

# Airport titan BAA elevates data-center efficiency

HP ProLiant servers and AMD Opteron™ processors lighten energy loads and space requirements



"BAA handles some 141 million passengers a year across its seven airports. Every passenger is touched in some way by HP ProLiant servers and AMD Opteron processors. The HP-AMD team is the power behind our airports."

– Simon Gale, IT Systems Service Manager, BAA plc

#### Business needs:

Headquartered in London, England, BAA plc provides airport services at its seven U.K. airports – from car parking to ticketing. To become more efficient and proactive in providing IT services to the enterprise, this international airport company needed to consolidate its databases and servers, as well as improve the IT environment's use of space and energy. Furthermore, the company needed the ability to add more processing power in the future – without disrupting business-critical services.

#### Solution overview:

BAA avoided having to expand its current data center or build a new one by standardizing on HP ProLiant DL585 and DL385 AMD Opteron™ processor-based servers for Microsoft® Windows® Server and other business-critical applications. This strategy also delivered computing, hosting, electrical power, and cooling efficiencies. ProLiant DL585 clusters attach to an HP StorageWorks Enterprise Virtual Array to support Microsoft SQL Server databases. BAA continues to use ProLiant DL-series servers for a myriad of functions. The airport operator also counts on HP Services and adaptive management solutions, including HP OpenView applications and Systems Insight Manager for centralized control and proactive



administration. The HP solution enables BAA to add more processing power to accommodate additional IT systems.

#### Propelled to a first-class solution

BAA hosts 141 million passengers through its airports in the United Kingdom. With growing numbers of travelers and airlines using its facilities, the world's largest airport operator strives for improved efficiency and customer service. In large measure, BAA's success is predicated on an ability to invest in assets that promote quality customer service and better operations. BAA complements this strategy with a thrust toward corporate responsibility and environmental stewardship. At its seven U.K. airports, the company engages in noise and energy reduction programs. Its business and environmental goals also cascade to IT, where the staff maintains approximately 1,100 Microsoft Windows-based servers throughout BAA's airport facilities. BAA IT staff must make the best use of space and save energy, which are challenges due to the heat generated, power required, and real estate consumed by numerous data center servers.

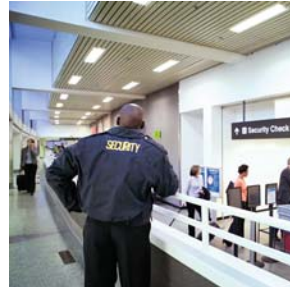
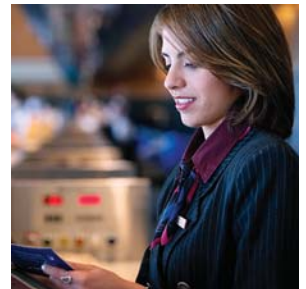
Compounding the challenge is that the company may need to add even more processing power in the future, while hosting business-critical services and tackling a companywide database consolidation to render high levels of system availability, knowledge management, and information accessibility. Therefore, BAA IT needed to consolidate about 80 servers running 135 separate Microsoft SQL Server databases that contain departmental, parking, environmental, regulatory, financial, and security information.

BAA's Windows Operations Manager Robert Harris states: "Since we are an airport operation, our database systems must deliver 24 hours a day, 365 days a year." Some of the SQL databases help BAA comply with government licensing, air, security, and passenger regulations. Other databases house systems that enable





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BAA to track aircraft noise in a continual effort to improve environmental performance. BAA data stores are in constant use and range in size from 100 MB to nearly 150 GB.

"Besides needing to consolidate these databases," Harris emphasizes, "we were concerned about the amount of heat the servers generated, the electrical power they consumed, and whether we'd need to revise our server builds and standards if we brought on new computers." For years BAA has remained loyal to HP server technologies. Therefore, to satisfy these issues, BAA again sought advice from the HP account team, who helped its IT staff set up tests of ProLiant servers with AMD Opteron processors.

"In our Microsoft Windows environment, we were purely an Intel-processor shop," Harris recalls. "Although we had great confidence in AMD from the start, we wanted to see for ourselves that the Opteron processor platform could deliver outstanding performance and low energy consumption."

#### **A short route to lower TCO**

The simulations in the HP lab used BAA's production data and server configurations. BAA IT saw firsthand that ProLiant DL585 servers would satisfy their criteria for performance, power, and cooling, so the company eagerly adopted the platform for business-critical systems, server administration, file-print services, and general applications. "HP ProLiant DL585 servers with AMD Opteron processors out performed our other servers, but had much less heat output and power consumption," Harris reports.

The four-processor workhorses rendered 20 percent lower energy and hosting costs and allowed BAA to put more servers into the same amount of space. "We regard the ProLiant Opteron-based server as an economical solution," explains Harris. "It prevented us from having to

build a new data center, expand our present real estate, and pay more for hosting, cooling, power supplies, emergency alarms, network components, and other infrastructure necessities."

Therefore, BAA is retiring older servers and replacing them with either ProLiant DL585 or DL385 systems. This strategy, while prolonging the use of existing real estate, also lowers total cost of ownership (TCO) variables, such as server downtime associated with maintenance activities. "If a server providing data for car parking or preordering duty-free goods went down, it could cost the company millions of pounds a day in revenue," Harris points out. "At the same time, if a SQL database isn't operating correctly due to a hardware failure, BAA could be fined substantial amounts of money by the Civil Aviation Authority for not fulfilling its regulatory requirements."

#### **Top-flight performance on a comparable plane**

Julia Burney, BAA SQL Manager, acknowledges that the Opteron-based HP platform rose to meet performance criteria for the company's important Microsoft SQL Server databases, which impact nearly all of BAA's workforce in some way or another. "Since our initial testing, we've achieved great performance for the SQL databases," she says.

AMD's integrated memory controller for Opteron server chips, which directly connects to the processor, contributes to performance and delivers outstanding memory bandwidth for database searches. The AMD Direct Connect™ Architecture reduces bottlenecks and boosts overall performance and efficiency because processors, memory controller, and I/O connect to the central processor unit (CPU). This was one of the features that prompted BAA to deploy a ProLiant server cluster at Gatwick airport and another at Heathrow. Each cluster consists of two nodes running in an active-active mode with network load balancing to serve up four separate

SQL Server instances. BAA has plans underway to migrate some 100-plus databases onto these two clusters. So far the company has eliminated 18 of its 80 database servers.

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– Robert Harris, Windows Operations Manager, BAA plc

Burney explains: "This is partially due to how we're using the clustering technologies of Microsoft Windows Server 2003 Enterprise Edition and future proofs BAA for the introduction for X64. BAA is now able to put more database services on to a single server."

Each ProLiant DL585 cluster links to an HP StorageWorks Enterprise Virtual Array configured in a storage area network. "We like the replication, virtualization, and centralized storage capabilities of our StorageWorks EVA," emphasizes Burney. "It is engineered to provide no single point of failure for our SQL databases."

#### **Management from a central control tower**

HP Systems Insight Manager comes standard with ProLiant servers. This software provides a single management interface, which allows customers to organize their management processes around IT services and remove the constraints of traditional management platforms. "We have such a large number of servers, we needed HP Systems Insight Manager to give us centralized control and server status," Harris explains. "It lets us adjust servers and components, and notifies us of degradation or eminent failures so that we can make the necessary adjustments to prevent downtime."

Another HP adaptive management solution BAA staff use is HP OpenView. This management software enables the company's central monitoring administrative team to see the status of a number of IT systems. "HP OpenView modules and plug-in opportunities help us monitor storage and networks components through a single pane of glass," Harris notes.

To promote and achieve its IT availability objectives, BAA employs HP Services for mission-critical support and SAN management services. "We have a close relationship with HP," Harris comments. "An organization of BAA's size and infrastructure complexity requires mission-critical capabilities with access to HP's top-ranking technical experts and developers. HP gives us expert support."

#### **Forward progression in the wings – without shuffling standards**

According to BAA, another advantage of moving to the new AMD Opteron processor-based ProLiant servers was to continued normal IT operations without disrupting and reconfiguring the entire platform. Because HP embraces industry standards in engineering its ProLiant portfolio, products and software technologies work seamlessly together and simplify migration. "It would take a lot of effort to accommodate a big change," Harris admits. "We are very happy that we didn't have to reconfigure our set server builds. We could carry on as normal, while gaining all of the benefits of AMD Opteron processors."

About 12,000 users now rely on the fleet of ProLiant DL585 servers. If the number of users or services escalates, BAA plans on upgrading the servers to new x86 dual-core AMD Opteron processors or multi-core CPUs. AMD's 64-bit migration strategy helps customers grow into 64-bit computing, while maintaining the investments in their 32-bit hardware, applications, and expertise.

Concludes Harris: "BAA is looking more and more at 64-bit extensions for SQL Server, Active Directory, and domain controllers. With AMD dual-core processors, we will be able to run a lot more services on a single HP ProLiant server, which aids our migration and consolidation initiatives."

#### **About BAA plc**

Headquartered in London, England, and at the apex of the global flight network, BAA reigns as the largest airport operator with seven U.K. airports, including Heathrow, the world's busiest international airport. As a major commercial landlord, retailer, and developer, BAA ([www.baa.com](http://www.baa.com)) has management contracts or stakes in ten airports outside the United Kingdom, and maintains retail management contracts at two U.S. airports. Last year, BAA's had total revenues of £2,115 million GBP.

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## At a glance

### Hardware

- 16 HP ProLiant DL585 servers, each with quad-AMD Opteron™ processors
- 2 HP StorageWorks Enterprise Virtual Array systems attached to two ProLiant DL585 clusters running Microsoft SQL Server 2003

### Software

- HP Systems Insight Manager 5
- HP OpenView Storage Management Appliance
- HP OpenView Service Desk
- HP OpenView Operations for Windows
- HP OpenView Operations for UNIX
- Microsoft Windows 2000
- Microsoft Windows Server 2003 Enterprise Edition
- Microsoft SQL Server 2000
- Microsoft SQL Server 2005 (Future)
- Legato NetWorker backup software

### HP Services

- Mission-critical support services
- SAN management services
- Care Pack Services (hardware/software support)

## Business needs

- Maintain high levels of system availability and reliability
- Expend less heat and power in the data center
- Fit more servers into the same amount of space
- Retain server standards, builds, and configurations

## HP solution

- Implemented a platform of HP ProLiant servers with AMD Opteron™ processors
- Deployed HP virtualized storage solutions to support Microsoft SQL database clusters
- Provided centralized control and service status for monitoring through HP OpenView and HP Systems Insight Manager

## Customer results

### Simplicity

- Aids application consolidation and migration – BAA now able to run more applications on a single server
- Retains server builds to save time
- Integrates seamlessly with software and storage

### Agility

- Proven performance for application, business, and database services
- Accommodates 64-bit computing, which maintains company's investments in 32-bit hardware, applications, and expertise

### Value

- 20 percent reduction in power costs - decreased heat generated and related cooling expenses
- Helps meet environmental targets for gas and electric conservation
- Less space required, thus saving expense of building or expanding facilities
- Lower total cost of ownership (TCO) resulting from prolonged use of existing real estate
- 20 percent reduction in servers - eliminated 18 of 80 database servers

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