



Networking in Public Cloud Deployments

Assignment 1 – Web Site Design Document (v1)

December 23, 2019

ABSTRACT

The purpose of this document is to define the requirements of a web site to be hosted in Microsoft Azure.

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This web site will act as the business web site for Hogue Technology Services (HTS). The initial use of the site will be for marketing services to potential and existing customers. The web site will be accessed by both customers and administrators via the Internet. No access is required to an on-premises data center.

Upon accessing the site, the customer will see default web page(s) that offers an overview of all services provided by HTS. There will be additional links and tabs that will allow the customer to order services on-line. A back-end database will be used to store the available services. The available services will be displayed on the web site, where customers can then select the service they wish to order. The orders will be emailed to justme752011@hotmail.com for fulfillment.

Access

There will need to be several different layers of access to the web site. The access required automatically inherits all access levels below it. For example, create access includes modify and read access. The access is defined by user type in the below table:

User Type	Web Site Access	Database Access
Owner	C	C
Administrator	M	M
Customer	R	R

- Create=C Modify=M Read=R

Access to the web site will be via public IP for customers. Only HTTPS access will be allowed via TCP Port 443. All access requested via TCP Port 80 will be redirected to TCP Port 443.

Database access for the Owner and Administrator will need to be secure. The user will not have direct access to the database. The web site will access the database via TCP Port 1433.

Data Requirements

The data will consist of information needed to describe the services. A database will contain data in the following table format:

Service SKU – A 3 digit numerical field that will be used as the database index and service identifier

Cost of Service – A 6 digit numeric field whose last 2 digits will represent 2 decimals places to assign an US dollar amount to the service.

Service Description – Variable length (256 max alpha-numerical length field) that will describe the service being sold.

Load Balancing

Initial traffic loads will be low therefore, load balancing will be very simple and serve 2 purposes. First and most important will be redundancy for both the web site and backend database server. Since the load on each resource is expected to be low, round robin load balancing will be used. Monitoring of the load balanced pool members (either up or down) will be used to determine which resource the traffic will be directed to.

Security

Initially there will be no security needed to access the public site for customers. SSH keys will be used to access the site and backend database for owners and administrators. The use of SSH keys instead of user-id and passwords provides a more seamless access method for the orchestration tools that will be used.

Certificates will be used to encrypt traffic between the customer and the web site. The certificate must be from a public certificate authority, such as DigCert. Self- signed certificates are not acceptable to be present on the public facing web site. Self-signed certificates are acceptable to use to encrypt traffic between the web site and backend database server.

A firewall will need to be deployed creating a DMZ to separate the public web server from the private database. Rule(s) in the firewall will need to be created to allow both TCP port 80 and TCP port 443 to be able to access the web server. Additional rule(s) allowing only the DMZ web servers to access the private database servers via TCP Port 1433 will also be required.

High Availability

24x7 365 days a year availability is not required for the initial roll out of the site or backend database. As more services are added this requirement may change. The use of the Azure Cloud will allow for a very robust infrastructure that meets the current requirements and also support future higher levels of availability when they become a requirement.

Therefore, creating resources across Regions or Availability Zones is not initially required.

However, the use of load balancers should provide some protection against single VM or DB failure by allowing a single VIP pool of resources in which to choose from. There will need to be 2 load balancers configured in a 'HA' scenario to ensure the load balancer is not a single point of failure.

Connectivity and Routing

Access to the web site will be via public IP for users. Only HTTPS access will be allowed via TCP Port 443. All access requested via TCP Port 80 will be redirected to TCP Port 443.

Database access for the owner and Administrator will need to be secure. The user will not have direct access to the database. The web site will access the database via TCP Port 1433.

Dynamic routing using either OSPF or BGP will be configured. The use of these protocols allows for much quicker scaling of the solution.

Summary

The web site will provide customers with a list of services provided by Hogue Technology Services (HTS). The site will allow new and existing customers to order services online. Providing these services in the cloud will allow HTS to provide on-line ordering to its customers without a running a full-service datacenter. The Azure cloud solution will also scale in a timely manner as the business requirements increase.