

WE MANAGER

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Abstract

The beam monitor system in the KEK 12GeV proton synchrotron is consisted of modular interface called WE7000 series. The control and data presentation program ware developed by using "Control API". The API is provided mainly to control the WE7000 series modules, however it does not support Client/Server model. We developed a new API based on the DCOM architecture for WE7000 series modules. We need connect to COACK, STARS and *etc.* Therefore, we developed "WE Manager".

The implementation and the configuration of the "WE Manager" are described in this paper.

1 WE7000

The WE7000^[1] is modular type PC-Based measurement instruments, and so-called "Control Software" is also supplied by the industry. So that it is easy to control the module without any program developments. Figure 1 and 2 show modules of WE7000 series and the "Control Software", respectively. Each module has the virtual front panel called "Control Panel" as shown in figure 3.

API (Application Program Interface) called "WE Control API" is also supplied as option software. The API provides control functions for each module. So that it is extremely easy to develop various application programs by Visual Basic and Visual C++ by employing this API.



Figure 1: WE7000 series

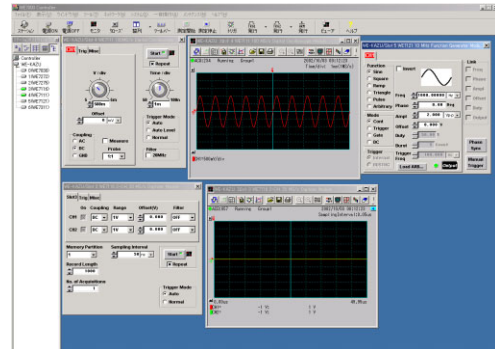


Figure 2: Control Software

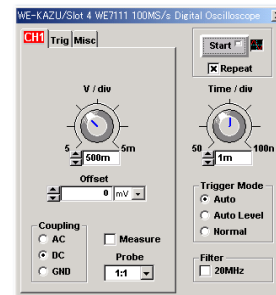


Figure 3: Control Panel for WE7111

2 CURRENT MONITOR SYSTEM

2.1 DCOM System

The beam monitor system in the KEK 12GeV proton synchrotron is consisted of modular interface called WE7000 series. Applications of this system need to be configured according to the Client/Server model. Figure 4 is an image of Client/Server model for this system. However, "WE Control API" itself does not support Client/Server model. Therefore, we configured the application system as shown in figure 5. This system used DCOM (Distributed Component Object Model)

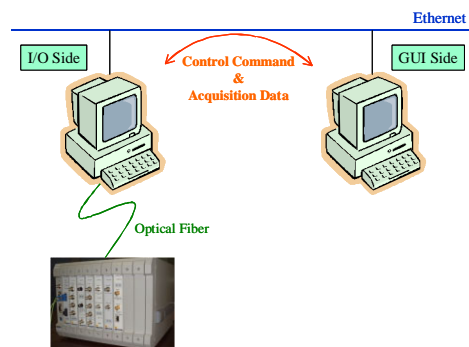


Figure 4: Image of Client/Server model

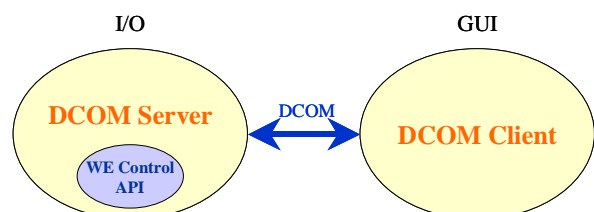


Figure 5: Image of DCOM system

technology. I/O side is DCOM server program included “WE Control API”, and GUI side is DCOM client program. This system configuration is easy to program. But, only several developers who understood DCOM are able to develop this system.

2.2 New API (WE Control API for DCOM)

We newly developed a special API system named “WE control API for DCOM”^[2]. This API system has two programs. One is DCOM server program named “WeDSvk”, and another is API for client program as shown in figure 6. This new API system was coded by Yokogawa Electric Corporation on our advice.

The API on client communicates with “WeDSvk” through the DCOM architecture. The implementation both “WeDSvk” and new API enable to realize Client/Server model for WE7000 series. The software development is mainly focused on the client application programs, this is efficient to save the software coding time.

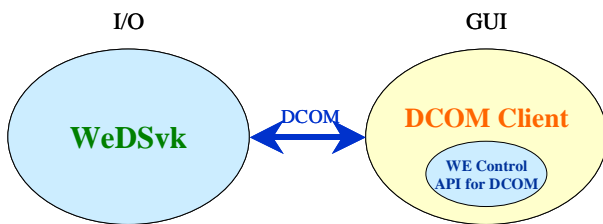


Figure 6: Image of WE Control API for DCOM

3 WE MANAGER

3.1 Outline

If we use “WE Control API for DCOM”, we can easily create Client/Server system. However, we need to connect I/O program of WE700 to COACK (Component Oriented Advanced Control Kernel)^[3], STARS (Simple Transmission and Retrieval System)^{[4][5]} and *etc.* The reason for connecting to those is as follows;

- Logging for control.
- Data acquisition on UNIX.
- *etc.*

Therefore, we developed "WE Manager" by Visual Basic 6. This manager has two components. One is used to control the WE7000 itself, "Control Component", the other is used to establish to network connection, “Network Component”. This Manager is I/O side program. Figure 7 is an image of this manager.

3.2 Control Component

Control Component is COM program included the "WE Control API". This component is used to control the WE7000 itself.

The control component has two global functions. One global function is prepared to analyze the control command. Other function is used to data acquisition via WE7000 modules. Figure 8 is an image of this component.

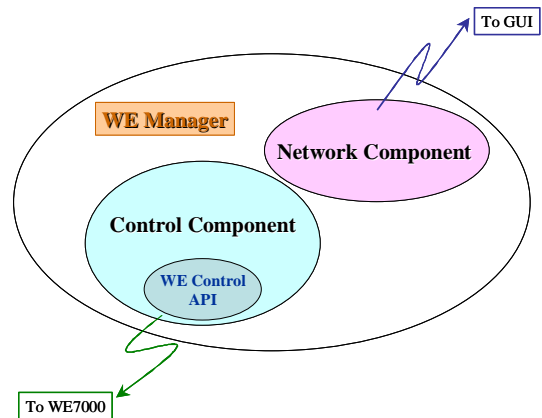


Figure 7: Image of WE Manager

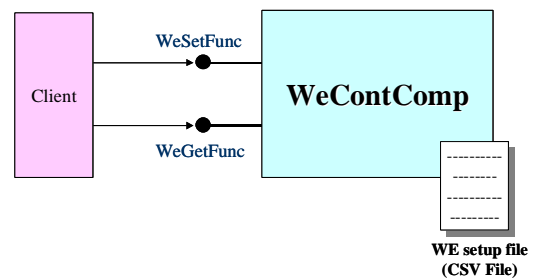


Figure 8: Image of Control Component

```

0,7052,
1,7111,CT1
2,7111,CT2
3,7111,CT2
4,7116,BPM
5,7111,Phase
6,no,
7,no,
8,no,

```

Figure 9: Example of CSV file

A CSV file is prepared to indicate the WE7000 module configuration, in which the hardware configurations of the individual module, module name, alias of the signal, etc, are stored. Figure 9 is an example of CSV file.

3.3 Network Component

“Network Component” works between “Control Component” and GUI application program. And, this component was developed to have an extendable connection not only to TCP/IP but also connection to other protocol, such as COACK, STARS and *etc.* Figure 10 is an image of this component. This component has interface to connect two global functions on “Control Component” and has network interface.

This component isn’t only one. User can select according to the protocol. Figure 11 is an image of it. Consequently, we can use desire Client/Server model.

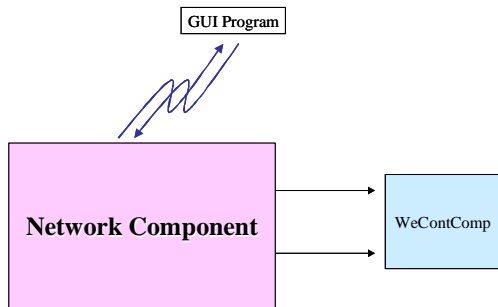


Figure 10: Image of Network Component

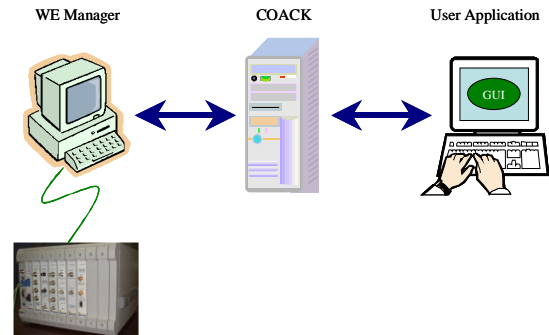


Figure 12: Test of Network Component for COACK

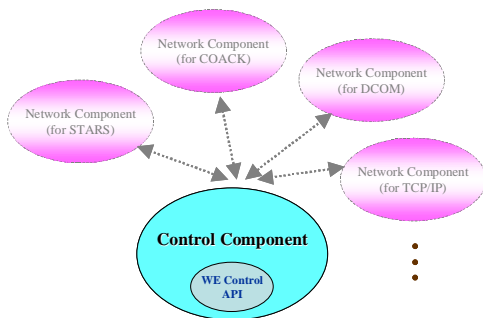


Figure 11: Image of Selecting Network Component

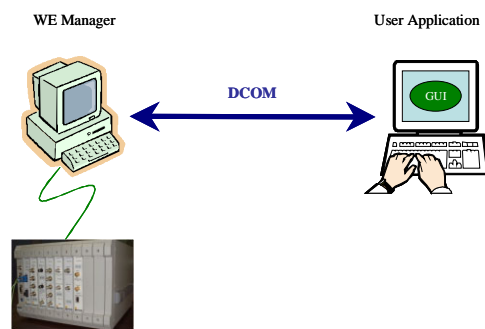


Figure 13: Test of Network Component for DCOM

3.4 TEST of WE Manager

At present, we are testing those components describe in the previous sections. We have already two “Network Component”. One is connecting to COACK as shown figure 12. And other is directly connecting to GUI application using DCOM as shown in figure 13.

We have good result, but the test operation is carried out only for WE7111 (100MS/s Digital Oscilloscope Module) and WE7116 (20MS/s Digitizer Module). We are remaking the control component to test for other modules of WE7000 series.

4 FUTURE PLAN

We are developing this manager as standard program for WE7000. The implementation of other modules is foreseen as soon as possible and the supporting so many protocols is necessary.

REFERENCES

- [1] <http://www.yokogawa.com/tm/Bu/WE7000/>
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- [5] T. Kosuge, Y. Saito, et al, “COACK Multi-Server System with STARS”, This Workshop, Frascati (RM), LNF, October 2002.