

Windows 2000 Based  
Fault Tolerant Server

NEC Express5800/ft series

## Case Study

FALCO biosystems Ltd.

The major clinical testing contracting company, FALCO biosystems Ltd. has adopted the NEC fault-tolerant, Express5800/ft series (preinstalled Windows 2000), as the blood sugar analyzer control system. Its cost of installation was much less than past systems, and at the same time fault tolerant functions using Windows-based applications was achieved. In the healthcare field where immediacy is key, the Express5800/ft series supports the mission-critical analyzer system control with high reliability.



### Reliability equivalent of mainframes at a low cost:

### Construction of a mission-critical test analysis subsystem using the Windows 2000 Advanced Server preinstalled Express5800/ft series

#### Purpose of Implementation

#### ■ Analyzing tens of thousands of samples overnight



**Yasuaki Adachi**  
Manager,  
Systems Division

“We were the first service to provide the results of basic blood tests such as blood sugar level, white blood cell count, and cholesterol count, the day after the sample was collected. For the past 20 years, the ‘next-day report’ has been the company’s tradition”, says Yasuaki Adachi, Manager of Systems Division, FALCO biosystems Ltd, with confidence.

FALCO biosystems Ltd. is one of the top 4, major clinical testing contracting companies in the industry. The number of customers (healthcare institutions, municipality, companies, schools, etc.) tops 14 thousands, which is the largest in Japan. During peak seasons, approximately 55 thousand samples per day are gathered in the Central Laboratory located in Kuse-gun, Kyoto. Most of the samples are objects of the “next-day report”, and may consist of blood sugar, biochemical tests, etc.

The tests are done at night. “The sales representatives come back to their branch offices in the evening. They enter test request information, using OCR, into their branch office systems. The samples and data arrive at the Central Laboratory around 8 pm or later. Then, the Central Laboratory transforms into a sleepless battlefield where the tests are done accurately and speedily by morning”, tells Shigeru Okuda, Systems Development Group Leader, Systems Division.

As well as NEC’s service support, who would come to the rescue with just one phone call, even at night, the reason for having used the NEC PX7600 mainframe as the test backbone system was that they valued its reliability of its nonstop operations, 24 hours a day for 365 days a year.



**Hiroshi Tainaka**  
Deputy Manager,  
Systems Division

#### ■ Requiring reliability equivalent to that of mainframes

FALCO biosystems Ltd.’s growth is accredited to its detailed community-based sales representation. In order to keep up with the growing number of samples, in January 2001 they installed the latest blood sugar analyzer and aimed to greatly reduce the time needed for testing.

“However, we sequentially placed the test tubes in the analyzer, checking each sample number attached to the tubes by hand, so we were unable to take full advantage of the new machine’s performance. So, we therefore decided to implement a barcode scanning system to attain higher speeds and higher accuracy”, says Hiroshi Tainaka, Deputy Manager, Systems Division.

When the sales representatives input test request information at the branch office, barcodes are automatically printed on labels. By sending the samples along with the barcode labels to the Central Laboratory, the order arrangement of samples, when put into the analyzer, is no longer important. The new blood sugar analyzer is barcode-ready, so it can instantly read the test request information and automatically and accurately perform the required tests. However, to support barcodes, they would have needed to restructure the whole test backbone system. Modifying the mainframe system would have cost over 100 million yen and taken over one year to develop.



**Shigeru Okuda**  
Systems Development  
Group Leader  
Systems Division

“The world is now in the PC servers age. So we decided to create the testing subsystem using PC servers, and have it support barcodes”, says Tainaka.

**System Outline**

**Low-cost and highly available Express5800/ft series**

“The mission-critical test request information in the healthcare field requires immediacy. If the system goes down, the samples cannot be assigned sample numbers and it will be impossible to finish the tests by morning.”

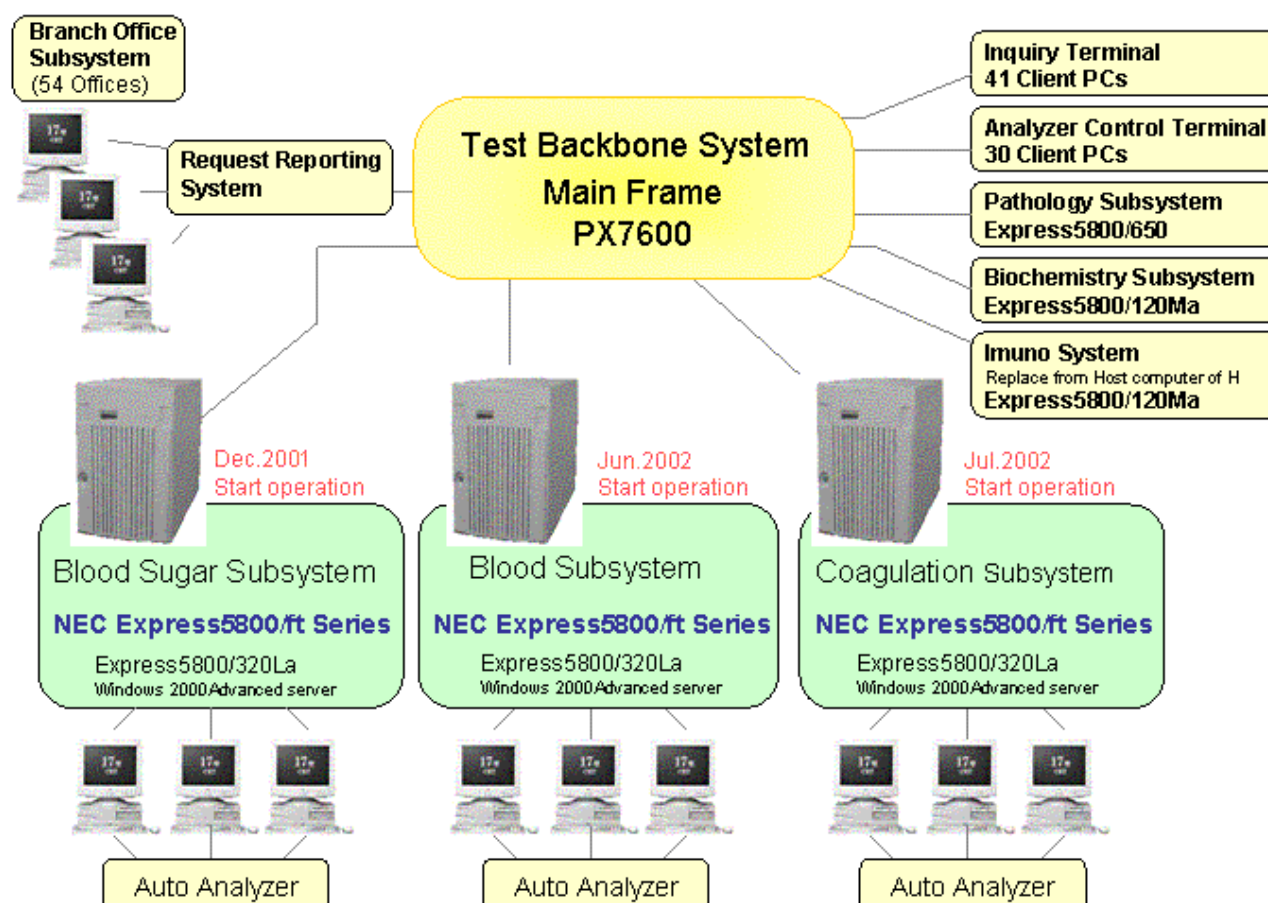
This is the reason why they focused their attention on the NEC Express5800/ft series. The Windows 2000 Advanced Server OS is preinstalled, and its fault-tolerance duplicate all major components such as processors, memory, hard disks, and power supplies. Each set of the duplicated hardware carries out the same processes simultaneously and so if a failure were to occur, they need not worry about the temporarily stoppage of services while the failover process is implemented and the faulted component is failed over to the standby component.

“The largest advantage of the Express5800/ft series was its ability to provide an ideal nonstop environment and fault tolerance, at a low cost”, tells Okuda.

A cluster system would require the purchase of two PC servers including not only hardware but also the operating systems and database. The costs would therefore exceed the acquisition of one Express5800/ft series. Not only is the initial cost of acquisition lower, the costs of daily operation can be reduced with the use of the Express5800/ft series..

With these reasons in mind, in December 2001, they implemented one Express5800/ft series with 6 client PCs as the blood sugar subsystem that controlled 4 blood sugar analyzers.

**System Outline of FALCO biosystems Ltd. Central Laboratory**



## Effects of Introduction

### ■ Speed up processing using barcodes

Implementation of the Express5800/ft series has caused a change in the flow of blood sugar testing, as described below.

At branch offices, there are multiple client PCs for the NX7000 server, NEC's UNIX server. When the sales representatives input the test requests into the OCR reader, the information is automatically entered into the request reporting system of the NX7000. The test request is then sent to the test backbone system where the test instructions are created for each analyzer, such as the blood sugar analyzer or the biochemical analyzer.

Information concerning the blood sugar test is in turn sent to the blood sugar subsystem on the Express5800/ft series. The blood sugar analyzer reads the barcode on the test tube, refers to the blood sugar subsystem for information regarding the test request, and performs the required tests. The test results are then sent back to the blood sugar subsystem where the results are automatically checked according to rules specified. When there is abnormal data, the Express5800/ft series sends an alarm message to the person in charge of the tests. The checked information is finally, sent to the request reporting system on the NX7000 via the test backbone system where the reports are created. In the morning at each branch office, the reports are printed on printers which are connected to the NX7000's client PCs.

### ■ Reliable performance for critical analyzer control

With the adoption of barcodes, the results for blood tests can be output 2 hours faster than before.

“In peak seasons, we must test about 30 thousands samples for blood sugar in one night. The night time work is a race against time, so the 2 hours difference is big”, explains Okuda. In addition, they no longer need to hire the five part-time workers who had previously arranged the test tubes by hand.

With the success of the blood sugar subsystem, FALCO biosystems Ltd. scheduled to start the operations of the blood test subsystem in June of 2002 and the coagulation subsystem the following month.

“We are satisfied with the performance of the Express5800/ft series. The analyzer is a very sensitive machine which if it does not receive a response within 2 seconds, it would return an error. In the past, these operations were done only on UNIX servers, but we are very happy that we are able to use the user-friendly Windows 2000 Intel Architecture (IA) server”, smiles Okuda.

Bigger success is that they have attained a feeling of security. In a cluster system, there is always a temporary stoppage of service, so they would have felt uneasy about the failover process while the analyzer was operating at high-speeds. With high reliability and availability, the Express5800/ft series firmly supports this mission-critical test control, where small mistakes could result in disasters.

## Customer's Profile



Name	FALCO biosystems Ltd.
Head office	44-3 Shogoin Rengezo-cho, Sakyo-ku, Kyoto
Founded	July 1, 1962.
Established	August 24, 1982
Capitalization	1,644 million yen
Employees	986

URL: <http://www.falco.co.jp/falco/> (Japanese)

One of the top 4 clinical testing contracting companies, Handles a wide range of services including clinical examinations, genetic testing, testing of food ingredients, and the analysis of safety. The number of customers (healthcare institutions, companies, schools, etc.) tops 14 thousands, which is the largest in Japan. They are community-based, and their face-to-face sensitive response is their asset. (FALCO is the acronym for Fast and Accurate Laboratories with Confidence.)

