bounti XP

Application Infrastructure and Security

changing the world of work

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Infrastructure Provider

bountiXP's cloud infrastructure provider is Amazon Web Services (AWS). AWS provides us with a mix of Infrastructure As A Service (IAAS) and Platform As A Service (PAAS) solutions. It also affords us flexibility to scale and deploy our application worldwide.

bountiXP was built for the South African market and has plans to include the international market.

The benefits of the availability zones enable scalability and the redundancy of the bountiXP infrastructure and applications. Edge computing, cloud content and distribution allows for quicker delivery of web application assets.
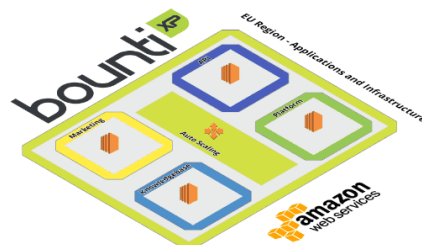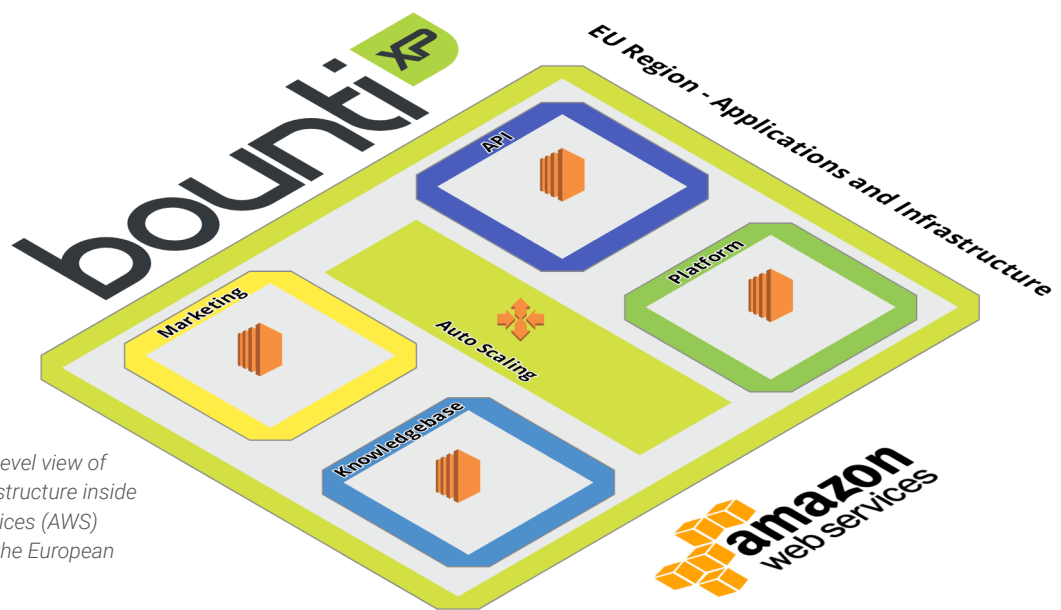

Figure 1 – *Amazon Web Services (AWS) and the global availability zones across the world. Our bountiXP infrastructure and applications reside in the EU region (Ireland)*
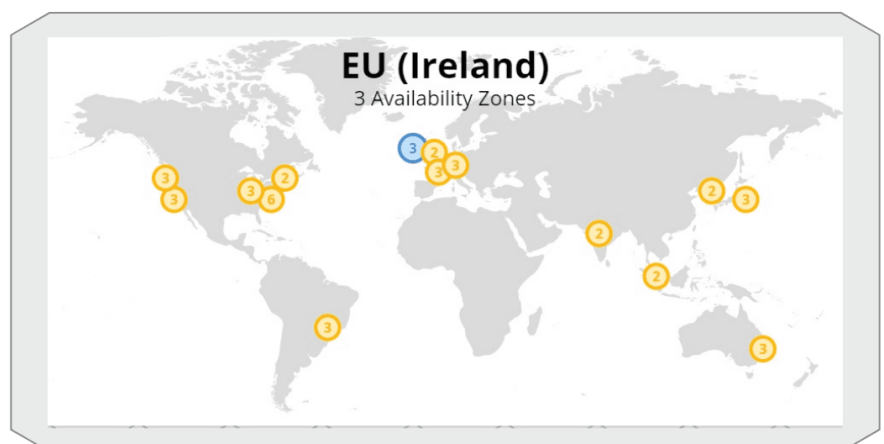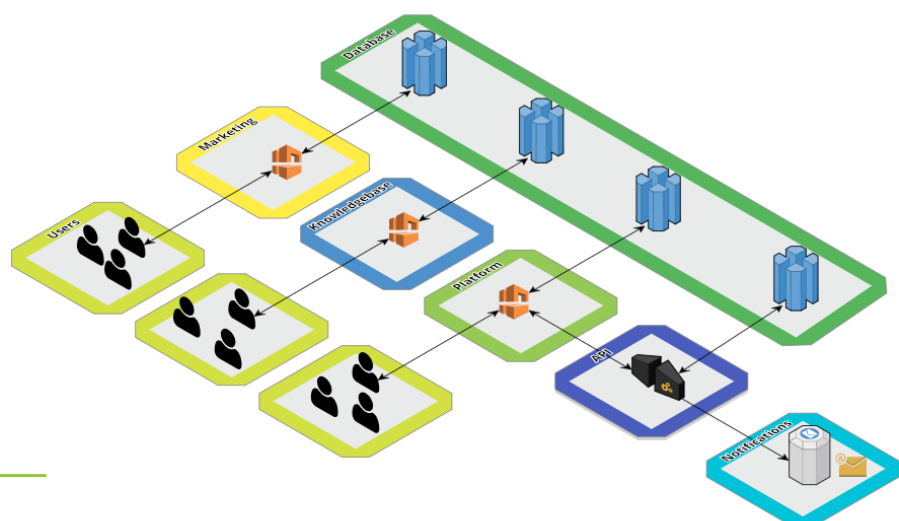
Applications

The image below depicts four bountiXP applications hosted in an availability zone. An availability zone within Amazon Web Services (AWS) can contain multiple data centre clusters. Our representation in Figure 1 describes a single geographic location and its availability zone allows us to scale our application within that region.

Figure 2 – *A high level view of the bountiXP infrastructure inside Amazon Web Services (AWS) and within one of the European availability zones.*


Figure 3 – *Depicts four different bountiXP applications namely Marketing, Knowledgebase, Platform and the API with the database layer and Amazon notification service.*

Figure 4 and Figure 5 depicts how web users connect to the bountiXP marketing website, platform as well as the way in which the applications connect to a database. Our applications use a load balancer called an ELB (Elastic Load Balancer), that will distribute web-based traffic to our applications. Based on metrics such CPU, Memory or Network connectivity, we also utilise EB (Elastic Beanstalk) to scale our application accordingly.

These metrics have pre-set thresholds. If any of the thresholds are breached EB will assume that the application resources are being impacted and will start to scale the application by creating more application resources.

All the applications use the same configuration for infrastructure.

Figure 4 – *The bountiXP marketing application as depicted in Figure 2 and 3 with more detail regarding the underlying web infrastructure and technologies*
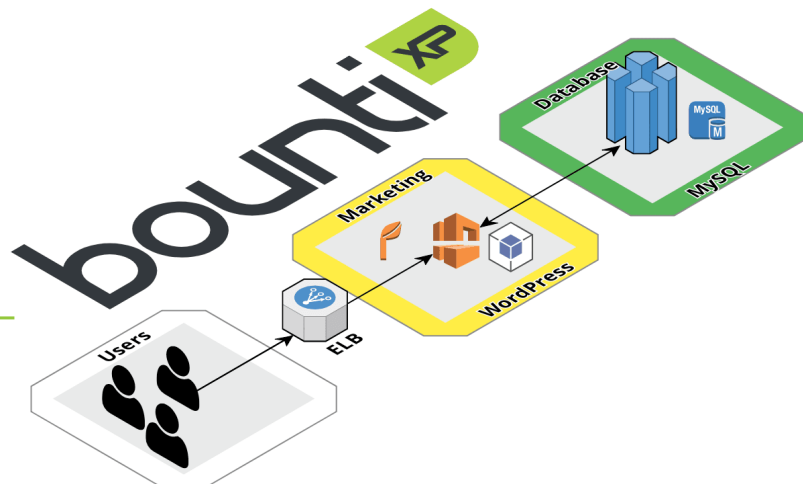
Figure 5 – *The bountiXP Platform application as depicted in Figure 2 and 3 with more detail regarding the underlying web infrastructure and technologies.*
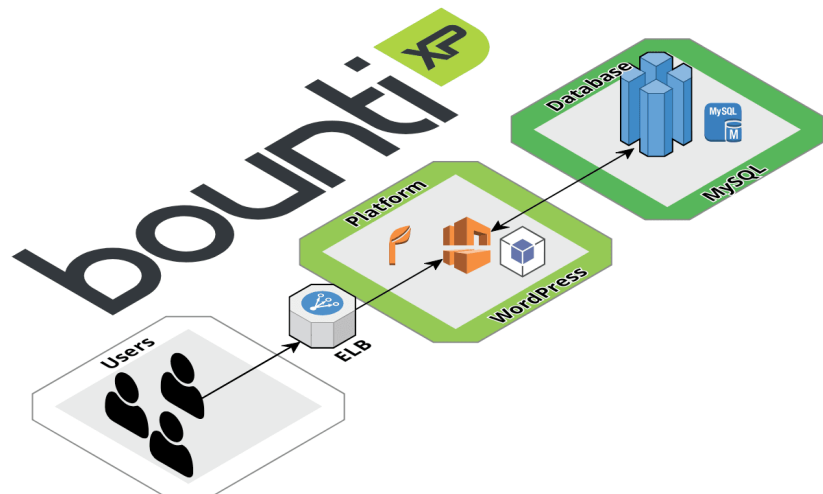
As seen in Figure 6, a web user's request travels from the Domain Name Server (DNS) to our load balancer and parallel requests are pulled from the Content Distribution Network (CDN) that calls assets from storage called Simple Storage Service (S3).

Once the request passes through the load balancer a fleet of application servers are used to service the request. These servers are called Elastic Cloud Compute (EC2) and has our bountiXP application installed.

The EC2 servers in Figure 6 are grouped to automatically scale if the servers are under load. The bountiXP EC2 servers are hosted in more than one availability zone. For example, if there is a disaster in one of the Amazon data centres, that is hosting our bountiXP applications one of the other data centres will initialise the switch over from the faulty data centre. This provides the bountiXP applications with high availability and ensures that there is no application down time.

Amazon's Relational Database Services are used for hosting the bountiXP databases. The bountiXP databases are configured to use availability zones that allows for disaster recovery and redundancy.

Figure 6 – *Detailed view of the lower level of our application infrastructure, beginning with a simple web user request.*
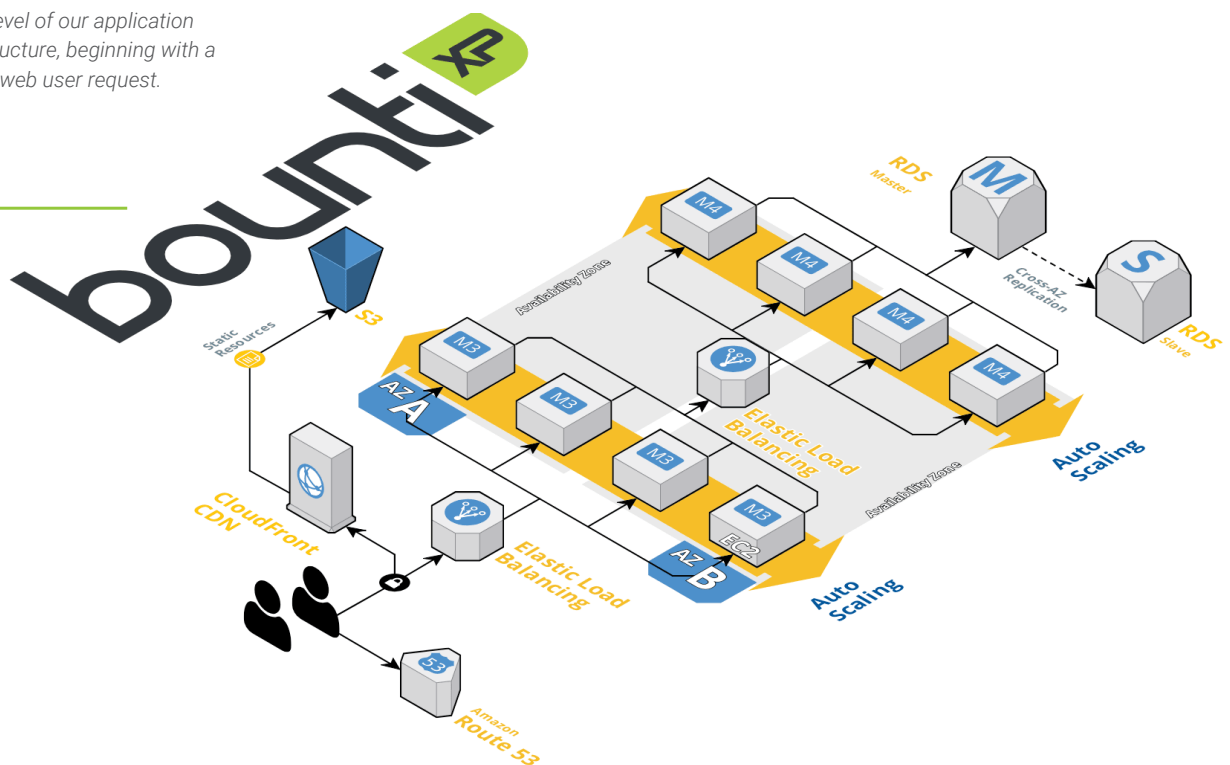
Integration

Figure 7 is a depiction of our current supplier, who is located in South Africa. We can integrate to other suppliers through APIs. Geographic location wouldn't be an issue as long as there is stable Internet connectivity.
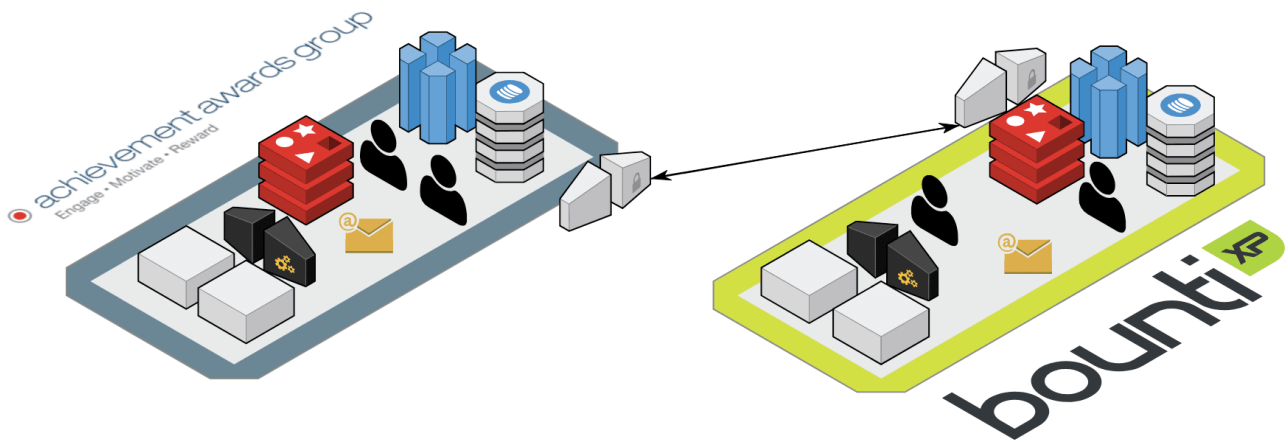
Figure 7 – *Supplier integration using Achievement Awards Group, where commination occurs over the Internet from bountiXP to Achievement Awards Group using secure APIs and NAT Gateways.*

Figure 8 – *Integration with clients and 3rd party applications.*

As seen in Figure 8, we are able to integrate with clients' and third party applications. A use case for this is getting the clients' user data from the SAP application.

Security

bountiXP leverages Amazon Web Services as their core focus is security expertise. We also use best practices and international coding standards:

Infrastructure Security
Our applications and servers are hosted in a private cloud environment, where public access to the servers are not possible; unless through the Virtual Private Cloud (VPC); rendering it exceptionally secure.

DDoS Mitigation
Our applications and servers are built for scaling and configured for high availability, where they reside in multiple Amazon data centres.

Monitoring and Logging
All our application servers and infrastructures are monitored by Amazon Cloud Watch; from auto scaling thresholds to server, database and application events.

Data Encryption
Our web traffic application is encrypted using SSL/TLS. Our databases are encrypted and hosted in Relational Database Services (RDS). Server access requires password protected SSH keys and complies with best practices. Infrastructure user and role policy govern exchange and access to various resources within our applications.

Access Control
Identity and access management, roles and policies are used to control infrastructure, server and application access to our resources.

Application Security
oAuth token authentication with http authentication on the APIs.
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Compliance

Amazon Web Services (AWS) has a list of all certifications and regulations on their website:
https://aws.amazon.com/compliance/programs/
Amazon Web Services is fully GDPR compliant

System requirements

We recommend using any modern web browser. The application is a responsive web application and will work on any desktop, smartphone or tablet.