WHITE PAPER

HOW DO AWAREX ENSURE CUSTOMER SELF SERVICE IS ALWAYS AVAILABLE?

Customer self-service is a 24*7*365 responsibility and needs to be available at all times to support end customers service requirements. We see Communication Service Provider CSP's globally classifying customer facing Digital Omni-Client systems as class A in their operational support categories and thus requiring the most stringent availability SLA's. By using a world class systems architecture AwareX offers an SLA of either 4 nines or 5 nines availability, to ensure customer satisfaction and continued revenue flow.

We also published our actual achieved service availability and for the whole of 2017 this was recorded at 100%.

AN ARCHITECURE TO DELIVER RELIABLE UPTIME

PRINCIPALS

We want to deliver a service which has zero downtime, is always available to end customers and incase of failure at most suffers gradual degradation of the service within acceptable limits and has a zero time to recover following a disaster situation. All traffic must be routed automatically to available services.

Both AwareX and the CSP must have full access to alarms and operational monitoring and reporting.

All this must be achieved whilst continuing to comply to data security requirements (see our separate White Paper on data security).

DESCRIPTION

The AwareX Integration Platform (IP) is the heart of our system and controls and manages the flow of requests from customers through all digital channels. It enables the secure end-to-end communication between a user's digital device and the CSP's back end BSS and other systems. It facilitates the operational support and monitoring of the system and undertakes required workflow, data formatting and correlation tasks to enable efficient display on a user's device.

The IP is located in the AWS cloud and is configured with an architecture which uses best practice to achieve the highest possible levels of system and service availability. There is a choice of our standard highly available Metro area DR solution offering 99.99% availability or the Wide area DR solution offering 99.999% availability depending upon a CSP's policy and preference. In practice, we see most CSP's opting for the Metro area solution which is our standard and is both Highly Available HA and DR enabled. We provide this as a minimum in all our implementations.

ARCHITECTURAL APPROACH

Separate Server Software Stacks

Every system comprises of multiple independent servers. Each system has a different software stack build using different components to provide resilience in case of a software bug or vulnerability becoming apparent. The IP application runs separately and independently on each of the stacks.

Load Balancing

DNS load balancing is used throughout the architecture to facilitate automated load balancing between multiple servers and traffic re-routing in the case of server failure. All native iOS and Android information requests both inbound and outbound are managed through the DNS.

Separate Server Stacks to Maximise Availability
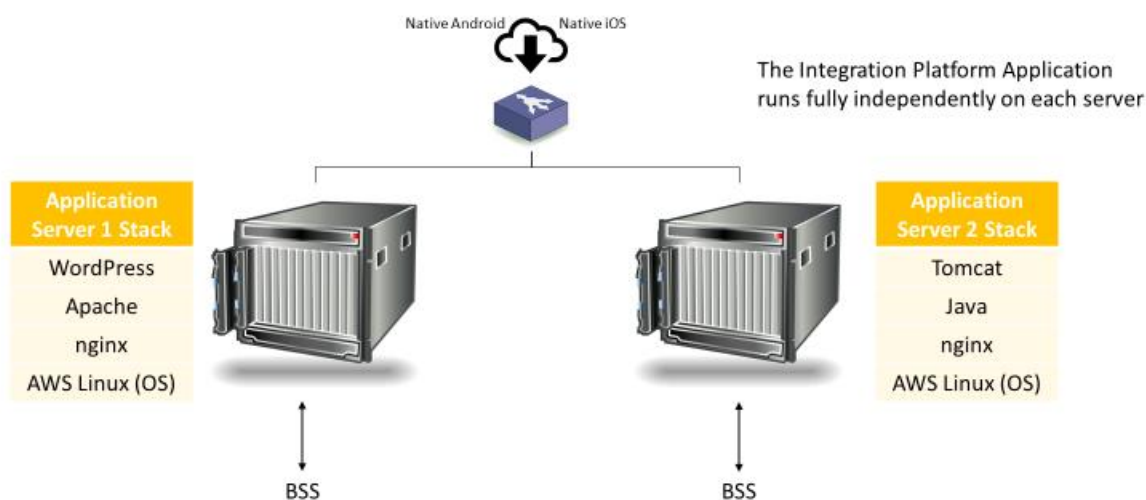
Seperation of Functions

Each IP server operates independently of the others and is capable of handling the total traffic of the combined system. This may be without any degradation of service at all or show some graceful degradation. This depends upon the time of day when a failure occurs. For example, between midnight and 7am we see on average less than 10% of the traffic during the day. This means one sever can handle all traffic with no service degradation at all. During the daily busy hour, a graceful degradation can be expected but one which should not inconvenience the end user, even if the monitoring tools will show the exact request return times have increased.

Each server has its own local high-performance disk drives configured as HA RAID5 for the storage of the software stack, application, root disk, dump disk and short-term storage of secondary information. (all of which is encrypted or hashed and contains no personal data or independently identifiable user data).

Content Management System – An exception to the rule

The Content Management System CMS is part of the Integration Platform IP and is located on one of the servers. This is the only software component which is not duplicated. The CMS contains the configured FAQ's, Terms and Conditions and marketing banners. In the case that the server without the CMS installed fails then there is no impact at all. In the case where the Server hosting the CMS fails then the CSP will not be able to edit content during the 'down' period and the end

user will not be able to access the content such as the FAQ or T&C's. This will not stop the APP user having full access to all the other normal features and functions of the APP.

Long Term Storage

AWS S3 is used to hold system logs and backups. The retention period is configurable but is usually 30 days. This data is used for efficient operation of the system, operational analysis and reporting of items such as SLA compliance. There is no storage of personally identifiable data. S3 allows the size of the local disks to be minimized and thus the reliability improved.

Operational Tools

AwareX utilizes the ELK suit of operational systems and tools to manage the IP. This industry standard operational tool set provides a full monitoring capability for the system, analysis, reporting and alerting. The Alerts are fully available to the CSP as well as AwareX.

Metro Area High Availability

This is our normal and standard architectural implementation and provides both high availability and DR capability.

The cloud infrastructure is based upon independent zones which are clustered to form a region. Each zone has separate utility services such as mains power, back up batteries, generators and air conditioning which are isolated from the other zones. We locate servers in separate zones with traffic balanced between them in normal operation. A third zone is used for long term storage, back up and operation tool support.

High Availability Architecture
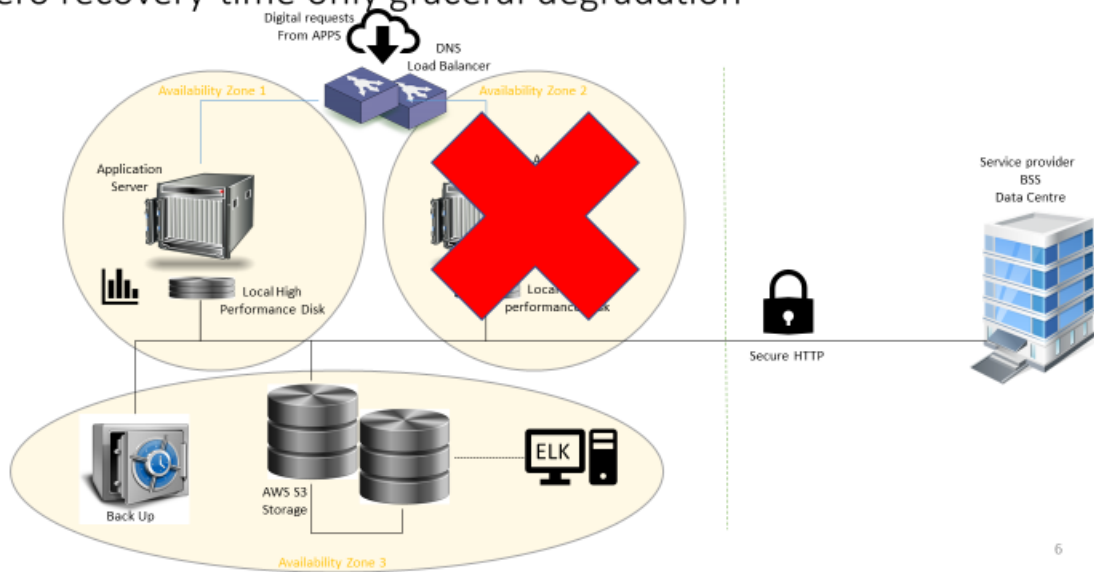3 Independent Zones within 1 Metro Area
SLA
99.99% Availability
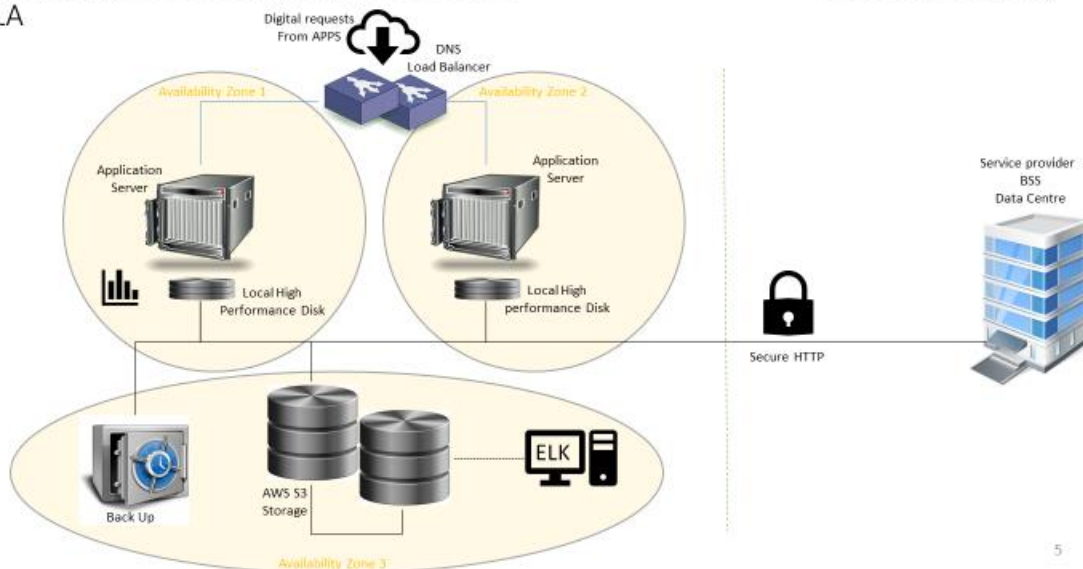
In the unlikely case of a failure of a zone then the second Zone takes over all processing tasks until the failed Zone is restored to normal service without impacting the end customer experience.

In case of disaster to one zone there is zero recovery time only graceful degradation

Wide Area High Availability

This is our highest level of SLA availability and is a duplicated architectural implementation using 2 separate Regions. The Metro area configurations are retained and duplicated in widely separate geographic locations proving a fully redundant back up capability. Whilst a disaster on a scale which would disable a full Metro area configuration is unlikely some CSP's IT Operations policy's require the highest possible level of availability and redundancy.
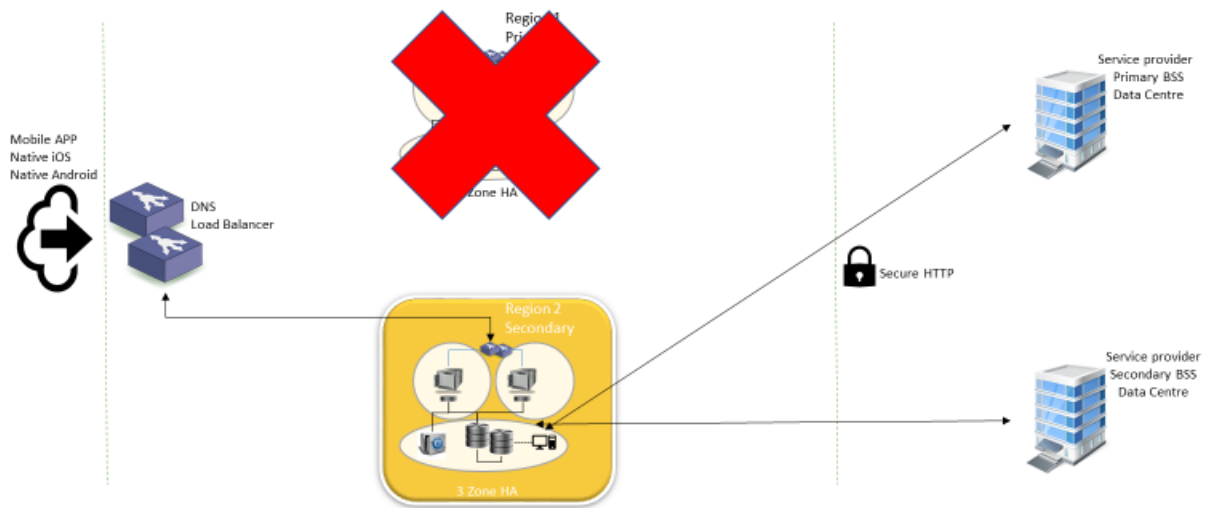
High Availability Architecture
2 Independent Regions with 2 Metro Area Data Centres each with 3 Zone High Availability
99.999% Availability SLA
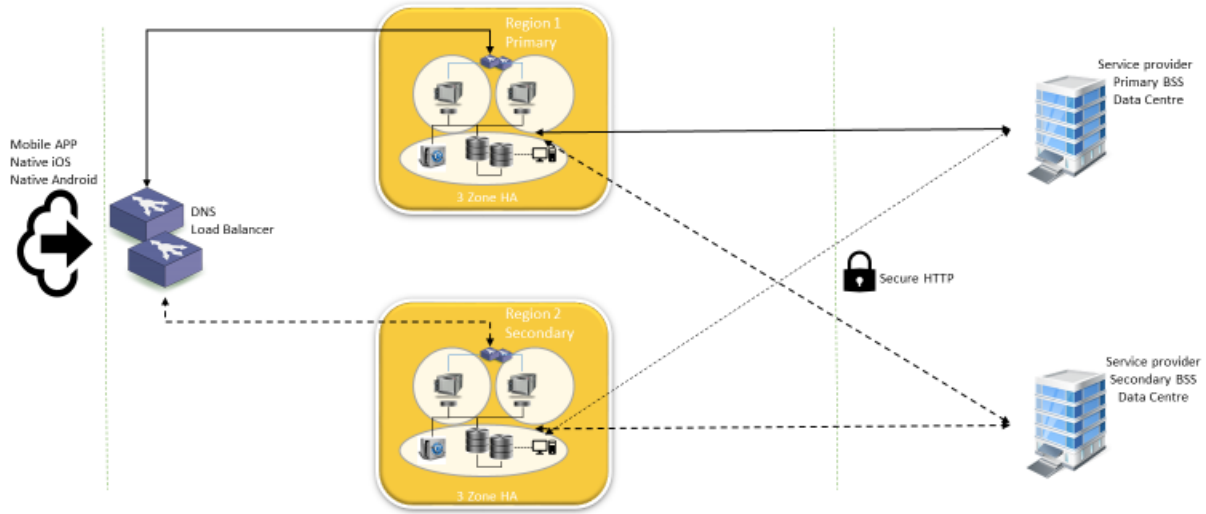
In the unlikely case of a failure of a Region then the second Region takes over all processing tasks until the failed Region is restored to normal service without impacting the end customer experience.

In case of disaster to 1 region there is zero recovery time and no degradation of service

CONCLUSIONS

AwareX offers a choice of Highly Available architectures to support availability SLA's of either 99.99% or 99.999% uptime. This allows a CSP to have total confidence in their customer facing digital channels always being available to service end customers' needs and to allow those all-important Top Ups and bill payments, new product discovery, purchases and review bills, usage and account information.

In the case of any failure there is no downtime and no loss of customer experience.

Since AwareX is a product we are always developing and releasing (every two-months) new features and functions which include enhanced platform capability's. It is to be expected that the capability described in the white paper will be enhanced and refined as we continue to bring our new versions to market.

The AwareX digital omni-Client system architecture is built for an always on services economy and offers true dependability to Communications Service Providers who want the best possible digital channel solutions as they migrate to becoming Digital Service Providers.