

Tech Note 424

Working with DAServers

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Introduction

Working with DAServers' installation, configuration, and runtime, end-users often encounter unexpected errors and warnings. The DAServers often seem to require fine tuning, but documentation regarding the individual parameters is not always easy to understand, particularly for their functions and how the parameter settings effect the servers' performance.

Application Version

New DAServers are released on a continuous basis. This technote provides explanations for, and augments the OnLine Help files for several existing servers. The following information contains examples that demonstrate resolving unusual DAServer errors and warnings, and how the setting of global and vendor-specific parameters effects the performance of the DAServers.

The following DAServers and versions are included in this tech note:

- **DASABCIP V2.0 .100**
- **DASABTCP V1.1.200**
- **DASABDHPlus V1.0.100**
- **DASMBTCP V1.1**
- **DASMBSerial V1.0**
- **DASS7 V1.1.100**
- **DASSiDirect V1.0.100**
- **FSGateway V1.0**

Note: This documentation is intended to be used in conjunction with the DAServer Online Help and User's Guides. However, some of the detailed information found in the Online Help and User's Guides is not included in this material.

Problems Associated with Installation

Installation Incomplete

Error 25001: Unable to create user account "User Name" on the local machine. Error Code: 2245

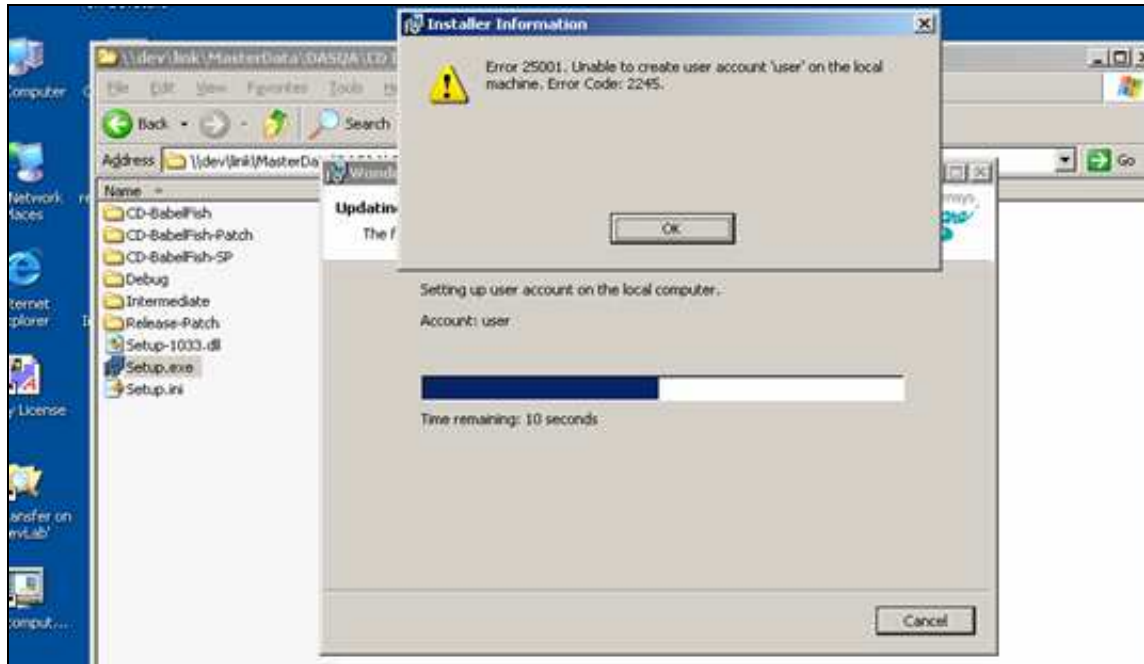


FIGURE 1: ERROR 25001

When installing the DAServer the first time on the new machine, you will be prompted to enter the account user name and password.

Both the users name and the password must be at least 8 characters long. Otherwise, the installation will not complete, the error is generated and the **Installer Information** error dialog box appears as shown in Figure 1 above.

No Diagnostic Components Showing After Activation of the DAServer

After the successful installation and configuration of a DAS server, activating the DAServer makes the Diagnostic Object available in the SMC under the **DAServer Configuration** object.

Expand the diagnostic object. Six components are listed below. However, in some cases, nothing is visible under the diagnostic object.

This is usually caused by the excessively long computer name (more than 15 characters). The DAServer installer could not properly register the server to this computer.

Shorten the computer name using **Control Panel/System/Computer Name/Change**.

No DAServer Showing Under Local After Installation

The current user profile does not have sufficient privilege.

Please refer to Wonderware **Technote 343** for the detail instructions how to set up administrative rights of the user's profile.

Check the DAServer Version

There are a couple of ways to check the version of the DAServer(s) installed on your machine:

Support Information Link

1. Launch **Control Panel/Add and Remove Programs**.
2. Locate the Wonderware DAServer in question and highlight the list item (Figure 2 below):

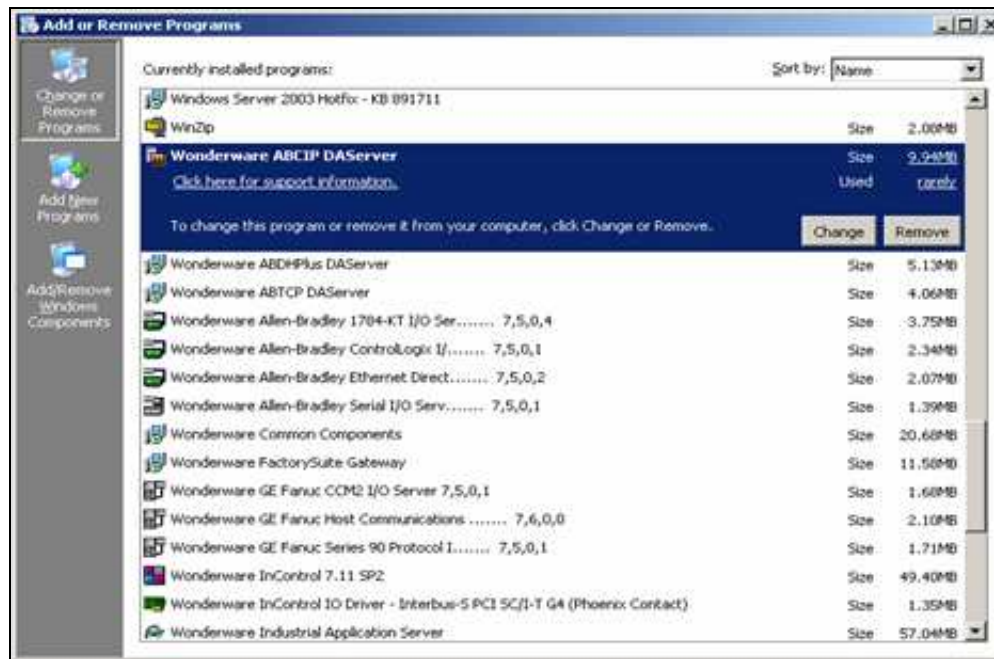


FIGURE 2: CHECK DASERVER VERSION

3. Click on the link **Click here for support information**.

The **Support Info** dialog box appears. It contains the version information:



FIGURE 3: SUPPORT INFO DIALOG BOX

SMC Configuration Display

Launch the SMC (System Management Console) and highlight the Server (Figure 4 below):

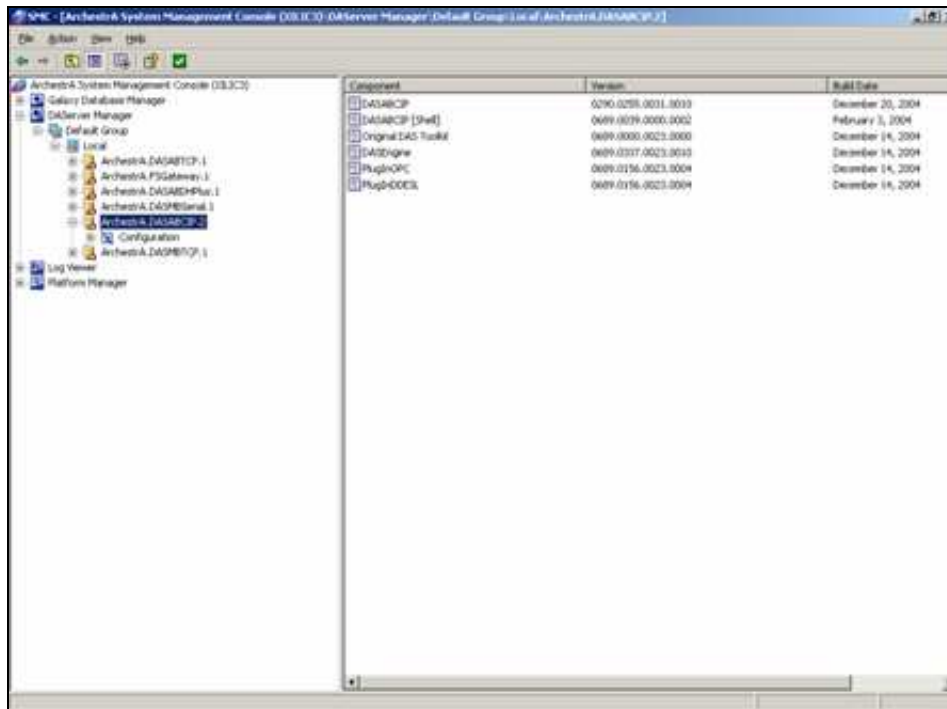


FIGURE 4: SMC VIEW OF DASSERVER INFORMATION

More detailed **Version** and **Build Date** information is displayed at the **ArchestrA.DASABCIP.2** component level.

These numbers are usually not meaningful for the end-users; however they reflect accurate information on the currently-installed DAServers and other important components such as **PlugInDDESL**.

When calling for technical support, the support engineer will request these numbers for their service log.

In some instances, end-users may see blank space instead; that is usually the indication of insufficient privileges as login or during installation.

Try logging in as the Administrative-level user, and if the version information still missing, you might need to reinstall the DAServer, making sure you have admin privileges when reinstalling.

DAServer And Legacy I/O Servers On The Same Machine

DAServers use ArchestrA-level common components. The legacy I/O servers use FactorySuite 2000-level common components.

The differences in the toolkit version are significant enough so that the new common components are not 100% compatible, and if installed in the same machine, they will be installed in completely separate folders.

When installing DAServers and Legacy I/O Servers on the same machine, use the following installation sequence:

1. Install the FactorySuite 2000 v. 7.1X Common Components first.
2. Install the legacy I/O Server(s).
3. Install the DAServer.

Note: If InTouch V7.1x or prior version needs to be installed on the same machine, please install it before installing the DAServer; if InTouch V8.0 or later version is used, it must be installed *after* the legacy I/O Server(s) installation.

DAServer Configuration Parameters

The following section contains more detailed information about global DAServer configuration parameter settings and how they effect DAServer performance.

About Global Parameters

From time to time, questions arise asking what each Global Parameter means and how to set them using Global Configurations and the sub-object configuration editor panes.

This section attempts to answer these questions and provide some examples.

- Launch the SMC and select **DAServer Manager/Default Group/Local/<ServerName>/Configuration** (Figure 5 below).

The **Global Parameters** pane appears:

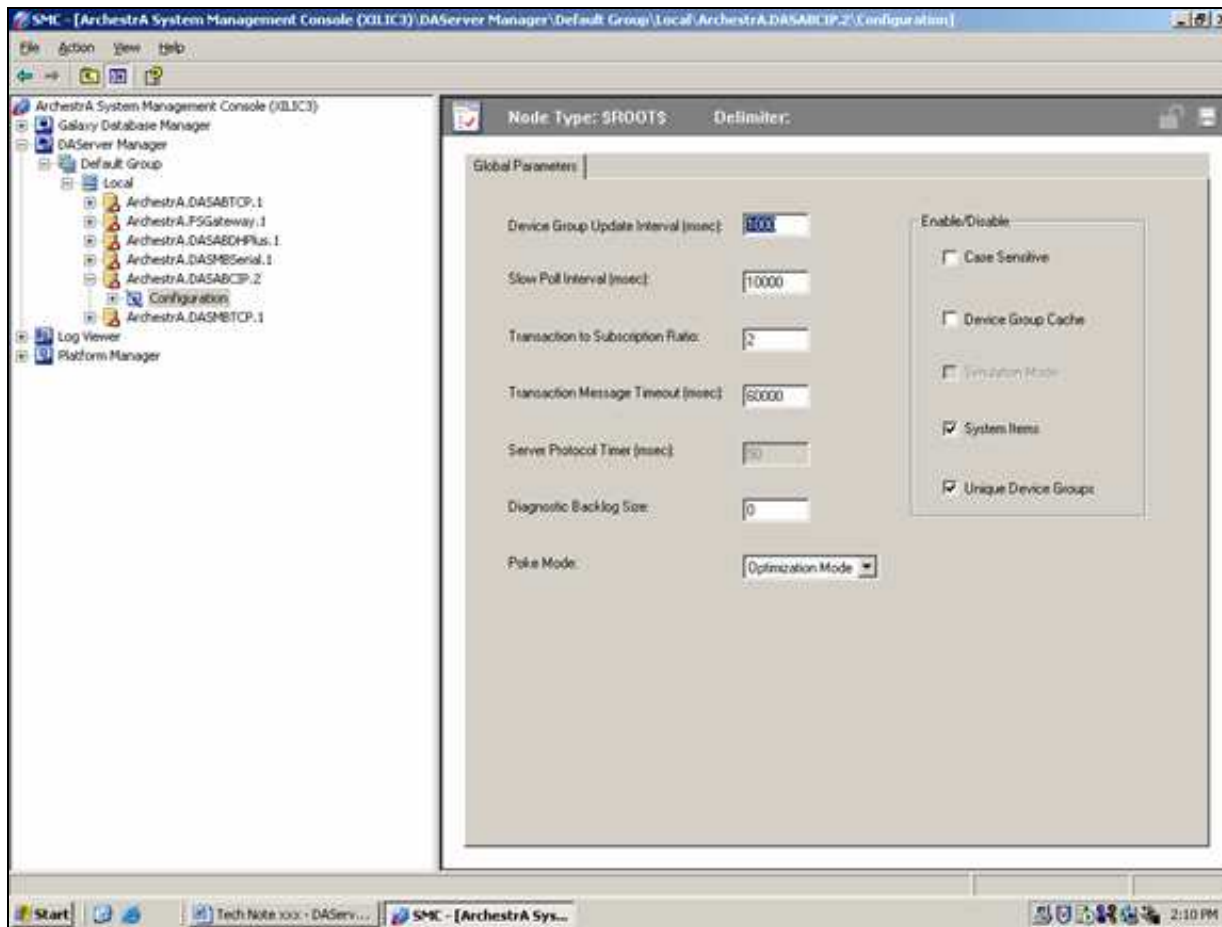


FIGURE 5: GLOBAL PARAMETER SETTINGS

The **Global Parameter** setting options are explained below:

Device Group Update Interval

This parameter applies when the DAServer is an OPC server; any OPC client can connect to the DAServer without defining any device group. The update interval value will follow this definition. Default value is **1000 ms**.

If a device group is configured and being used, then the Update Interval *in the device group* overrides the interval value in the Global

Parameter page.

Slow Poll Interval

This parameter defines the timeout period before the DAServer polls the field device again after it goes into slow poll mode. This occurs when connectivity to the PLC(s) is lost. The default value is **10000 ms**.

The Slow Poll concept is somewhat different between the legacy I/O Servers and the DAServers.

Legacy I/O Server

If the I/O server's request for data gets 3 consecutive time outs, the topic is placed in to the slow poll mode. All data communication stops in that topic until the slow poll time interval is reached. The I/O server requests data again; and it leaves the slow poll mode when a good response is received.

DAServers

Multiple data packets are sent to the PLC at any given time. If one of the packets gets a reply time-out, the topic goes into slow poll mode immediately and no new request is generated for this topic.

However, if any of the other data packets that has *already been sent* gets proper response from the PLC, the topic leaves the slow poll right away, regardless of the slow poll interval.

For example, 2 packets of data from the DAServer are sent to the PLC via topic X. One of the addresses (in the first packet) is not defined in the PLC – a bad address. This causes the server to receive the response time-out when the server tries to poll data from this address - topic X then enters Slow Poll Mode after the one time-out message is received.

However the other packet of data already sent to the PLC receives the response with good confirmation; Topic X leaves the Slow Poll Mode at this point , regardless of the Slow Poll Interval.

Transaction to Subscription Ratio

In this specific context, **Transaction** means writing data, and **Subscription** means reading data.

In general, a data **Transaction** (writing) has higher priority than a data **Subscription** (reading). The Transaction to Subscription Ratio defines in the pending occurring situation; how often at least one reading will be performed with respect to the how many writings are performed.

The default value of **2** means that for every 2 transactions, there is one subscription. The larger the value entered for this ratio, more data transactions are performed before data subscriptions. The range for this parameter is **1-1000**: 1000 means all the pending data

transactions (writes) are completed before performing any pending subscriptions (reads).

Note: For all Wonderware servers, the write command has higher priority than the read command. The reading of data is polled from the source based on the Update Time Interval (**UTI**). If the UTI is **500ms**, the data is polled (read) every 500ms.

Data *writing* is not dependent on the UTI, but is executed as soon as it is generated. The write operation does, however, request confirmation from the target device. Thus, if more writes are generated while the first write is waiting for the confirmation, all the new writes are sent to the queue.

Now, when the first write receives the confirmation and completes the transaction, you might have many writes backed up to be executed in the queue. At this time the Write to Read ratio determines the actual data execution – if the ratio is set to be **3**, the server will execute **3** writes from the queue and then one read operation.

The write-to-read ratio overwrites the **UTI**, which means if it takes longer than normal UTI period to complete 3 writes, the reading will be delayed. That is why the end-user sometimes sees slower data updates, despite of increasing their update time interval.

The Transaction to Subscription ratio also exists in legacy I/O Servers, but it is hard coded in the program with a ratio of **3:1**; the end-user cannot modify this parameter. However, this ratio is configurable in DAServers.

Transaction Message Timeout

In general, a transaction includes multiple types (read/write/refresh/property). This parameter sets the timeout for a specific transaction type per message.

Normally, a DAServer should never encounter this timeout limit, because a transaction is always completed by the protocol engine (successful or not). The timeout setting prevents a client from hanging in an operation forever (such as a bug in the DAServer code causing the transaction messages to never schedule until completion).

The timeout is specified on an individual message level. It is not the maximum amount of time a transaction can take. It is the maximum amount of time a message update can take within a transaction.

The timeout has to be set so that under no circumstances can data acquisition on an individual message take longer than this timeout. The time it might take for a transaction containing several messages theoretically can be multiples of this timeout.

For example, if a transaction with five messages that all have reply timeout (see **Reply Timeout**) of 10 seconds. The longest time it takes for any given message to complete is 10 seconds, so the Transaction Message Timeout should be set to a value that is *greater* than 10 seconds. The message will either complete or get a Reply Timeout before it reaches the Transaction Message Timeout threshold.

Now if the Transaction Message Timeout is set to 15 seconds, theoretically a transaction of 5 messages could potentially take multiples of 15 seconds to complete without actually getting the timeout – how could this be?

For example, the hardware (PLC, Bridge, etc) in use can only handle one message at the time; and each message takes 9 seconds to

complete, therefore the total time for the transaction to complete is 45 (5 messages x 9 seconds), and it never gets Transaction Message Timeout because none of individual message took more than 15 seconds to complete.

Server Protocol Timer

This parameter is not used by the DAServer. It is a left-over toolkit item for the legacy I/O server and is disabled.

Diagnostic Backlog Size

This parameter reserves the block size that is used by the Diagnostic for monitoring the details on all the Demand Write requests. With the default **0** for block size, no Demand Write details are displayed in the diagnostic pane.

If a value **5** is entered, **5** demand write requests are displayed in First-In-First-Out fashion with each write status detail (Figure 6.):

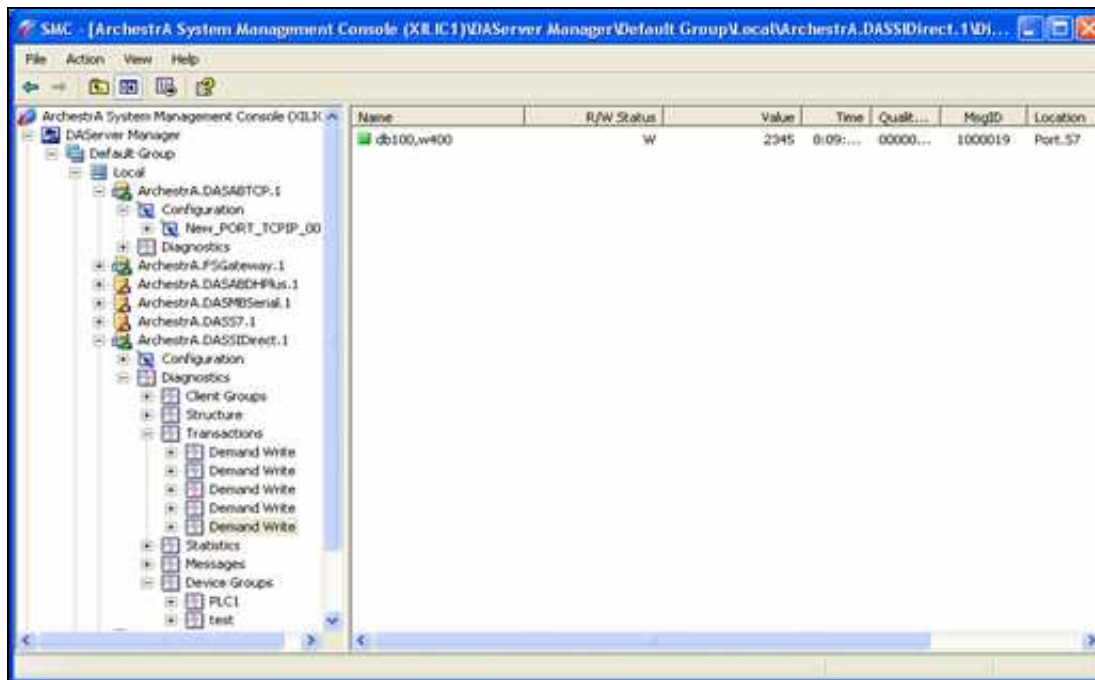


FIGURE 6: DIAGNOSTIC WRITE STATUS DETAILS

Note: The Diagnostic Backlog Size parameter does not effect the number of transactions allowed by the DAServer. It only effects the number of transactions shown in the **Transactions** diagnostic list root.

Poke Mode

This parameter controls how the DAServer treats pokes within a transaction with respect to optimization and folding. Choose between three modes: Control Mode, Transition Mode and Optimization Mode. The Default mode displayed is DAServer-dependent.

- **Control Mode:** Preserves the poke order without folding. Typically used by Batch and Control applications that depend on order of the pokes and the processing every item poked.
- **Transition Mode:** Preserves the poke order with minimum folding by keeping the first, second and last poke values of an item. Typically used by Batch and Control applications that depend on the order of pokes but not processing every item poked.
- **Optimization Mode:** Does not preserve the poke order and has maximum folding by only poking the last value of an item. Typically used by HMI applications.

For example, a series of poking commands is generated by the client – write data value 1,2,3,4,5,6,7 in sequence to one PLC register location:

- For the **Control Mode**, all data changes will be preserved and data value 1,2,3,4,5,6,7 will all be poked to the PLC register one at the time in the order they are queued.
- For the **Transaction Mode**, the first, second and the last data value will be poked to the PLC register, thus 1, and next 2, and then 7 will be written to the register, and the rest of the value will be discarded – folded.
- For the **Optimization Mode**, only the current value (last value) of this series of poke – 7 will be written to the PLC.

Case Sensitive

This parameter controls how the DAServer scans items (fully qualified item IDs) and device group names with respect to upper/lower case. Default is unchecked (case insensitive), which is recommended for working with legacy applications. Case sensitivity applies to item names (fully qualified item ID including hierarchy names) and device group names.

Device Group Cache

This parameter is for future use only, and should not be selected. Some DAServers, in fact, may disable this option. In the future, this parameter will control whether the VTQ cache for items with the same ItemID is shared across device groups.

Simulation Mode

This parameter sets the DAServer's operation mode. Checking this element sets the DAServer in simulation mode, in which it simulates communication with a configured field device. Clearing this element sets the DAServer in normal operation mode. Default value is normal operation (unchecked). Availability of simulation mode is DAServer-specific. If it is not supported, this element is disabled.

System Items

This parameter controls whether the system items appear in the browser interface and if they are recognized as valid ItemIDs by the DAServer's data acquisition interfaces. Default is selected (checked), for system items enabled. Unchecking this option means that no

system items exist in the DAServer's namespace.

Unique Device Groups

This parameter controls whether the device group names are checked for uniqueness across all device nodes of a DAServer. In other words, when this option is checked, all device groups on a server node are considered in one list across the namespace. Since device group names are not case sensitive, a specific name is allowed only once, regardless of case.

When this option is deselected, you can have the same device group name in different device nodes but not in the same node (inside device groups, names are not case sensitive). In other words, deselecting this option means that device group names are unique on one hierarchy level only. Default for this option is selected (checkbox checked). Enabling this option (selected) is recommended when working with DDE/SuiteLink legacy installations.

Other Configurable Parameters

Other parameters need to be configured for different DAServers at lower levels. For details, please refer to the online help or the User's guide. The following section discusses a few of the most commonly used parameters.

Maximum Outstanding Messages (Modbus DAServers)

The number of messages a DAServer can send to the queue for an end device (PLC) before getting any acknowledgement from that destination.

- The default value is **4**.
- The valid range is **1** to **20** (other DAServers may have a different maximum value).

Note: Excessive amounts of outstanding messages will require more resources from the PLC processor to handle them. If the PLC runs out of resources to handle communication, those outstanding messages will time out and cause the server to enter the **Slow Poll** mode.

Other DAServers may have similar parameters with somewhat different names such as **Maximum Queued Messages** or **Maximum Queued Msg**. They are essentially the same but with different ranges and default values. Please check the online help or the User's Guide for each DAServer regarding this setup.

Reply Timeout

Many DAServers include Reply Timeout parameters (the same as the Reply Timeout parameter in the legacy I/O Servers). If the DAServer receives a single transaction message timeout, the topic is placed in **Slow Poll** mode.

Normally, a larger number (longer time) is used for slow-action end devices – for example, communication to the end devices over a radio

modem network. However, the longer the timeout period is, the longer the next request has to wait its turn to be executed.

This often causes different problems, especially when it comes to writing data. For example, if the client is poking a block of data in a script, each write command will be pending against the Reply Timeout to receive the confirmation from the PLC. While in pending all the rest of the write requests will be sent to a write queue. Since only **10** (30 for the newer release of the DAServer) queue spaces are reserved, when the queue is full, any the new write requests are rejected and the following error is generated in the logger:

```
10 outstanding write already, refused.
```

When this happens, the end user should consider options such as slowing down the poking rate; using shorter Reply Timeout periods (so it will get timeout quicker and get on with the next transaction), increasing the reaction time of the network- or end-devices.

The end users need to use their own judgments and tweak this setting to fit their own situation.

Connection Timeout

The time allowed to establish a socket connection to a target device. The default value and the valid range differ from DAServer to DAServer:

Max CIP Connections (DASABCIP): The maximum number of CIP connections which can be originated from the DAServer to the ControlLogix PLC.

- The default is **4**.
- Valid range is **1 - 31**.

Note: For each CIP connection established, the PLC allocates certain resources to handle the connection. If too many CIP connections are established by the DAServer, the PLC processor allocates more resources for the CIP, and other operations will suffer. For example, with **31** connections, the data updates become extremely sluggish since the PLC ran out of resources to handle the runtime logic and updating the control items.

Use ControlLogix Optimization (DASABCIP)

The Optimized mode settings for the controller are enabled when this check box is selected.

- When checked, the server sets up an optimization packet in the controller to speed up the polling process.
- When the check box is not selected, the server uses a Multi-request service to retrieve data from the controller. This method is slower, but it does not consume additional resources in the controller.

Optimize User Defined Data Types

The optimization for reading structures is enabled when this check box is selected.

- If checked, the server retrieves the whole structure in one packet provided the size of the structure is **488** bytes or less.

Supports PID and String Files (DASABTCP)

Set this flag if using a **1785 PLC-5** that supports PID, ASCII String, Block Transfer, and SFC Status Files.

- If this option is not selected, no PID parameters or any String value would be updated by the Daserver.

Supports Unsolicited 'CLIENT' Messaging (DASABTCP)

There two different kinds of Unsolicited messaging: **Peer-to-Peer** unsolicited messaging and Unsolicited Client Messaging.

- **Peer-to-Peer** unsolicited messaging is generated from the PLC MSG block to specific node (coded with IP address, bus node ID, etc). The
- **Unsolicited Client Message** is a "Request" message that is broadcasted from the PLC over entire network, looking for the "First Client" to answer the request, and then PLC records this first receiver's node ID and then send unsolicited data to this node.

The DAServers are designed to automatically accept the normal, **Peer-to-Peer**, unsolicited message updates.

When a topic sets its Update Time Interval to **0**, this topic will only receive unsolicited data whenever the PLC sends it, and no other data polling updates occur.

Setting the **Supports Unsolicited Client Messaging** option enables the DAServer to receive **CLIENT Requests** roaming the network and establishes a connection to receive unsolicited data update from the PLC.

This option is only set to **TRUE** (turned on) when the MSG instructions programmed inside the PLC/Host is configured with **CLIENT** as the target station, rather than a specific IP address on the network.

Local TSAP (DASSIDIRECT)

Select the Hex numbers for the Rack/Slot from the drop-down menu.

- The local TSAP consists of two (2) Hex numbers for the Rack/Slot, each of which ranges from **00** to **FF**.
- The default values are **01 00**.

Remote TSAP (DASSIDIRECT)

The Remote TSAP can be configured as follows:

1. Enter the decimal number for the Rack.
 2. Enter the decimal number for the Slot.
 3. Select the Hex number for the Connection Resource from the drop-down menu.
- The remote TSAP consists of two (2) numbers for the Rack/Slot, each of which ranges from **00** to **FF**.
 - The default values are **03 03**.

Using the DAServer's Diagnostic Utilities - Diagnostics Component

All DAServers display at least six diagnostic roots:

- **Client Groups**
- **Structure**
- **Transactions**
- **Statistics**
- **Messages**
- **Device Groups**

Each diagnostic root is described below. See the figures below for an example of the diagnostic hierarchy.

Your DAServer may have additional diagnostic roots and additional data displayed for the common diagnostic roots described below. Please refer to the specific DAServer documentation for descriptions of those features.

The **Client Groups** item contains diagnostic items for each plug-in that has been installed. In the example shown in Figure 8 (below), the **DDE/SuiteLink** plug-in is shown. Your display may vary depending on which plug-in(s) you have installed.

When you select individual diagnostic roots or items contained in one, the **Details** pane displays data for that root or item.

Icons accompany each data element and indicate the quality of the information presented. The quality icons are described below:



Clock: Indicates that the data displayed on that line was not updated during the last update interval and the data item has just been scrolled into view. It is displayed until the next update interval, at which time it changes to one of the icons below.



White: Initializing (no VTQ available yet, no timeout yet)



Red: Error Active



Yellow: Warning Active



Green: Normal Active



Red Marked: Bad Inactive



Yellow Marked: Warning Inactive



Green: Normal Inactive

Client Groups Diagnostic Root

The **Client Groups** Diagnostic root displays all individual client groups in the Details pane (right pane).

Data for each individual client group includes the **Data Quality** icon, **Name**, **Items**, **Active Items**, (Number of Items with) **Errors**, **Update Interval**, and **State**:

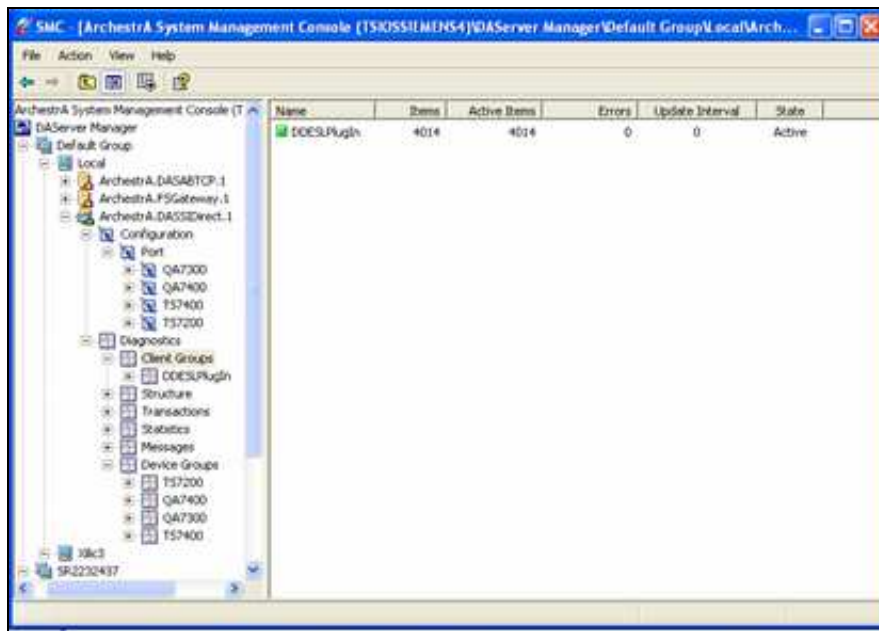


FIGURE 7: CLIENT GROUPS DETAILS PANE

Name	Client Value	Time	Client Quality	Subscr. Pkg	State	Location	Device Group
db100,v111.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v100.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v65.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v54.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v43.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v364.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v265.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v32.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v21.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v10.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v7.0	FALSE	7:57:55 PM	0000		Active	Port: T57400	T57400
db100,v232.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v221.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v144.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v133.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v122.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v111.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v100.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v90.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v87.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v76.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v65.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v54.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v43.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v32.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v21.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v10.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v7.0	FALSE	7:07:46 PM	0000	8F001068	Active	Port: QA7400	QA7400
db100,v922.0	FALSE	7:07:33 PM	0000		Active	Port: QA7300	QA7300
db100,v911.0	FALSE	7:07:33 PM	0000		Active	Port: QA7300	QA7300
db100,v900.0	FALSE	7:07:33 PM	0000		Active	Port: QA7300	QA7300
db100,v899.0	FALSE	7:07:33 PM	0000		Active	Port: QA7300	QA7300
db100,v879.0	TRUE	7:07:33 PM	0000		Active	Port: QA7300	QA7300
db100,v867.0	TRUE	7:07:33 PM	0000		Active	Port: QA7300	QA7300
db100,v856.0	FALSE	7:07:33 PM	0000		Active	Port: QA7300	QA7300
db100,v845.0	FALSE	7:07:33 PM	0000		Active	Port: QA7300	QA7300

FIGURE 8: CLIENT GROUP DETAIL

Select an individual client group from the Tree-pane hierarchy such as **DDESLPlugIn**.

The following Normal/Warning/Error icon colors apply:

Icon State	Individual Client Group
Normal	The OPC quality is good.
Warning	The OPC quality is uncertain.
Error	The OPC quality is bad.

Structure Diagnostic Root

The DAServer namespace may include many hierarchy levels, some which have not been added (and therefore, are not visible) in the Tree pane.

In the **Structure** diagnostic root, you can view data about many possible levels, based on the DAServer structure.

Data for each structural hierarchy includes the **Data Quality** icon, **Name** of item, (number of) **Items**, (number of items with) **Errors**, **R/W Status**, **Value**, **Time**, **Quality**, (number of) **Messages**, and **Device Groups**.

The **R/W Status** column always displays **R/W**, which means that the structure supports both read/refresh/property transactions and write transactions.

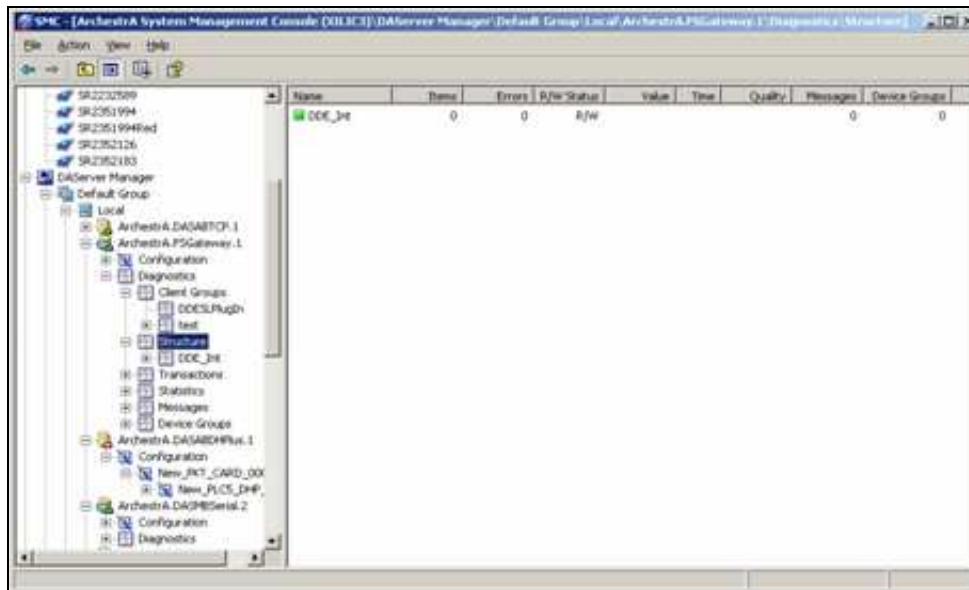


FIGURE 9: DIAGNOSTIC ROOT

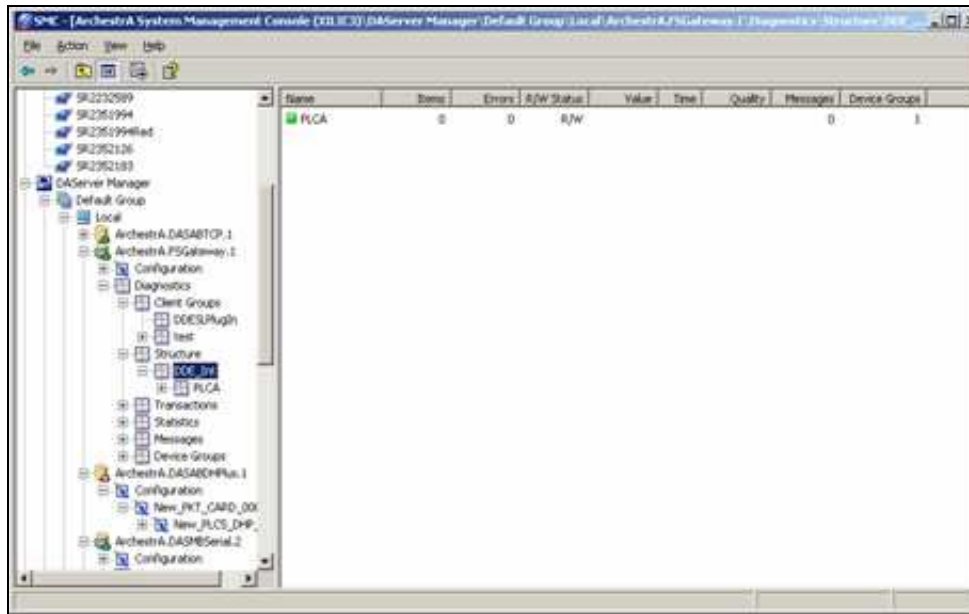


FIGURE 10: DIAGNOSTIC ROOT DETAIL

Structure icons are marked as Active/Inactive. Hierarchical elements (structural branches) are always marked as active, and the Normal/Warning/Error color of the icons is set as follows:

Icon State	Hierarchical Element
Normal	The status error code is greater than or equal to zero (not negative) and the OPC quality is good for all items on this level.
Warning	The status error code is greater than or equal to zero (not negative) and the OPC quality is uncertain or bad for at least one item on this level.
Error	The status error code is less than zero (negative).

Hierarchical items (leaves) are marked as active if at least one group item referencing it is active. It is marked as inactive if all group items referencing it are inactive. The Normal/Warning/Error color of the icons is set as follows:

Icon State	Item
Normal	The OPC quality is good.

Warning	The OPC quality is uncertain.
Error	The OPC quality is bad.

Note: Error indications in the Diagnostics-Structure root do not necessarily mean that an error condition exists at the hierarchical level in focus. It means that an error condition exists at some point down the hierarchical tree.

Transactions Diagnostic Root

The Transaction diagnostic root contains all individual transactions. Data for the Transaction root includes the **Data Quality** icon, **Type** of transaction, item **ID**, number of **Items**, **Status**, **Start** time, and **End** time.

The **Status** column displays whether the transaction is **COMPLETE**, **ERROR**, or **INCOMPLETE**. The Normal/Warning/Error color of the icons for the Transactions root is set as follows:

Icon State	Transaction
Initializing	Transaction is in process.
Normal	Transaction has completed successfully, and the OPC quality is good for all items or write completed with success.
Warning	Transaction has completed successfully, and the OPC quality is uncertain or bad for at least one item or write completed with error in at least one item.
Error	Transaction has completed with error, the OPC quality is uncertain or bad for all items or write completed with error.

Note: Items below the root level in this hierarchy are subject to customization by the code and configuration of individual DAServers.

Type	ID	Items	Status	Start	End
Demand Write	33722...	12	COMP...	4/15/2005 10:57:34 PM	4/15/2005 10:57:34
Demand Write	33554...	12	COMP...	4/15/2005 10:57:36 PM	4/15/2005 10:57:36
Demand Write	34561...	12	COMP...	4/15/2005 10:57:38 PM	4/15/2005 10:57:38
Demand Write	34561...	12	COMP...	4/15/2005 10:57:40 PM	4/15/2005 10:57:40
Demand Write	41607...	12	COMP...	4/15/2005 10:57:42 PM	4/15/2005 10:57:42
Demand Write	41775...	12	COMP...	4/15/2005 10:57:44 PM	4/15/2005 10:57:45
Demand Write	97308...	12	COMP...	4/15/2005 10:57:46 PM	4/15/2005 10:57:46
Demand Write	92275...	12	COMP...	4/15/2005 10:57:48 PM	4/15/2005 10:57:48
Demand Write	28521...	12	COMP...	4/15/2005 10:57:50 PM	4/15/2005 10:57:50
Demand Write	19629...	12	COMP...	4/15/2005 10:57:52 PM	4/15/2005 10:57:52
Demand Write	34393...	12	COMP...	4/15/2005 10:57:54 PM	4/15/2005 10:57:54
Demand Write	31373...	12	COMP...	4/15/2005 10:57:56 PM	4/15/2005 10:57:57
Demand Write	31037...	12	COMP...	4/15/2005 10:57:58 PM	4/15/2005 10:57:58
Demand Write	34057...	12	COMP...	4/15/2005 10:58:00 PM	4/15/2005 10:58:00
Demand Write	33890...	12	COMP...	4/15/2005 10:58:02 PM	4/15/2005 10:58:02
Demand Write	33890...	12	COMP...	4/15/2005 10:58:04 PM	4/15/2005 10:58:04
Demand Write	33554...	12	COMP...	4/15/2005 10:58:06 PM	4/15/2005 10:58:06
Demand Write	38419...	12	COMP...	4/15/2005 10:58:08 PM	4/15/2005 10:58:08
Demand Write	30366...	12	COMP...	4/15/2005 10:58:10 PM	4/15/2005 10:58:10
Demand Write	30366...	12	COMP...	4/15/2005 10:58:12 PM	4/15/2005 10:58:12

FIGURE 11: TRANSACTION STATES

Note: For a Demand Write transaction, the data shown in the **Quality/Results** column indicates the success or failure of the item in the transaction. All zeroes (**00000000**) means the item was successful. A positive number means the item was successful but indicates a condition that should be noted. Double-click the item to open the **Diagnostic Info** dialog box, and note the **Write Status** data for additional information about the item.

A negative number in the Quality/Results column of the Details pane of the Transactions root means the item in the transaction was not successful.

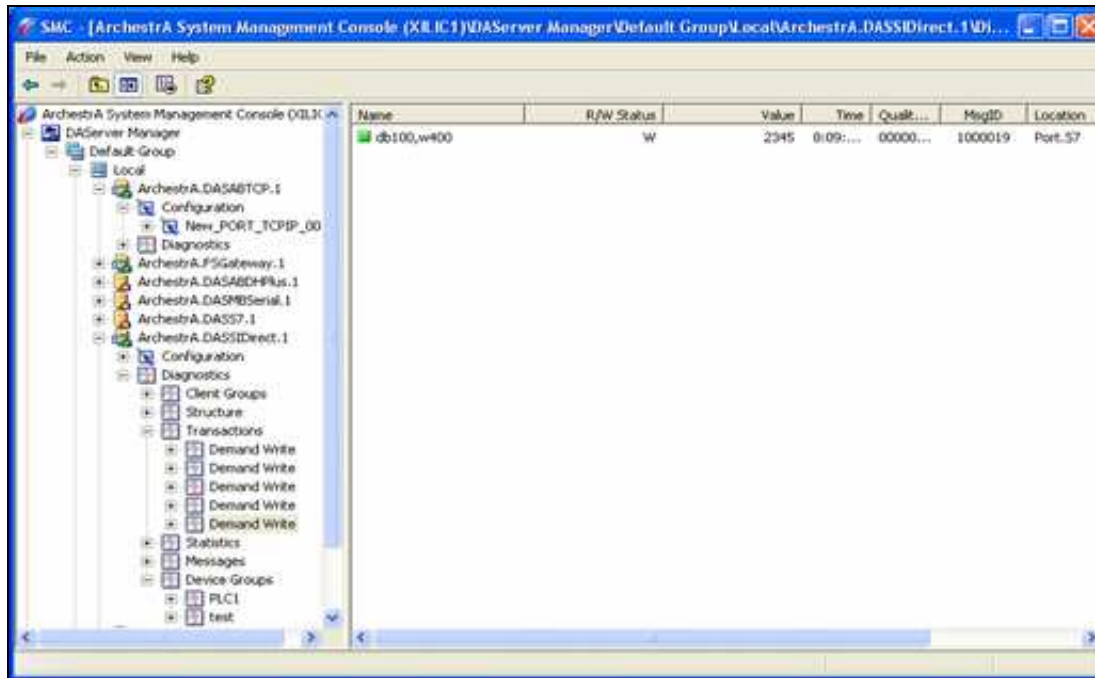


FIGURE 12: SUCCESSFUL TRANSACTION

Individual transactions that are pending are marked with a white icon (the state is undefined/pending). A transaction item element is always marked as active (viewing completed transactions is viewing a snapshot).

Data for an individual transaction item include **Data Quality** icon, **Name** of item, **R/W Status**, **Value**, **Time**, **Quality/Result**, **MsgID** (Message ID), and **Location**.

The **Quality/Result** column displays the write complete code for Demand Write transactions and data quality for all other transactions. The R/W Status column displays **R** for read/refresh/property transactions or **W** for write transactions (See R/W Items in Diagnostics for further details.). Location is the path of the hierarchical item name.

The Normal/Warning/Error color of the individual Transaction icons is set as follows:

Icon State	Transaction Item
Normal	The OPC quality is good, write completed with success.
Warning	The OPC quality is uncertain.
Error	The OPC quality is bad, write completed with error.

Statistics Diagnostic Root

The Statistics diagnostic root has no sub-nodes since it displays general DAServer data.

The types of statistics available includes **Server State**, **DAS Engine Version**, **Start Time**, **Current Time**, **Client Groups**, **Client Group Items**, **Client Group Errors**, **Device Items**, **Device Errors**, and **Messages**.

For each statistic, data displayed includes the data quality icon, type of Statistic, Value, and Unit/Info.

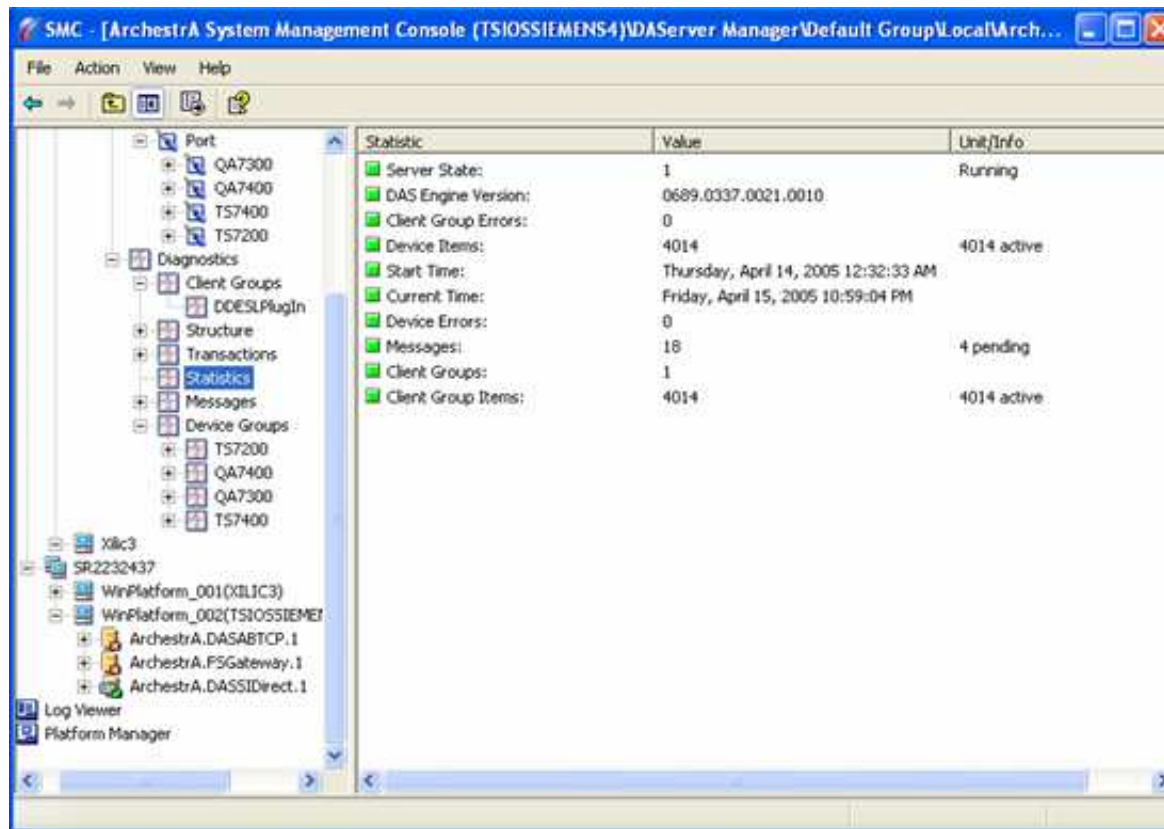


FIGURE 13: STATISTICS DIAGNOSTIC ROOT

The Normal/Warning/Error color of the icons for the **Statistics** items is set as follows:

Icon State

Normal

Statistic

The value is 0.

The value is not zero and not equal to the

Warning	corresponding total number of items.
Error	The number of items with errors is equal to the corresponding total number of items.

Messages Diagnostic Root

The Messages diagnostic root displays data for the root as well as individual messages. Data displayed for the root includes Data Quality icon, **MsgID**, (number of) **Items**, number of items with **Errors**, and **Status**.

The Normal/Warning/Error color of the icons for the Statistics items is set as follows:

Icon State	Message
Normal	The OPC quality is good for all items in this message.
Warning	The OPC quality is uncertain or bad for at least one item in this message, and the OPC quality is good for at least one item.
Error	The OPC quality is uncertain or bad for all items in this message.

Note: Items below the root level in this hierarchy are subject to customization by the code and configuration of individual DAServers.

MsgID	Items	Errors	Status	S7 Msg ID	PDU Size	Msg Error
AD0022BA	112	0	IDLE	P	24/130	3
AF0022BB	222	0	PENDING	P1	24/240	3
990022BC	222	0	IDLE	P	24/240	3
9A0022BD	222	0	IDLE	P	24/240	3
9D0022BE	222	0	IDLE	P0	24/240	3
C2000FDA	462	0	IDLE	P	24/480	0
04000FD9	76	0	IDLE	P	24/94	0
C5000FD8	462	0	IDLE	P	24/480	0
CC000FF7	112	0	PENDING	P0	24/130	0
C2000FFA	222	0	IDLE	P	24/240	0
C0000FFB	222	0	IDLE	P	24/240	0
C6000FFD	222	0	IDLE	P	24/240	0
CC000FF6	464	0	IDLE	P	24/480	0
C9000FF8	88	0	IDLE	P	48/118	0
C4000FF9	462	0	IDLE	P	24/480	0

FIGURE 14: MESSAGES ROOT

Both messages and message items are always marked as **Active**.

Data for an individual message item include Data Quality icon, **Name** of item, **R/W Status**, **Value**, **Time**, **Quality**, message ID (**MsgID**), and **Location**.

The R/W Status column displays R for read/refresh/property messages, W for write messages, or R/W for both read/refresh/property and write messages. (See R/W Items in Diagnostics for further details.) Location is the path of the hierarchical item name. The Normal/Warning/Error color of the icons for message items is set as follows:

Icon State	Message Item
Normal	The OPC quality is good.
Warning	The OPC quality is uncertain.
Error	The OPC quality is bad.

Device Groups Diagnostic Root

The Device Groups diagnostic root displays data for the root as well as individual device groups. Data displayed for the root includes Data Quality icon, **Device Group**, **Update Interval**, number of **Items**, number of **Active Items**, number of items with **Errors**, and **Location**.

Device Group	Update In...	It...	Ac...	Er...	Location	Poll...	Cycle...
T57200	1000	1000	1000	0	Port.T57200	5	0
QA7400	1000	1000	1000	0	Port.QA7400	3	0
QA7300	1000	1000	1000	0	Port.QA7300	5	0
T57400	1000	1014	1014	0	Port.T57400	3	0

FIGURE 15: DEVICE GROUPS ROOT

The Normal/Warning/Error color of the icons for the **Device Groups** items is set as follows:

Icon State	Device Group
Normal	The OPC quality is good for all items in this device group.
Warning	The OPC quality is uncertain or bad for at least one item in this device group, and the OPC quality is good for at least one item.
Error	The OPC quality is uncertain or bad for all

items in this device group.

Device group items are marked as **Active** if at least one active group item (from any active group) is referencing it. They are marked as inactive if no active item in any active group is referencing it. Referencing means having the same fully qualified ItemID/hierarchical name and the same OPC access path/device group.

Name	R/W St...	Value	Time	Q...	Ms...	Location	S...	It...
db100,x992.0	R/W	FALSE	1...	0...	C9...	Port.TS7400	P	R255
db100,x981.0	R/W	FALSE	1...	0...	C9...	Port.TS7400	P	R255
db100,x970.0	R/W	FALSE	1...	0...	C9...	Port.TS7400	P	R255
db100,x893.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x882.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x871.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x860.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x794.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x783.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x772.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x761.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x750.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x695.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x684.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x673.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x662.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x651.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x640.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x596.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x585.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x574.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x563.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x552.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x541.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255
db100,x530.0	R/W	TRUE	1...	0...	C4...	Port.TS7400	P	R255

FIGURE 16: INDIVIDUAL DEVICE GROUP ITEMS

Note: Items below the root level in this hierarchy are subject to customization by the code and configuration of individual DAServers.

Data for an individual device group item includes **Data Quality** icon, **Name** of item, **R/W Status**, **Value**, **Time**, **Quality**, message ID (**MsgID**), and **Location**.

The R/W Status column displays R for read/refresh/property device group items, W for write device group items, or R/W for both read/refresh/property and write device group items. Location is the path of the hierarchical item name.

The Normal/Warning/Error color of the icons for device group items is set as follows:

Icon State **Device Group Item**

Normal	The OPC quality is good.
Warning	The OPC quality is uncertain.
Error	The OPC quality is bad.

Setting Up the Log Flags to Record Additional Information to the LogViewer

There variety of log flags that one can set in order to track messages from different Factory Suite components or ArchestrA components. To set the log flags:

1. From the SMC window, select **Log Viewer/Default Group/Local**.

The log viewer window appears.

2. Select **Action/Log Flags**, and from the left pane, select the component such as **DASSiDirect**.

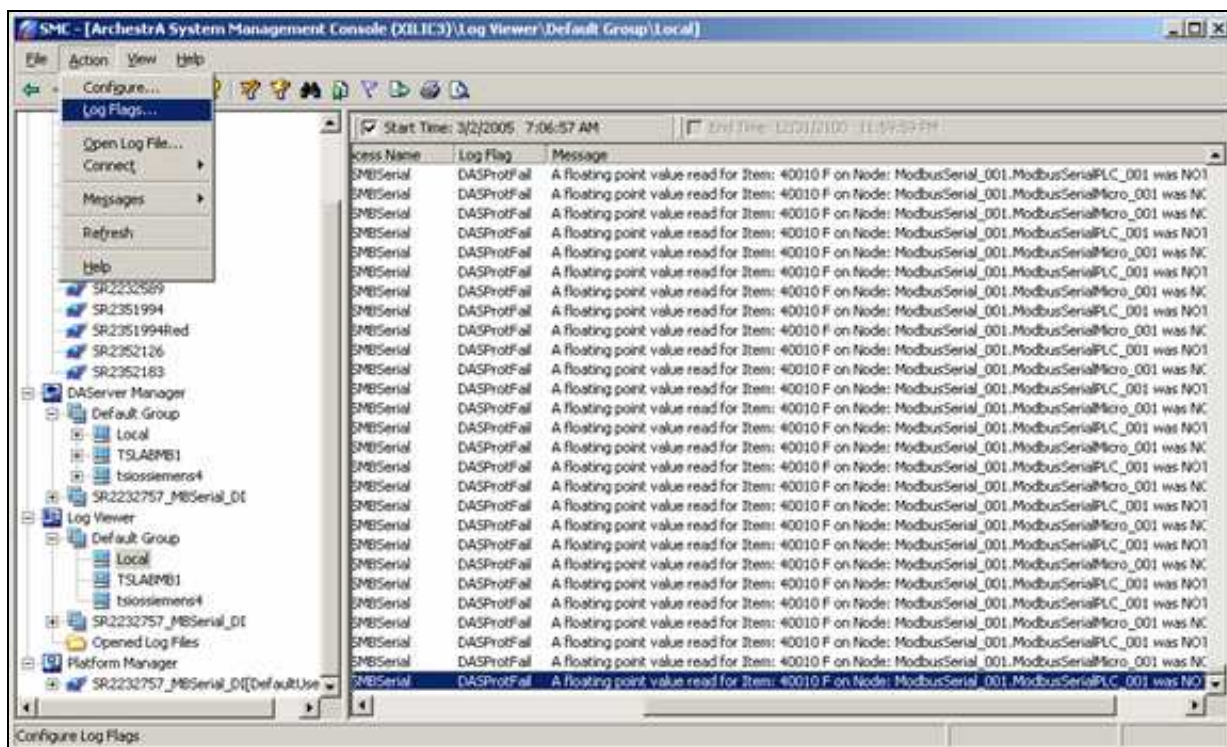


FIGURE 17: LOG FLAGS SELECTION

This selection displays all the log flags available for the selected component.

Common diagnostic flags (in addition to the default flags) are **DASSend**, **DASReceive**, and **DASVerbose**.

These flags record detailed data messages being sent and received from the DAServer and provide useful information for Tech Support or end-user analysis (Figure 18 below).

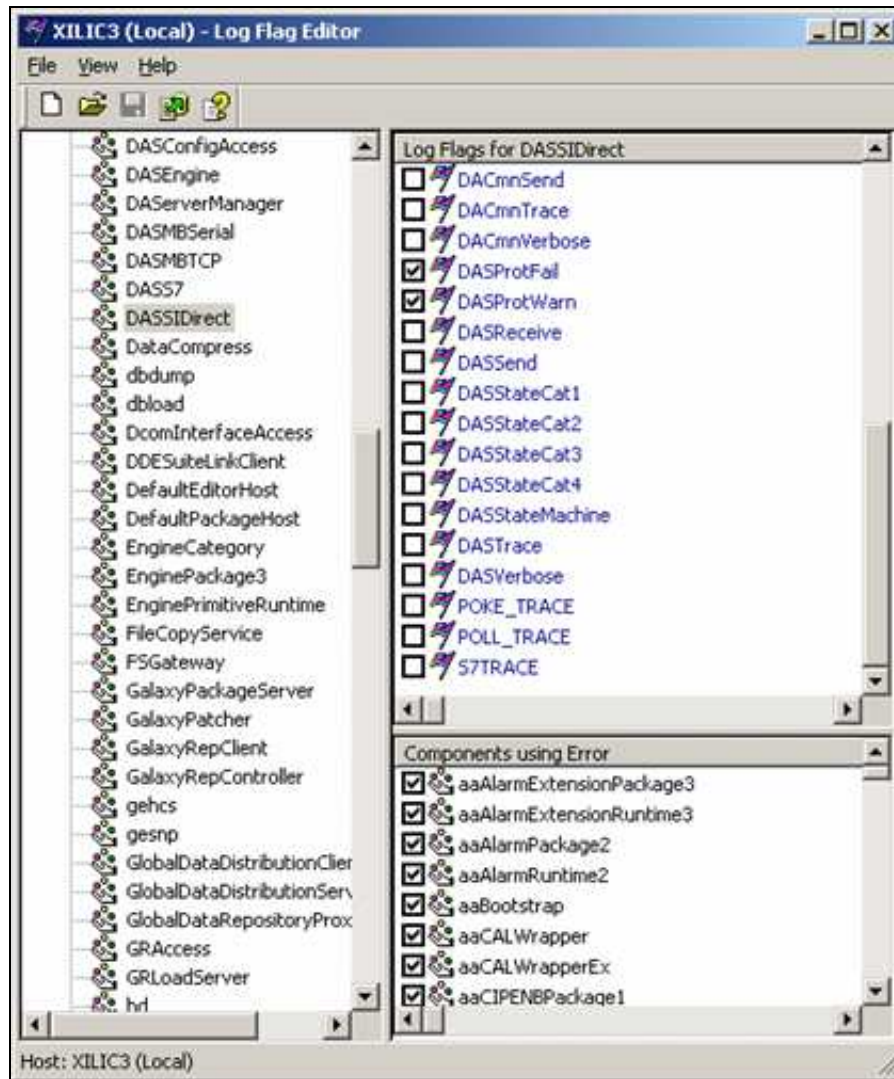


FIGURE 18: AVAILABLE LOG FLAGS

Frequently Asked Questions and Answers

Frequently asked questions and answers will be compiled and distributed in a future Tech Note.

A. Chaque

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