Mr. Junichi Kazami
Manager,
Information Systems Division,
General Affairs Department,
Tsukuba City

"Local governments are increasingly expected to respond swiftly and flexibly to various conditions. Our new platform provides us an IT environment that can smoothly adjust to any given need or policy."

Mr. Yuichi Numajiri
Assistant Manager,
Information Systems Division,
General Affairs Department,
Tsukuba City

"This system allows each staff member to choose a virtualized PC installed with applications needed for their task. I would say it's a cloud computing kind of system."

Mr. Hiroyuki Tsukamoto
Chief,
Information Systems Division,
General Affairs Department,
Tsukuba City

"Virtualized PC sharing allows a total of 1000 staff to share 700 virtualized PCs. We are now making efficient use of our IT resources."

Mr. Hideki Aizawa
Chief,
Information Systems Division,
General Affairs Department,
Tsukuba City

"Not only will it enhance efficiency in our Information Systems Division, it will improve usability for all the staff and increase productivity, and as a result enhance the quality of Tsukuba's municipal services."

Background

Tsukuba City: home of leading science technology institutions has been long committed to IT system innovation

Virtual PC Center enhances data security and IT resource efficiency of municipal offices. Now 1000 staff members conveniently share 700 virtualized PCs
Home to many universities and leading edge research institutions, Tsukuba City of Ibaraki Prefecture is known as a science technology hub of Japan. Through efforts to become a progressive information society, including the establishment of the Information Network Center ten years ago, the municipality of Tsukuba has long been actively engaged in the implementation and operation of innovative IT systems. It has been especially committed to enhancing data security to protect the vast amounts of personal data the city manages. For example, PCs are controlled under three security status levels—prohibited, limited, or monitored status—according to the user's task and authority level. In addition, using PCs outside of the office and writing data to USB memory devices are restricted. Furthermore, the city's IT system uses separate OSs for its mission critical system which accesses information about citizens and its internal information system—dual booting required users to select the OS according to their task to avoid simultaneous access to both systems while reducing the number of terminals.

### Over 1000 PCs become a growing burden for management and operation

However, the city was facing difficulties maintaining its IT system.

"PCs in the municipal office numbered over 1000 and their environments were hardly consistent. Since we have about 170 remote offices, it required tremendous work to apply security patches and policy settings for each client PC," recalls Mr. Junichi Kazami, Manager, Information Systems Division, General Affairs Department of Tsukuba City. It was often the case that his department staff were too busy with PC maintenance for their primary tasks. In addition, there were concerns that the dual boot system was time consuming and therefore reducing productivity. Users had to shut down the OS they were using to boot up the other OS when switching between mission critical and information related tasks.

### Installation Process

### Why did desktop virtualization attract Tsukuba?

What caught the interest of Tsukuba City for its IT solution were thin clients or desktop virtualization. The city's approach to the technology dates back 10 years.

"From around the time the Information Network Center was launched, we had started searching for a new client environment. Demonstrations showed that desktop virtualization was extremely effective. We first were attracted by benefits related to security and operational management—there was no risk of data loss because terminals did not store any data whatsoever and security patches and policy settings could be distributed in batch. On top of that, centralized management could simplify otherwise extremely complicated software license management," explains Mr. Hiroyuki Tsukamoto, Chief, Information Systems Division, General Affairs Department of Tsukuba City.

However, despite their interest, at the time the solution was unable to support the city's self-developed applications and shortcomings of the network forced them to give up the implementation.

### The decision to go forward

It was the new municipal building, opened in May 2010, that put desktop virtualization back on the table. The city recognized that the relocation to the new office was a good opportunity to review their client environment. During the intervening years, virtualization technology had advanced and previous issues had been resolved. The city concluded that time was ripe to introduce desktop virtualization.

Following the decision, the city drew up the specifications, conducted the bid, and as a result selected NEC's Virtual PC Center thin client system (hereinafter VPCC) as their solution. NEC Fielding undertook the onsite implementation.
For Tsukuba, the greatest advantage of NEC's VPCC was its virtualized PC sharing technology—a method which allows multiple users to share a common application environment.

"Our survey on PC usage had showed that, contrary to our expectation, quite a few terminals were left unused by staff members who were out of the office for meetings, business trips, or absence on leave. Therefore we determined that by adopting virtualized PC sharing technology, instead of having one PC for every staff, we could build an environment with a PC for each of the staff members working the same hours," explains Mr. Tsukamoto.

With the adoption of virtualized PC sharing, the information system environment was greatly reduced from over 1000 PCs to 700 virtualized PCs plus a minimal number of traditional PCs for specific operations. Mr. Kazami comments, "We have 700 virtualized PCs for 1000 staff working with the information system in the main office which demonstrates that we are making maximum use of our resources. Shifting from an environment with one PC per staff member to this new environment with just enough PCs for the simultaneously working staff helped us achieve significant reductions."

VPCC's support for various applications was another decisive feature in selecting the NEC solution. The city's self-developed accounting software, which did not operate smoothly in previous virtualized environments, ran with no difficulty with VPCC. The city found this very promising in the long run for municipalities like themselves incorporating specially developed, sophisticated applications.

The onsite implementation, preceded by intensive operational testing, was managed by NEC Fielding. Mr. Tsukamoto, pleased with the process mentions, "Issues concerning application operations and compatibility with other systems were detected at a fairly early stage to minimize modifications in the latter process." It was the good coordination with the Virtual PC Center Product Division that is credited for this achievement. NEC Fielding and the Product Division shared their know-how from previous implementations including proven knowledge related to application validation and virtualization procedures. Therefore issues that arose could be swiftly communicated and resolved. In addition, NEC Fielding provided a 200V power source to create a test environment comparable to the new building under construction. With these thorough arrangements, implementation to the new municipal building was completed in merely two months.

In May 2010, the new system started operations smoothly. The illustration below shows the overall structure of the configuration. The core feature of the VPCC system is the 700 virtualized PCs configured for using the information system. The solution includes 500 A4-sized US40a thin client notebooks used exclusively for the internal information system, 200 notebook PCs with access to both the internal information system and mission critical system with citizen data, Express5800 series servers for the virtualized server platform and the management platform, and NEC Storage D series.
Throughout the system configuration process, great attention was paid to improving usability. With the new system, staff who engage in tasks with both the internal information system and the mission critical system which accesses citizen data no longer need to reboot the OS when switching systems. This was achieved by completely separating the environment and network of the two systems. The mission critical system requires a PC installed with an OS and wired LAN, while the information system is used by accessing a virtualized PC via wireless LAN.

"When switching from the mission critical system to the information system, all you do is click on the icon on the desktop. The network automatically alters the connection from the wired LAN to the wireless. Then the computer hooks itself up to VPCC's environment with virtualized PCs configured for the information system. This mechanism provides both data security and usability," explains Mr. Yuichi Numajiri, Assistant Manager, Information Systems Division, General Affairs Department of Tsukuba City.

For further usability enhancement, virtualized PCs are pre-installed with one of two master images with different sets of applications. Users can choose a virtualized PC by the two sets of applications, applied to 350 virtual PCs each, according to their task. Mr. Numajiri comments, "I would say it's a cloud computing kind of system—delivering service to people who need it, when they need it."

### Future Benefits

#### Expected reductions in environmental impact and simplified operational management

The new system has benefited Tsukuba in many other ways including contributing to the city's active efforts for environmental enhancement. By replacing the traditional PCs with US40a thin clients, power consumption of terminals has dropped by around 75% of previous levels.

In addition to power savings, when the system is extended to the remote offices, thin clients are expected to improve operational manageability even more. "Some remote offices are located as far as 30 minutes from the main building. VPCC can bring significant difference through centralized management and simplified maintenance of remote PCs. Not only will it enhance..."
efficiency of our Information Systems Division, it will improve usability for all the staff and increase productivity," foresees Mr. Hideki Aizawa, Chief, Information Systems Division, General Affairs Department of Tsukuba City.

The successful implementation of an IT infrastructure by Tsukuba, the city of leading science technologies, offers a valuable example for corporations and municipalities in search for solutions for better operational efficiency, system migration, data security enhancement, and cost reductions.

A total of 700 virtualized PCs are centrally managed in the server room of the main municipal building. Municipal staff members using the virtualized PCs see very few differences from traditional PCs.

**Opinions of NEC Staff**

*‘One NEC’ — a highly professional team for success*

NEC Fielding, Ltd., project members (from left): Tomoyuki Oshiyama, Noriyuki Tateuchi, and Taichi Seto

In addition to separating the networks of the two systems, substantial improvements were achieved by the combination of VPCC and Active Directory. Previously, PC maintenance had been a great burden for Tsukuba City since the system was managed by workgroups. System administrators directly edited the PC's registry or applied policy settings as 'accessible' or 'not accessible' for each individual PC. Now, centralized management by Active Directory boosts the efficiency of PC maintenance, reduces the administrator's workload, and avoids the risk of failing to apply patches.

Regarding implementation, the key to the successful process was the establishment of a strong project framework. NEC Fielding took charge of total project management and contact with
Tsukuba City while communicating with the VPCC Product Division at the backend. In this structure, results of the validation tests of applications and concerns about implementation were collected for NEC Fielding and the Product Division to examine thoroughly and prepare a solution in advance. This proved extremely important for on-time implementation and prevention of major problems in the migration process.

The success of this project is a perfect example of our strength as One NEC—providing the best by leveraging the expertise of the whole NEC Group for our customers.

## Related Links

- **Virtual PC Center thin client system (desktop virtualization solution)**
  - Thin client notebook terminal US40a
  - Virtual PC server / management server: NEC Express5800 Series servers
  - NEC SAN Storage D Series
  - Virtual PC Center management software

## Customer profile

### Tsukuba City

<table>
<thead>
<tr>
<th><strong>Address</strong></th>
<th>Address 2530-2 Karima, Tsukuba City, (D32-2 Tsukuba Science City), Ibaraki Prefecture, Japan</th>
</tr>
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<tbody>
<tr>
<td><strong>Area</strong></td>
<td>284.07km²</td>
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<tr>
<td><strong>Population</strong></td>
<td>214,811 (as of August 1, 2010)</td>
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<tr>
<td><strong>Overview</strong></td>
<td>Located 50km northeast of Tokyo, Tsukuba City of Ibaraki Prefecture is historically well known for the legendary Mt. Tsukuba dominating its northern area. Designated as Tsukuba Science City by the Japanese government, Tsukuba is the base of many private and governmental institutions devoted to research and development of leading-edge technologies.</td>
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(Nov 1, 2010)