success story

Fraport AG

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Matthias Driesdow
Aviation Ground Services & Logistics
Baggage Services
Procedures and Quality Management
Fraport AG

innovations in baggage handling

It's a typical day at the Frankfurt Airport — the busiest commercial airport in Germany, seventh largest international airport, and major continental gateway to Europe.

What you see is impressive. A bustling city in itself, the airport serves 48.5 million passengers each year and offers a multitude of services for travelers, including hotel and conference facilities, a 24-hour medical clinic, entertainment and shopping.

But what you don't see is even more impressive. On a peak day, Frankfurt Airport handles more than 100,000 pieces of incoming and 100,000 pieces of outgoing baggage — each of which reaches its destination within 45 minutes — with an unprecedented track record of reliability.

The mastermind behind this sophisticated baggage system is Fraport AG, the owner and operator of Frankfurt Airport. To run its state-of-the-art baggage transportation control system, Fraport Aviation Ground Services & Logistics relies on HP OpenVMS AlphaServer systems.

eliminating the baggage bottleneck

As any traveler knows, a lost bag can ruin your day — if not your trip. From the airport's perspective, baggage handling can be a bottleneck in the time required to clear a flight. It's therefore one of the most important services at any airport — especially for a hub where more than half the luggage is being transferred from one flight to another.

Baggage management calls for a high level of logistics, accurate database information, and a streamlined workflow to maximize the operations and get every passenger's baggage to the airport destination at the same time as the passenger. These are factors on which Fraport has proven itself to be a global leader in aviation ground services.

According to Matthias Driesdow, Fraport AG, Aviation Ground Services & Logistics, Baggage Services, their biggest challenge is the guaranteed minimum connecting time of 45 minutes. "To handle these guaranteed minimum transfer times, we have to be efficient. We need good quality procedures, good quality in our employees, and good quality in our systems."

"Our goal is to be the market leader in quality aviation ground services," Driesdow continues. "HP plays a very important role in Frankfurt Airport aviation ground services. HP has the hardware and systems for running our streamlined workflow and is a partner in maximizing the efficiency of our operation. OpenVMS AlphaServer clusters provide the high availability, stability and disaster tolerance we need to achieve the highest levels of availability. And the support by HP is fantastic."

Here's what goes on behind the scenes at Frankfurt Airport.

There are 369 central check-in counters for passengers in two terminals and in a new long-distance railway station located at the airport.

The baggage handling system contains all the necessary data for each flight. In addition to the departure time and ramp position, it also contains the extraction point to ensure the shortest route to the plane. By entering the flight number, each item of luggage is issued with a set destination address that is activated in combination with the container number. Automatic elevator installations feed the baggage into the system. During the entire underground transport, computer-controlled reading systems check the containers by means of a bar code on the outside. In this way, each container is automatically transported to its destination.

Sorting up to 18,000 pieces of luggage an hour, the system runs with enormous precision. Only two items per thousand do not directly reach the correct destination — and this is usually due to such causes as too-large items or broken mechanical parts. The airport's baggage service has been certified since 1997 and re-certified based on the requirements of the new ISO 9001:2000 quality standards.

The baggage system currently includes 15,620 electric motors, 1,550 rail switches and has a total of more than 67 kilometers of conveyers running at speeds of up to 5 meters per second in the tunnel between the terminals. Impressive statistics, by any measure.

good logistics requires a reliable IT system

Today, a baggage handling service without the use of information technology is inconceivable. The large quantities of baggage and the many special cases that occur — such as booking changes, irregularities and security — call for comprehensive tracking and tracing of all baggage.

For more than 10 years, this baggage transportation control system has run on a fault-tolerant OpenVMS VAX platform, managed by a custom application written by Fraport. To keep up with increasing demands, Fraport is upgrading the platform to four OpenVMS AlphaServer clusters.

A constant innovator in the industry, Fraport recently developed a leading-edge database management system called the Baggage Operational Database (BODB). All baggage data from the subsystems are collected into this database, which is continually updated. The BODB receives information in real time from various applications that support the distribution of transfer baggage, the control of the baggage conveyor offloading points, and the amount of traffic on the conveyors handling inbound baggage — as well as data coming from the carriers called baggage service messages.

Driesdow explains, "To be the quality leader in aviation ground services in the future, we developed the BODB running on OpenVMS AlphaServer systems because we can make better use of the existing capacity and improve its quality." Fraport developed the BODB application in-house.

The BODB consists of two HP AlphaServer ES45 clusters running Oracle 9*i*™ Real Application Clusters (RAC). There is a Gigabit network connection and 900 gigabyte storage in a very high redundant storage area network — which guarantees a very high data throughput rate.

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the power of clustering

Fraport considered several options for this solution, but chose HP OpenVMS AlphaServer systems after the platform proved itself in a month-long pilot.

According to Dirk Rolfsmeier, Application Development at Fraport, "We chose OpenVMS because of its proven strength in clustering. It really is the best solution because it makes it easy to build a disaster-tolerant system. By having clusters running in separate terminals, we have system and network redundancy, as well as data mirroring in conjunction with Oracle 9*i* RAC. If one component fails, the operation can continue and we have no transaction loss."

Oracle9*i* RAC enables Fraport to run applications using the Oracle9*i* database across a number of separate servers acting as a single database. As server nodes are added, 9*i* RAC can scale and extend processing power beyond the limits of the individual components. With this multiple-node environment, Fraport immediately benefits from a significant increase in both system and database availability — without any changes to its application software.

By deploying Oracle9*i* RAC on the HP OpenVMS platform, Fraport further benefits from a significant reduction in the administrative costs associated with complex distributed data management. It's as easy to manage an OpenVMS cluster of servers as it is to manage a single system.

HP support played a big part in the success of the BODB deployment. Rolfsmeier explains, "HP Global Service was a great help. They helped us install and test the Oracle 9*i* RAC cluster, they supported us in the migration of our database from the previous version, and they supported us in the migration of our own programs and applications."

Rolfsmeier continues, "The interoperability of OpenVMS is also very important. We have various systems, all of which produce data. Therefore, we must have an interface to all these other systems."

future visions

Over the next decade, Fraport expects an average increase in traffic volume of about two million passengers per year — and a corresponding increase in baggage. Part of the expansion plan includes building a third terminal at the south of the airport on a former air base site, and extending the baggage handling infrastructure to maintain the 45-minute minimum transfer time.

According to Martin Bien, Vice President, Aviation Ground Services and Logistics, "This will be a good opportunity for HP to also be our partner in the future. With good products, good computers and good reliability, you can be successful."

Tomorrow, as today, OpenVMS AlphaServer systems will be on board, providing the technical innovation to help propel Fraport wherever it goes.

customer at a glance

Fraport AG

profile

Fraport AG (www.fraport.com) is the owner and operator of Frankfurt Airport, the world's seventh largest airport and main continental gateway to Europe

industry

international transportation

challenges

- provide a baggage logistics system and real-time database that offer high reliability
- ensure guaranteed baggage turnaround in 45 minutes

solutions

- Baggage Operational Applications (BOAP)
- Baggage Operation Database (BODB), a custom application written by Fraport
- partner in developing BODB: COS-Concat (hardware supplier)

results

- guaranteed uptime
- fault tolerance and no downtime
- scalability to meet future demands

technology highlights

- hardware: OpenVMS cluster consisting of two AlphaServer ES45 systems, each of which has two CPUs
- operating system: OpenVMS v7.3-1
- storage: 900 gigabyte storage in a highly redundant, fibre channel-based storage area network
- database: Oracle 9*i* RAC
- services: consulting services from HP Global Services

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