



CAEN OPC SERVER

Outline

- **CAEN OPC Server:**
 - General Information
- **Tests report:**
 - Problems and solutions
- **Conclusions**



CAEN OPC SERVER

General Information

- **CAEN OPC Server allows OPC clients (e.g. SCADA systems) to access and control CAEN HV power supplies**

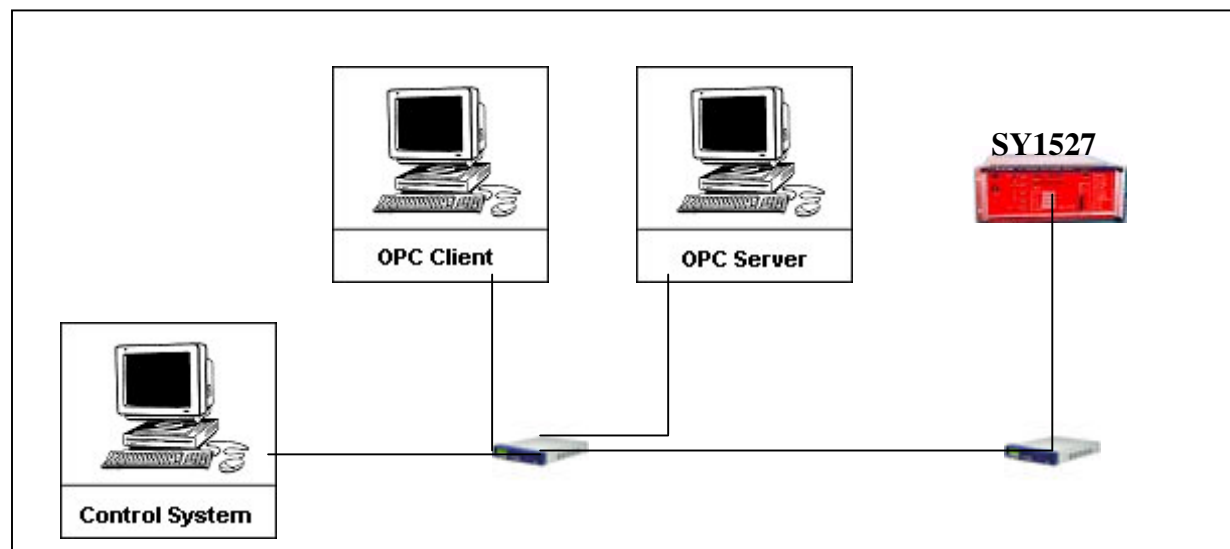


Fig. 1 - Scheme example for OPC Client/Server



CAEN OPC SERVER

General Information

- The current CAEN OPC server version (2.7) allows access to power supplies via two types of network:

- Ethernet (SY1527, SY2527)

- Communication with the power supplies via a CAEN proprietary TCP/IP-based protocol.
- Supports up to five concurrent sessions

- CAENET

- Two CAENET cards are available:
 - The A303 ISA board
 - The A1303 PCI card



CAEN OPC SERVER

General Information

- Version History

Version	Description	Date
2.7 CAEN HV OPC Server	The server is now XP compatible. Improved performances for the access via CAENET. Fixed access violation which occurred during the read of item property when the item property was a BSTR.	08.08.2003
2.6 CAEN HV OPC Server	Performance enhancement - New versions of Libraries CAENHWWrapper (v2.10) and HSCAENETLib (v1.6)	23.05.2003
2.5 CAEN HV OPC Server	Performance enhancement - New versions of Libraries CAENHWWrapper and HSCAENETLib	13.03.2003
2.5 CAEN HV OPC Server	Fixes bug regarding SY 1527/2527	4.02.2003
2.4 CAEN HV OPC Server	New version of Server and CAEN HV OPC Server Configuration 1.1.0	17.12.2002
1.1 CAENHSLib.dll	Bug fix for SY403 Support	07.05.2002
1.0 CAENHSLib.dll	A1303 Support	16.04.2002
2.1 CAENHWWrapper	SY403 Support	16.04.2002
2.1	Version enhancement includes bugfixing re off-line configuration file	05.03.2002
2.0 beta	Version enhancement includes support of CAENET, off-line configuration file.	18.12.2001
1.0	First release	18.09.2000



CAEN OPC SERVER

General Information

- What is OPC?

“OPC (OLE for Process Control) is open connectivity via open standards.”

from www.opcfoundation.org



CAEN OPC SERVER

Tests report: problems and solutions

TESTS DEFINITIONS:

- **Hardware: CAEN CRATE SY1527**
 - Firmware: 2.00.02**
 - 2 Modules A1821P inserted (24 HV channels)**
- **Software: - Server (CAEN OPC Server 2.7, CAEN OPC Server 2.8, wrapper library 2.11, wrapper library 2.13);**
 - Client (Matrikon Explorer version 3.2.1.150, PVSS 2.12);**
- **OS: Windows 2000 Pro.(2.00.2195), Windows XP Pro.**
- **Connections: ethernet + several switches**



CAEN OPC SERVER

Tests report: problems and solutions

July/2004

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Date	Description	Info
05/07/2004	Problems reported to CAEN and to CERN-IT/CO	1- Values are not updated 2- Errors in PVSS client: “Could not refresh within timeout. Possible server deadlock” 3- The server crashes after some hours
	“weak” solution	Stop/restart server manually every ~10 hours
08/07/2004	Improvment: items divided in small groups	Succeed to read the items and run in “more or less” stable conditions.
	Error detected in CAEN manual (RampDown item)	The p.s. provides the “RDWn” item, instead of the “RDwn” one, as written in the manual.



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Tests report: problems and solutions

July/2004

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Date	Description	Info
18/07/2004	Better solution: switch from "manual restart" to "automatic restart"	- Windows script developed by the DCS to automatically stop and restart the server every 6 hours
19/07/2004	Other experiments reported the same problem	- NA60 DCS – Eirik Tveiten informed us that they have the same problem with the CAEN OPC Server
21/07/2004	Meeting with CAEN	Meeting at CERN with CAEN hardware expert (Mr. Di Maio)
	Problem reported to ETM expert at CERN (Joachim Auer) and CERN IT/CO (Mark Beharrell and Renaud Barillere)	Errors in PVSS: 1- “refreshThread did not terminate within timeout: Possible Server deadlock” 2- “OPCGroup::Could not start Refresh on <XPTO>:0x800706be”



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Tests report: problems and solutions

July/2004

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Date	Description	Info
21/07/2004	TEST 1	- Using command “Device read” in Matrikon OPC Explorer, the CAEN server crashes
23/07/2004	TEST 2.1	- SY1527 connected to server using direct ethernet cable. - Time: ~ 3 hours (during MD) - Client: PVSS opc - Results: NO ERRORS
	TEST 2.2	- SY1527 connected to server using public network. - Client: PVSS opc - Results: same usual errors



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Tests report: problems and solutions

August/2004

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Date	Description	Info
02/08/2004	Interaction with NA60 experiment	- Jacques Rochez asked COMPASS/DCS help to develop an identical solution (script) to stop/restart the CAEN OPC server automatically.
30/08/2004	Problems reported to CAEN and CERN-IT/CO group	- Server sends incorrect information: -Results: Fake alarms



CAEN OPC SERVER

Tests report: problems and solutions

September/2004

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Date	Description	Info
From 21/09/2004 to 24/09/2004	Meeting with CAEN	- Meeting at CERN with CAEN software expert (Claudio Raffo) in order to establish a debugging session.
21/09/2004	TEST 3.1	System simulation : - OS: W2K - Client: Matrikon Explorer - Server: version 2.7 - Time: ~30 minutes - Machine: CAEN PC - Results: Same errors as displayed in PVSS client



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Tests report: problems and solutions

September/2004

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Date	Description	Info
21/09/2004	TEST 3.2	System simulation : - OS: WXP - Client: Matrikon Explorer - Server: version 2.7 - Time: ~30 minutes - Machine: CAEN PC - Results: Same errors as displayed in PVSS client
22/09/2004	TEST 3.3	- System simulation : - OS: WXP - Client: Matrikon Explorer - Server: version 2.7 (debug version) - Time: ~30 minutes - Machine: CAEN PC - Results: No errors



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Tests report: problems and solutions

September/2004

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Date	Description	Info
22/09/2004	TEST 3.4	System simulation: - OS: W2K - Client: Matrikon Explorer - Server: version 2.7 (debug version) - Time: ~30 minutes - Machine: pccompass06.cern.ch - Results: no errors
23/09/2004	TEST 3.5	System simulation: - OS: W2K - Client: Matrikon Explorer - Server: version 2.7 (debug version) - Time: ~10 hours - Machine: pccompass06.cern.ch - Results: Connection Lost



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Tests report: problems and solutions

September/2004

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Date	Description	Info
24/09/2004	TEST 3.6	- OS: W2K - Client: PVSS/Matrikon - Server: version 2.7 (debug version) - Time: ~10 hours - Machine: pccompass03.cern.ch - Results: server crashed
	Meeting with CAEN and IT/CO	- Mark (IT/CO) reported in the meeting that he also detected fake alarms using CAEN devices - Possible bug in Windows 2000 DCOM technology



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September/2004

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Date	Description	Info
24/09/2004	Solution for the “connection lost” problem	Moving from W2K to WXP (WXP fixed the existing bug with OPC, in W2K)
27/09/2004	TEST 5.1	- OS: WXP - Client: PVSS/Matrikon - Server: version 2.7 (remote) - Time: ~10 hours - Machine: pccompass03/ pccompass06 - Results: - no errors/no lost connection - server crashed
	TEST 5.2	same as Test 5.1 but: - R. Server (WXP/pccompass06) - Local Client (W2K/pccompass03) - Same results...



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September/2004

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Date	Description	Info
27/09/2004	Problem detected: Bad representation of the sessions status in the firmware of SY1527/SY2527	- The user doesn't always get a correct info about the number of active sessions
	TEST 5.3	- OS: WXP (Server) W2K (Client) - Clients: PVSS/Matrikon - Server: version 2.7 - Time: ~13 hours - Machines: pccompass03.cern.ch pccompass06.cern.ch - Results: - no errors/no connection lost - server crashed
	TEST 5.4	Same as Test 5.3 Time: ~12 hours



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September/2004

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October/2004

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18	19	20	21	22	23	24
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Date	Description	Info
29/09/2004	TEST 5.5	Same as Test 5.4 Time: ~20 hours
30/09/2004	TEST 5.6	Same as Test 5.5 Time: ~3 hours
	“Device read” problem in Matrikon solved	Fixed by CAEN with new OPC Server (version 2.8)
01/10/2004	TEST 6	- OS: WXP - Client: Matrikon - Server: version 2.8 (new) - Time: ~7 hours - Machine: IT/CO PC - Results: - no errors - no loss of connection - no crash



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Tests report: problems and solutions

October/2004

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Date	Description	Info
01/10/2004	TEST 7.1	- OS: WXP - Client: Matrikon - Server: version 2.8 + 2.13 Wrapper - Time: ~19 hours - Machine: pccompass06 - Results: - no errors/no connection lost - server crashed
02/10/2004	TEST 7.2	Same as Test 7.2 Time: ~12 hours Machine: pccompass06 Results: - no errors/no connection lost - server crashed



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Tests report: problems and solutions

October/2004

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Date	Description	Info
07/10/2004	Problem detected	Packages lost in the communication process.
	TEST 8.1	Communication (ping): - Switch: CentreCom FS709FC (Used different ports) - Results: ~10 % loss
	TEST 8.2	- Direct connection - Laptop – small hub – SY1527 - Results: 0 % loss
10/10/2004	TEST 8.3	- Switch: CentreCom MR820TR - Results: 0 % loss



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October/2004

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Date	Description	Info
10/10/2004	TEST 9	- OS: W2K - Client: PVSS - Server: version 2.8 + 2.13 Wrapper - Time: several days... - Machine: pccompass03 - Connection architecture changed (based on TESTS 8) - Results: - no errors! - no loss of connection! - no crash!



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Conclusions

4 Major Problems:

- 1 – Errors in OPC clients;
- 2 – Values not updated after some hours;

3 – Server crashes;

4 – Fake Alarms;

Solutions:

Using Windows XP (DCOM problem fixed)

Using CAEN OPC server 2.8 + wrapper 2.13 library and a compatible Switch Ethernet

Under investigation