Using Amazon AWS Route 53 for SIP Servers Survivability via a single FQDN

In redundant SIP servers environments, where the endpoints do not offer the possibility of defining a Secondary/Backup SIP server, such as in Zulu 3 (currently) and in other possible endpoints (phones, softphones, gateways, etc.), having a DNS service that would quickly and automatically switch the IP address a single FQDN resolves to, would be very convenient as it will allow for the automatic failover between the two such redundant SIP servers be possible.

In this guide we will be using two PBXact v14 appliances along with Zulu 3 as the endpoint but this could also be applied to other SIP servers such as SBCs or other endpoints such as SIP softphones lacking a the possibility of defining a Secondary/Backup SIP server.

Pre-Requisites

- Amazon AWS Route 53 account
- Both SIP servers must be reachable through a different public IP address of their own
- For automatic syncing of configurations and records (CDR, logs, etc) between two PBX servers, a Warm Spare backup and restore job should be properly configured first

Limitations

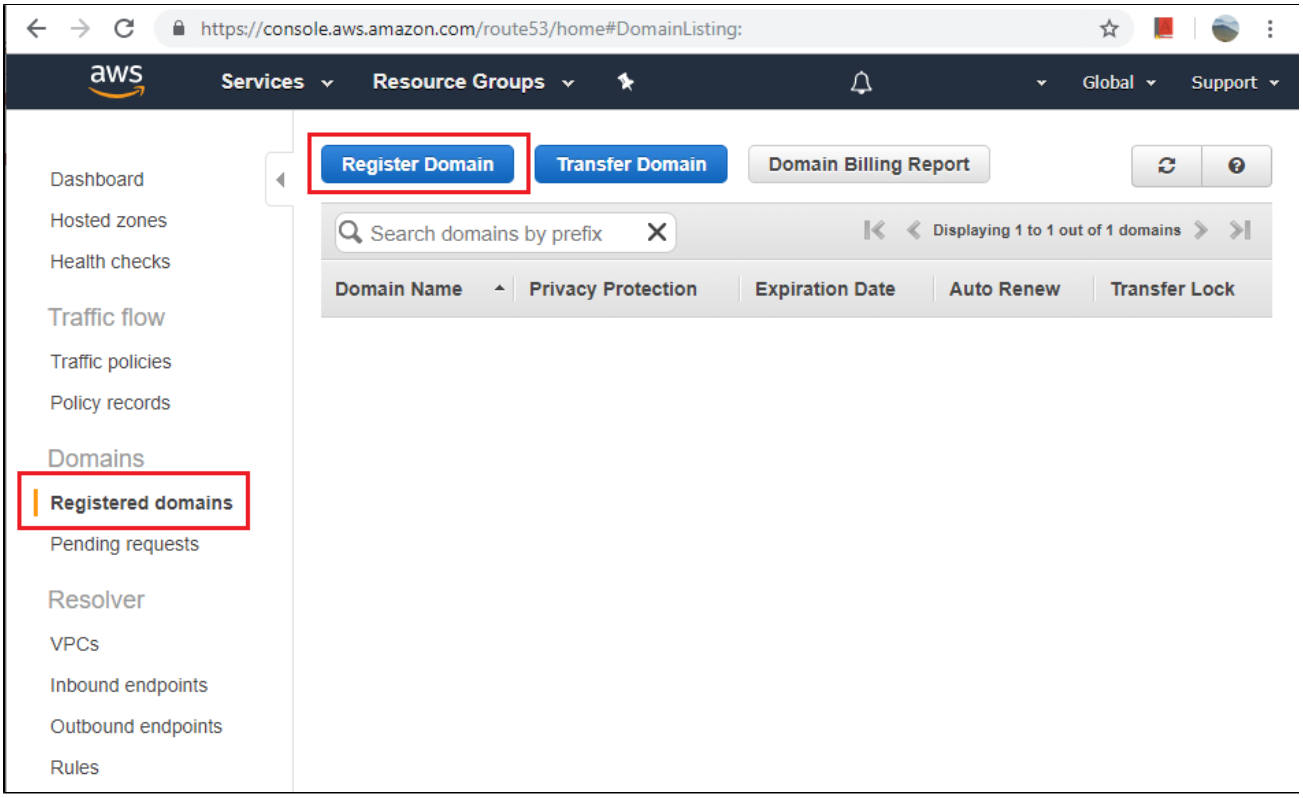
- Only one Health Checker, that is, AWS Route 53 method for determining server availability, can be setup at a time (ie. only one, the AMI port 5038 or the Zulu port 8002, could be monitored to determine if the PBX service is available or not). This brings the following possible complications:
    - When Asterisk process (tcp 5038) is selected to be monitored on AWS Route 53 for checking PBX availability (***recommended as asterisk service tends to fail more commonly than zulu server***)
        - If only Asterisk fails (tcp 5038), but not Zulu (tcp 8002), AWS will switch the IP address the FQDN resolves to. Zulu will not be able to automatically failover though as it does not detect any problem registering with the current server. Restarting the Zulu application will make the failover take place
        - If only Zulu fails (tcp 8002), but not Asterisk (tcp 5038), AWS will NOT switch the IP address the FQDN resolves to. Zulu will get disconnected as expected. Troubleshooting would be needed to determine the cause for Zulu server failing and bringing it back up
    - When Zulu process (tcp 8002) is selected to be monitored on AWS Route 53 for checking PBX availability
        - If only Asterisk fails (tcp 5038), but not Zulu (tcp 8002), AWS will NOT switch the IP address the FQDN resolves to. Zulu will not be able to make or receive calls as expected. Troubleshooting would be needed to determine the cause for Asterisk failing and bringing it back up
        - If only Zulu fails (tcp 8002), but not Asterisk (tcp 5038), AWS will switch the IP address the FQDN resolves to. Zulu will automatically failover (*Note:* restarting the Zulu application may still be needed for correctly authenticating on the new server)
- Zulu 3 has (currently) no possibility for defining the value for its SIP Registration Expiry timer, it is permanently set to 600 seconds (10 minutes). This makes it necessary to restart the application once the main server has come back online in order to failover back to it

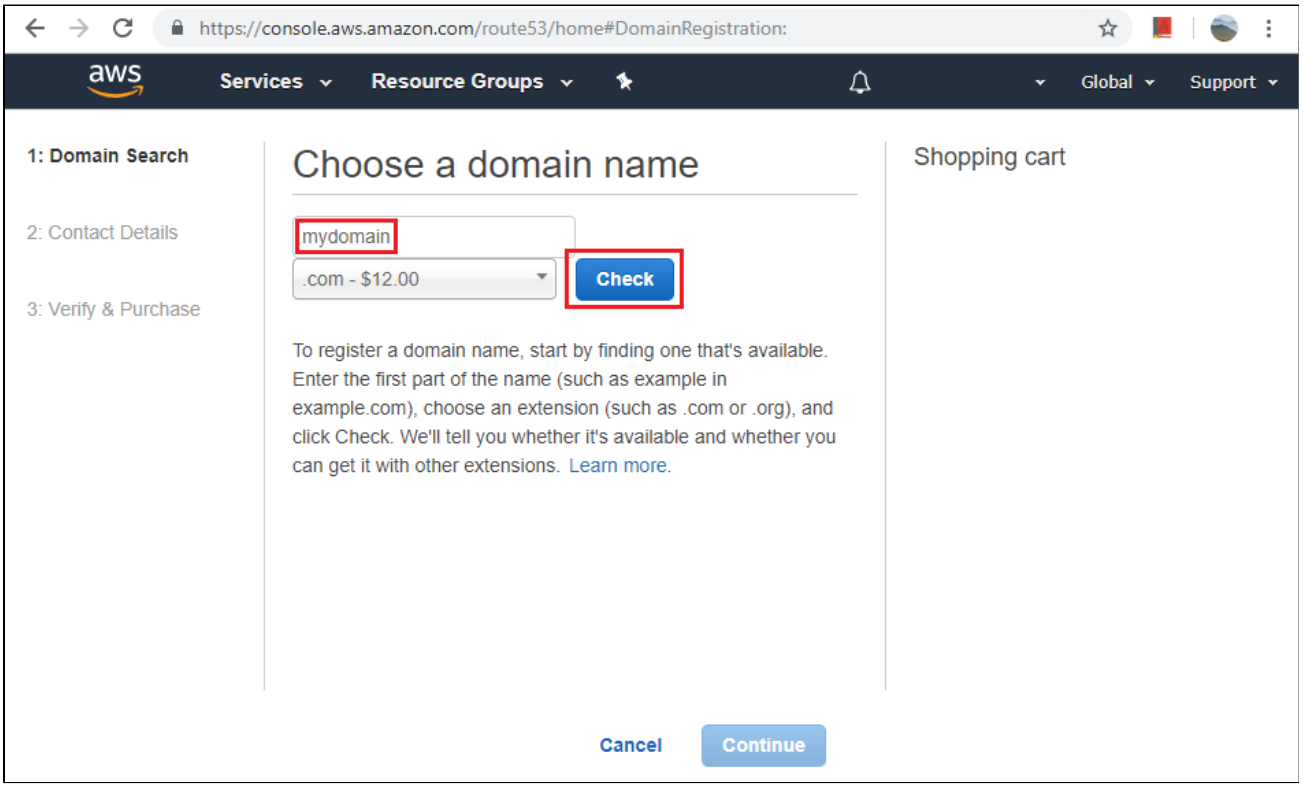
Step-by-step guide

Configurations on Amazon AWS Route 53:

1. Register or Transfer a Domain

    Registered domains > Register Domain


https://console.aws.amazon.com/route53/home#DomainListing:
aws
Services
Resource Groups
Global
Support
Dashboard
Hosted zones
Health checks
Traffic flow
Traffic policies
Policy records
Domains
Registered domains
Pending requests
Resolver
VPCs
Inbound endpoints
Outbound endpoints
Rules
Register Domain
Transfer Domain
Domain Billing Report
Search domains by prefix
Displaying 1 to 1 out of 1 domains
Domain Name
Privacy Protection
Expiration Date
Auto Renew
Transfer Lock


https://console.aws.amazon.com/route53/home#DomainRegistration:
aws
Services
Resource Groups
Global
Support
1: Domain Search
2: Contact Details
3: Verify & Purchase
Choose a domain name
mydomain
.com - $12.00
Check
To register a domain name, start by finding one that's available. Enter the first part of the name (such as example in example.com), choose an extension (such as .com or .org), and click Check. We'll tell you whether it's available and whether you can get it with other extensions. Learn more.
Shopping cart
Cancel
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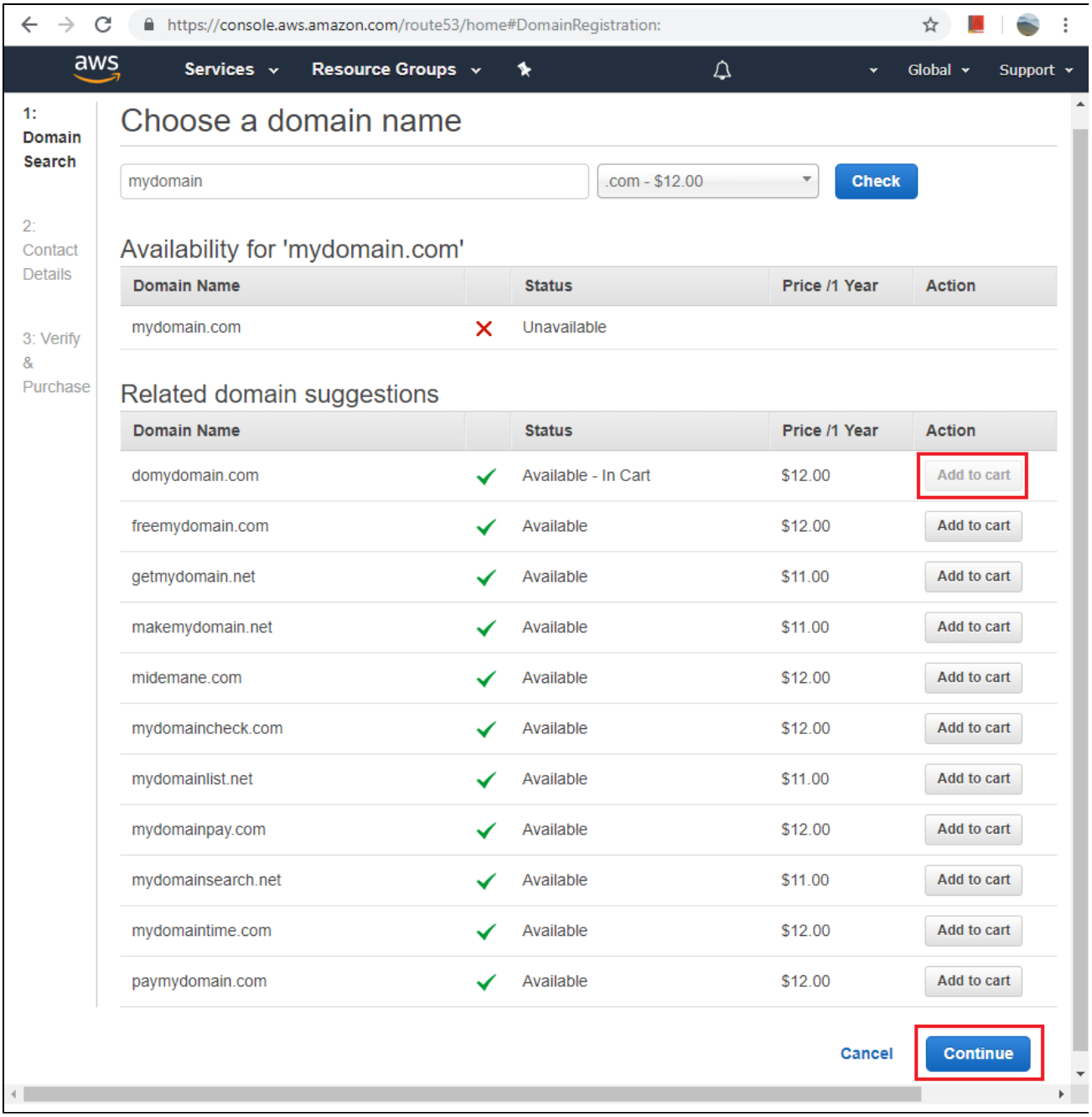
https://console.aws.amazon.com/route53/home#DomainRegistration:
aws
Services
Resource Groups
Global
Support
1: Domain Search
2: Contact Details
3: Verify & Purchase
Choose a domain name
mydomain
.com - $12.00
Check
Availability for 'mydomain.com'
Domain Name
Status
Price /1 Year
Action
mydomain.com
Unavailable
Related domain suggestions
Domain Name
Status
Price /1 Year
Action
domydomain.com
Available - In Cart
$12.00
Add to cart
freemydomain.com
Available
$12.00
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getmydomain.net
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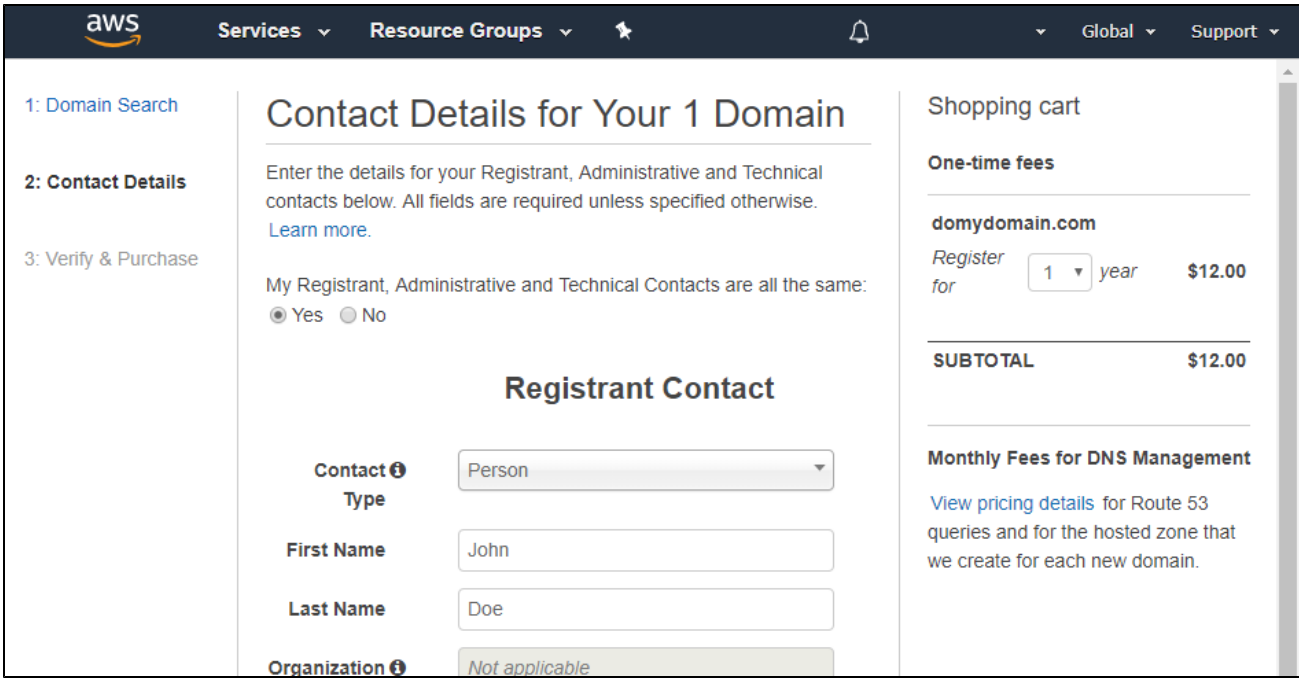
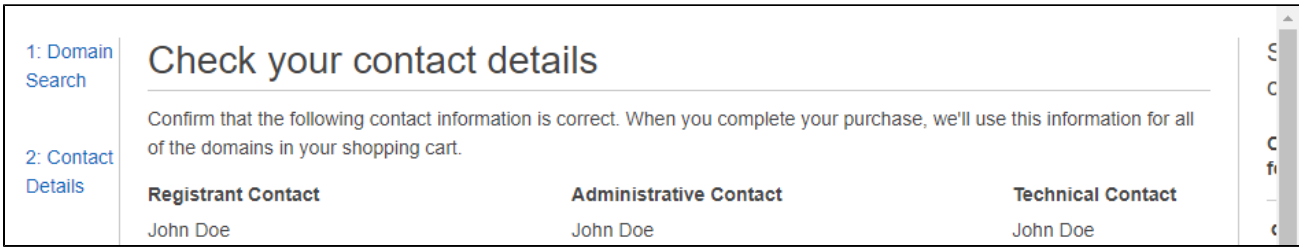
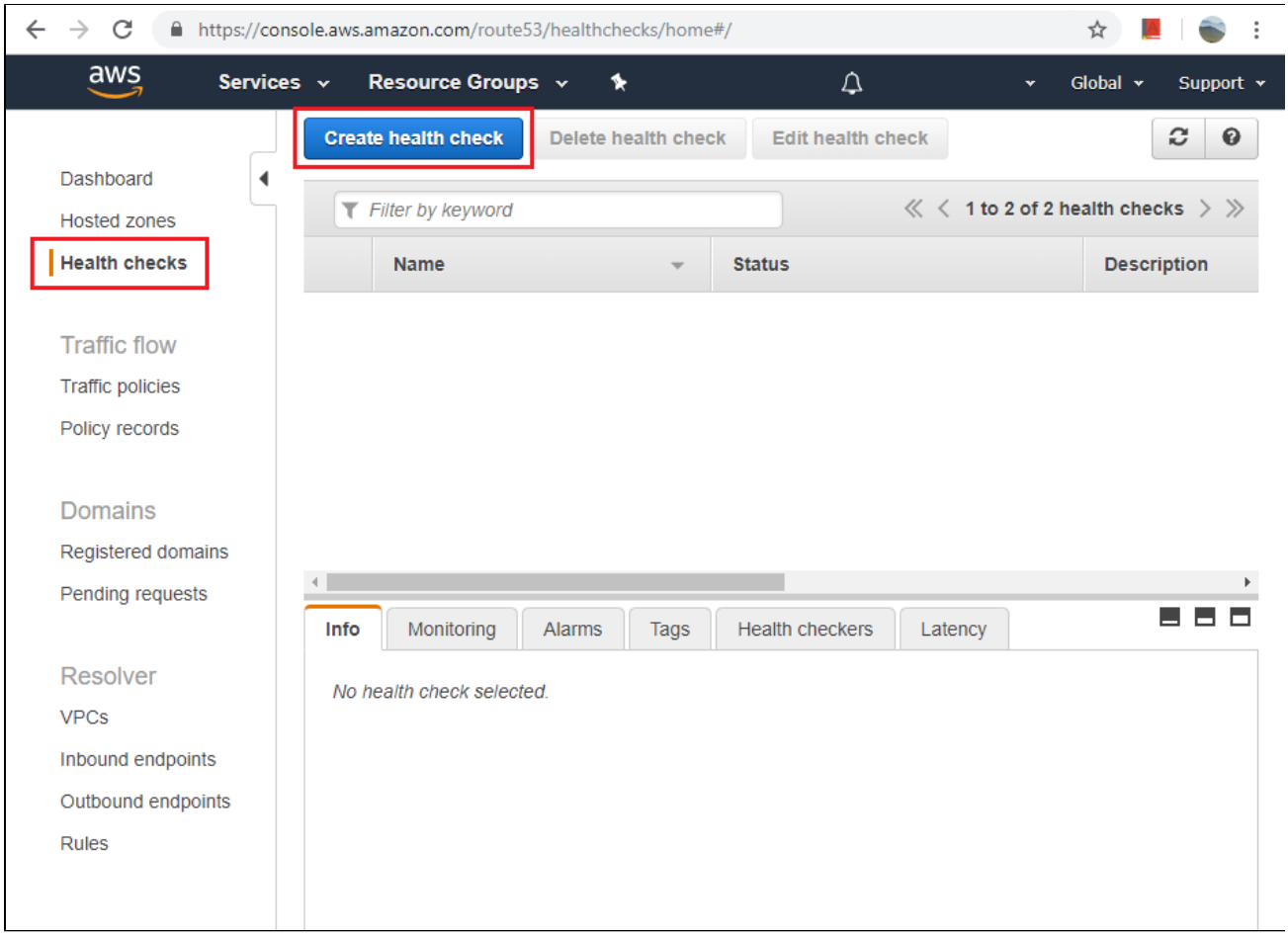


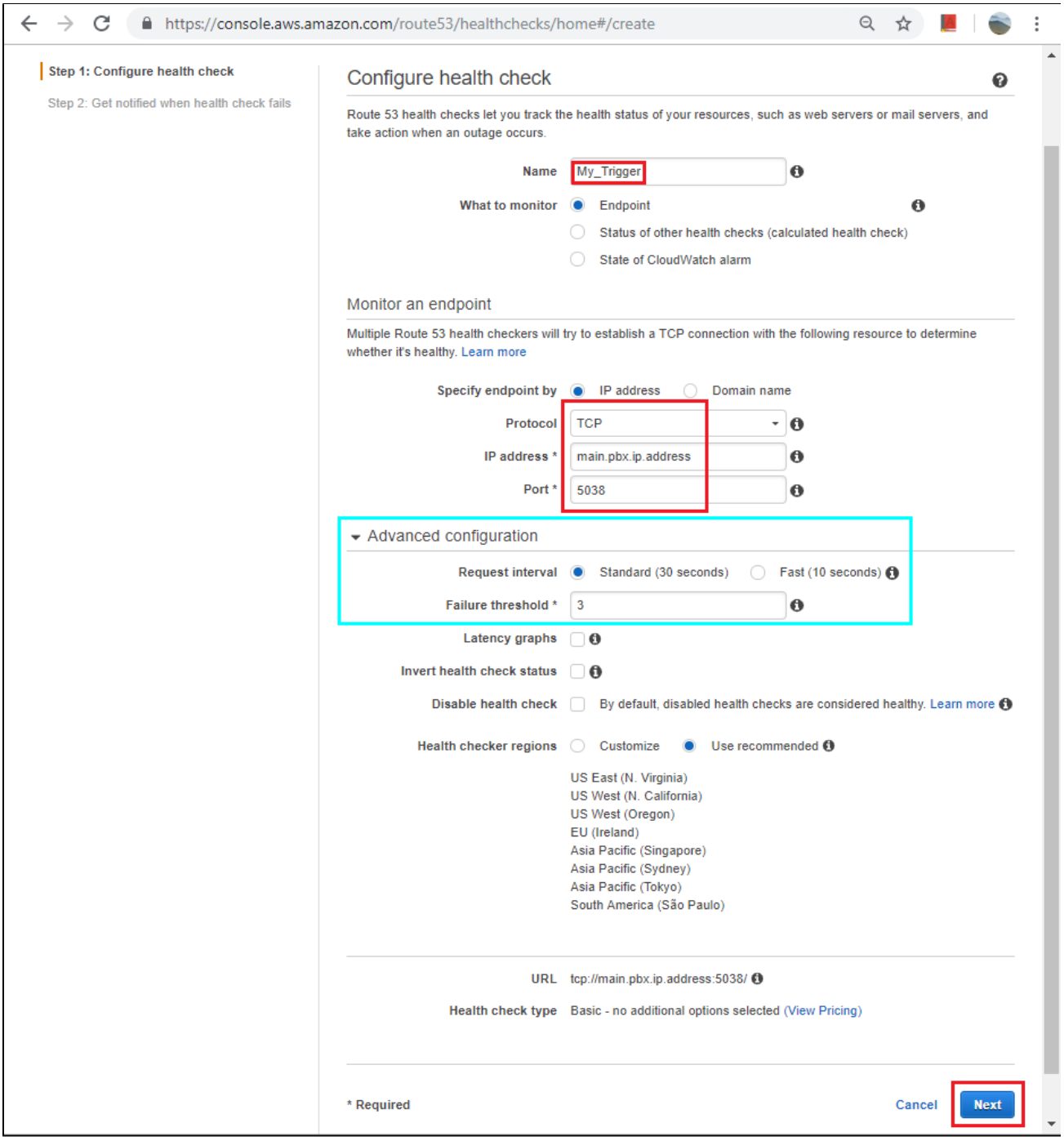


Once the Domain is registered, AWS Route 53 will automatically create a Hosted Zone for it.

2. Create the Health Check for AWS Route 53 to know when to deem a server as unhealthy and proceed to switch the IP address the Domain (FQDN) resolves to.

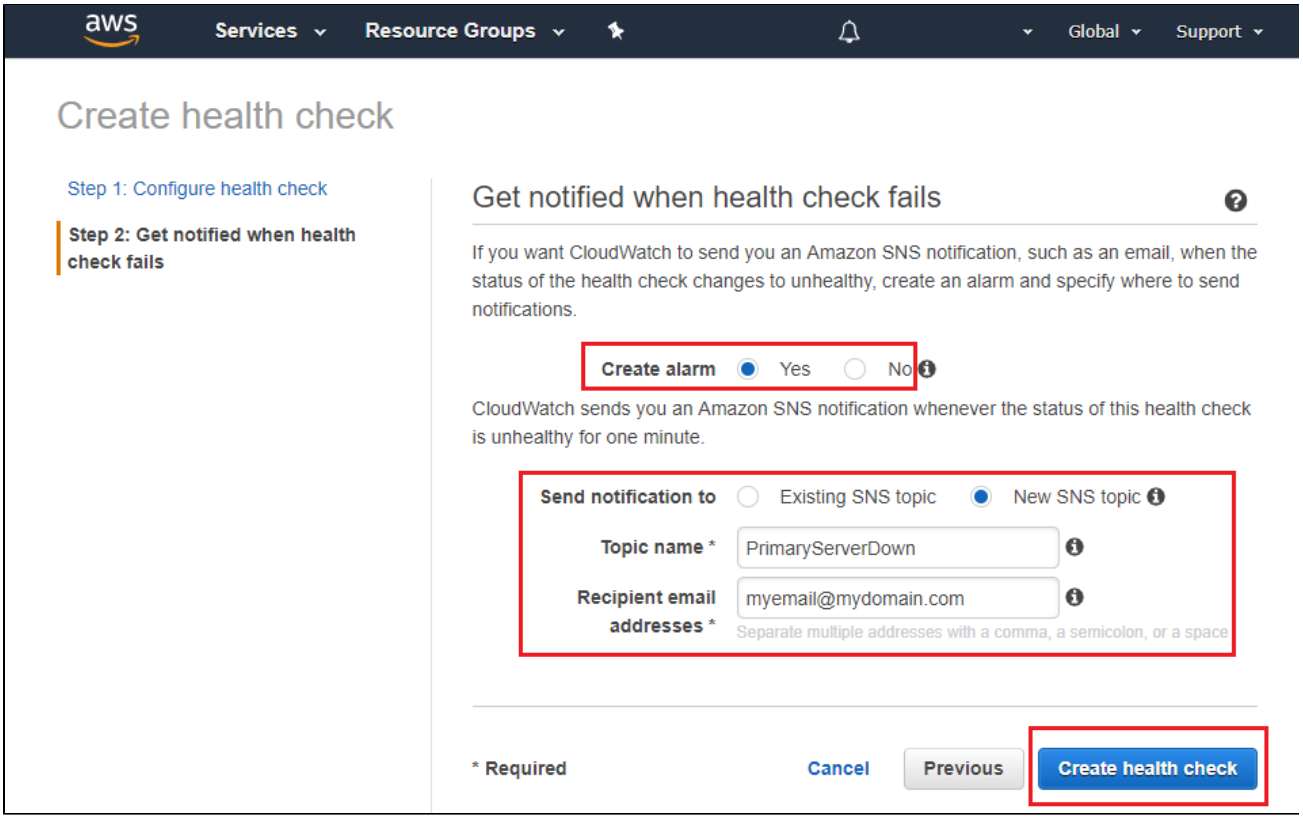
   Health checks > Create health check


https://console.aws.amazon.com/route53/healthchecks/home#/
aws
Services
Resource Groups
Global
Support
Create health check
Delete health check
Edit health check
Dashboard
Hosted zones
Health checks
Traffic flow
Traffic policies
Policy records
Domains
Registered domains
Pending requests
Resolver
VPCs
Inbound endpoints
Outbound endpoints
Rules
Filter by keyword
1 to 2 of 2 health checks
Name
Status
Description
Info
Monitoring
Alarms
Tags
Health checkers
Latency
No health check selected.

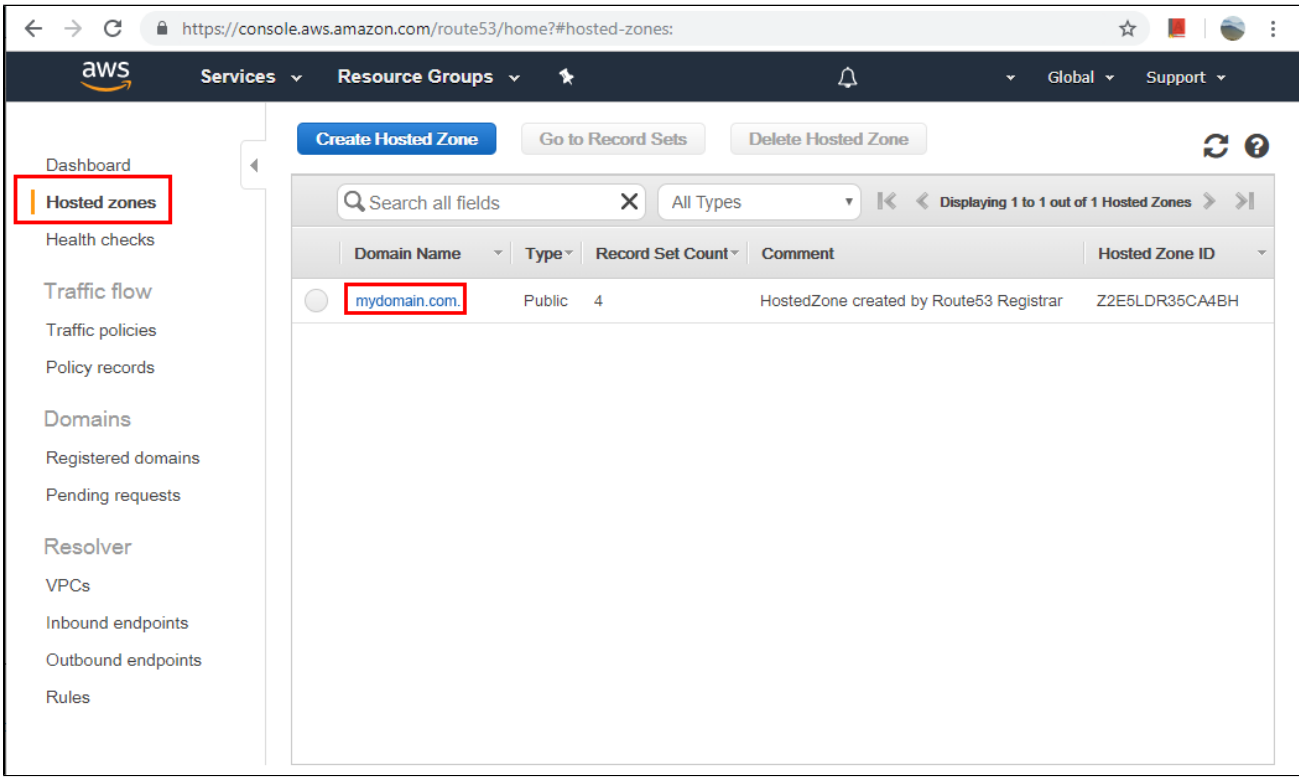


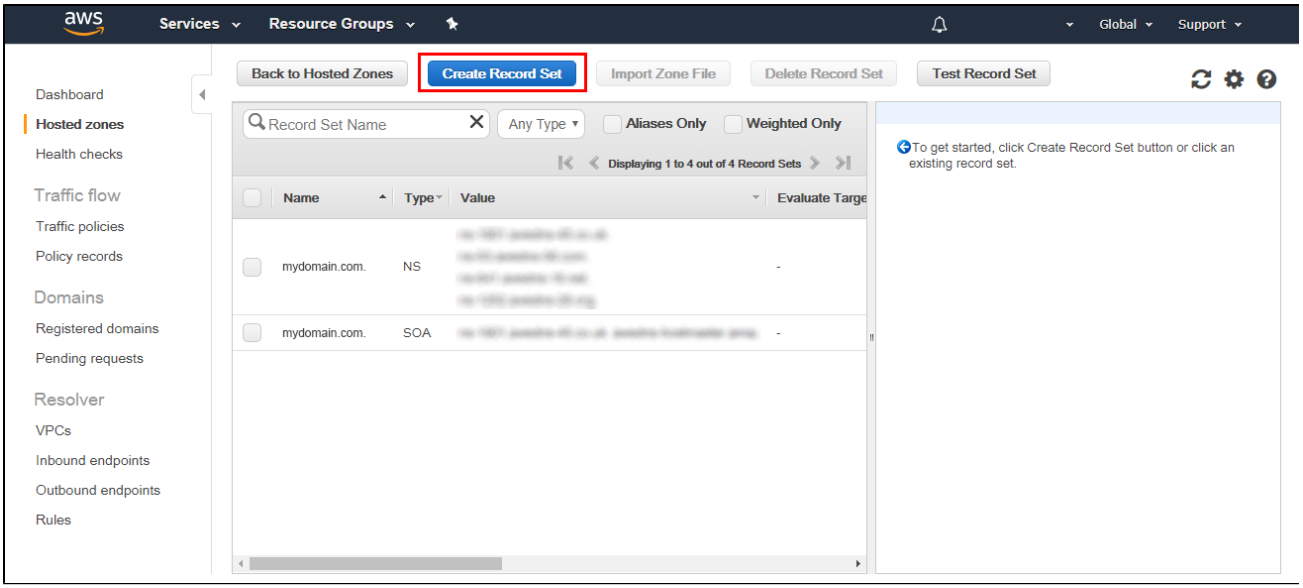
The "Request interval" and "Failure threshold" parameters inside the "Advanced configuration" section allow us to control how 'quickly' would a failing SIP server be detected, which in turn makes Amazon AWS Route 53 proceed to switch the IP address the Domain (FQDN) resolves to

Optionally, you can create an alarm to get notified via email when the server becomes unhealthy (ie. reaching TCP port 5038 is not possible)

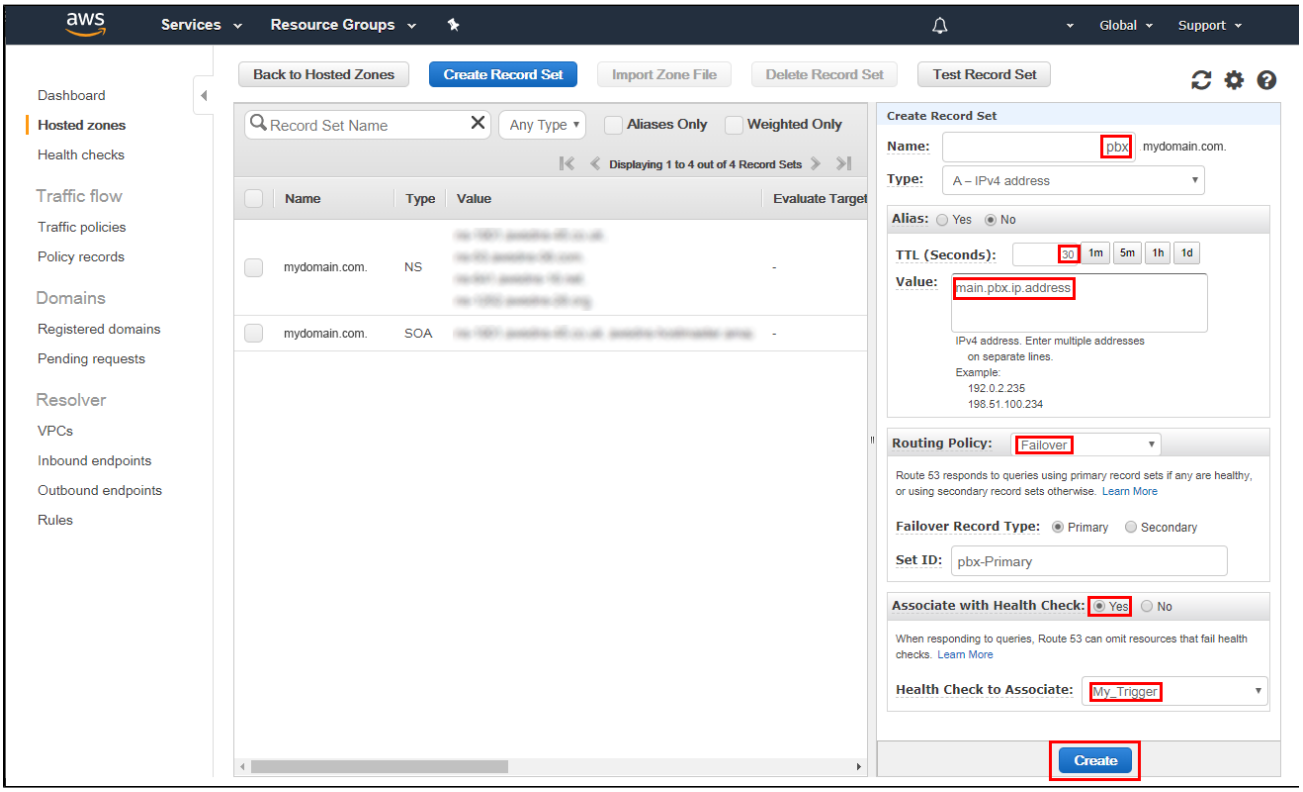


3. Assign your SIP servers, along with the Health check, to your Hosted Zone

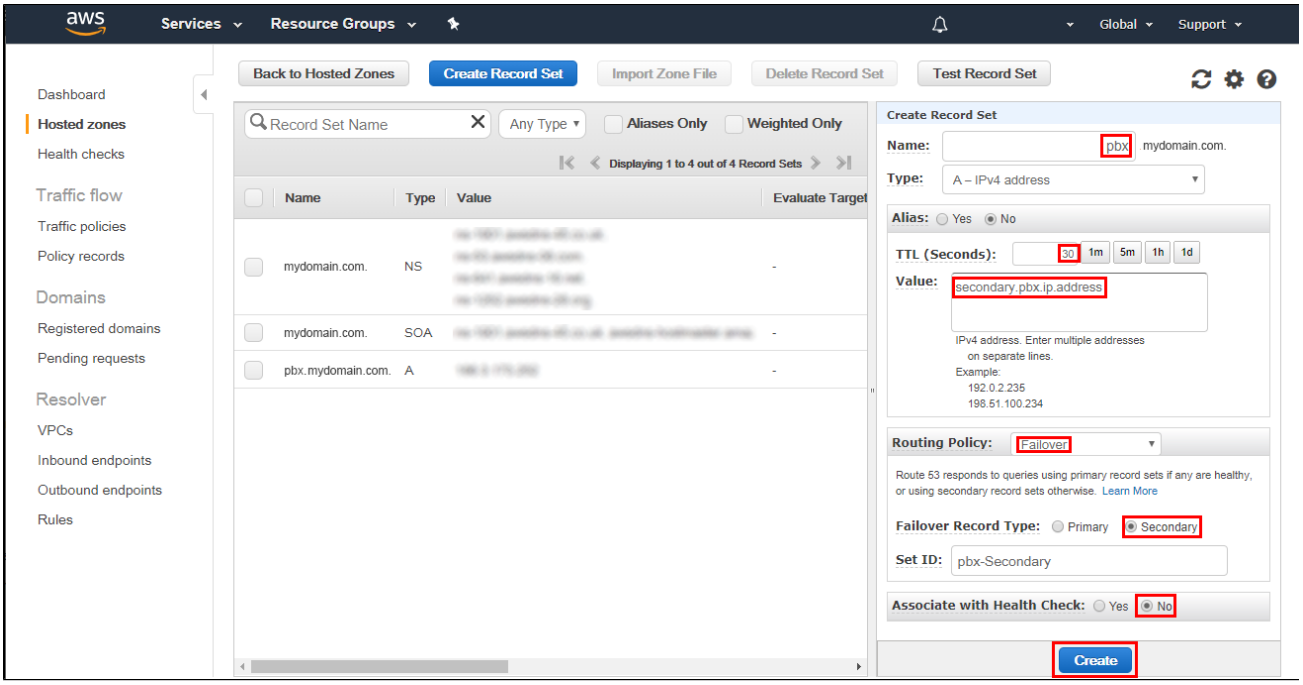


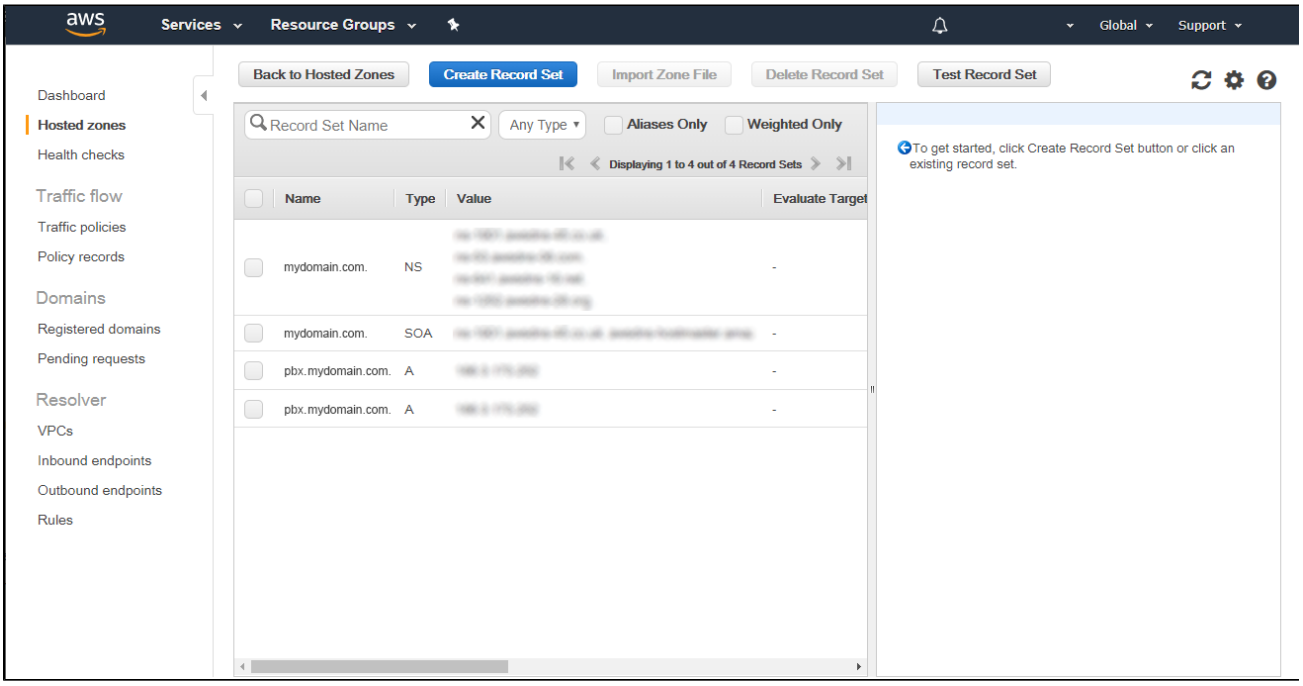


Add the main SIP server associating it with the Health check previously created



Add the secondary SIP server, this one is not associated with any Health check





Configurations on the main SIP server:

1. Open the firewall for the specific IP addresses Amazon AWS Route 53 uses for the Health checking of the SIP server. In a PBXact server it can be done by executing the following command in the Linux console as root user:

   fwconsole firewall add trusted 15.177.0.0/18 54.183.255.128/26 54.228.16.0/26 54.232.40.64/26 54.241.32.64/26 54.243.31.192/26 54.244.52.192/26 54.245.168.0/26 54.248.220.0/26 54.250.253.192/26 54.251.31.128/26 54.252.79.128/26 54.252.254.192/26 54.255.254.192/26 107.23.255.0/26 176.34.159.192/26 177.71.207.128/26

> For the current list of IP addresses Amazon AWS Route 53 uses for its Health checks search its ip-ranges.json file for "ROUTE53_HEALTHCHECKS" - Ref. https://docs.aws.amazon.com/general/latest/gr/aws-ip-ranges.html

2. fwconsole firewall stop
3. fwconsole firewall start

Conclusion

The configurations have been completed. For testing the failover you can easily force the main SIP server to go down. In a PBXact server, for example, this can be done by executing the following command in the Linux console as root user:

fwconsole stop

After approximately ~1-2 minutes (this can be changed by adjusting the "Request interval" and "Failure threshold" parameters inside the "Advanced configuration" section when creating the Health check, as shown above), the endpoints previously registered to the main SIP server will start failing over to the secondary SIP server. Please note that you may also need to adjust the value for the *SIP Registration Expiry timer* in your SIP endpoints to a lower value, to 30 seconds for example.

Amazon AWS Route 53 will automatically revert the IP address the Domain (FQDN) resolves to back to the main SIP server as soon as it detects, thanks to its Health check, that the main server has come back online again.

Related articles

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