

# GSoC 2019 Proposal

## Organization: CNCF (coredns)

### Student Info:

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### Contributions to coredns:

Issue	Description	PR	Status
<a href="#">#1407</a>	plugin/secondary: add metrics	<a href="#">#2550</a>	Under review
-	fix link to whoami plugin page	<a href="#">#139</a>	Merged
<a href="#">#1520</a>	plugin/rewrite: Add metrics	<a href="#">#2767</a>	Under review
<a href="#">#2695</a>	Dedup code between grpc and forward plugin	<a href="#">#2771</a>	WIP

### Project Info:

Title	A google cloud DNS backend for coredns
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Mentors	<a href="#">Yong Tang</a> @yongtang
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## **Abstract:**

CoreDNS is able to serve DNS with cloud vendors (such as AWS) as the backend. The feature is very much useful in a hybrid environment where cloud-vendor specific service endpoints need to be exposed to clusters managed by Kubernetes. The goal of this project is to support Google Cloud DNS (similar to already supported [route53 plugin](#)) as a backend for CoreDNS.

## **Project Deliverables and Goals:**

This project aims to achieve the development of a fully functional, unit-tested plugin for gcp dns backend that is able to serve zones from resource record sets stored in gcp dns. Support for various cloud providers will enable the CoreDNS project to gain more adopters and users and provide developers with more options of providers to run CoreDNS on.

## **Implementation Details:**

The second phase deals with the fetching of resource record sets and the DNS zones from Google cloud so that they can be served from CoreDNS. Looking through both the aws and google cloud go sdk some parallels for such methods were discovered. Google cloud provides

```
// GET https://www.googleapis.com/dns/v1/projects/project/managedZones

func (c *ManagedZonesListCall) Do(opts ...googleapi.CallOption)
(*ManagedZonesListResponse, error)
```

Which lists the DNS zones in all resource groups in a subscription

```
{
  "kind": "dns#managedZonesListResponse",
  "header": {
    "operationId": string
  },
  "managedZones": [
    managedZones Resource
  ],
  "nextPageToken": string
}
```

And the method

```
// GET
https://www.googleapis.com/dns/v1/projects/project/managedZones/managedZone/rrsets

func (c *ResourceRecordSetsListCall) Do(opts ...googleapi.CallOption)
(*ResourceRecordSetsListResponse, error)
```

Which lists all record sets in a DNS zone. A successful response returns

```
{
  "kind": "dns#resourceRecordSetsListResponse",
  "header": {
    "operationId": string
  },
  "rrsets": [
    resourceRecordSets Resource
  ],
  "nextPageToken": string
}
```

These two methods can be leveraged to serve records from google cloud. A **New** method can be used to validate the existence of domain name and hosted zone id key value pairs read from the Corefile and appends the valid zones to a map.

The plugin would then run in an infinite loop and keep updating the zone information by requerying the resource record sets and updating the zone object

```
func (gcp *google cloud) updateZones(ctx context.Context) error {
    for zName, z := range az.zones {
        // .....

        // RS being the RecordSetsListCall struct
        gcp.client.RS.Do(...)

        // .....
    }
}
```

The last phase would be focussed on writing documentation and unit tests for the plugin and achieving as much test coverage as possible.

## Timeline

### Pre-Community Bonding Period:

Make as many contributions to the CoreDNS organization as possible. Read up more on DNS server.

### Community Bonding Period (April 23rd - May 14th):

Keep making contributions to the core repo. Try writing a few CoreDNS plugins of my own to get more comfortable with the project

### Coding Phase (May 27th - Aug 26th):

#### Coding Phase 1(May 27th - June 24th):

Week #	Tasks	Deliverables
<b>Week 1 &amp; 2</b> (May 27th - June 9th)	<ul style="list-style-type: none"> <li>Write a basic plugin to read the google cloud config from the Corefile</li> </ul>	<ul style="list-style-type: none"> <li>The plugin can parse the google cloud blocks in the Corefile</li> </ul>
<b>Week 3</b> (June 10th - June 16th)	<ul style="list-style-type: none"> <li>Implement authentication using credentials</li> <li>Write the phase 1 blog post</li> </ul>	<ul style="list-style-type: none"> <li>The plugin can parse the creds and initialize an authenticated client</li> </ul>
<b>Week 4</b> (June 17th - June 23rd)	<ul style="list-style-type: none"> <li>Buffer week</li> <li>Contribute to core repo</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

#### Coding Phase 2(June 25th - July 22nd):

Week #	Tasks	Deliverables
<b>Week 1 &amp; 2</b> (June 29th - July 12th)	<ul style="list-style-type: none"> <li>Work on the update zones logic</li> </ul>	<ul style="list-style-type: none"> <li>The design and implementation details of the update mechanism are finalized</li> </ul>
<b>Week 3</b> (June 13th - July 19th)	<ul style="list-style-type: none"> <li>Implement fetching zones and record sets from google cloud</li> <li>Write the phase 2 blog post</li> </ul>	<ul style="list-style-type: none"> <li>The plugin is able to fetch resource record sets and upadte zones from google cloud</li> </ul>
<b>Week 4</b> (July 19nd - July 22nd)	<ul style="list-style-type: none"> <li>Buffer week</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

#### Coding Phase 3(July 9th - August 6th):

Week #	Tasks	Deliverables
<b>Week 1 &amp; 2</b> (July 27th - Aug 9th)	<ul style="list-style-type: none"> <li>Write tests for the whole plugin</li> <li>Try to achieve full code coverage</li> </ul>	<ul style="list-style-type: none"> <li>The unit tests are written and code coverage is 100%</li> </ul>

<b>Week 3</b> (Aug 10th - Aug 16th)	<ul style="list-style-type: none"> <li>• Document the plugin</li> <li>• Write the phase 3 blog post</li> </ul>	<ul style="list-style-type: none"> <li>• The plugin has been documented along with examples</li> </ul>
<b>Week 4</b> (July 17th - Aug 26th)	<ul style="list-style-type: none"> <li>• Write the project report</li> </ul>	<ul style="list-style-type: none"> <li>• Final report submitted</li> </ul>

## Possible Outcomes:

- Coredns is able to serve zone data from google cloud backends

## Stretch goals / Future plans:

- I would like to keep contributing to CoreDNS as I am interested in making a career in the DevOps/Distributed Systems space and I think contributing to a CNCF project would help me gain the necessary insight and skills for this.
- Currently I am only trying to make PRs but I would also like to extend my contributions to raising issues and reviewing other PRs as I was doing with my previous GSoC community.

## Why are you the right person to work on this project?

- I have **past software development experience** and have been working as a backend developer intern at <http://appbase.io/> **writing Go** for about 6 months now so I am pretty comfortable with Go
- Last year **I had completed a GSoC with coala**. Here is my [project completion report](#). So I am **used to meeting the evaluation deadlines** and **submitting quality PRs**
- Have already started exploring the coreDNS project and I have **made three PR** to the core repo under review and been also trying my hand in **writing a plugin** by hacking on the demo plugin by Yong Tang. [\[Link to the plugin.\]](#)
- Have **been contributing to open source software for over a year** now so I am **familiar with the git-flow** and the best practices followed by various orgs.
- Have been researching and documenting my findings about my project and DNS servers in general since the last month [here](#).
- The most important reason would be my love for open source software and communities and the desire to become a long term contributor to the communities that I contribute to.

## **Open Source Contributions**

I am a regular open source contributor and have contributed to these organizations/projects (PR links are included) [coala](#), [Google](#), [Ethereum Foundation](#), [Kubernetes](#), [Prometheus](#), [Appbaseio](#), [TaskCluster\(Mozilla\)](#), [DuckDuckGo](#), [Kinto\(Mozilla\)](#), [Elastic](#), [Kong](#), [CoreDNS](#), [Snowplow Analytics](#), [NodeJS](#), [OpenEBS](#) and [gojektech](#)

## **Other Commitments**

- **Do you have any other commitments during the GSoC period, May 8th to August 29th?**

I have applied for a an internship at a startup. If selected I would like to do it along

GSOC. I know that I will be able to handle the two together because last year I had almost 30-40 hrs of free time even after working on my project. I have successfully completed a GSoC so I understand the pressure of meeting deadlines and can handle it well

- **Do you have exams or classes that overlap with this period?**

No exams or classes during the coding phase.

- **Have you applied to any other organizations?**

No I am only applying for the three coredns projects and no other organization.

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Primary choice of project is the firewall plugin and the azure backend support is my secondary choice with google cloud plugin being my tertiary choice.