



# iFIX 6.1

OPC A&E Server for iFIX



**Proprietary Notice**

The information contained in this publication is believed to be accurate and reliable. However, General Electric Company assumes no responsibilities for any errors, omissions or inaccuracies. Information contained in the publication is subject to change without notice.

No part of this publication may be reproduced in any form, or stored in a database or retrieval system, or transmitted or distributed in any form by any means, electronic, mechanical photocopying, recording or otherwise, without the prior written permission of General Electric Company. Information contained herein is subject to change without notice.

© 2020, General Electric Company. All rights reserved.

**Trademark Notices**

GE, the GE Monogram, and Predix are either registered trademarks or trademarks of General Electric Company.

Microsoft® is a registered trademark of Microsoft Corporation, in the United States and/or other countries.

All other trademarks are the property of their respective owners.

We want to hear from you. If you have any comments, questions, or suggestions about our documentation, send them to the following email address:

[doc@ge.com](mailto:doc@ge.com)

# Table of Contents

<b>OPC A&amp;E Server for iFIX</b> .....	<b>1</b>
<b>Getting Started: OPC A&amp;E Server</b> .....	<b>2</b>
Features of the OPC A&E Server .....	2
Unsupported Features .....	3
Setting up the OPC A&E Server .....	3
Notes .....	3
Running the OPC A&E Server with Other GE Products .....	3
Local Node Setup .....	4
Concentrator Node Setup .....	5
OPC Overview .....	6
How OPC Works .....	7
iFIX Message Mappings .....	8
Standard OPC Alarm Event Parameters for iFIX Alarm States .....	8
Attributes Passed to the OPC A&E Client .....	9
Simple Event Types .....	9
Condition Events Types .....	10
Tracking Events Types .....	11
Alarm Differences .....	11
Between FIX32 and iFIX .....	12
Between the Server and the iFIX Alarm History or ALMODBC Utility .....	12
Between Alarm Acknowledgements in iFIX and the OPC A&E Server .....	12
Between Alarm States in iFIX and the OPC A&E Server .....	12
<b>OPC Server Configuration</b> .....	<b>12</b>
Understanding the Configure iFIX OPC A&E Server Dialog Box .....	13
Description of Configuration Fields .....	14
OPC Attributes .....	14
Select All and Restore Defaults Buttons .....	15
User Field Data Source .....	16
Advanced .....	16

Alarm Acknowledgement Security .....	17
Configuration Available through the OPCAEConfig.ini .....	18
Running the OPC A&E Server When You Start iFIX .....	19
Synchronizing Network Clocks .....	20
Connecting and Disconnecting from the Server .....	20
Running Multiple Clients .....	21
Browsing Sources and Areas .....	21
Sources .....	21
Areas .....	22
Viewing iFIX OPC A&E Server Statistics .....	22
Descriptions of iFIX OPC A&E Server Statistics .....	22
Sample Period vs. the Refresh Rate .....	23
<b>How Do I...</b> .....	<b>24</b>
Configure the iFIX OPC A&E Server .....	24
Configuration Overview .....	24
To enter information in the Configure iFIX OPC A&E Server dialog box: .....	25
To run the server as a service when iFIX starts: .....	25
To verify that the iFIX OPC A&E Server is running after starting iFIX: .....	26
To verify that the iFIX OPC A&E Server is running as a service: .....	26
Configure DCOM Settings in Windows .....	26
To configure the DCOM settings when the iFIX OPC A&E Server runs as a service: .....	26
To configure the DCOM settings when the iFIX OPC A&E Server runs as a local server: .....	28
Filter Alarms and Events By Node Name .....	28
To filter alarms and events by node name: .....	29
Disconnect All Clients .....	29
To disconnect from all clients: .....	29
<b>Advanced Features</b> .....	<b>29</b>
Trace Logging OPC A&E Server Communications .....	29
Specifying Logged Data .....	30
iFIX OPC A&E Data Source Syntax .....	31
Alarm Data Source Syntax .....	31

Failover Configuration Notes .....	31
<b>Troubleshooting .....</b>	<b>32</b>
Alarm Queue Overflow .....	32
Issue .....	32
To verify that the alarm queue actually overflowed: .....	32
Possible Solution .....	33
To change the queue size: .....	33
Alarm Processing Rate Set Too Moderately .....	33
Issue .....	33
Possible Solution .....	33
To modify the alarm processing rate: .....	33
Server Starts in Configuration Mode .....	34
Issue .....	34
Possible Solution .....	34
If More Than One Running Server Instance Appears... .....	34
If Only One Running Server Instance Appears... .....	35
To verify that you can restart the server with its full functionality: .....	35
<b>Index .....</b>	<b>37</b>

# OPC A&E Server for iFIX

This help system describes the OPC Alarms and Events (A&E) Server for the iFIX product. The help includes the following sections:

- [Getting Started: OPC A&E Server](#)
- [OPC Server Configuration](#)
- [How Do I...](#)
- [Advanced Features](#)
- [Troubleshooting](#)

## Getting Started: OPC A&E Server

the iFIX OPC Alarms and Events (A&E) Server reads alarm events and messages from a set of iFIX SCADA servers and sends them to interested clients. External OPC A&E clients, such as the GE Historian OPC A&E Collector, can connect to this server to acquire and analyze alarm data for any of those SCADA nodes.

the iFIX OPC A&E Server converts all iFIX alarms and events (including 21 CFR 11 messages) to meet the OPC A&E standard. In addition to all iFIX alarms and events, the OPC A&E Server generates messages in the following scenarios:

- Alarm Acknowledgements - In addition to the operator Tracking message, the iFIX OPC A&E Server generates a Condition event about the Acknowledgement for this operator message.
- Change of State (COS) Alarm - For every COS alarm, the iFIX OPC A&E Server immediately generates an "OK" message.
- Bad Quality Notifications - When an open alarm is no longer found, the iFIX OPC A&E Server generates a message indicating that an unknown event occurred.

The reason the iFIX OPC A&E Server does this is so that the alarm life cycle can properly be represented in the Historian Archiver, for instance. If you compare the events logged in the Alarm ODBC (ALMODBC.exe) with the ones from the iFIX OPC A&E Server, you will obtain more messages from the iFIX OPC A&E Server than found in the Alarm ODBC.

Refer to the following sections for additional information:

- For a list of supported and unsupported features for the iFIX OPC A&E Server, refer to the [Features of the OPC A&E Server](#) section.
- For more information on how to setup the iFIX OPC A&E Server, refer to the [Setting up the OPC A&E Server](#) section.
- For more information on how the Server works, refer to the [Running the OPC A&E Server with Other GE Products](#) section.
- For more information on OPC in general, refer to the [OPC Overview](#) section.
- For details on the information retrieved for each alarm event, refer to the [iFIX Message Mappings](#) section.
- For details on FIX32 and iFIX alarms or the Alarm History and ALMODBC utilities, refer to the [Alarm Differences](#) section.

## Features of the OPC A&E Server

The main features provided by the iFIX OPC A&E Server include:

- Support for the OPC A&E Server specification (1.10) for iFIX alarms and events.
- Ability to send standard properties of iFIX alarms and events to the GE Historian archive.
- Configuration of the iFIX OPC A&E Server from a user interface (iFixOPCAESrv.exe).

- Ability to report the complete lifetime for almost all iFIX alarms in the OPC A&E client. For more information on doing so with GE Historian OPC A&E Collector, refer to the Historian online help.

**NOTE:** Exceptions include acknowledge all, acknowledgements not done through the iFIX WorkSpace or an OPC A&E Client, some FIX32 alarms, any connection loss to a block in alarm, and manual deletions.

- Support for area and source browsing.
- Filtering of OPC A&E event types, event categories, severities, areas, and sources. In addition to these OPC defined filtering techniques, you can also filter alarms and events by the node name.
- Alarm acknowledgement from an OPC A&E client.

## Unsupported Features

The following features are not supported by the iFIX OPC A&E Server:

- DCOM support.  
**NOTE:** The Historian OPC A&E Collector does not currently support DCOM either.
- Ability to display alarms from the OPC A&E Server in the iFIX WorkSpace.
- Migration of ALMODBC configuration.
- Running the OPC A&E Server as a service when iFIX is not running as a service.

## Setting up the OPC A&E Server

In general, setting up and using the iFIX OPC A&E Server involves the following steps:

1. Install the iFIX OPC A&E Server.
2. Configure the OPC A&E Server. For more details, refer to the [Configure the iFIX OPC A&E Server](#) section.
3. Configure any external OPC A&E Clients to connect to the iFIX OPC A&E Server. the iFIX OPC A&E Server name is:  
`Proficy.OPCiFIXAE.1`
4. Use the A&E OPC Client to view and analyze alarm data as desired.

### Notes

the iFIX OPC A&E Server must be running as long as OPC A&E clients are accessing alarm data. If you manually exit and close the server window, communications between the OPC A&E Server and any connected clients will be lost.

OPC clients that connect to the iFIX OPC A&E Server must support the OPC A&E extension of the OPC protocol.

## Running the OPC A&E Server with Other GE Products

The iFIX OPC A&E Server (iFixOPCAESrv.exe) runs concurrently with an iFIX system. One or more clients can connect to the iFIX A&E Server. When an OPC A&E client (such as the Historian OPC A&E Collector) wants to receive alarm and event data, it connects to the iFIX OPC A&E Server and acquires (or "subscribes to") the server's alarms and events. Once a connection is established, any alarm event information is sent from iFIX OPC A&E Server to the Historian OPC A&E Collector and other connected clients.

**NOTE:** If you are using the iFIX OPC A&E Server with the Historian iFIX A&E Collector, it is recommended that you disable startup alarms (`DisableStartupAlarms=1`) and disable system acknowledgement (`WhenToSysAck=-1`) in the `OPCAEConfig.ini` file. For more information, refer to the [Configuration Available through the OPCAConfig.ini topic](#).

The OPC clients do not directly connect to iFIX. Instead, they connect to the iFIX OPC A&E Server. It is this server that connects to each SCADA node.

- For more information on the OPC protocol in general, refer to the [OPC Overview](#) section.
- For an overview of the iFIX OPC A&E Server, refer to the [Getting Started: OPC A&E Server](#) section.

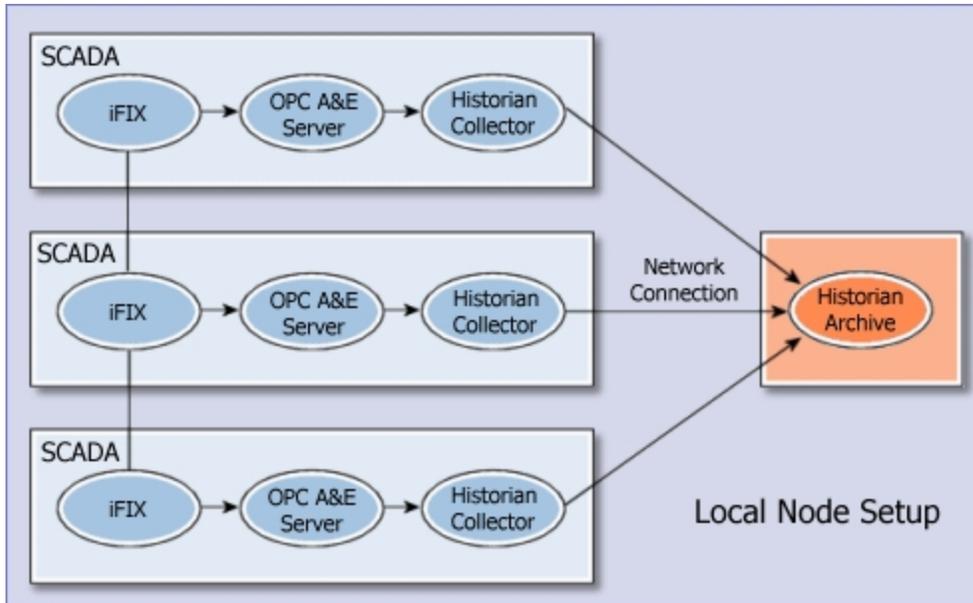
For examples of computer configurations with the iFIX OPC A&E Server, refer to these sections:

- [Local Node Setup](#)
- [Concentrator Node Setup](#)

**TIP:** In both the local node and concentrator node cases, if the SCADA servers communicate with each other, the OPC A&E Server and the Historian OPC A&E Collector obtain alarms and events from many nodes. If you want to filter the alarms by node name, you can configure this in the iFIX OPC A&E Server or in the GE Historian. For steps on how to configure this in the iFIX OPC A&E Server, refer to the [Filter Alarms and Events By Node Name](#) section. For steps on how to configure this in the GE Historian, refer to the GE Historian electronic books.

## Local Node Setup

It is strongly recommended that the iFIX OPC A&E Server run on the SCADA node whenever possible. When using GE Historian with the OPC A&E Server, the Historian OPC A&E Collector should also run on the SCADA node. An example of a typical local node configuration is illustrated below.



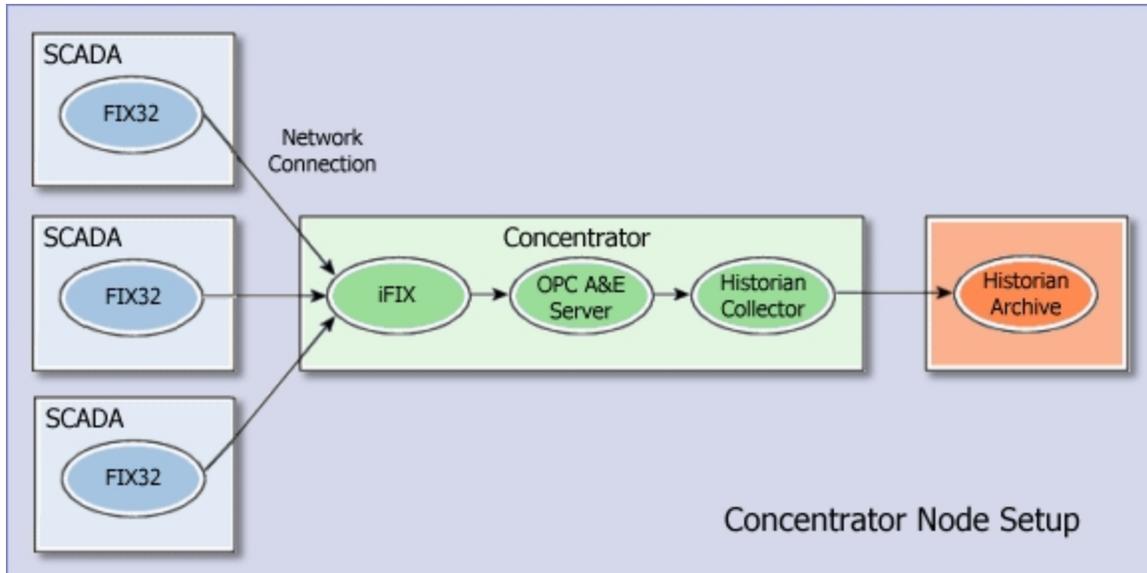
This setup ensures that all alarms and messages generated by the SCADA server are sent to GE Historian in the event of a network failure between a SCADA node and View node. The Historian OPC A&E Collector provides a store and forward feature, which means that even in the event of a network failure between the SCADA node running the collector and the Historian Archive, all alarms and messages will be sent to the Historian Archive.

### Concentrator Node Setup

Use of a concentrator node means that the network includes a single iFIX concentrator node that acquires alarms from multiple nodes. The iFIX OPC A&E Server gets the data that it sends to its clients from this one concentrator node. This configuration is not recommended with GE Historian, because it is probable that some alarms may not be delivered to the Historian A&E Archive when network failures occur.

Another drawback is that if iFIX shuts down on the concentrator node, then the Historian Archive marks this shutdown time as the end time for all open alarms, regardless of whether or not alarms from the other nodes are still open. For instance, there still may be open alarms on the FIX32 nodes. The archived alarm life cycle may therefore be incorrect for those alarms.

An example of a typical concentrator node configuration is illustrated below.



## OPC Overview

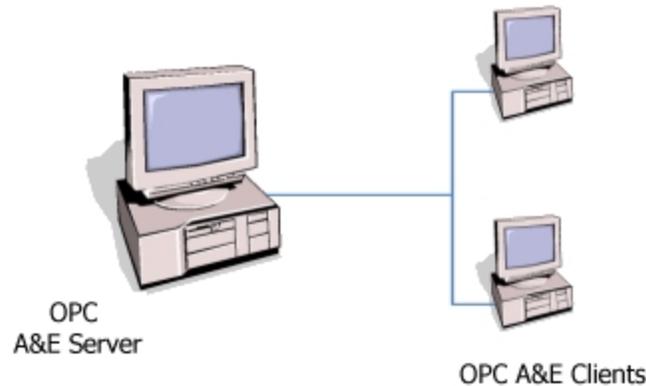
OPC (OLE for Process Control) is a standard client/server protocol for the transfer of data and I/O information between applications within a Windows® environment. OPC was developed by the not-for-profit OPC Foundation, which makes specifications for OPC freely available.

OPC specifications are built upon Microsoft's OLE (Object Linking and Embedding) and DCOM (Distributed Component Object Model) technologies. OPC is fully endorsed by Microsoft.

OPC was created to allow different automation applications to communicate with each other, regardless of the manufacturer. This allows for greater flexibility and reliability when setting up automation systems. The OPC A&E (Alarms and Events) protocol is an extension of the overall OPC specifications, designed specifically for sharing alarm event information.

For manufacturers of OPC-compliant applications, it simplifies the development process, since they only have to create one I/O interface. For consumers of OPC-compliant applications, it increases the flexibility of their automation process—they're no longer limited to communicating with devices specified by the applications' developers.

## How OPC Works



Applications that use the OPC protocol implement a client/server relationship. You can think of OPC Servers as being producers of information, and OPC Clients as being consumers:

- The *OPC A&E Server* has alarm and event data that it makes available to other computers as OPC A&E data sources.
- The *OPC A&E Client* connects to the OPC A&E Server to gain access to its data.

The communication interfaces of an OPC server are made available to other programs by use of COM (Component Object Model) and DCOM (Distributed Component Object Model) technology. Essentially, this makes the existence of the OPC A&E Server known to other programs (that is, OPC A&E Clients) that may want to connect to it on the network.

Since the OPC A&E Server and OPC A&E Client are simply programs or applications, they can run on the same computer.

An OPC A&E Server running on the same computer as the OPC A&E Client is called a local server. A server running on a different computer than the client is called a remote server. Since administrators often set up security restrictions for communications between computers on a network, this distinction can be important.

**NOTE:** Any clients that connect to the iFIX OPC A&E Server must specifically support the OPC A&E protocol, not just the OPC protocol. With an ordinary OPC Client, you may be able to connect to the iFIX OPC A&E Server, but any data you receive will be nearly useless.

While manufacturers of OPC-compliant applications use the same protocol to communicate data, how OPC is configured within those applications can vary widely. Typically, in the client, you'll do the following:

- Specify the address of the computer running the OPC A&E Server that you want to connect to. Often, you can browse a network to find out what OPC A&E Servers are currently running on each computer, much like browsing the Windows Network Neighborhood to find a particular computer.
- If more than one OPC A&E Server is running on the same computer, you may have to select the iFIX OPC A&E Server from a list or manually specify its name (Proficy.OPCiFIXAE.1).

- Specify the alarm event data that you want the client to acquire. Typically, the configuration utility for the OPC client will present you with a browse list or tree of OPC data sources. If this is not available, you will have to manually specify the syntax for desired OPC data sources (refer to the [iFIX OPC A&E Data Source Syntax](#) section for details).

## iFIX Message Mappings

The following table describes the iFIX alarm messages and the corresponding OPC event types, categories, conditions, and sub-conditions for each message.

iFIX Alarm Message Type	Event Type	Event Category
ALM_MSG_UNKNOWN	Simple	N/A
ALM_MSG_ALM	Condition	Tag
ALM_MSG_HARDWARE	Simple	Device Failure
ALM_MSG_NETWORK	Simple	System Message
ALM_MSG_SYSTEM_ALERT	Simple	System Message
ALM_MSG_USER	Simple	System Message
ALM_MSG_FLAG_ACK	Tracking	Operator Process Change
ALM_MSG_FLAG_DEL	Tracking	Operator Process Change
ALM_MSG_OPERATOR	Tracking	Operator Process Change
ALM_MSG_RECIPe	Simple	Batch Status
ALM_MSG_EVENT	Simple	System Message
ALM_MSG_TEXT	Simple	System Message
ALM_MSG_TEXT_6X	Simple	System Message
ALM_MSG_AAM	Simple	System Message
ALM_MSG_SQL	Simple	System Message
ALM_MSG_SIGNED	Tracking	Operator Process Change

## Standard OPC Alarm Event Parameters for iFIX Alarm States

All conditional events for the iFIX alarm message, ALM\_MSG\_ALM, fall under a single OPC condition: Tag. There are several OPC sub-conditions that the events could be placed in. The iFIX block alarm state determines the assigned sub-condition. The following table shows the relationship between the sub-condition and the iFIX block alarm state.

iFIX Block Alarm State	Event Type	Event Category	Condition	Sub-Condition
IA_OK	Condition	Tag	Tag	OK
IA_LOLO	Condition	Tag	Tag	LOLO
IA_LO	Condition	Tag	Tag	LO
IA_HIHI	Condition	Tag	Tag	HIHI
IA_HI	Condition	Tag	Tag	HI
IA_RATE	Condition	Tag	Tag	RATE
IA_DEV	Condition	Tag	Tag	DEV

IA_CFN	Condition	Tag	Tag	CFN
IA_COS	Condition	Tag	Tag	COS
IA_URNG	Condition	Tag	Tag	UNDER
IA_ORNG	Condition	Tag	Tag	OVER
IA_RANG	Condition	Tag	Tag	RANGE
IA_FLT	Condition	Tag	Tag	FLT
IA_NODATA	Condition	Tag	Tag	NO DATA
IA_NOXDATA	Condition	Tag	Tag	NO XDATA
IA_OCD	Condition	Tag	Tag	OCD
IA_TIME	Condition	Tag	Tag	TIME
IA_MANL	Condition	Tag	Tag	MANL
IA_DSAB	Condition	Tag	Tag	DSAB
IA_ACCESS	Condition	Tag	Tag	ACCESS
IA_IOF	Condition	Tag	Tag	IOF
IA_DEVICE	Condition	Tag	Tag	DEVICE
IA_STATION	Condition	Tag	Tag	STATION
IA_SQL_CMD	Condition	Tag	Tag	SQL CMD
IA_DATA_MATCH	Condition	Tag	Tag	DATA MATCH
IA_COMM	Condition	Tag	Tag	COMM
IA_SQL_LOG	Condition	Tag	Tag	SQL LOGIN
IA_FIELD_READ	Condition	Tag	Tag	FLD READ
IA_FIELD_WRITE	Condition	Tag	Tag	FLD WRITE
IA_ANY	Condition	Tag	Tag	ANY
IA_NEW	Condition	Tag	Tag	NEW
IA_ERROR	Condition	Tag	Tag	ERROR

## Attributes Passed to the OPC A&E Client

With every event notification, the iFIX OPC A&E Server passes a set of attributes to the clients. Different attributes are passed back to the client depending on the event type. The following tables outline these attributes.

In the Attribute Type column of these tables, "Standard" refers to the attribute types defined in the OPC specification. "Vendor" refers to additional iFIX-specific attributes passed in addition to the standard attributes.

For descriptions of most of the iFIX fields, refer to the table in the "OPC Attributes" section of the [Description of Configuration Fields](#) topic.

### Simple Event Types

The Simple attributes in the following table are included with all event types.

Attribute Name	Attribute Type	Data Type	iFIX Field(s)
Source	Standard	LPWSTR	LogicalNodeName.TagName or "iFIX"
SourceTag	Vendor	BSTR	Tag Name
Time	Standard	FILETIME	Date/Time In

Message Type	Vendor	BSTR	Message Type
Type	Standard	DWORD	Derived from Message Type
Event Category	Standard	DWORD	Derived from Message Type, Alarm Status
Alarm Priority	Vendor	BSTR	Alarm Priority
Severity	Standard	DWORD	Derived from Alarm Priority (1-1000)
Message	Standard	LPWSTR	Message Description
Areas	Vendor	SAFEARRAY of BSTRs	Alarm Area
Node	Vendor	BSTR	Logical Node Name
Application	Vendor	BSTR	iFIX application name (for example: iFIX)
ApplicationVersion	Vendor	BSTR	iFIX version number (for example: 3.5.5717.0)
Physical Node Name	Vendor	BSTR	Physical Node Name
Message ID	Vendor	BSTR	Message ID

### Condition Events Types

Condition event types include the ones listed in the table below, in addition to the Simple event types.

Attribute Name	Attribute Data Type		iFIX Field(s)
ChangeMask	Standard	WORD	Derived from the attributes changed
Alarm Status	Vendor	BSTR	Alarm Status
Condition name	Standard	LPWSTR	Derived from Alarm Status
Sub-condition name	Standard	LPWSTR	Derived from Alarm Status
New State	Standard	WORD	Derived on Alarm Status, Acknowledgements received, and Disabling
Quality	Standard	WORD	Derived from loss/gain of block communication
AckRequired	Standard	BOOL	Always false
Active Time	Standard	FILETIME	Time that this condition entered the most recent sub-condition
Cookie	Standard	DWORD	Server defined cookie associated with this client
CV	Vendor	VARIANT	Value
EngUnitLabel	Vendor	BSTR	Unit
Alarm Ext Field1 - Alarm Ext Field2 (name can be changed by user)	Vendor	BSTR	Alarm Ext Field1 - Alarm Ext Field2
User Field1 - User Field4 (name can be changed by user)	Vendor	BSTR	User Field1 - User Field4
Tag Description	Vendor	BSTR	Tag Description
ActorID	Standard	LPWSTR	Operator Login User Name if unsigned, Perform_Name if signed
Ack_By_FullName	Vendor	BSTR	Operator Login Full Name if unsigned, Performed By Full Name if signed
Perform_Name	Vendor	BSTR	Performed By User Name
Perform_FullName	Vendor	BSTR	Performed By Full Name

Perform_Comment	Vendor	BSTR	Performed By Comment
Verify_Name	Vendor	BSTR	Verified By User Name
Verify_FullName	Vendor	BSTR	Verified By Full Name
Verify_Comment	Vendor	BSTR	Verified By Comment

**NOTE:** When you select the Perform\_Name and Verify\_Name attributes, be aware that the Perform\_Comment and Verify\_Comment attributes must also be selected when using GE Historian and electronic signatures with iFIX. If only the Perform\_Comment and Verify\_Comment fields are selected, the values in those fields will not be written into the Historian Alarm Archiver database. (There is logic in the Historian Alarm Archiver to check for the Perform\_Name and Verify\_Name fields before the perform and verify information is written.)

### Tracking Events Types

Tracking event types include the ones listed in the table below, in addition to the Simple event types.

Attribute Name	Attribute Data Type		iFIX Field (s)
ActorID	Standard	LPWSTR	Operator Node Name::Operator if Login Full Name if unsigned. Operator Node Name::Perform_Name if signed. Operator Node Name and if security is disabled
UserFullName	Vendor	BSTR	Operator Login Full Name if unsigned, Perform_FullName if signed
Operator Node Name	Vendor	BSTR	Operator Node Name
Operator Name	Vendor	BSTR	Operator Login User Name
Operator Full Name	Vendor	BSTR	Operator Login Full Name
Perform_Name	Vendor	BSTR	Performed By User Name
Perform_FullName	Vendor	BSTR	Performed By Full Name
Perform_Comment	Vendor	BSTR	Performed By Comment
Verify_Name	Vendor	BSTR	Verified By User Name
Verify_FullName	Vendor	BSTR	Verified By Full Name
Verify_Comment	Vendor	BSTR	Verified By Comment

**NOTE:** When you select the Perform\_Name and Verify\_Name attributes, be aware that the Perform\_Comment and Verify\_Comment attributes must also be selected when using GE Historian and electronic signatures with iFIX. If only the Perform\_Comment and Verify\_Comment fields are selected, the values in those fields will not be written into the Historian Alarm Archiver database. (There is logic in the Historian Alarm Archiver to check for the Perform\_Name and Verify\_Name fields before the perform and verify information is written.)

### Alarm Differences

## Between FIX32 and iFIX

When using a configuration that also uses FIX32 alarms and events, there will be some differences in the alarm data sent by the iFIX OPC A&E Server:

- FIX32 Alarms and Events have no Message ID
- The Time In and Time Last values will always be the same for FIX32
- For alarms generated by FIX prior to FIX v7.0, alarm messages indicating that an alarm returned to an "OK" state may not have always been sent by FIX. Therefore, the GE Historian may not be able to properly represent the alarm life cycle (specifically, the time the alarm was "closed") for these alarms.

## Between the Server and the iFIX Alarm History or ALMODBC Utility

When using the re-alarms feature of AA or DA database blocks in iFIX, the OPC A&E Server may not send all re-alarm notifications for those blocks to the client. When the block first enters the alarm state, this initial alarm will always be sent. However, subsequent re-alarm notifications will only be sent to the connected OPC A&E clients if the alarm has been acknowledged since the previous re-alarm.

For example, if an AA or DA block generates the following sequence of events (as seen in the Alarm History application):

(1) Hi, (2) Hi, (3) Hi, (4) Ack, (5) Hi, (6) Hi

The iFIX OPC A&E Server will only send these 3 messages:

(1) Hi, (4) Ack, (5) Hi

This differs both from what is seen in the Alarm History application and ALMODBC utility.

## Between Alarm Acknowledgements in iFIX and the OPC A&E Server

Be aware that the OPC A&E Server does not report alarm acknowledgements in the following scenarios:

- With a failover configuration in which all nodes do not have the same active SCADA. For information on how to properly configure failover settings in the iFIX environment, refer to the [Enhanced Failover](#) electronic book.

**NOTE:** In some cases, the OPC A&E Server reports the Tracking messages for the event, but does not update the alarm life cycle with the acknowledgement.

## Between Alarm States in iFIX and the OPC A&E Server

When you acknowledge an iFIX alarm immediately after a change in the alarm's state, it is possible for the iFIX OPC A&E Server to improperly represent the alarm state of the iFIX database block when the acknowledgement occurred. In most cases, the alarm states appear the same in iFIX and in the OPC A&E Server. Network latency, CPU usage, and clock settings, however, can affect when iFIX reports the alarms to the iFIX OPC A&E Server, which also affects the order of alarms sent to its OPC A&E clients.

In these rare instances, the alarm states may appear out of order. This may result in an incorrect alarm life cycle appearing in the client applications that store information about the alarm's life cycle, such as the Historian Archive.

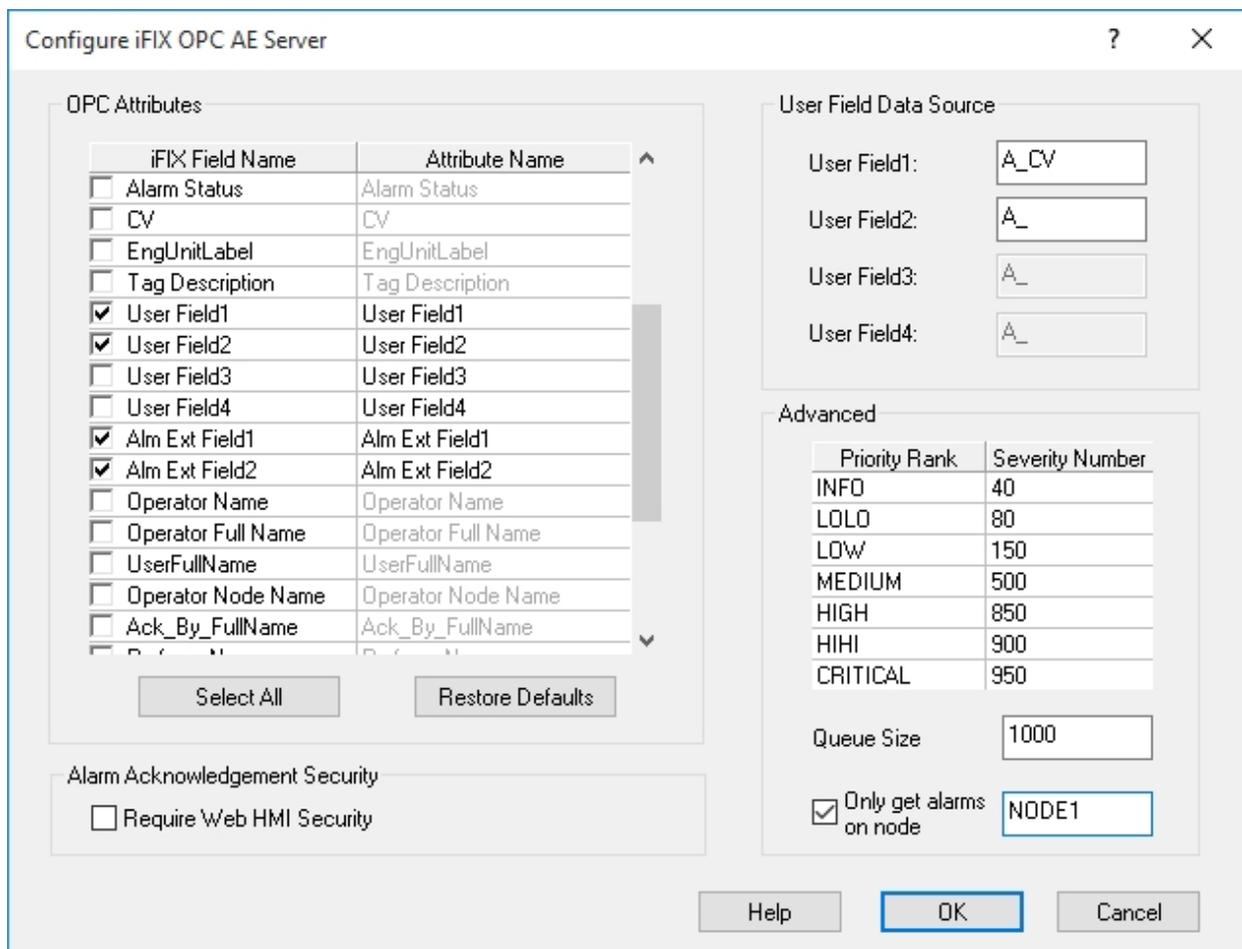
## OPC Server Configuration

When configuring the iFIX OPC A&E Server you should review these sections:

- [Understanding the Configure iFIX OPC A&E Server Dialog Box](#)
- [Running the OPC A&E Server When You Start iFIX](#)
- [Synchronizing Network Clocks](#)
- [Connecting and Disconnecting from the Server](#)
- [Running Multiple Clients](#)
- [Browsing Sources and Areas](#)
- [Viewing iFIX OPC A&E Server Statistics](#)

## Understanding the Configure iFIX OPC A&E Server Dialog Box

Most of the configuration can be performed in the Configure iFIX OPC A&E Server dialog box. To access this dialog box, on the Configure menu, choose Configure Fields. The Configure iFIX OPC A&E Server dialog box is illustrated below.



In this illustration of the Configure OPC AE Server, note the following:

- User Fields 1 and 2 are selected.
- Alarm Extension Fields 1 and 2 are selected.
- The default attribute names of these iFIX fields are used: User Field1, User Field2, Alm Ext Field1, and Alm Ext Field2, respectively.
- The data source for User Field 1 is the A\_CV field - the current value of the block displayed as text.
- The iFIX OPC A&E Server filters alarms for NODE1.
- The Alarm Acknowledgment Security option is **not enabled** to Require Web HMI Security.
- The rest of the fields display the default settings.

For more information on these fields, refer to the [Description of Configuration Fields](#) section.

## Description of Configuration Fields

The Configure iFIX OPC A&E Server dialog box contains the following information:

- OPC Attributes
- User Field Data Source
- Advanced
- Alarm Acknowledgement Security

### OPC Attributes

This table lists the attributes that the server can send to OPC A&E clients for the alarms and events it handles. Select the check marks (☑) next to the attributes that you want to make available to the OPC A&E client.

You can edit attribute names of User Fields and Alarm Extension Fields. Names of attributes that appear in grey cannot be changed.

The table that follows describes the attributes passed to the collector.

iFIX Field Name	Attribute Description
Source Tag	The tag name. For example: AI-1.
Message Type	The iFIX message type. For example: ALARM, OPERATOR, ESIGNATURE, DELETE, and so on. Message types less than 11 characters in length use hard-coded trailing spaces to make up the difference. For instance, the "ESIGNATURE " message type includes a space at the end, and the "DELETE " message type includes five trailing spaces. For more information on message types, refer to the <a href="#">Selecting Specific Alarm and Message Fields</a> section.
Alarm Priority	Priority value before it is translated to a severity number. For example: INFO, LOLO, LOW, MEDIUM, HIGH, HIHI, or CRITICAL.
Areas	The iFIX alarm area to which the source belongs. iFIX provides 16 default alarm areas, named A through P; however, you can rename the default areas or add new ones. Each alarm area name is unique and can be up to 30 alphanumeric characters.
Node	The node where this event occurred. This value is the logical node name.
Physical Node	The physical node where this event occurred. This value is the local node

Name	name.
Application	The application responsible for this event (iFIX).
ApplicationVersion	The version of the application responsible for this event. For example: 3.5.5717.0.
Message ID	Globally Unique Identifier (GUID) that uniquely identifies the message.  This field does not contain a value for messages manufactured by the server such as acknowledgements or bad data quality notifications.
Alarm Status	The iFIX status, such as OK, LO, LOLO, and so on, before it is translated to the sub-condition name.
CV	The current value of the source when the condition occurred.
EngUnitLabel	The engineering unit label for the current value (CV).
Tag Description	The tag's description field as entered in the process database.
User Field1-4	User-configurable field names. Spaces are allowed in this name.  <b>NOTE:</b> Only text data (the A_ fields) are supported as user-configurable fields. Numeric data (the F_ fields) are not currently supported.
Alm Ext Field1-2	The text entered in the block's alarm extension field. Typically, the first extension field contains the name of the picture that shows alarms from the current block. Spaces are allowed in this name.
Operator Name	When security is enabled, this field represents the name of the currently logged in user.  <b>NOTE:</b> This value may be different than the Perform_Name value.
Operator Full Name	When security is enabled, this field represents the full name of the currently logged in user.  <b>NOTE:</b> This value may be different than the Perform_FullName value.
User Full Name	The full name of the user associated with the event.
Operator Node Name	The name of the SCADA node where the operator acknowledged the event.
Ack_By_FullName	The full name of the user who acknowledged the alarm.
Perform_Name	The first signature for this event.
Perform_FullName	The full name of the user who signed the first signature.
Perform_Comment	The comment associated with the first signature.
Verify_Name	The second signature for this event.
Verify_FullName	The full name of the user who signed the second signature.
Verify_Comment	The comment associated with the second signature.
Ack_Comment	The comment entered when acknowledging an alarm in the Alarm Viewer. This comment goes into Historian SQL tables where the alarm and events are stored.

### Select All and Restore Defaults Buttons

The Select All button enables the check mark next to all items in the OPC Attributes list.

The Restore Defaults button clears all user entries and restores the check marks for the default attributes:

- SourceTag
- Message Type
- Node
- Alarm Status
- CV
- EngUnitLabel

### User Field Data Source

If you select User Field 1, 2, 3, or 4 from the Attribute list, the fields become available in this group box. Enter the iFIX data source tag name.

**NOTE:** Only text data (the A\_ fields) are supported as user-configurable fields. Numeric data (the F\_ fields) are not supported.

User Fields are implemented in the same manner as they are in the Alarm ODBC. If you configured user fields in the Alarm ODBC, you need to configure them here as well. The values listed for the User Fields are available in the iFIX ODBC Alarm Service Configuration dialog box. Access this dialog box if you need to obtain User Field values for the iFIX OPC A&E Server configuration. Refer to the "Configuring the Alarm ODBC Service" section in the iFIX Implementing Alarms and Messages electronic book for more on how to access this dialog box.

### Advanced

The following table describes the fields in the Advanced group box.

**NOTE:** For the Priority Rankings in the following table, the Severity for the Alarm must conform to the OPC A&E specification guidelines. OPC Severity ranges from 1-1000, where 1000 is the most severe alarm. If you are using Web HMI with iFIX, be sure to read the "Alarm Microservice" topic or search for "alarm severity" in the Web HMI documentation. It's important to configure this severity correctly so that you get the results that you want to see in Web HMI. For example, events of high urgency can be mapped into the OPC severity range of 667-1000, events of medium urgency can be mapped into the OPC severity range of 334 to 666, and events of low urgency can be mapped into the OPC severity of 1 to 333.

Field	Description
Priority Rank - INFO	By default, the INFO (Informational) priority alarms for iFIX tags map to an OPC severity number of 40.  This number is configurable. OPC Severity ranges from 1-1000, where 1000 is the most severe alarm or event.  The iFIX alarm priority tag that this field maps to is the ALM_PRIORITY_INFO tag.
Priority Rank - LOLO	By default, the LOLO (Low Low) priority alarms for iFIX tags map to an OPC severity number of 80.  This number is configurable. OPC Severity ranges from 1-1000, where 1000 is the most severe alarm or event.  The iFIX alarm priority tag that this field maps to is the ALM_PRIORITY_LOLO tag.
Priority Rank - LOW	By default, the LOW priority alarms for iFIX tags map to an OPC severity number of 150.

	<p>This number is configurable. OPC Severity ranges from 1-1000, where 1000 is the most severe alarm or event.</p> <p>The iFIX alarm priority tag that this field maps to is the ALM_PRIORITY_LOW tag.</p>
Priority Rank - MEDIUM	<p>By default, the MEDIUM priority alarm for iFIX tags map to an OPC severity number of 500.</p> <p>This number is configurable. OPC Severity ranges from 1-1000, where 1000 is the most severe alarm or event.</p> <p>The iFIX alarm priority tag that this field maps to is the ALM_PRIORITY_MEDIUM tag.</p>
Priority Rank - HIGH	<p>By default, the HIGH priority alarms for iFIX tags map to an OPC severity number of 850.</p> <p>This number is configurable. OPC Severity ranges from 1-1000, where 1000 is the most severe alarm or event.</p> <p>The iFIX alarm priority tag that this field maps to is the ALM_PRIORITY_HIGH tag.</p>
Priority Rank - HIHI	<p>By default, the HIHI (High High) priority alarms for iFIX tags map to an OPC severity number of 900.</p> <p>This number is configurable. OPC Severity ranges from 1-1000, where 1000 is the most severe alarm or event.</p> <p>The iFIX alarm priority tag that this field maps to is the ALM_PRIORITY_HIHI tag.</p>
Priority Rank - CRITICAL	<p>By default, the CRITICAL priority alarms for iFIX tags map to an OPC severity number of 950.</p> <p>This number is configurable. OPC Severity ranges from 1-1000, where 1000 is the most severe alarm or event.</p> <p>The iFIX alarm priority tag that this field maps to is the ALM_PRIORITY_CRITICAL tag.</p>
Queue Size	<p>The maximum number of records that can be stored in the alarm queue.</p> <p>You must restart iFIX for Queue Size changes to be applied. The iFIX Queue design requires restart of iFIX if there is a change in queue size.</p> <p>For tips on how to deal with issues with the alarm queue, refer to the <a href="#">Troubleshooting</a> section.</p>
Only get alarms on node	<p>Select this option to filter the alarm by a the specified node name. Enter the logical node name in the field next to this check box.</p>

### Alarm Acknowledgement Security

This section contains the settings that determine how security is enforced for alarm acknowledgement requests received from the OPC A&E clients.

Setting	Description
Require Web	When disabled (the default), standard OPC A&E clients can acknowledge

HMI Security alarms in the same way as always, using the currently logged-in iFIX user privileges. Web HMI clients, however, are authorized using the privileges of the user logged into the Web HMI client.

When enabled, this setting requires alarm acknowledgements to come from a valid Web HMI session, and authorizes acknowledgements according to the logged-in Web HMI client user.

**NOTE:** When this option is enabled, standard, non-Web HMI client alarm acknowledgements are rejected.

## Configuration Available through the OPCAConfig.ini

The iFIX OPC A&E Server also includes settings that can be enabled through the OPCAConfig.ini file. The OPCAConfig.ini file can be found in the iFIX install path, within the LOCAL folder. These settings are not included in the UI, and only can be set through this .INI file. The iFIX OPC A&E Server must be restarted after changing these settings. See the following table for more information.

Field	Description
DisableStartupAlarms	<p>This parameter controls whether the iFIX OPC A&amp;E Server sends startup alarms to its clients. Startup alarms provide the clients with a list of the alarms that occurred prior to starting the Server.</p> <p>The settings for this parameter are:</p> <ul style="list-style-type: none"> <li>• 0 (default) - Send startup alarms to the clients.</li> <li>• 1 - Refrain from sending startup alarms to the clients; this setting effectively disables startup alarms.</li> </ul> <p>You configure the DisableStartupAlarms parameter by adding "DisableStartupAlarms=n" to the [Performance] section of the OPCAConfig.ini file in the LOCAL folder. If the DisableStartupAlarms parameter is absent from the [Performance] section, the default of 0 is used.</p>
WhenToSysAck	<p>This parameter allows you to control system acknowledgements. When system acknowledgement is enabled, acknowledgements that occur outside of an operator action are sent to the clients.</p> <p>The most common ways that acknowledgements can be done outside of an operator action are by using Acknowledge All, by using the Database Manager by writing directly to the A_NALM field of a tag in alarm or by using Remote Acknowledgement on a AA or DA tag. When system acknowledgement is disabled, only acknowledgements that occur within an operator action are sent to the clients. Using the WhenToSysAck parameter, you can disable or delay sending system acknowledgements to give the iFIX OPC A&amp;E Server the opportunity to process an "acknowledged by" operator message.</p> <p>The settings for this parameter are:</p> <ul style="list-style-type: none"> <li>• 0 (default) - Send system acknowledgements to the clients immediately after the alarm acknowledgement is detected.</li> </ul>

LogLevel

- n - Send system acknowledgements to the clients n seconds after the alarm acknowledgement is detected, with n ranging from 1 to 30000.
- -1 - Never send system acknowledgements to the clients; this setting effectively disables system acknowledgement.

You configure the WhenToSysAck parameter by adding "WhenToSysAck=n" to the [Performance] section of the OPCAEConfig.ini file in the LOCAL folder. If the WhenToSysAck parameter is absent from the [Performance] section, the default of 0 is used.

The LogLevel parameter controls the level of detail in the Server's log file (OPCAELog\_XXXXXXX.txt in the iFIX ALM path). Valid Log Levels include 1, 2, and 3.

- 1 (default) - Results in the least amount of information.
- 2 - Results in more information.
- 3 - Results in the greatest amount of information.

LogLevel=2 is usually sufficient for troubleshooting purposes. Do not leave a system set with Log Level=3 for long as this will fill a hard drive quickly.

You configure the LogLevel parameter by adding "Log Level=n" to the [Performance] section of the OPCAEConfig.ini file in the LOCAL folder.

**NOTE:** If you are using the iFIX OPC A&E Server with the Historian iFIX A&E Collector, it is recommended that you disable startup alarms (DisableStartupAlarms=1) and disable system acknowledgement (WhenToSysAck=-1) in the OPCAEConfig.ini file.

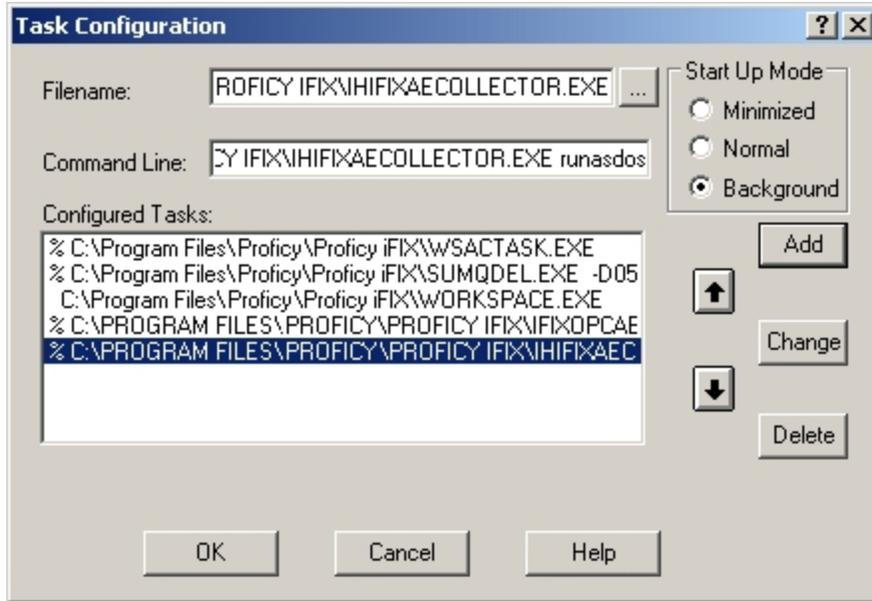
## Running the OPC A&E Server When You Start iFIX

To automatically run the iFIX OPC A&E Server when you start iFIX, add it to the startup task list in the iFIX SCU. To access the SCU, click Start and point to Programs, iFIX, and then System Configuration.

To display the Task Configuration dialog box, click the Task button on the SCU toolbox (or, on the Configure menu, choose Tasks). The tasks listed in the Configured Tasks box start when you run the iFIX Startup program.

After you configure the startup task list, if you want to run the iFIX OPC A&E Server as a service, you must configure iFIX as a service. You cannot run the OPC A&E Server as a service if iFIX is not configured to run as a service. Refer to the [Configure the iFIX OPC A&E Server](#) section for more details about running in these different manners from the SCU.

If you also want to add the OPC A&E client to the task list, make sure that it is listed *after* the OPC A&E Server. That way, when the client connects to the running server, it does not spawn another instance of the server. For instance, in the following figure the GE Historian OPC A&E Collector (ihIFIXAECollector.EXE) client appears after the OPC A&E Server (iFixOPCAESrv.exe). The ihIFIXAECollector.EXE runs with the runasdos command.



*iFIX Task Configuration Dialog Box*

**NOTE:** The path illustrated for the GE Historian OPC A&E Collector (ihIFIXAECOLLECTOR.EXE) in the above figure - that appears as the last item in the task list - is not the default path that the collector installs to. Also, be aware that adding the Historian OPC A&E Collector to the SCU task list is the preferred way to start this collector. The collector then starts automatically whenever you start iFIX.

A percent sign (%) preceding a task means that iFIX Startup starts that task in the background. To change the state of a task, select the task, select an option from the Start Up Mode group box, and click Change. iFIX executes the tasks in the same order as they appear in the Configured Tasks list. To remove a task from the list, select the task from the Configured Tasks list and click Delete.

After you add the iFIX OPC A&E Server to the task list, you must restart iFIX for your change to take effect. For information on how to configure the SCU task list, refer to the [Configure the iFIX OPC A&E Server](#) section.

## Synchronizing Network Clocks

The system clocks for each iFIX node on the network should be synchronized. This ensures that the client (such as the Historian Archiver) does not receive events that appear to happen in the future, and that when viewing stored data you will see events in the order that they occurred.

Since the iFIX OPC A&E Server receives and sends alarms in GMT format, there is no requirement for iFIX operator computers and SCADA nodes to be in the same time zone.

## Connecting and Disconnecting from the Server

Any OPC A&E client, including the Historian OPC A&E Collector, can connect to the iFIX OPC A&E Server. As with any OPC server, if the iFIX OPC A&E Server is not running when a client tries to con-

nect to it, the server starts automatically. If a client tries to connect to a server that is already running, the client connects to the running instance of the server.

When shutting down the iFIX OPC A&E Server, the server behaves according to COM rules. That is, whatever started the server must shut it down. So, if the client startup caused the server to start, when the client shuts down, the server shuts down (as long as there are no other clients connected). Under COM rules, a server should continue to run as long as there are connected clients. If the OPC A&E Server started before the client started, however, the server will continue to run after the clients disconnect.

The server delivers all the alarms and events generated from iFIX from the time the server starts up. Therefore, the client receives alarms and events generated from the time it connects to the server. The client has no knowledge of any events that occurred prior to its connection, including information about alarms originating from iFIX database blocks during the startup.

To disconnect all connected clients from the iFIX OPC A&E Server, on the File menu, choose Request Clients to Disconnect. For more information about disconnecting clients, refer to the [Disconnect All Clients](#) section.

## Running Multiple Clients

In most cases, multiple instances of the OPC A&E clients can connect to the server without any additional configuration. In some cases however, you may need to perform some extra configuration. For instance, when clients connect to the server while running in different modes or user accounts, you may need to change some DCOM configuration settings for the server or the clients.

For example, when running the GE Historian OPC A&E Collector as a service and another OPC client as a normal foreground application, you must perform additional configuration before both clients will be able to receive events from the iFIX OPC A&E Server.

In this scenario, you have two options:

- Option 1: Run the iFIX OPC A&E Server as a service
- Option 2: Run the iFIX OPC A&E Server as a local server (not as a service)

Option 1 is the preferred method. Configuration steps vary depending upon the version of Windows. Refer to the following sections for more information in the [Configure DCOM Settings in Windows XP and Windows Server 2003](#) section.

## Browsing Sources and Areas

### Sources

An OPC A&E client can request a list of sources from the server. The server returns a list of all sources from which it currently obtains alarms. Each source name is in the "*Node.Tag*" format. The node name appears as part of the tag name. Therefore, the user does not need to browse the node to obtain the tag name. For an Alarm Source that is not associated with a specific tag (such as the SAC Started or iFIX Shutdown event notification), the data source name is "iFIX."

**NOTE:** Only sources that went into an alarm state since the OPC A&E Server startup are available when browsing.

As such, the list of returned sources may not match the actual list of sources. If the iFIX OPC A&E Server processes the alarms for all nodes, such as when it acts as a concentrator node, then the client can browse tags for all nodes.

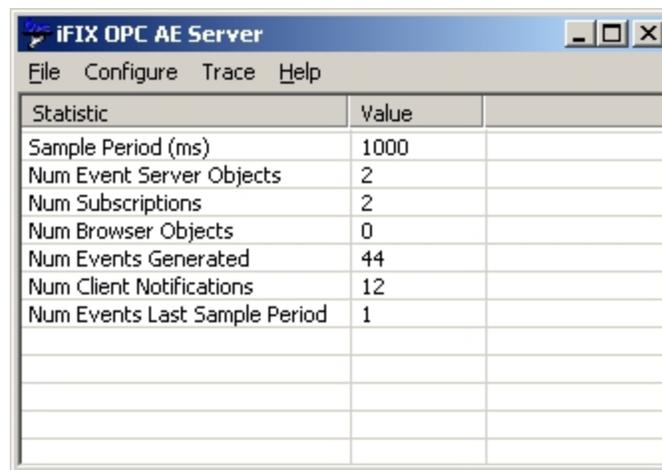
### Areas

OPC A&E areas are represented by iFIX alarm areas. The client can request, from the iFIX OPC A&E Server, a list of all the alarm areas that exist. The server responds to the browse request by retrieving a list of alarm areas for each block which appears in the source browse.

For GE Historian, the source area(s) will be passed to the collector as a vendor attribute. Sending an alarm for a source with multiple areas is valid, since the area is not part of the source name.

## Viewing iFIX OPC A&E Server Statistics

As you work with the iFIX OPC A&E Server Configuration utility, the main window continuously updates with information and statistics on the current OPC Server session, as illustrated below.



The screenshot shows a window titled "iFIX OPC AE Server" with a menu bar containing "File", "Configure", "Trace", and "Help". Below the menu bar is a table with two columns: "Statistic" and "Value". The table contains the following data:

Statistic	Value
Sample Period (ms)	1000
Num Event Server Objects	2
Num Subscriptions	2
Num Browser Objects	0
Num Events Generated	44
Num Client Notifications	12
Num Events Last Sample Period	1

In the above example, we observe the following data:

- The current sample time for periodic statistics is 1,000 milliseconds (or one second).
- There are currently two event server objects instantiated, indicating two active clients.
- Two subscriptions have been created by the OPC clients.
- No browse sessions are currently underway (since there are zero browse objects).
- 44 events have been generated since the server started.
- 12 event notifications have been sent to the server's clients (an event notification can contain data for multiple events).
- Only one event was generated within the last 1,000 milliseconds (the sample period time).

## Descriptions of iFIX OPC A&E Server Statistics

The following table describes the statistics displayed in the main window for the iFIX OPC A&E Server. For an example of this window, refer to the [Viewing Proficiency iFIX OPC A&E Server Statistics](#) section.

Statistic	Description
Sample Period	The length of the sample period for the Num Events Last Sample Period statistic, in milliseconds.  <b>TIP:</b> To change the Sample Period, on the Configure menu, choose Set Refresh Rate. Enter the new value in the Alarm Refresh Rate field in seconds.
Num Event Server Objects	The number of OPC clients connected to this server. This is referred to as "Event Server Objects" because the iFIX OPC A&E Server instantiates a separate event server object for each active client.
Num Subscriptions	The number of active subscriptions to alarm and event data for all active OPC clients.
Num Browser Objects	The number of OPC item browse sessions that are currently under way. Once they have connected to the iFIX OPC A&E Server, OPC clients that include support browse capabilities can open a browsable list of available OPC items. Users can then select which items to which they want to subscribe.
Num Events Generated	The total number of alarm events generated during this session. This includes events for all currently-active connections.
Num Client Notifications	The total number of alarm event notifications that have been sent to OPC clients.  <b>NOTE:</b> An alarm notification can contain data for multiple events. OPC clients are notified of alarm events only if they have subscribed to the relevant OPC items.
Num Events Last Sample Period	The number of alarm events generated during the last sample period. This includes events for all currently-active connections.

## Sample Period vs. the Refresh Rate

The Sample Period field appears in the main window of the iFIX OPC A&E Server utility. This value represents the length of the sample period for the Num Events Last Sample Period statistic, in milliseconds. If you want to change the Sample Period, you need to enter a new value for the Alarm Refresh Rate. This field is configured in the Set Refresh Rate dialog box.

**NOTE:** The Set Refresh Rate dialog box displays the Sample Period value in seconds, while the iFIX OPC A&E Server utility displays the refresh rates in milliseconds.

To access the Set Refresh Rate dialog box, on the Configure menu, choose Set Refresh Rate. The Alarm Refresh Rate value sets how often the iFIX OPC A&E Server checks for new alarms. For instance, say that you have your refresh rate set to 10 seconds. After the first 10 seconds, the iFIX OPC A&E Server finds 100 new alarms. It processes all of these alarms, and after processing them the OPC A&E Server waits another 10 seconds to check again for new alarms.

The Data Refresh Rate sets how often the iFIX OPC A&E Server checks for an unexpected deletion of an open alarm (such as HIHI, LO). In most cases, these events will not occur. Examples of when unexpected deletions occur in open alarms include the following scenarios:

- A deleted tag
- Database reload
- An iFIX shutdown on a remote node
- Disabled alarming
- Remote node loses communication to iFIX (such as during a network failure)
- Tag placed off-scan

For example, if you delete a HHHI alarm from iFIX or reload the entire database, a bad data quality notification occurs for each of the open alarms. The Data Refresh Rate determines how often the OPC A&E Server checks for that notification.

## How Do I...

This section outlines the steps perform the following tasks:

- [Configure the iFIX OPC A&E Server](#)
- [Configure DCOM Settings](#)
- [Filter Alarms and Events By Node Name](#)
- [Disconnect All Clients](#)

## Configure the iFIX OPC A&E Server

- [Entering information in the Configure iFIX OPC A&E Server dialog box](#)
- [Running the server as a service when iFIX starts](#)
- [Verifying that the iFIX OPC A&E Server is running after starting iFIX](#)
- [Verifying that the iFIX OPC A&E Server is running as a service](#)

## Configuration Overview

After installing the iFIX OPC A&E Server, you need to configure it. To do so, run the iFixOPCAESrv.exe file in your iFIX folder (C:\Program Files (x86)\GE\iFIX, by default) and enter the configuration information in the Configure iFIX OPC A&E Server dialog box.

If iFIX is already running as a service, do not run the iFIX OPC A&E Server by double-clicking the iFixOPCAESrv.exe file. Instead, use the iFixOPCAESrv.exe -config command line to open the iFIX OPC A&E Server and enter configuration information. Be aware that while iFIX is running as a service, you must restart the iFIX OPC A&E Server for any configuration changes you make to take effect.

To run the iFIX OPC A&E Server as a service, you need to run iFIX as a service. If iFIX is not already configured as a service, enable the "Continue Running After Logoff" option in the Local Startup Definition dialog box of the SCU. Before you can enable this option, you must exit iFIX. You can then update

the SCU task list by adding the iFIX OPC A&E Server. The next time you start iFIX, it starts as a service along with the iFIX OPC A&E Server.

When running as a service, iFIX and the iFIX OPC A&E Server continue to run after you log off from your Windows user account. For more information, refer to the [Running iFIX as a Service](#) section of the Setting Up the Environment electronic book.

**NOTE:** When configured to run as a Windows' service, the OPC A&E Server appears as "iFIX OPC Alarms and Events Server" in the list of services. iFIX appears as "iFIX server" in the list of services. To view the Services window, from the Control Panel, point to Administrative Tools, and then click Services.

► **To enter information in the Configure iFIX OPC A&E Server dialog box:**

1. Start iFIX.
2. Open the Windows Explorer.
3. Browse to the folder that contains the installed iFIX product. If you installed to the default location, browse to the C:\Program Files (x86)\GE\iFIX folder.
4. Double-click the iFixOPCAESrv.exe file. the iFIX OPC A&E Server appears.

**NOTE:** If iFIX is running as a service, the iFixOPCAESrv.exe file does not appear automatically when you double-click it. Instead, on the Start menu, point to Run, and in the Open field enter:

iFixOPCAESrv.exe -config

Click Run. the iFIX OPC A&E Server appears. Be aware that when iFIX is running as a service, you must restart iFIX after entering your configuration changes.

5. On the Configure menu, click Configure Fields. The Configure iFIX OPC A&E Server dialog box appears.
6. Enter the required information. For more information on these fields, refer to the [Description of Configuration Fields](#) section.
7. Click OK to save the configuration.

**IMPORTANT:** You must restart iFIX for your changes, such as Queue Size, to be applied.

► **To run the server as a service when iFIX starts:**

**NOTE:** In this configuration, no user interface displays. The iFIX OPC A&E Server continues to run after you log off from your Windows user account.

1. Shut down iFIX.
2. Make sure that you are logged in as a user in the Administrators group. If not, log in as an Administrator now. You must be logged in as an Administrator to configure iFIX to run as a service.
3. Click the Start button and point to Programs, and then iFIX, and click System Configuration. The SCU appears.
4. On the Configure menu, click Tasks. The Task Configuration dialog box appears.
5. In the Filename field, click the browse (...) button. The "Select file name to use..." dialog box appears.
6. Browse to the iFIX installation folder. By default, this is C:\Program Files (x86)\GE\iFIX folder.
7. Select the iFixOPCAESrv.exe file in the iFIX folder and click Open.
8. Click Add. The new entry should appear in the Configured Tasks list.

9. Click OK.
10. Configure iFIX to run as a service.  
**TIP:** To configure iFIX to run as a service, on the Configure menu, click Local Startup. The Local Startup Definition dialog box appears. Select the Continue Running After Logoff option. This option runs iFIX as a service and all its configured tasks whenever you start iFIX.
10. On the File menu, click Save to save the SCU.
11. On the File menu, click Exit.
12. Restart iFIX to apply the configuration changes you made in the SCU task list. As iFIX restarts it should start the iFIX OPC Alarms and Events Server as a service.

► **To verify that the iFIX OPC A&E Server is running after starting iFIX:**

1. Start iFIX.
2. Press CTRL+ALT+DELETE and click the Task Manager button. The Windows Task Manager appears.
3. Click the Processes tab.
4. Confirm that iFixOPCAESrv.exe appears in the list.

► **To verify that the iFIX OPC A&E Server is running as a service:**

1. Start iFIX, if it is not already running.
2. From the Control Panel, point to Administrative Tools, and then click Services. The Services dialog box appears.
3. Scroll to the iFIX OPC Alarms and Events Server entry.
4. Confirm that the Status field displays "Started."

## Configure DCOM Settings in Windows

**NOTE:** In most cases, multiple instances of the OPC A&E clients can connect to the server without any additional DCOM configuration. In some cases, however, you may need to change DCOM settings for the server or the client. For more information on these scenarios and the options available for each one, refer to the [Running Multiple Clients](#) section.

- [Configuring the DCOM settings when the iFIX OPC A&E Server runs as a service](#)
- [Configuring the DCOM settings when the iFIX OPC A&E Server runs as a local server](#)

► **To configure the DCOM settings when the iFIX OPC A&E Server runs as a service:**

1. Ensure that you are logged in to Windows as an administrator.
2. Ensure that the iFIX OPC AE Server is configured as a service, as described in the [Configure the iFIX OPC A&E Server](#) section.
3. Create a new Windows user account under which the iFIX OPC A&E Server will run. Set its permission level to Administrator. For more details on how to add user accounts, refer to the Microsoft® Windows® help.

4. Shut down iFIX, if it is running.
5. Click the Start button on the Windows taskbar and select Run (or type Run) and press Enter. The Run dialog box appears.
6. Enter dcomcnfg.exe and click OK. The Component Services Microsoft® Management Console (MMC) snap-in appears.
7. Double-click the Component Services folder.
8. Double-click the Computers folder within the Component Services folder.
9. Double-click the My Computer (or computer name) icon.
10. Double-click the DCOM Config folder to display the list of DCOM applications.
11. Locate the iFIX OPC Alarms and Events Server in the list of applications, right-click it, and select Properties. The My Computer Properties dialog box appears.
12. Select the Security tab.
13. In the Access Permissions group box, select the Customize option and then click Edit. The Access Permission dialog box appears.
14. Click Add to add the new user created in step 3 or the group that this user belongs to. In Permissions area of the dialog box, select Allow Access for this user.
15. Click OK.
16. With the Security tab still selected, in the Launch Permissions group box, select the Customize option (if it is not already selected) and then click Edit. The Access Permission dialog box appears.
17. Click Add to add the new user created in step 3 or the group that this user belongs to. In Permissions area of the dialog box, select Allow Launch for this user.
18. Click OK.
19. Select the Identity tab.
20. Change the account which will run this application from *The launching user* to *This user*.
21. Type in the User name and password created in step 3.
22. Click OK. Your settings should take effect the next time you start the iFIX OPC A&E Server.
23. Configure iFIX to start under the account created in step 3.
24. Depending on the OPC A&E clients you use, you may also need to configure the OpcEnum application in the same way that you configured the iFIX OPC Alarms and Events Server application in the Distributed COM Configuration Properties dialog box.
25. Restart iFIX.

The iFIX OPC A&E Server starts with iFIX since you listed it in the SCU task lists. Any client that tries to connect to the server connect to this instance. To ensure that you successfully performed these steps, ensure that there is only one instance of iFIXOPCAESrv.exe listed in the Windows Task Manager, while multiple clients are connected.

► **To configure the DCOM settings when the iFIX OPC A&E Server runs as a local server:**

1. Add the iFIX OPC A&E Server to the iFIX SCU task list, so that it runs with no command line options:
  - a. In the SCU on the Configure menu, choose Tasks. The Task Configuration dialog box appears.
  - b. In the Filename field, click the browse (...) button. The "Select file name to use..." dialog box appears.
  - c. Browse to the iFIX installation folder. By default, this is C:\Program Files (x86)\GE\iFIX.
  - d. Select the iFixOPCAESrv.exe file and click Open.
  - e. Click Add. The new entry should appear in the Configured Tasks list.
  - f. Click OK.
  - g. From the File menu, choose Save to save the SCU.
2. Restart iFIX. As iFIX restarts it should start the iFIX OPC A&E Server.
3. Follow step 4-22 from option 1, above. When a name and password is required, enter those for the currently logged-in user account.

**TIP:** Press **Ctrl+Alt+Del** to view information on the current user.

4. Depending on the OPC A&E clients you use, you may also need to configure the OpcEnum application in the same way that you configured the iFIX OPC Alarms and Events Server application in the Distributed COM Configuration Properties dialog box.

**IMPORTANT:** If you want to always run the iFIX OPC A&E Server with the user interface, you cannot run iFIX as a service.

## Filter Alarms and Events By Node Name

By default, an iFIX OPC A&E Server obtains alarms and events from all attached nodes. For example, each OPC A&E Server in the configuration described in the [Local Node Setup](#) section obtains alarms and events for all three iFIX nodes, since they are all in the same network. This means that each OPC A&E Server obtains three copies of each alarm. Filtering alarms and events by node name lets the OPC A&E Server obtain data only from one specific node.

When filtering is enabled, an OPC A&E Server delivers only the following data:

- Alarms and events for the specified node.
- All Simple or Tracking event messages. For a list of Simple and Tracking event attributes, refer to the [Attributes Passed to the OPC A&E Client](#) section.

To enable filtering in the [Local Node Setup](#) section, in the Configure iFIX OPC A&E Server dialog box on each node, select the *Only get alarms on node* check box and enter the logical node name of the node that you want to filter by. The node name that you enter should be the same on all three configured nodes.

In addition, leave one Historian OPC A&E Collector configured to receive simple, tracking, and condition event types. Configure all of the other Historian OPC A&E Collectors (in this case, the other two

Collectors) to filter by condition events. This client configuration is necessary to remove duplicate simple and tracking messages, since these messages are not associated with a node as are the condition messages.

These steps should prevent the sending of duplicate messages to the Historian Archiver.

► **To filter alarms and events by node name:**

1. Start the iFIX OPC A&E Server: double-click the iFixOPCAESrv.exe file in the iFIX installation folder (by default, this is C:\Program Files (x86)\GE\iFIX).  
the iFIX OPC A&E Server dialog box appears.
2. On the Configure menu, click Configure fields. The Configure iFIX OPC A&E Server dialog box appears.
3. Select the *Only get alarms on node* check box.
4. Enter the logical node name in the field next to this check box.

**TIP:** For more information on this dialog box, refer to the [Understanding the Configure iFIX OPC A&E Server Dialog Box](#) section.

5. Click OK.
6. Restart the iFIX OPC A&E Server.

## Disconnect All Clients

If needed, you can disconnect a iFIX OPC A&E Server from all connected clients at once.

► **To disconnect from all clients:**

1. Start the iFIX OPC A&E Server: double-click the iFixOPCAESrv.exe file in the iFIX installation folder (by default, this is C:\Program Files (x86)\GE\iFIX).  
the iFIX OPC A&E Server dialog box appears.
2. On the File menu, click Request Clients to Disconnect.

**NOTE:** There may be scenarios when all clients do not disconnect. This can occur due to a provision in the OPC A&E specification that allows clients to deny this request.

## Advanced Features

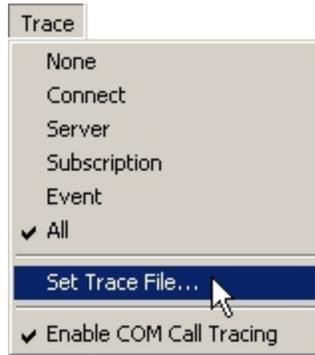
Advanced features of the iFIX OPC A&E Server are described in the following topics:

- [Trace Logging OPC A&E Server Communications](#)
- [Proficy iFIX OPC A&E Data Source Syntax](#)
- [Failover Configuration Notes](#)

## Trace Logging OPC A&E Server Communications

**NOTE:** The Trace Logging feature is designed for use only by support personnel to assist in diagnosing issues with the OPC A&E Server.

the iFIX OPC A&E Server includes a built-in trace log feature to help diagnose issues with your system. This feature logs communications with the OPC Server into a text file. Advanced users can use this log file to trace a history of communication events dealt with by the OPC Server. The trace log options are available from the iFIX OPC A&E Server's Trace menu.



*Trace Log Menu Options*

The Trace Log file is a simple text file. To specify the name and location of the log file, on the Trace menu, choose Set Trace File. By default, the trace file name is AETrace.txt, and it is saved to the My Documents folder.

The information logged for each event includes:

- The date and time the event occurred.
- The type of event.
- Any parameters and attributes supplied with the event.

For an example of a trace log file, refer to the [Example Trace Log File](#) section.

## Specifying Logged Data

To specify the data logged in the trace log file, select the desired item on the Trace menu. The current information that will be logged is indicated with a check mark (✓). You can choose from the following types of communication information:

Menu Option	Description
None	Turns off logging for Connect, Server, Subscription, and Event items.
Connect	Logs information on attempts by the iFIX OPC A&E Server to connect or disconnect with the iFIX SCADA server target.
Server	Logs information on general iFIX OPC A&E Server communication events.
Subscription	Logs attempts by external OPC clients to subscribe to data supplied by the iFIX OPC A&E Server.
Event	Logs information on alarm events read by the iFIX OPC A&E Server from the iFIX targets it is connected with.
All	Logs all types of events: Connect, Server, Subscription, and Event.

**Enable COM Call Tracing** Logs incoming and outgoing COM messages. This may be useful if an administrator needs to diagnose COM or DCOM issues.

**NOTE:** Only one of Connect, Server, Subscription, and Event can be enabled at a time. If you want to log information on more than one of those types of events, choose All.

Trace logging can be a CPU-intensive operation. It is recommended that you use trace logging only when setting up your OPC Clients and Server or to diagnose communication problems, turning it off when the system is functioning correctly.

The options selected in the Trace menu determine the information that appears in the trace log file. The following messages illustrate the type of information that trace log file provides. In this sample portion of text from the log file, the All option was selected for the trace log:

```
...
2004-07-30 13:28:19.198 : NDIAEServer.dll : OPC A&E Client connected : id='33010800'
2004-07-30 13:28:22.653 : NDIAEServer.dll : Client '33010800' created subscription : handle=1243108, active=1, buffer t
2004-07-30 13:28:28.792 : NDIAEServer.dll : Client '33010800' removed subscription : handle=1243108
2004-07-30 13:28:28.792 : NDIAEServer.dll : OPC A&E Client disconnected : id='33010800'
2004-07-30 14:56:43.879 : NDIAEServer.dll : Queued event : source='', type=TRACKING, category=4, cond='', subcond='', m
2004-07-30 14:56:47.906 : NDIAEServer.dll : Queued event : source='SLEMOB.AI_ML1', type=CONDITION, category=1, cond='T
2004-07-30 14:56:48.907 : NDIAEServer.dll : Queued event : source='SLEMOB.AI_NEW', type=CONDITION, category=1, cond='T
2004-07-30 15:18:28.975 : NDIAEServer.dll : TRACE FILE OPENED / CREATED
...
```

## iFIX OPC A&E Data Source Syntax

When configuring third party OPC clients, a client utility (such as GE Historian) typically generates lists of OPC items or data sources to which the client can subscribe. If the OPC client does not support browsable item lists, you will have to manually specify the path for each OPC item.

In an alarm event sent by the iFIX OPC A&E Server, the category, condition, sub-condition, and attributes of an event detail the specific alarm that occurred. For more information, refer to the [iFIX Message Mappings](#) section.

### Alarm Data Source Syntax

The general syntax for alarm-related iFIX OPC A&E data sources is as follows:

```
LogicalNodeName.Tagname
```

where *LogicalNodeName* is the name of the iFIX node where the event occurred and *Tagname* is name of the tag associated with the alarm.

For example, here is the syntax for tag A1 on iFIX NODE1:

```
NODE1.AI1
```

**NOTE:** For an Alarm Source that is not associated with a specific tag (such as the SAC Started or iFIX shut-down event notification), then the data source name is "iFIX."

## Failover Configuration Notes

When using the iFIX OPC A&E Server with iFIX, failover configurations are supported. For information on how to configure failover setting in the iFIX environment, refer to the [Enhanced Failover](#) electronic book.

Both the primary and secondary SCADA servers should use the same settings for the iFIX OPC A&E Server. To ensure that both SCADA servers have the same settings, first configure the OPC A&E Server on the primary server first. Next, copy the OPCAEEConfig.ini file from the Local folder under the iFIX installation directory on the primary server (by default, this is C:\Program Files (x86)\GE\iFIX\Local) to the same folder on the secondary server. This ensures that both servers have the same OPC A&E Server configuration.

When using iFIX OPC A&E Server with Historian, it is recommended that both the server and the collector be installed on both SCADA servers in failover configurations. However, the failover configuration of the SCADA nodes is dependent on the configuration of both the GE Historian OPC A&E Collector and the Historian Archiver.

## Troubleshooting

The following are possible issues that can occur when processing alarms with the iFIX OPC A&E Server:

- [Alarm Queue Overflow](#)
- [Alarm Processing Rate Set Too Moderately](#)

A possible indication that the Server is not processing all alarms is a discrepancy between the number of events appearing in iFIX versus the number collected in the Historian archive.

If you experience problems starting the iFIX OPC A&E Server, it could be because you have more than one instance of the iFIX OPC A&E Server running. In this case, the [Server Starts in Configuration Mode](#) only.

This section provides tips for troubleshooting these issues and enhancing the performance of the iFIX OPC A&E Server.

### Alarm Queue Overflow

#### Issue

If the alarm queue for the iFIX OPC A&E Server overflows, the server could be dropping alarms before it has a chance to process them. An iFIX error message may appear indicating that the queue overflowed.

#### ► To verify that the alarm queue actually overflowed:

1. While iFIX is running, type the following at the command line:

```
almstat
```

The Alarm Status Utility appears.

2. Type Q to view the alarm queue status.
3. For the iFIXOPCAEQ queue, review the Lost column:
  - If a number other than zero appears in this column, an alarm overflow occurred.
  - If the alarm queue reads 0, then refer to the [Alarm Processing Rate Set Too Moderately](#) section. The alarms could be dropping for a different reason.

### Possible Solution

Change the queue size. The queue size is the maximum number of records that can be stored in the alarm queue. By increasing the queue size in the iFIX OPC A&E Server, you can prevent the alarm loss.

#### ► To change the queue size:

1. From the iFIX OPC A&E Server window, on the Configure menu, click Configure Fields. The Configure Fields dialog box appears.
2. In the Queue Size field, enter a new value. This value can be any number from 1 to 32,767.
3. Restart the iFIX OPC A&E Server.

**NOTE:** Other iFIX applications, such as the Alarm ODBC service (ALMODBC.exe) require the same queue size configuration. Refer to the "Configuring Alarms" section of the *Implementing Alarms and Messages* electronic book for details on configuring the Alarm ODBC Service and other alarm options.

## Alarm Processing Rate Set Too Moderately

### Issue

If the iFIX OPC A&E Server does not send all events, the alarm processing rate may be set too moderately. In this case, alarms appear to have dropped, but the alarm queue did not overflow. The rate at which the iFIX OPC A&E Server processes alarms may not be fast enough.

### Possible Solution

Tweak the server configuration to improve the throughput rate for alarm processing in the iFIX OPC A&E Server.

#### ► To modify the alarm processing rate:

1. From the iFIX OPC A&E Server window, on the Configure menu, click Set Refresh Rate. The Set Refresh Rate dialog box appears.
2. Modify the values in these fields:
  - **Alarm Refresh Rate** - the frequency (in seconds) that server looks for new alarms.
  - **Data Refresh Rate** - the frequency (in seconds) that the server queries iFIX to send bad data quality notifications.

Experiment with different values and see how they improve or hinder the alarm processing rate.

For performance, set the Alarm Refresh Rate to 1 and the Data Refresh Rate to the highest number that is acceptable for your application. For example, change the Alarm Refresh Rate to 1 and the Data Refresh Rate to 500. The server will be able to process more new events at once. This will be at the cost of delaying the time it takes to receive a bad quality notification if a tag in the alarm is manual deleted.

3. Restart the iFIX OPC A&E Server.

## Server Starts in Configuration Mode

### Issue

If a message appears when the iFIX OPC A&E Server starts, indicating that you are in configuration mode, there is more than one instance of the OPC A&E Server running. Be aware that you are allowed to run multiple server instances at one time, but only the first instance serves events to the clients. Subsequent instances allow the configuration of the server from the user interface, but these instances will not serve any events to clients.

If a message such as this appears and you did not intend to run in configuration mode, you may need to perform one of the following tasks, and then restart the server:

- Reconfigure the SCU task list
- Apply additional settings for the Windows DCOM configuration if using multiple clients
- Shutdown iFIX or other applications

### Possible Solution

Before deciding which task applies, you should verify the actual number of instances of the server that are running. To verify the number of running instances, open the Windows Task Manager, click the Processes tab, and count the number of iFIXOPCAESrv.exe processes that are running. If the iFixOPCAESrv.exe appears more than once, the server is running more than one instance. The solutions vary depending on the number of running instances of the server.

### If More Than One Running Server Instance Appears...

If more than one instance of the server appears running in the Windows Task Manager, and you did not explicitly start the other services, perform the following tasks:

- If the iFIX SCU task list includes both the server and client, ensure that the client appears after the server in the task list. Reconfigure the SCU task list if necessary.
  - For an example of the SCU task list, refer to the [Running the OPC A&E Server When You Start iFIX](#) section.
  - For steps on how to configure the SCU task list properly, refer to the [Configure the iFIX OPC A&E Server](#) section.

- If there are multiple clients connecting to the server, ensure they are all properly configured. In some cases, you may need to perform some extra configuration steps to the additional clients. Refer to the [Running Multiple Clients](#) section for details on these configuration steps.

### If Only One Running Server Instance Appears...

If only one instance of the server appears running in Windows Task Manager, it's possible that the server may not have shutdown correctly on a previous occasion. For example, other applications still accessing server resources while the server is trying to shutdown would cause this scenario to occur. To resolve this issue, shutdown these applications, as well as the OPC A&E Server running in configuration mode, to allow the server to complete its shutdown process. The server can then be properly restarted.

One way to restart the iFIX OPC A&E Server with its full functionality is to restart iFIX. However, if you do not want to restart iFIX, it may be possible to shutdown the specific application that is preventing the server shutdown from occurring. One known application that will cause this behavior is the iFIX ALMSTAT utility.

#### ► To verify that you can restart the server with its full functionality:

1. Shutdown the iFIX OPC A&E Server from the Windows Task Manager.

**NOTE:** If ALMSTAT is running in the Windows Task Manager, you must shut it down and then restart it, since it is likely to be the offending application.

2. While iFIX is running, type the following at the command line:

```
almstat
```

The Alarm Status Utility appears.

3. Type Q to view the alarm queue status.
4. Look for iFIXOPCAEQ in the list.
  - If iFIXOPCAEQ is not listed as one of the queues, then you verified that it is okay to restart the server and that it will run with its full functionality.
  - If the iFIXOPCAEQ appears in the list, shutdown an iFIX or OPC application in the Windows Task manager, and then repeat steps 1-3. Repeat this step until the iFIXOPCAEQ queue no longer appears in ALMSTAT utility. Once the server successfully restarts, you can start up any iFIX or OPC applications that you shutdown.



# Index

---

## A

advanced features 29  
alarm 32  
    differences (FIX32 and iFIX) 11  
    processing rate 33  
    queue overflow 32  
areas, browsing 21  
attributes 9

## B

browsing sources and areas 21

## C

clients, disconnecting 29  
concentrator node setup 5  
configuration fields, described 14  
configuration mode, OPC A&E Server 34  
Configure iFIX OPC A&E Server dialog box 13  
configuring, iFIX OPC A&E Server 24  
connecting and disconnecting 20

## D

data source syntax 31  
DCOM configuration 26  
    Windows 26  
description 22  
    configuration fields 14  
disconnecting 20

---

## F

failover 31  
features 2  
filtering by node name 28

## G

getting started, iFIX OPC A&E Server 1

## I

iFIX message mappings 8

## L

local node setup 4  
logged data 30

## M

message mappings, iFIX 8  
multiple clients 21

## N

node name filtering 28

## O

OPC  
    overview 6  
    server configuration 12  
OPC A&E Server 1  
overflowed queue 32

## P

passed attributes 9  
processing rate for alarms 33

---

## Q

queue overflow 32

## R

running 21

    as a service 19

    multiple clients 21

running, other GE products with the OPC A&E  
Server 3

## S

sample period vs. the refresh rate 23

service, running as 19

setting up 3

setup examples 4

    concentrator node 5

    local node 4

sources, browsing 21

specifying logged data 30

standard OPC alarm event parameters 8

statistics, OPC A&E Server 22

statistics, server 22

steps 24

synchronization of network clocks 20

syntax, data source 31

## T

trace log file example 31

trace logging 29

troubleshooting 32

---

## U

using other GE products 3

## V

viewing server statistics 22