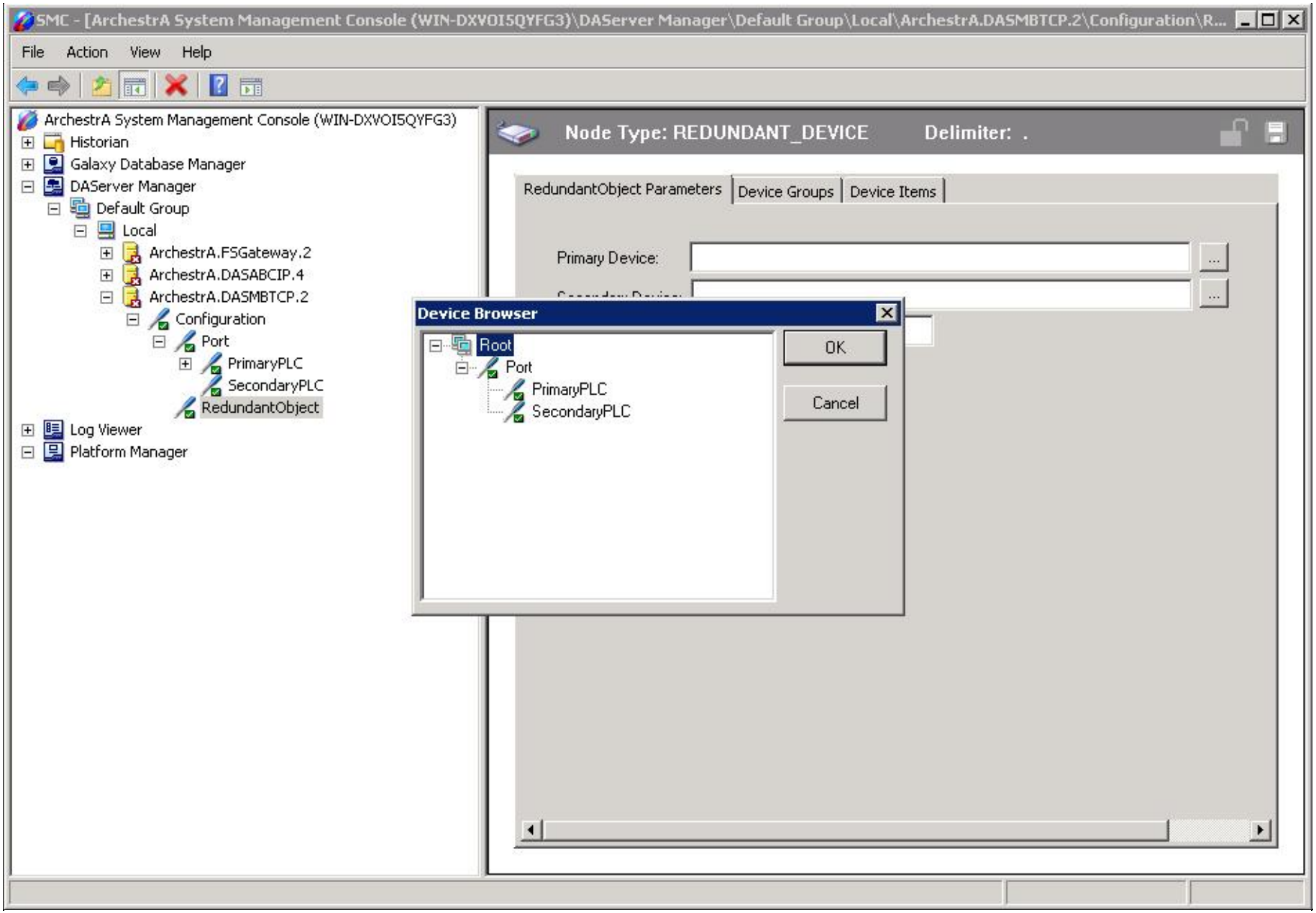


**FIGURE 2: SELECT THE PRIMARY OBJECT**

5. In the **Redundant Device Object** configuration window, click the Elipsis button next to the **Secondary Device** field.

   Use the Device Browser to find the **SecondaryPLC** object.

6. Select this object, then click **OK**.

7. Type a **Ping Item**.

   A ping item must be specified and be a valid tag in both the Primary and Secondary PLCs to determine the connection status. If the ping item is invalid or does not exist in the PLC, the failover operation may not function correctly.

   In this example we use the first holding register in the PLC (**400001**).

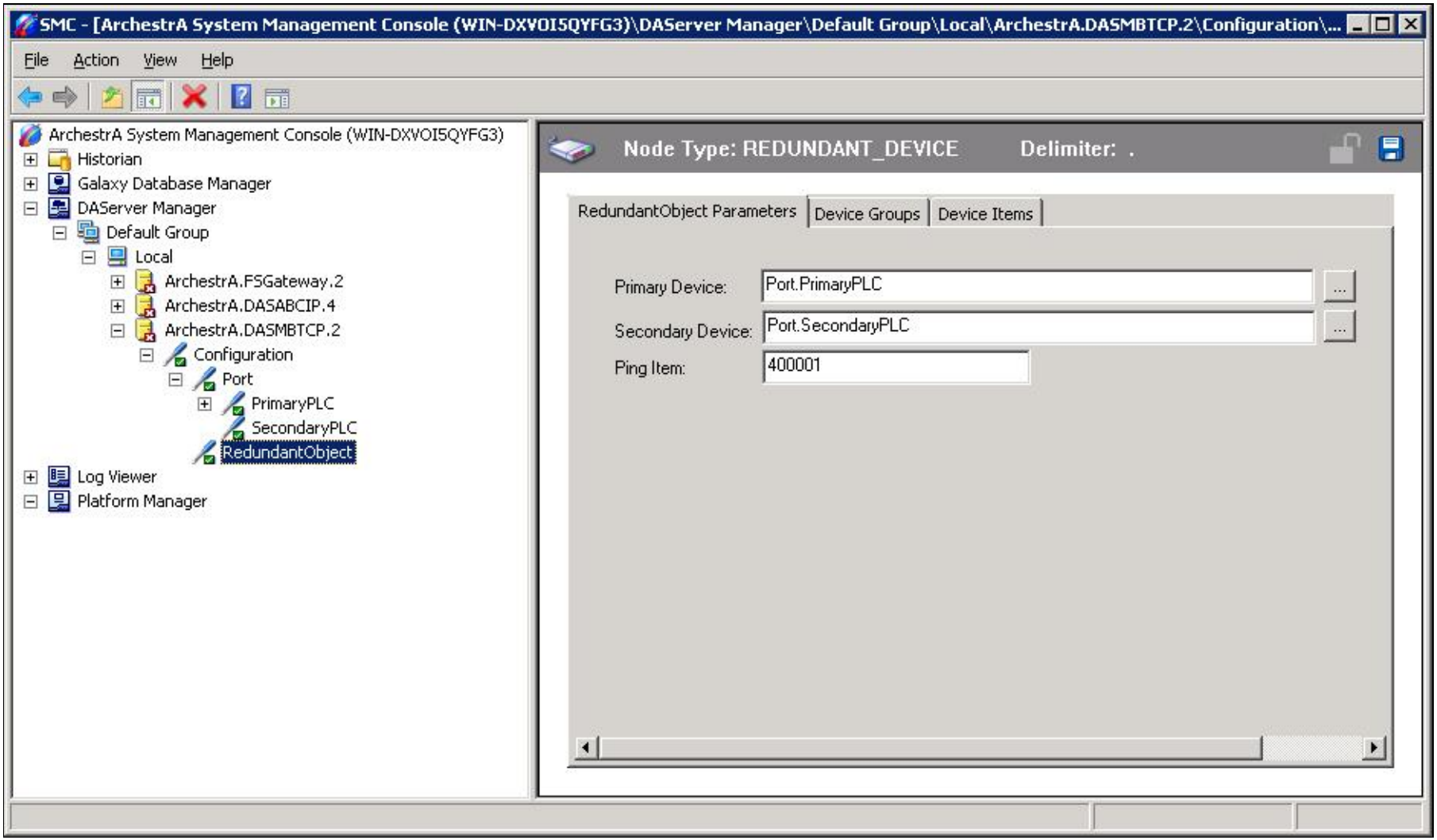


**Figure 3: Ping Item Common to Both PLCs**

8. Select the **Device Groups** tab and type a device group name and update interval. In this example **PLC** is the device group with a 1000 ms update interval.

## Testing the Configuration

For this example, WWClient will be used for testing. Information and download links for WWClient can be found on the Wonderware Technical Support Website: **WWClient Information**

1. After the DAServer has been configured, activate **DASMBTCP**.
2. Start **WWClient**.
3. Using WWClient, click **Connections/Create** from the main menu, then connect to the **DASMBTCP** Redundant device group.

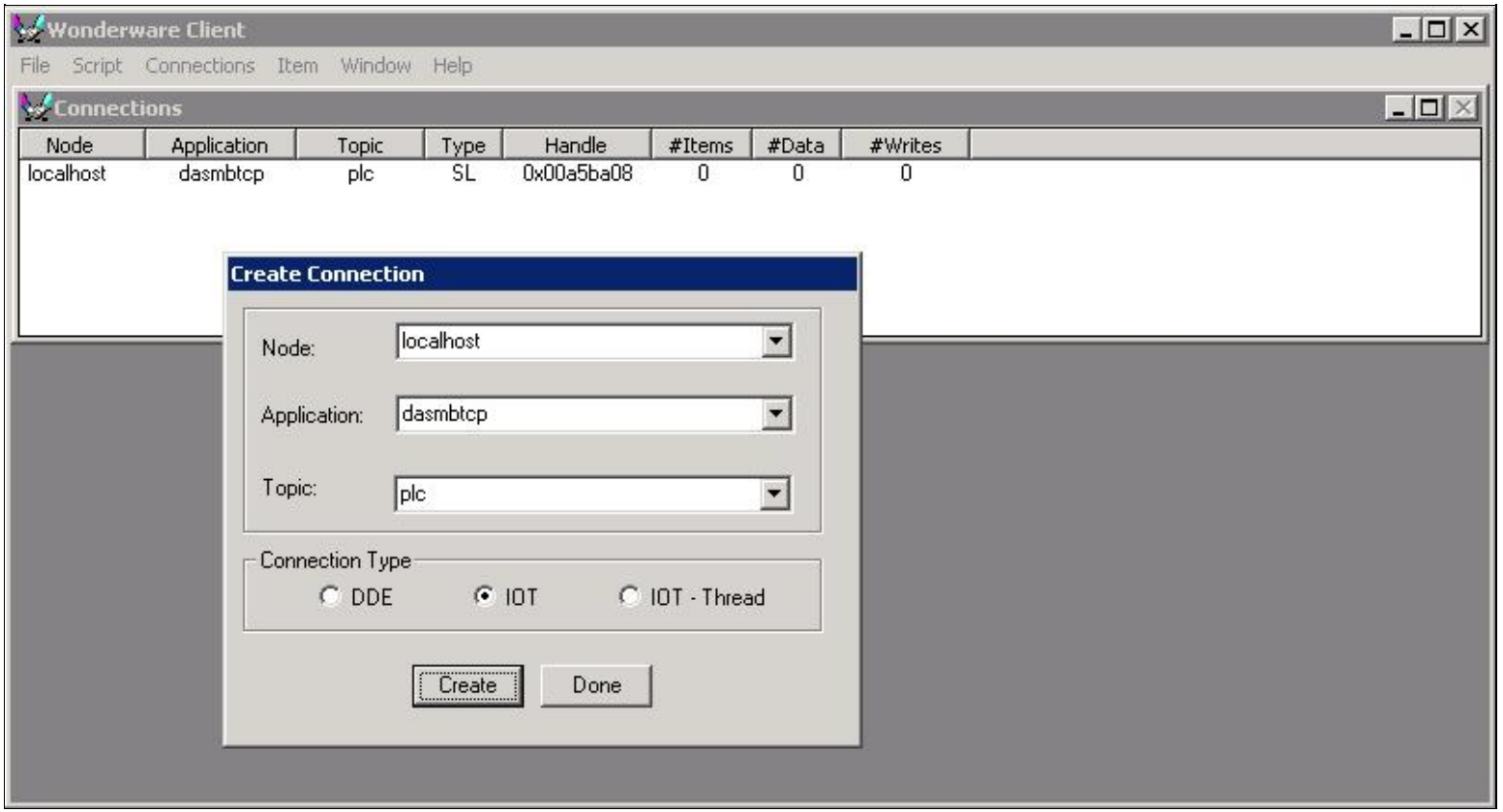


**FIGURE 4: WWCLIENT TEST: CREATE CONNECTION**

4. Select **Item** from the main menu then type a valid PLC register.
5. Click **AdviseEx** (Figure 5 below).

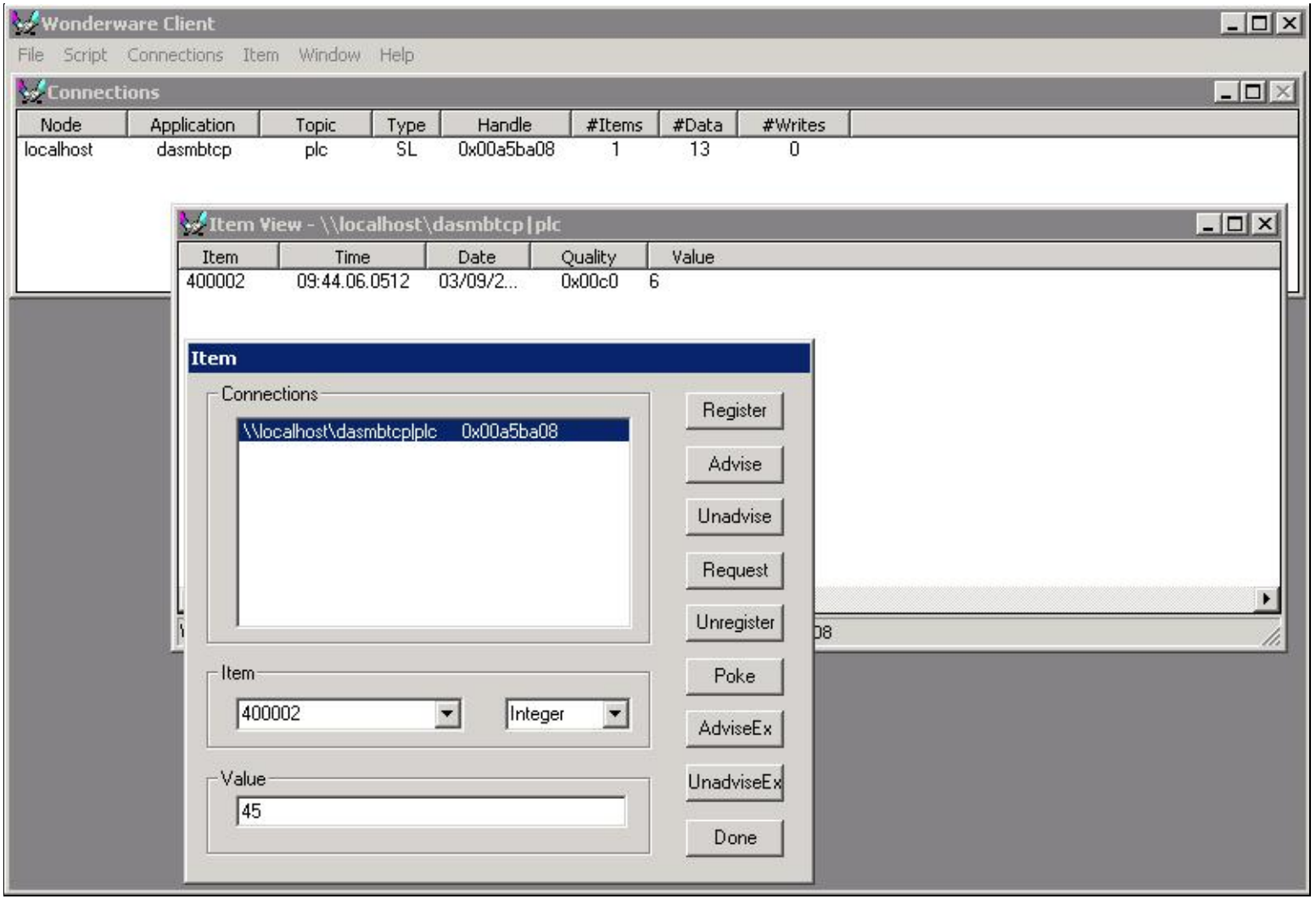


**FIGURE 5: ADVISE ITEM CONFIGURATION**

You can also monitor the following system items that are specific to Redundancy:

| System Item | Description |
|---|---|
| **$sys$ActiveDevice** | Current runtime active device. |
| **$sys$StandbyDevice** | Current runtime standby device. |
| **$sys$PrimaryDeviceStatus** | Status of the primary device.<br><br>**0** = Error communicating with the device,<br>**1** = Connection to the device is good. |
| **$sys$SecondaryDeviceStatus** | Status of the secondary device.<br><br>**0** = Error communicating with the device,<br>**1** = Connection to the device is good. |
| **$sys$FailoverTime** | Time at which a failover occurred. Time is in UTC. |
| **$sys$FailoverReason** | Reason for Failover |

| | |
|---|---|
| **$sys$ForceFailover** | A client can force a failover by writing a 1 to this system tag. |

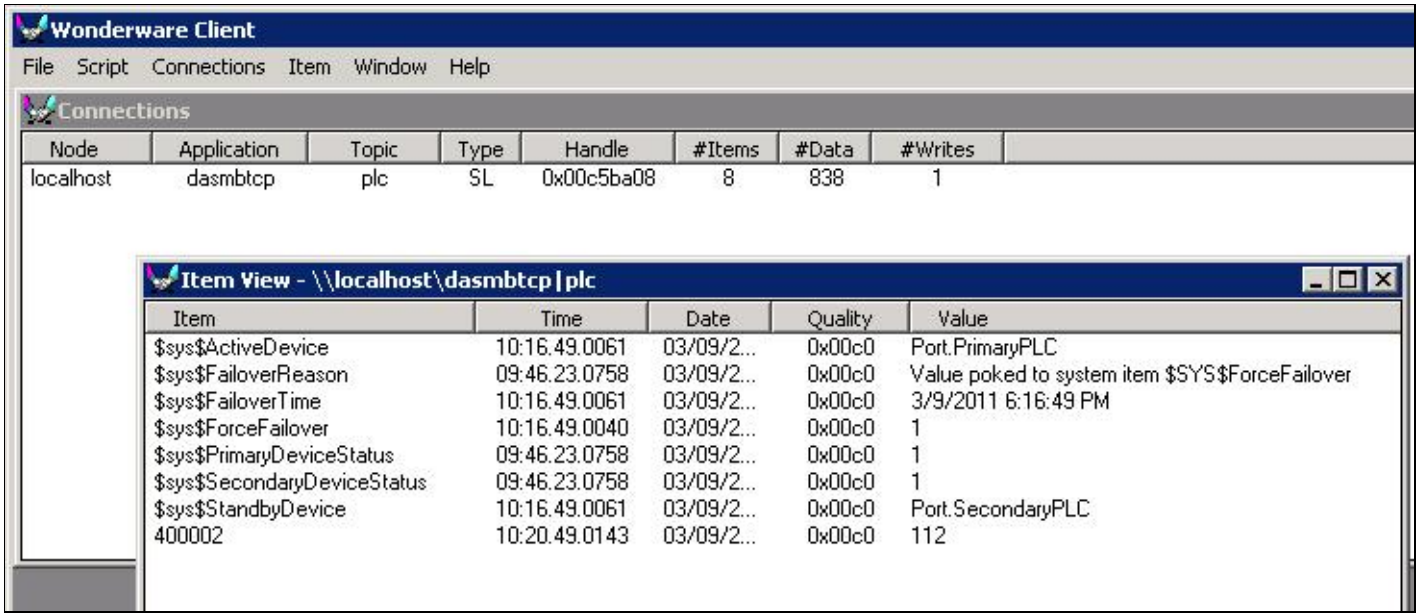


**FIGURE 6: REDUNDANCY MONITORING IN WONDERWARE CLIENT**

## Testing the Failover

You can test the Failover by setting **$sys$ForceFailover** to 1.

You can also test Failover by shutting down the primary PLC or unplugging the Ethernet cable from the primary PLC.

Figure 6 (above) shows the system tags contents just after a force failover event from the secondary PLC back to the primary PLC.

G. Alldredge

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