The Ultimate in Availability for Port Traffic Safety

In 1859, the Port of Yokohama opened its doors for foreign trade, marking a new era in the way Japan approached business. Located on Tokyo's southwestern edge, the port has since played an important role in the modernization of Japan's international commerce by pushing the boundaries of harbor processes, efficiency, and technology. Today, the Port of Yokohama is recognized around the globe as one of the world's most important shipping hubs, processing nearly 127 million tons of cargo handling for a total of over 10 trillion Yen or nearly $90 billion in 2005 alone.

Background

The turn of the millennium saw an ever-increasing impetus toward a continuous global economy. In Japan, this meant that international shipping harbors needed seamless data transfer capabilities to keep up with the pace of world business. Once again, Japanese commerce leaders looked to the Port of Yokohama to help pave the way into fully electronic communication and logistic systems.

The Challenge

In 1999, the Japanese government recognized that its port systems needed a complete modernization and revitalization overhaul to be a true international industry leader. The government launched an initiative to integrate a to be as instantaneous as possible. Losing any critical data could damage the business and hinder internal processes. A high availability solution was required.

NEC's Fault Tolerant server & ExpressCluster® software provides a comprehensive business continuity solution for public safety operation.

collaborative electronic data interchange (EDI). Part of this initiative was the establishment of new standards for applications, reports, and forms for optimized electronic administration and processing. The ultimate goal was to have all applications, reports, and messages safely submitted and transmitted online.

The Port of Yokohama has consistently set the standard for Japan's shipping industry. This role demanded that the Port of Yokohama lead the way in pursing the 1999 initiative, and modernizing applications and data usage. For the port to meet these goals, server downtime had to be minimized, disasters had to be prevented, and application recovery had

In 2003, the Port of Yokohama set out to find a system that prevented the interruption of communications and operations in order to maintain its status as Japan's shipping industry leader. This system had to merge the best of all worlds. Its high availability features were absolutely critical, as any data or communications lost could affect everything from day-to-day records to boat navigation and communication. In addition, the system had to be affordable, easy to implement, and set an achievable precedent for streamlining processes so that other ports could follow in Yokohama's footsteps.

The Solution

With all of these challenges in mind, the Port of Yokohama selected a combination of NEC's Express5800/ft series of servers and ExpressCluster® software as its new high availability solution.

NEC Express5800 Fault Tolerant (FT) servers are designed to deliver complete system redundancy. Memory, processors and Input–Output components are all redundant, which helps to eliminate potential failure points and ensure data is continually processed and not lost. This active lockstep processing delivers sustained system integrity to the operating systems and applications by ensuring continuous processing – even in the event of a hardware failure. Unlike conventional Intel®-based server solutions that are not fully redundant, NEC's FT redundant server architecture helps to eliminate single points of failure and can isolate failure points immediately. This process saves significant time troubleshooting and helps to preserve memory and processor status. The system will continue to operate even while the required parts are replaced to establish full redundancy again.

NEC ExpressCluster software provides fast, automatic failover recovery of mission critical applications in the event of OS and application software failure. ExpressCluster allows the Port of Yokohama to have critical protection against both planned and unplanned system failures. In addition, ExpressCluster acts as a constant server monitor that detects problems and implements automatic recovery procedures to minimize server downtime.

Like all international harbors, the Port of Yokohama is always available and operational. With port business constantly coming and going, downtime directly translates into critical loss of revenue and communication. The combination of Express5800/ft series of servers and ExpressCluster software creates a single high availability solution for the Port of Yokohama.

The ability to link the different pier offices based on robust system platform enables effective harbor procedures, error reduction, and elimination of paperwork. Instant connectivity through secure "Single Windows System" provides easy access for any port office, making overall harbor processes quicker and more efficient.

The Construction figure of Yokohama harbor information system
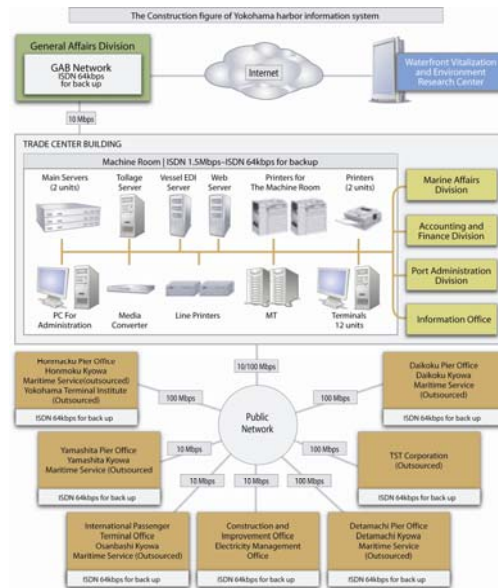
The Results

Since the implementation of Express5800/ft series of servers and ExpressCluster in April 2003, the Port of Yokohama has not experienced a single interruption of service. The new system has increased port traffic safety and established Yokohama as one of Asia's leading ports. Results show that Port of Yokohama EDI usage increased 45% within a year of implementing the NEC technologies. In addition, port information management Web site traffic increased to 300,000 - 400,000 visits a month.

Environmental conditions create the demand for real-time information updates. Weather often affects arrival and departure schedules. The new system ensures that the necessary information gets to those who need it quickly and easily, which makes the port safer not only for ships, but also for local residents.

The combination of Express5800 FT server and ExpressCluster system is expected to support continuous harbor system operation corresponding to increase of business volume in each subsequent year as Japan's role in the global freight market grows. The Port of Yokohama plans to enhance the system continually and to monitor its performance through a full-scale log analysis.

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