bet365: Netcomms Case Study

Managing Dynamic Change in Network Architecture

Neil Selby, Head of IP and Security for bet365 explains the challenges presented by an IT infrastructure that never stands still

Introduction

Networks can be unpredictable – with every change comes risk. It's small wonder many companies shy away from changing their networks - unless they absolutely have to.

bet365 doesn't have that luxury. The company specialises in In-Play betting, which enables users to bet on the outcome of specific actions that take place while a sport is in progress, e.g. the next point in a tennis match or the next corner in a football game. As such it requires the delivery of a continuous stream of real-time information to millions of concurrent users, whilst simultaneously receiving and processing a huge amount of incoming customer data.

Users can access the bet365 system via the company's website or through a network of banners on affiliate sites. The exponential growth in users, the vast quantity and volatility of the odds data and the need to push that data out to users quickly involves a complex network architecture that is spread across multiple geographic areas.

"It's a game of high availability and low latency on a massive scale," said Selby. "It's essential that the network team continually innovates and evolves the infrastructure so that it can keep up with the needs of the business and is fully prepared for future growth."

Challenges and Solutions

Connectivity has presented issues throughout the evolution of the bet365 network. The company began by outsourcing the management of their data and bandwidth to a tier one ISP and hosting company. Within a few years they had outgrown the 500Mbps infrastructure altogether.

This would be the last time that bet365 would outsource any element of their network build and management. The next step was to move out and go it alone.

"We wanted full control of our destiny, so we decided to move everything in-house. With fewer entities involved comes greater control and efficiency. Our IT is in a constant state of flux and having the knowledge brokers on-site means we can identify issues and deploy solutions with genuinely surprising speed," said Selby.

Building out the first data centre in Heathrow came with its fair share of challenges, not least of which was becoming carrier neutral. The goal was to fit out a 1Gbps infrastructure. bet365 opted for a solution with multiple transit connections and controlled their own traffic. The level of expertise needed was significant.

"When you run your own Border Gateway Protocol you essentially become part of the Internet. You are not a client sitting on a connection that has data passed through it. The Internet is fundamentally volatile and the routing can get messy. Without skilled IP professionals in the business, we would have struggled," said Selby.

More recently the major issue has been balancing the growth in users with the need for low latency in data exchange. This coupled with the need for robust security to protect against the proliferation of malicious traffic that a high profile presence on the Internet brings. The business doubles in size every 18 months to two years and traditional database technologies can only take the company so far. bet365 uses HP Superdomes to house its transactional databases and looking forward, can see that they will reach the limit of their capabilities in a few years.

"As we have grown and the load on the database estate has increased, it has become clear that a new approach was needed to deliver continued scale, whilst maintaining the high standard of our customer service. Rather than scaling horizontally, which could be cumbersome and expensive, we looked for a long-term solution in software," said Selby.

This new direction has led to the creation of bet365's personal cloud. The distributed computing model has taken the pressure off the database through the deployment of a middleware layer that caches and fans out the odds data. Where previously the user would fetch information from bet365's servers, the same transaction is now pushed into the appropriate area of the user's dashboard. This allows bet365 to take control of the timing of data refreshes and greatly improve the freshness of data – most notably the ever changing odds offered – without overloading the system.

The Push Systems produced greater packet throughput, which put more pressure on the security infrastructure and accelerated bandwidth usage. New security measures were brought in and a 10Gbps infrastructure was introduced to manage the data throughput.

Increasing network speeds and connection rates requires upgraded systems, deployed to provide security, monitoring and forensic capabilities. Our IT department prides itself on its ability to analyse problems quickly and turn around solutions within minutes and hours. With higher capacity networks we have had to re-evaluate our tools and techniques to inspect traffic at wire speed (in real time) and do one or a combination of the following:

- Deploy new technology to accommodate the greater traffic levels (Cisco's Nexus range)
- Scale out existing solutions using techniques and products that provide traffic aggregation (increasing server farms and parallel streaming traffic)
- Develop our own technology

"By addressing these monitoring and forensic scale issues head-on we have continued to analyse problems and performance issues on our new 10Gbps infrastructure with the same speed as we did on our 1Gbps infrastructure," said Selby.

Picking the right technology to meet current and future needs is one thing. Making sure that the IT team can take advantage of it, is another altogether. While IT development at other companies can be stifled by bureaucracy, the management at bet365 have worked hard to create a culture where techno-innovation thrives. This has a great deal to do with the fact that this is a family business and that the final decision lies with just two people, bet365's owners, Denise and John Coates.

"It's refreshing. Former employers would balk at spending a few thousand pounds on much needed infrastructure upgrades. Here, customer service is the number one priority. If there is an issue, a team is selected to deal with it. They come up with the solution and it is deployed. Decisions aren't made in weeks, months or years. They are made in hours," concluded Selby.

One example was a meeting to discuss a particular service issue and 10 minutes later the department had the green light to build a 24 x 7 operations team. The following week they had adverts in the news papers and we were recruiting keen young IT graduates! The team has grown in numbers over the years as the work load and complexity has increased and the people they took on have all used their experience to either further their careers within the company or moved onto senior roles within other organisations.

The Result
The hard work has certainly paid off. bet365 was recently voted number 1 in eGaming Review's Power 50, which rates the biggest online gambling businesses in the world. With network statistics like these, it's not hard to see why:

- *Total IT spend in 2010 was £60 million before salaries*
- *Hundreds of thousands of concurrent users supported on the bet365 system*
- *Millions of concurrent users supported on the banner system*
- *Data latency reduced to less than 2 seconds*
- *The In-Play System is capable of thousands of live changes per second*

bet365 continues to grow and this year alone will be looking to take on more technical staff to continue the development and support of their database and network infrastructure in pursuit of an ever-better, and larger, product to offer the world's gaming enthusiast.

About bet365

bet365 is a world leading eGaming company and a driving force in the development of Enterprise and Internet technology. Established in 2001 from a portakabin in Stoke-on-Trent, it has grown into a global operation that employs over 1,400 people and is live in 17 languages. Giving its development teams the freedom to innovate is key to bet365's success. The company has worked hard to cultivate a culture of innovation where good ideas and a techno-entrepreneurial attitude are encouraged and rewarded. Today bet365 continues to push technological boundaries and break new ground in software innovation.