# Paddy Power Betfair selects Arista Networks as the critical network layer in its transition to an Infrastructure-as-a-Service and DevOps focused environment

## Highlights

### Challenge

As one of the world's largest and fastest growing online betting operators, Paddy Power Betfair decided to move towards a scalable and more agile Infrastructure-as-a-Service architecture

### Arista Solutions

- Arista EOS® with MLAG, CloudVision and Zero Touch Provisioning (ZTP)
- Arista 7500 Series Spine with 7050X Series and 7280 Series Leaf

### Results

- Significant increase in the ability for the IT department to handle change requests
- Software defined architecture allows for greater levels of automation allowing for up to 2000 Virtual Machines to be brought online within a single 24 hour period.
- Lower latency, higher reliability and room to scale to a 100Gbps capable network design

Paddy Power Betfair plc was formed in 2016 following the merger of two of the fastest-growing online betting operators in the world: Paddy Power plc and Betfair Group plc. Today, the company is split into four divisions. 1) Online: which boasts two of Europe's leading online sports betting and gaming brands, Paddy Power and Betfair. 2) Australia: which under the Sportsbet brand, is the market leader in the fast-growing Australian online betting market. 3) US: which combines TVG, the leading horse-racing TV and betting network in the USA, and two Betfair operations in New Jersey, an online casino and a racing exchange. And 4) Retail, which operates 600 Paddy Power betting shops across the UK and Ireland, employing almost 5,000 people.

## Project Background

Modern technology infrastructure is needed to meet the demands of a fast-moving sector such as modern sports betting and gaming. The pace of change in application development has grown exponentially over the past few years, driven by the need to deliver new products and features to customers at an ever increasing rate. These customers expect to use their favourite digital products around the clock, wherever they are.

Prior to the merger in 2014, Betfair's infrastructure, which includes the betting exchange, handled approximately 135 million transactions, that in turn, generated 3.7bn API calls and 2.5TB of log data output each day. To deliver this level of performance, while balancing availability and routine maintenance duties, is a major challenge. This workload, combined with improvements to the automation of application deployment, means that infrastructure teams can quickly encounter a bottleneck.

"We effectively process more transactions than the London Stock Exchanges combined and our development teams are continually working on a variety of projects that require our infrastructure to deliver both high performance and the ability to rapidly scale," explains Richard Haigh, Head of Delivery Enablement for Paddy Power Betfair.

## Challenge

Betfair's existing infrastructure had evolved to keep pace with a rapidly growing company. To support future business expansion, the organisation needed to make a fundamental change to the way it viewed infrastructure. Building on experience gained from driving more agility in its development teams, and using the latest technology available, Betfair began a project called the i2 private cloud, in reference to the second generation of infrastructure that would help the company scale in line with its expected growth.

The i2 private cloud is designed to deliver a new network and hosting infrastructure based on Infrastructure-as-a-Service (IaaS) principles. Ultimately, this will host all of Paddy Power Betfair development, test and production applications and the associated tooling. The new infrastructure uses software defined networking (SDN) to reduce the reliance on physical network equipment and simplify network operations. This allows software applications to run independently in multiple data centres and balance customer traffic between them. Wherever possible, applications run active-active across data centres to provide a high level of resilience.

The infrastructure was designed following an in-depth selection process that evaluated products and vendors across the areas of server, storage, networking and key technologies such as KVM virtualisation, OpenStack and SDN.

## Solution

Although the project had many key requirements and expected benefits, one of the fundamentals was the ability to deliver faster, self-service environment provisioning, leveraging OpenStack APIs as the infrastructure middleware to reduce delays in

creating environments and expediting the delivery of code to market. This API-driven approach to infrastructure means that resources can be programmatically requested, which enables economies of scale and mobility of staff between teams. This approach also allows easier future changes or extended integration where appropriate.

With the company still growing at a rapid rate, and at a stage prior to the merger between Betfair and Paddy Power, the i2 project offered a horizontally scalable model allowing rapid growth as more compute resources are added. Yet even with the need to meet growth and DevOps requirements, the infrastructure needed to have rigorous security risk control baked-in and high levels of transparency to meet stringent regulatory requirements.

Haigh and his team embarked on a multi-month RFP process of vendor and product selection and evaluation. For the networking elements, the key requirement was for a 100Gbps capable network design exhibiting consistent throughput and latency at any scale to increase application performance. But just as crucially, the networking layer needed to support ts chosen Nuage SDN architecture without vendor lock-in to ensure flexibility in its future networking directions.  However, the network elements needed to provide full risk mitigation in case the primary SDN solution failed with seamless fall back to avoid service outage.

Yet elements beyond just technology were also crucial for success: "There was a good cultural fit between us and Arista," explains Haigh. "We are doing things that hit the limit of scale and automation and Arista had an appetite for the challenge – they were prepared to roll up their sleeves, pitch in and really push the technology in new directions."

One of the biggest advantages of Arista was its flexibility to support a range of SDN architectures and deployment schemes. The i2 project team chose to use a Clos style multistage circuit switching network design with a series of leaf switches to form the access layer. These switches are fully meshed to a series of spine switches that ensures that access-layer switches are no more than two hops away from each other. This approach minimises latency and the likelihood of bottlenecks between access-layer switches and gives the ability to select and alter the appropriate switch architecture based on each new use-case.

"We also had access to very senior engineering and technical staff at Arista across the project which helped us to optimise many of the design choices and streamline the implementation phases," comments Haigh.

The i2 project uses Arista 7500 series spine switches, each with a deep buffer option as these offered the best capability to support the mixed workloads, future developments, and provide a path to higher capacities including 100G and beyond.

The i2 design uses four types of rack configurations. Bare metal, infrastructure and compute racks contain two Arista 7050X leaf switches. While storage racks make use of two deep buffer 7280 Arista Leaf switches, designed with storage in mind. Each rack is configured for redundancy using Multi-Chassis Link Aggregation (MLAG) with layer-2 domain segmentation.

The Arista switches are updated using Arista ZTP (Zero Touch Provisioning) once they are racked and cabled in the data centre. These pull configurations from Arista's CloudVision® platform which contains all routing information for the Arista switches. Arista's CloudVision platform provides single point abstraction of the physical infrastructure to the Nuage SDN controller.

In operation, the Arista driven leaf-spine architecture is tightly coupled to the Nuage SDN to minimise network latency. One Nuage SDN instance is present per data centre to govern two OpenStack clouds and their associated layer-3 domains. The data centres are connected by dark fibre and both are direct mirrors of each other.

## Conclusion

The first parts of the i2 Private Cloud are now in production serving around 20% of the workload with a transition project still underway. However, Haigh notes a significant improvement in certain core metrics. Where planning, approving and provisioning new VMs could take days or weeks, the process is now measured from start to finish in minutes.

At an operational level, where the IT team would previously handle 500 change requests on a week, today that is the number of requests processed in a single day with a recent record of 2000 VM brought online in a 24 hour period.

Crucially, the switch to the i2 private cloud has led to major productivity gains without any rise in headcount and has allowed the IT teams to automate many mundane tasks and concentrate more on higher value activities.

"The expectations we had around Arista have been met and in many areas exceeded," says Haigh, "Reliability has been absolute, performance has been stellar and our future roadmap to scale out our infrastructure is well within the capability of the network architecture."

**Santa Clara—Corporate Headquarters**
5453 Great America Parkway,
Santa Clara, CA 95054

Phone: +1-408-547-5500
Fax: +1-408-538-8920
Email: info@arista.com

**Ireland—International Headquarters**
3130 Atlantic Avenue
Westpark Business Campus
Shannon, Co. Clare
Ireland

**Vancouver—R&D Office**
9200 Glenlyon Pkwy, Unit 300
Burnaby, British Columbia
Canada V5J 5J8

**San Francisco—R&D and Sales Office 1390**
Market Street, Suite 800
San Francisco, CA 94102

**India—R&D Office**
Global Tech Park, Tower A & B, 11th Floor
Marathahalli Outer Ring Road
Devarabeesanahalli Village, Varthur Hobli
Bangalore, India 560103

**Singapore—APAC Administrative Office**
9 Temasek Boulevard
#29-01, Suntec Tower Two
Singapore 038989

**Nashua—R&D Office**
10 Tara Boulevard
Nashua, NH 03062