From 0 to 1 with Nomad

Agenda

- Introduction
- What is Nomad?
- Glossary
- Architecture
- Start Nomad
- Q&A

Introduction

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- Sr. Engineer at Wistron
- Kubernetes, Nomad, Vault, Consul, AWS, ...
- 12th iThelp Ironman

  Hashicorp 0 到 0.003

  https://ithelp.ithome.com.tw/users/20129223/ironman/3020

What is Nomad?

- A **simple** and **lightweight** workload orchestrator.
- Support containers and **non**-containerized applications across on-prem and clouds at scale.
- Easy config file.

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Glossary

- **Job** - A Job is a specification provided by users that declares a workload for Nomad.

```
job "docs" {
   ...
   ...
}
```

Glossary

- **Task Group** - A Task Group is a set of tasks that must be run together.

```
job "docs" {
  group "web-ui" {
    # the unit of scheduling
    # the entire group must run on the same client node
    ...
  }


  group "web-login" {
    # maybe run on different client node
    ...
  }


}
```

Glossary

- **Task** - Task is the smallest unit of work in Nomad.

```
job "docs" {
  group "web-ui" {
    task "server" {
      # the smallest unit of work
      ...
    }
  }

}
```

Glossary

- **Driver** – A Driver represents the basic means of executing your **Tasks**.

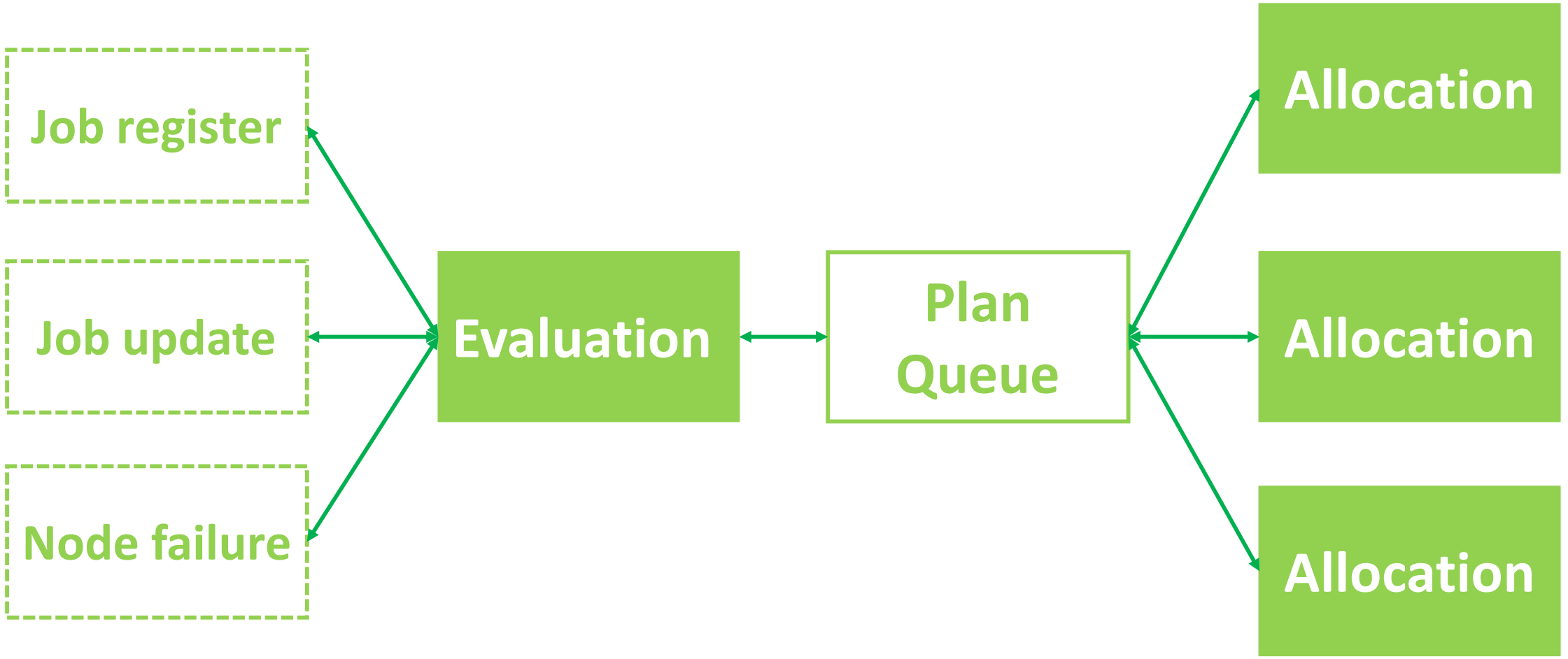
  e.g. Java, Docker, QEMU, exec

```
job "docs" {
  group "web-ui" {
    task "server" {
      driver = "docker"
      ...

    }
  }

}
```

Glossary

- **Evaluation** - Evaluations are the mechanism by which Nomad makes scheduling decisions.
- **Allocation** - An Allocation is a mapping between a task group in a job and a client node.
- **Bin Packing** - Bin Packing is the process of filling bins with items in a way that maximizes the utilization of bins.

Scheduler


Job register
Job update
Node failure
Evaluation
Plan Queue
Allocation
Allocation
Allocation

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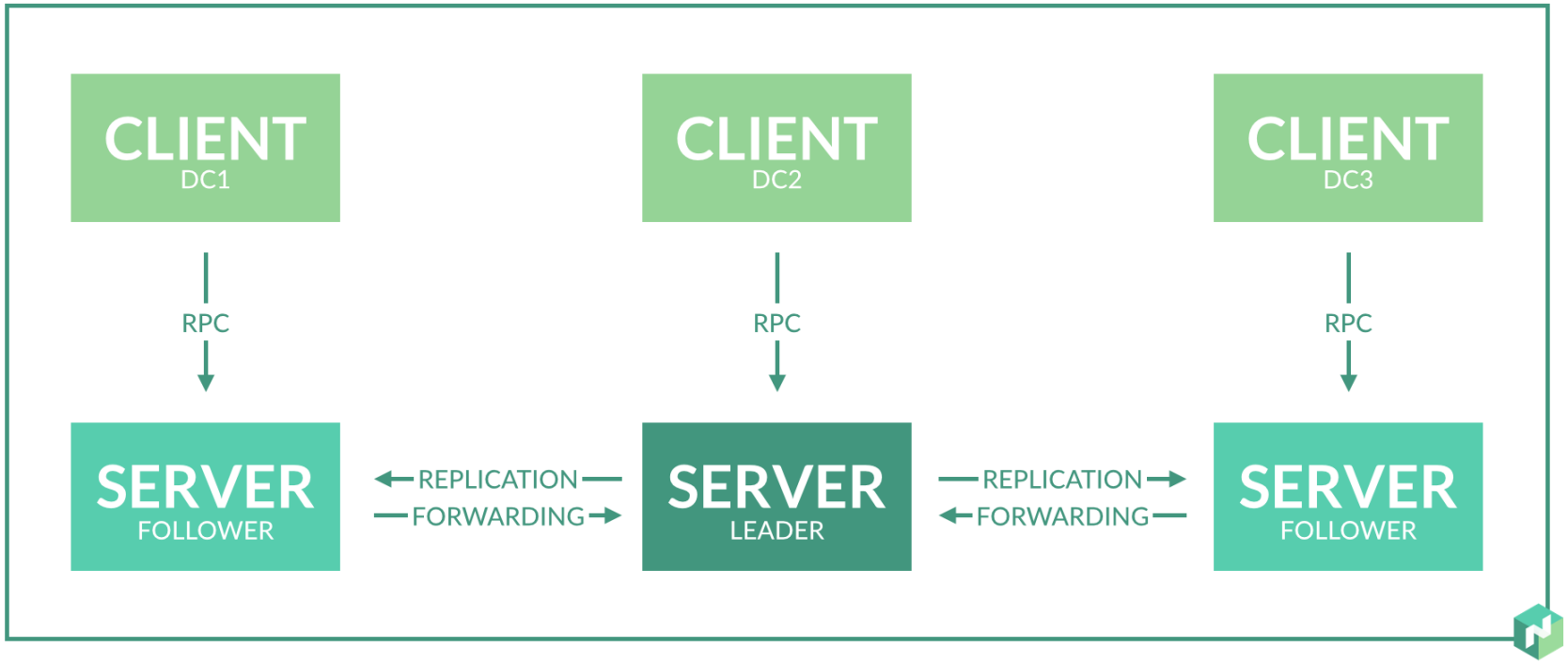
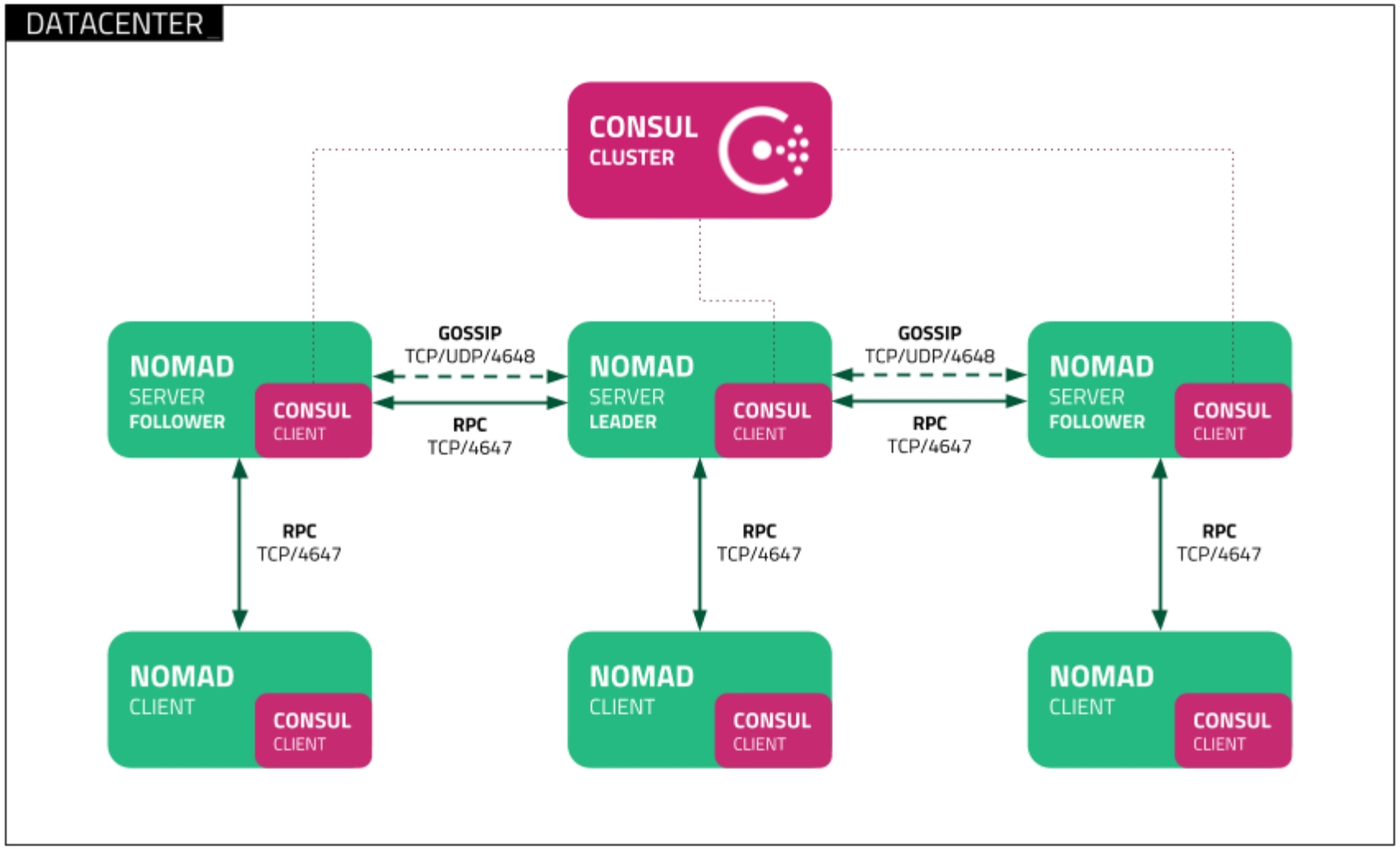
Architecture

- **Client** - A Client of Nomad is a machine that tasks can be run on.
- **Server** - Nomad servers are the brains of the cluster.



Architecture



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Start Nomad

- Download
  - https://www.nomadproject.io/downloads
- Installation
  - $ unzip nomad_1.0.4_linux_amd64.zip
- Dokcer
- Github: sunny760408/**hashicorp-share**
  - https://github.com/sunny760408/hashicorp-share/tree/main/nomad

Demo 1: Running Nomad

Running Nomad

- Dev mode
  - $ nomad agent -dev
  - Agent run as both server and client.

```
==> No configuration files loaded
==> Starting Nomad agent...
==> Nomad agent configuration:

       Advertise Addrs: HTTP: 127.0.0.1:4646; RPC: 127.0.0.1:4647; Serf: 127.0.0.1:4648
            Bind Addrs: HTTP: 127.0.0.1:4646; RPC: 127.0.0.1:4647; Serf: 127.0.0.1:4648
                Client: true
             Log Level: DEBUG
                Region: global (DC: dc1)
                Server: true
               Version: 1.0.4

==> Nomad agent started! Log data will stream in below:
```

Demo 2: Nomad UI

Nomad UI

- Port 4646
- $ nomad agent -dev -bind 0.0.0.0 -log-level INFO
- Server and Client information.
- Job information.
- Manage Job.

Demo 3: Run a Job file

Run a Job file

- nomad agent -dev -bind 0.0.0.0 -log-level INFO -config=<(echo 'client {options = {"driver.allowlist" = "docker,qemu,raw_exec,exec"}}’)
- Web UI
- nomad job plan docs.nomad
- nomad job run docs.nomad

Demo 4: Scaling up

Demo 5: Service Discovery with Consul

Demo 6: Upgrade

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