

GENBROKER V8.0

Performance White Paper

**Version 8
August 2004**



OPC Automation at your fingertips

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Contents

1	<i>About This Document</i>	3
1.1	Scope of the Document	3
1.2	Copyright and Confidentiality	3
1.3	Revision History	3
2	<i>Introduction</i>	4
2.1	Overview	4
3	<i>Test Setup</i>	5
3.1	Hardware	5
	PC1: Server	5
	PC2: Client	5
3.2	Software	5
3.3	Network Layout	5
3.4	Testing Methodology	6
4	<i>Test Results – V8 Throughput</i>	7
4.1	OPC Server with 500 ms configuration: (OPC Direct, DCOM)	7
4.1.1	Visible OPC Tags:	7
4.1.2	Hidden OPC Tags:	7
4.2	GenBroker over TCP / IP	8
4.2.1	GenBroker over TCP/IP Visible OPC Tags:	8
4.2.2	GenBroker over TCP/IP Visible OPC Tags:	8
4.3	GenBroker over SOAP / XML	9
5	<i>Test Results – V8 verses V7</i>	10
5.1	Hardware	10
	PC1: Server	10
	PC2: Client	10
5.2	Test Results	10
5.2.1	OPC Direct CPU usage	10
5.2.2	GenBroker over TCP/IP CPU usage	10
5.2.3	OPC Direct First-Update Performance	11
5.2.4	GenBroker over TCP First-Update Performance	11
5.2.5	OPC Direct throughput	11
5.2.6	GenBroker over TCP throughput	12
6	<i>Conclusions</i>	13
6.1.1	OPC Direct Direct CPU usage is slightly higher in V8	13

6.1.2	GenBroker over TCP/IP CPU usage is slightly lower in V8	13
6.1.3	OPC Direct First-Update Performance is improved in V8	13
6.1.4	GenBroker over TCP First-Update Performance is improved in V8.....	13
6.1.5	OPC Direct throughput is improved in V8	13
6.1.6	GenBroker over TCP throughput is improved in V8.....	13

1 About This Document

1.1 *Scope of the Document*

The intended audience includes the design engineers working on the product, sales and marketing management as well as key customers providing input as to the features of this product.

1.2 *Copyright and Confidentiality*

The document is © Copyright 2004, ICONICS, Inc., Foxborough, Massachusetts as an unpublished work. It is considered CONFIDENTIAL, and contains trade secret information proprietary to ICONICS, Inc.

1.3 *Revision History*

1.0 Malish Patel, October 2003

1.1 Shafqat Akbar , May 2004

1.1 Oldrich Vecerek, May 2004

1.2 Shafqat Akbar, May 2004

1.3 Dave Oravetz, June 2004

2 Introduction

2.1 Overview

This document is written to outline a set of Tests, with their corresponding results, used to test GenBroker over TCP/ IP Channel and OPC direct (DCOM) Communication and GenBroker over SOAP/XML.

The objective of this set of tests is to determine the relative performance (load time and throughput) of various GraphWorX displays (500, 1000, 2000, 5000 and 10000 tags).

Two different sets of results were observed for different communication methods including visible and hidden OPC tags displays.

Each test (for *visible OPC tags* displays) recorded initial load time, OPC update rate for 60 second and CPU utilization on the Client (GraphWorX) PC for the following communication methods. A full detail of the results is provided in section 3.

- 1) OPC Direct (DCOM) Communication between Server and Client.**
- 2) GenBroker over TCP/IP Communication between Server and Client.**
- 3) GenBroker over SOAP/XML Communication between Server and Client (Yet to Test SOAP/ XML communications for V8.0)**

Each test (for *hidden OPC tags* displays) recorded Throughput and CPU utilization on the Client (GraphWorX) PC for the following communication methods. A full detail of the results is provided in section 3.

- 1) OPC Direct (DCOM) Communication between Server and Client.
- 2) GenBroker over TCP/IP Communication between Server and Client.
- 3) GenBroker over SOAP/XML Communication between Server and Client (Yet to Test SOAP / XML communications for V8.0)

3 Test Setup

3.1 Hardware

Two PC's have been used for these tests utilizing a 100 MB/s Ethernet Network.

PC1: Server

OS:	Windows XP Professional SP1
RAM:	512 MB
Processor:	Pentium IV, 2.4 GHz

PC2: Client

OS:	Windows XP Professional SP1
RAM:	512 MB
Processor:	Pentium IV, 2.4 GHz

3.2 Software

ICONICS Genesis Version 8.0

GraphWorx32 V 8.0.135

GenBroker V8.0.138

GenClient V 8.0.138

3.3 Network Layout

Both PC used utilized a 100 Mbps Ethernet Switch / Hub with 100 Mbps connection

3.4 Testing Methodology

The following displays were used to measure the initial load time and OPC update rates with visible and hidden OPC tags:

- 1) **AD250** - GWX Display with 250 Analog and 250 Digital Tags (500 Tags)
- 2) **ADH250** - GWX Display with 500 Hidden Tags
- 3) **AD500** - GWX Display with 500 Analog and 500 Digital Tags (1,000 Tags)
- 4) **ADH500** - GWX Display with 1,000 Hidden Tags
- 5) **AD1000** - GWX Display with 1,000 Analog and 1,000 Digital Tags (2,000 Tags)
- 6) **ADH1000** - GWX Display with 2,000 Hidden Tags
- 7) **AD2500** - GWX Display with 2500 Analog and 2500 Digital Tags (5,000 Tags)
- 8) **ADH2500** - GWX Display with 5,000 Hidden Tags
- 9) **AD5000** - GWX Display with 5,000 Analog and 5,000 Digital Tags (10,000 Tags)
- 10) **ADH5000** - GWX Display with 10,000 Hidden Tags

4 Test Results – V8 Throughput

4.1 OPC Server with 500 ms configuration: (OPC Direct, DCOM)

4.1.1 Visible OPC Tags:

# of Tags	1st Update (sec)	* # of OPC Update (per minute)	**Throughput	CPU Utilization
500	2	950	7916.67	28%
1000	4	900	15000.00	52%
2000	6	575	19166.67	75%
5000	10	185	15416.67	90%
10000	30	95	15833.33	100%

4.1.2 Hidden OPC Tags:

# of Tags	* # of OPC Update (per minute)	**Throughput	CPU Utilization
500	975	8125.00	25%
1000	915	15250.00	45%
2000	600	20000.00	65%
5000	187	15583.33	80%
10000	98	16333.33	100%

* **Update Rate** = Last OPC data update Time – Initial OPC data Update Time
(from GraphWorX– Gen Statistics)

** **Throughput** = Update Rate x # of Tags of GraphWorX Display / 60

All reading are at the client PC for GraphWorX displays

4.2 GenBroker over TCP / IP

4.2.1 GenBroker over TCP/IP Visible OPC Tags:

GB over TCP/IP with V3.10 Sim OPC Server 500 ms Configuration - Visible Tags

# of Tags	1st Update (sec)	* # of OPC Update (per minute)	**Throughput	CPU Utilization
500	3	252	2100.00	25%
1000	5	240	4000.00	45%
2000	7	195	6500.00	65%
5000	25	85	7083.33	75%
10000	35	72	12000.00	95%

4.2.2 GenBroker over TCP/IP Visible OPC Tags:

GB over TCP/IP with V3.10 Sim OPC Server 500 ms Configuration - Hidden Tags

# of Tags	* # of OPC Update (per minute)	**Throughput	CPU Utilization
500	255	2125.00	5%
1000	241	4016.67	15%
2000	198	6600.00	25%
5000	87	7250.00	50%
10000	79	13166.67	75%

* **Update Rate** = Last OPC data update Time – Initial OPC data Update Time
(from GraphWorX32 – Gen Statistics)

** **Throughput** = Update Rate x # of Tags of GraphWorX Display / 60

All reading are at the client PC for GraphWorX32 displays

4.3 GenBroker over SOAP / XML

4.3.1 GenBroker over SOAP/XML Visible OPC Tags:

GB over SOAP/XML with V3.10 Sim OPC Server 500 ms Configuration - Visible Tags

# of Tags	1st Update (sec)	* # of OPC Update (per minute)	**Throughput	CPU Utilization
500	18	30	250.00	20%
1000	40	20	333.33	5%
2000	50	5	166.67	90%
5000	n/a	n/a	n/a	n/a
10000	n/a	n/a	n/a	n/a

4.3.2 GenBroker over SOAP/XML with Hidden OPC Tags:

GB over SOAP/XML with V3.10 Sim OPC Server 500 ms Configuration - Hidden Tags

# of Tags	* # of OPC Update (per minute)	**Throughput	CPU Utilization
500	32	266.67	10%
1000	20	333.33	25%
2000	4	133.33	75%
5000	n/a	n/a	n/a
10000	n/a	n/a	n/a

* **Update Rate** = Last OPC data update Time – Initial OPC data Update Time
(from GraphWorX32 – Gen Statistics)

** **Throughput** = Update Rate x # of Tags of GraphWorX Display / 60

All reading are at the client PC for GraphWorX32 displays

5 GenBroker Test Results - V8 verses V7

5.1 Hardware

Two PC's have been used for these tests utilizing a 100 MB/s Ethernet Network.

PC1: Server

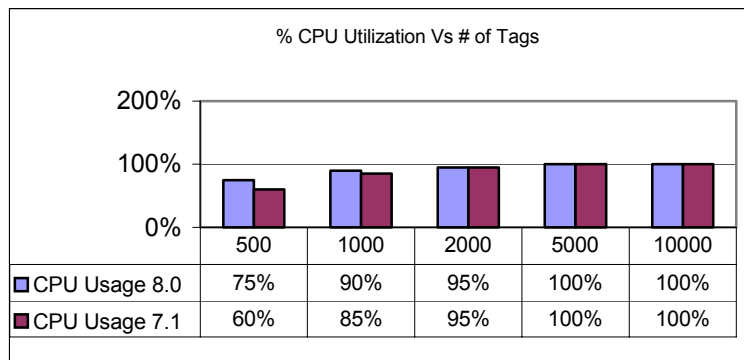
OS: Windows 2000 Professional, SP4
RAM: 384 MB
Processor: Pentium III, CPU 447 MHz

PC2: Client

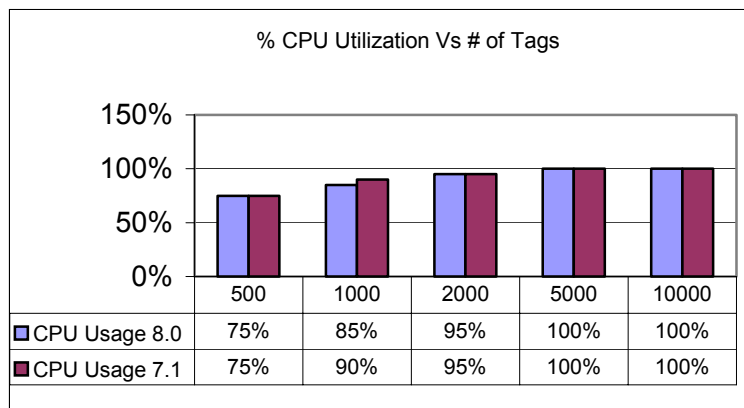
OS: Windows 2000 Professional SP4
RAM: 128 MB
Processor: Pentium III , CPU 500 MHz

5.2 Test Results

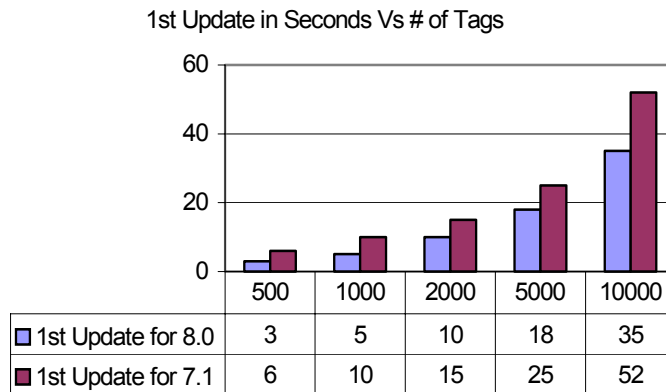
5.2.1 OPC Direct CPU usage



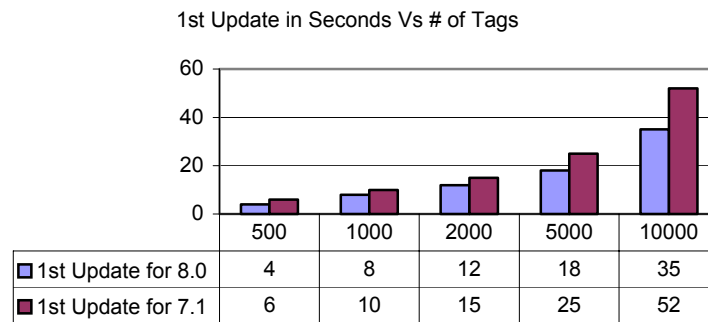
5.2.2 GenBroker over TCP/IP CPU usage



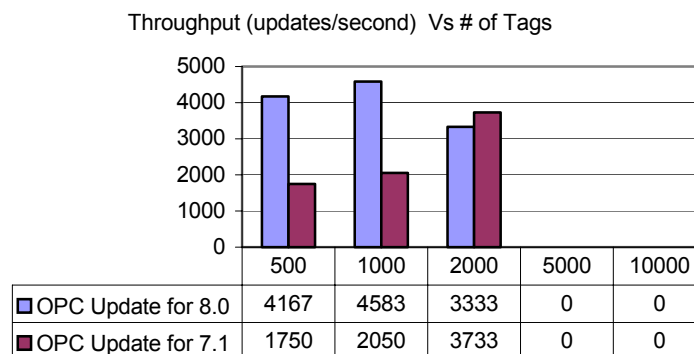
5.2.3 OPC Direct First-Update Performance



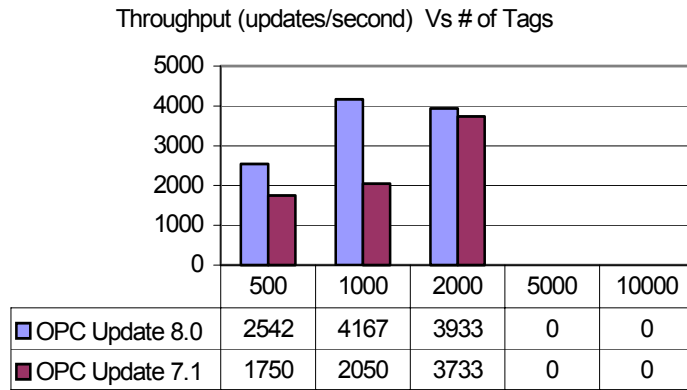
5.2.4 GenBroker over TCP First-Update Performance



5.2.5 OPC Direct throughput



5.2.6 GenBroker over TCP throughput



6 Conclusions

- 6.1.1 OPC Direct Direct CPU usage is slightly higher in V8 than in version 7**
- 6.1.2 GenBroker over TCP/IP CPU usage is slightly lower in V8 than in version 7**
- 6.1.3 OPC Direct First-Update Performance is greatly improved in V8**
- 6.1.4 GenBroker over TCP First-Update Performance is improved in V8**
- 6.1.5 OPC Direct throughput is improved in V8**
- 6.1.6 GenBroker over TCP throughput is improved in V8**