

Narita International Airport Corporation

CASE STUDY

A New Air Traffic Control Information System Built for Ease of Air Access No-Down System Delivers Smooth Airport Operations



Narita is changing to become one of the world's premier international airports.

The establishment of a 2,500 meter runway will enhance long range operations. Access times from the Tokyo Metropolitan area will be shortened by a new rapid railway, scheduled to start operating in fiscal year 2010.

Narita International Airport Corporation is responsible for the operation and management of the airport. Their NARC (Narita Airport Ramp Control system) provides backbone services and essential air traffic control operation. SPARC Enterprise servers form the processing heart of these systems and assure operational continuity, especially in the crucial requirements of air traffic management. SPARC Enterprise was selected for its high-reliability, asset protection, usability improvements, ability to reduce operational costs, and Fujitsu's support capability. "Fujitsu has complete understanding of both SPARC Enterprise hardware and its processors. Fujitsu is also a distinguished leader in the Japanese computer products industry. I am confident they can take full care of our system and provide the high reliability and peace of mind required in supporting our customers"

Industry

International air port facilities management

Hardware

UNIX server SPARC Enterprise M5000 and M4000
Industry Standard Servers
PRIMERGY RX300
Storage Systems ETERNUS4000
Fiber Channel Switches
ETERNUS SN200, Tape Library LT 230, Network Server
IPCOM L1400 and EX2000 IN

Software

Systemwalker Centric Manager,
Oracle Database 10g,
PRIMECLUSTER,

Problems and Resolutions

Cost rationalization following privatizing of the organization. Smooth interworking with system at other organizations.

Improved cost performance from high performance of SPARC Enterprise servers. Easier interworking with other systems due to Fujitsu's rich experience with Solaris OS and mission critical systems.

Require same levels of reliability as provided by the former mainframe system .

Use of mainframe high reliability technologies in SPARC Enterprise provides the required high reliability, but with simpler management and maintenance operations.

Renewal of the Traffic Control System to support additional demands from growing passenger numbers and stricter corporate governance requirements.

Performance growth of the new systems proven using strict performance traces when handling up to 220,000 annualized flight movements in Spring 2010. It also showed the potential to handle around 300 thousand annual flight movements in the future.

Installation Background

Growing Flight Numbers required renewal of air traffic control information system



Mr. Takeshi Inoue
General Manager
IT Promotion Office,
Business Promotion
Department,
Narita International
Airport Corporation

With over 520 flights and 90 thousand passengers a day, Narita International Airport, informally known as "Narita", is Japan's main entrance for international air traffic. Keeping pace with globalization and air transportation growth, Narita plays a crucial role in international transportation to and from Japan – 73 airlines from 38 countries use Narita (as of Oct. 2009). The responsibility for the operation and maintenance of Narita airport lies with Narita International Airport Corporation (shortened to NAA), which became a private company in April 2004. In line with the worldwide progress to "Open Skies" agreements between nations, competition between airports is heating up.

NAA is adapting to growing demands from airlines and passengers while striving to keep all its operations safe.

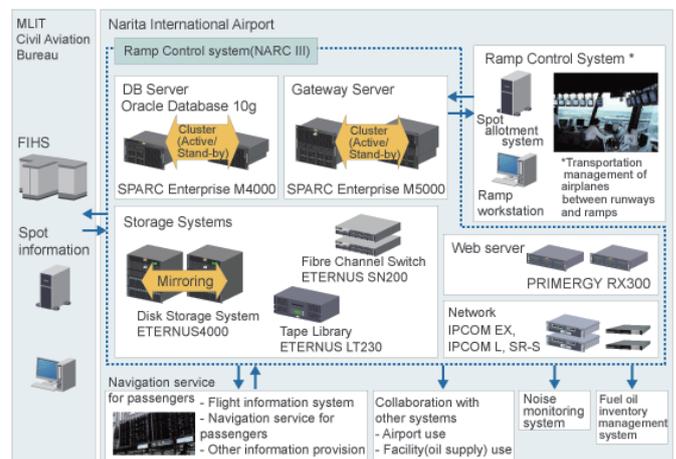
The extension of "Runway B" to 2,500 meters in Sep. 2009, made it usable in parallel with other runways. Narita Airport is now ready to upgrade the number of flights a year to around 220 thousand from around 200 thousand in March 2010. Plus, once the New Rapid Railway to Narita is opened, access times from Tokyo to Narita Airport will be shortened by up to 36 minutes.

As part of preparations for international flight departures, NAA has an "engine" called NARC (Narita Airport Ramp Control system).

The first generation of this air traffic control information system started

operation in 1982. A second generation system started in 1992 to manage the extended Apron (*) area required for the opening of the 2nd passenger terminal. Now NAA started development for a 3rd generation system called NARC III in 2006. It will provide more exact and efficient scheduling and is targeted to handling around 300 thousand flights a year in the future.

* Apron area : The area around terminals where aircraft can park to disembark and take on passengers, fuel and supplies. It is also called a Ramp.



Installation Process

“Open skies” competition and cost reductions

Within the Apron area, there are many airplanes arriving and departing. As the number of flights grows, so does the complexity of the movements and routes between Apron and runway. Efficient flight management becomes a “must” for exact and safe scheduling.

NARC monitors flight schedules, aircraft status and on-time history records to assist with airplane transportation within the Apron. For completing these objectives, NARC collaborates with other systems including the FIHS system at the Civil Aviation Bureau of MLIT(*). NARC is the “hub” for air traffic control. It provides the essential data for airport services including landing charges, parking charges, space rental charges, and passenger security service charges.

* MLIT : Ministry of Land, Infrastructure, Transport, and Tourism

“In envisioning the air-port management requirements, a major theme for NARC development was its transformation from mainframe to an open system.” Mr. Tsuchida, Advisor to the Information Management Group, IT Promotion Office of the Business Promotion Department at NAA, related as background.

“We evaluated the new system plan, based on cost reductions, competency and knowledge transfer. We knew the necessity for cutting costs and raising our competency compared to other airports. We were also required to consider changes to the other systems NARC collaborates with.”

“As a result of these evaluations we decided to move to an open system.

We saw that an open system would make the technology transfer easier than a mainframe could do. Technology transfer was very important for system development and maintenance. So making it happen without mistakes was important to us.”



Mr. Ryuichi Tsuchida
Advisor
Information
Management Group
IT Promotion Office,
Business Promotion
Department
Narita International
Airport Corporation

Key Installation Point

High reliability and full support from Fujitsu

NARC needs to be a non-stop system. This is one point on which the NAA could not compromise. If it stopped the effect on the airport and flight control would be disastrous, High reliability was the reason for using a mainframe.

Mr. Tsuchida talks about the reasons for their choice.

“The need with an open system was the same 24 hours-a-day operation we had. As a result of our investigations, we decided to choose UNIX servers. Another point in our choice was asset protection. We had an interest in Solaris because we found that it was the only OS that had achieved binary compatibility since the start of its history. High market share and rich experience in mission critical operation were also decisive factors.”

Mr. Tsuchida continues on SPARC Enterprise.

“SPARC Enterprise had sufficient performance and scalability for our system growth.

We also understand Fujitsu had a complete knowledge of SPARC Enterprise.

I think this is because they were developing the servers by themselves and jointly with Oracle. As a result Fujitsu knew everything from head to tail about the servers including the processors. I expected full support from Fujitsu. If you imagine a vender who just buys servers from another overseas vender and simply on-sells to its customers. Naturally they would not know so very much about those servers. In our eyes they would not be dependable enough for us. With our business essential to passenger flights, it's more than just talking about reliability. It includes total reliability covering everything including maintenance and support.”

Results of System Installation

Fully redundant system up and running 24 hours a day

After a smooth upgrade, NARC III commenced operation in June, 2009. Every piece of equipment in the system is redundant – SPARC Enterprise M4000 as the database server, SPARC Enterprise M5000 as the gateway server, PRMERGY RX300 Web servers, ETERNUS4000 disk arrays. The network equipment is also redundant. As a result even if one line is disconnected, the other line can continue operation.

Mr. Tsuchida talks about the effect of NARC III.

“With help from Fujitsu we created documentation on all NARC III technology and operations.

An assessment institute advised us on strengthening corporate governance by collecting operational traces and taking security measures against data corruption. The performance improvements provided by SPARC Enterprise also cleared up our concerns on performance downgrades due to such trace processes. We are gaining the return from our investment as we planned.”

NAA had a demand to visualize the Apron status including airplanes positions, for instance in preparing for heavy snow.

Mr. Inoue talks about their future perspectives.

“We will continue to update the system according to demands from system users and the business environment. If NAA is listed on a stock exchange according to our plan, we will also need to absorb demands from new shareholders. So, we always look at the costs even while updating the system for improved safety and business continuity. We are expecting Fujitsu's support to allow continuing to upgrade efficiency and accuracy for airport operation.”

Narita International Airport is now flying with the world's premier airports. With a wide range of foundation technologies both hardware and software, Fujitsu is fully supporting this customer's business.

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Company Profile

Narita International Airport Corporation

Head Office	NAA-Bldg., Narita Airport, Narita-City, Chiba 282-8601, Japan
Established	April 1st, 2004
Capital	100 Billion Yen
President	Kosaburo Morinaka
Number of Employees	720 (as of July 1st, 2009)

Industries	The company undertakes activities for the express purpose of providing greater convenience to air transport users by practicing efficiency in the establishment and management of Narita International Airport. It also contributes to the overall development of air transport and the enhanced international competitiveness of Japan's industry and tourism.
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URL www.naa.jp/en