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BT Processes 500 Million Call Records a Day on HP 9000 N-Class Enterprise Servers

Challenges

- Account accurately for interconnect calls.
- Increase processing capacity to deal with explosive growth in interconnect traffic.
- Act quickly to eliminate growing backlog of records.

Solution

- HP 9000 N-Class Enterprise Servers.
- InterNetwork Call Accounting (INCA) application, developed in-house.
- Mission-critical support service from HP.

Benefits

- Server processing capacity has tripled.
- Maintenance costs and space requirements have been reduced.
- The first new N-class server was fully operational within four days of being ordered.
- BT will be able to meet its objective of processing 500 million call records a day.

British Telecommunications plc (BT) is one of the UK's great success stories. Originally a state-owned provider of telecommunications services in the UK, it is now a major international communications group and one of Europe's largest private sector companies. It is continuing to grow vigorously, with group turnover increasing by nearly 14 per cent in 1999, and pre-tax profits reaching \$7 billion.

At home, BT operates nearly 28 million customer lines, with calls made in and from the UK currently accounting for 40 per cent of group turnover. However, the nature of the UK market is changing. As a consequence of deregulation, one of BT's fastest-growing areas of business in the UK is carrying interconnect calls for other licensed operators. Where nine years ago there were only three UK operators, there are now 160.

A single call may use the networks of several operators. However, the customer is normally billed by just one of these operators, who is subsequently billed by all the other operators for use of their networks. In BT's case, the need to bill for this interconnect traffic, and to verify bills received from other operators, led to the development of an application known as InterNetwork Call Accounting (INCA). Originally developed in 1990 using Sterling Software's Cool:Gen computer-aided software engineering (CASE) tool, INCA provides BT with an accurate system that processes call detail records (CDRs) for every individual interconnect call. The system also incorporates reporting functionality through Business Objects. Its main users are BT's Carrier Services and Financial Analysis Interconnect groups, who are responsible for billing other operators and managing their accounts. Currently, there are about 100 individual users.

The INCA system processes data 24 hours a day, every day of the year, and has been

designed with resilience in mind. Because of the great volumes of data involved and the crucial importance of the system to BT's business, extremely high levels of robustness and reliability are absolutely vital. To achieve these levels, BT based its system architecture on the UNIX-based HP 9000 range of servers.

One of the main criteria for the architecture was to provide sufficient scalability to support a fast-changing business area. The wisdom of this decision has become clear with the substantial growth of interconnect traffic over the nine years since INCA was first rolled out. Recently, this growth has accelerated further: in fact, the number of interconnect calls needing to be processed has increased by 60 per cent in the last ten months alone. Until recently, the INCA infrastructure was built around a cluster of HP 9000 Model K370 Enterprise Servers, which were able to process records in parallel up to a total of 200 million CDRs each day. However, even this processing capacity was being pushed to its limits as volumes kept on growing very quickly. BT therefore began to look for a cost-effective method of increasing performance still further.

“Basically, we wanted a solution that would provide us with double the performance,” said Prajay Shah, senior technical architect at BT. “There was no question of changing the architecture, particularly since HP had been such a good partner for nine years. However, we were very glad to have the chance to try out HP’s new N-Class server range.”

HP 9000 N-Class Enterprise Servers have been designed to offer the performance and reliability required by today's businesses, which are having to support more applications, more users and more traffic than ever before. In BT's case, it seemed that a switch from the K-Class to the N-Class would

double the available performance in accordance with its requirements. However, because it was also necessary to upgrade the operating system and database, BT felt that it was advisable to carry out benchmark tests in advance. In September 1999, therefore, a set of call records were taken from BT's production system and processed at HP's benchmarking centre using a HP 9000 N4000 server. The N-Class server showed itself to be capable of processing 62 million CDRs within the 12-hour window available to deal with each day's records, compared to 13 to 18 million for one of BT's existing six-way Model K370 servers.

"The benchmark results exceeded our expectations by a wide margin. Instead of the expected doubling of performance, we got a fourfold increase and we did not have to modify any code to run the application on HP-UX 11. This gave us confidence that our needs would be more than adequately met by the new server range," commented Shah.

BT anticipated a gradual replacement of the old servers by the new models, starting with the master charging server, which summarises all the records processed by the other machines in the cluster. The replacement was planned to start in spring 2000, but the speed at which call volumes were growing, caused BT to ask HP if the timetable could be brought forward. The result was unexpected.

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The architecture is covered by HP's Mission-Critical Server Suites solution, which provides 99.95 per cent uptime commitments for servers, operating system, database and storage solution. The mission-critical support team provided valuable assistance throughout the migration, from the planning stage onwards.

The new master charging server is a HP 9000 N4000 server with eight-way symmetric multiprocessing (SMP). For the moment, it is running in conjunction with BT's existing HP 9000 K-Class and I-Class servers, but these will be replaced over the next few months by ten new N-Class servers. Eight of these will be in the charging system. The others will replace the three servers currently used in the streamer system, which is responsible for splitting up the CDRs by operator, prior to further processing.

These changes will enable the INCA system to process as many as 500 million CDRs each day, well in excess of BT's current requirements. In the longer term, Shah is confident that the server architecture will keep pace with the continued growth of the interconnect market.

"With these servers, we know that we will be able to cope with further increases in call volumes. That is far from being the only benefit, however. The N-Class servers also boast excellent price/performance, while maintenance costs are very low. Furthermore, their small footprint ensures that we can make much better use of space," he said.

BT's interest in the new servers extends beyond the management of its own interconnect business. The company is also marketing the INCA solution to BT joint ventures and other telecom operators. It has

set up a bureau service, which currently carries out interconnect billing for eight customers and runs on HP 9000 K-Class servers. According to Shah, the service has been a tremendous success, partly because of the quality of HP's hardware and the speed with which HP has responded to BT's requirements. For the future, BT anticipates a greatly increased demand for the service. HP's N-Class servers are likely to play a key role in meeting this demand.

The INCA application that runs on the servers, as described above, was recently launched as a product set to the telecoms market through a collaboration between HP, EDB-4tel and BT. **“This collaboration with EDP 4tel and BT demonstrates HP's commitment to delivering advanced server technology for best-in-class interconnect solutions to telecoms operators. HP's expertise and support capability will help address the needs of operators worldwide for scalable, reliable solutions,”** said George McGregor, Marketing Director for Europe, Middle East and Africa, HP Communications Industry Business Unit. For further details please see www.hp.com or <http://www.edb.4tel.no>.

At a glance

- British Telecommunications plc (BT).
- London, UK.
- www.bt.com.
- 125,000 employees.
- Worldwide representation through subsidiaries, alliances, partnerships and joint ventures.
- 1999 group turnover nearly \$30 billion.
- Supplies local, long-distance and international telecommunications services and equipment.

Technology highlights

- HP 9000 N4000 Enterprise Server with eight PA-8500 processors.
- Six further N-Class servers to be added.
- HP-UX 11.0.
- HP GlancePlus and HP MeasureWare performance monitoring software.
- Five Oracle8 databases (4 Gb to 80 Gb in size).
- EMC 3430 storage solution with 48 x 18.1 Gb disks.
- Dorotech optical storage solution, running on six HP SureStore jukeboxes.
- INCA application developed by BT using Cool:Gen.
- Business Objects reporting solution.
- PC clients.
- BT multiprotocol router network links production site (Ipswich), development sites (Stockley Park) and user locations.

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