

# From 0 to 1 with Nomad



HashiCorp

**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, ...
- 12<sup>th</sup> 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**.

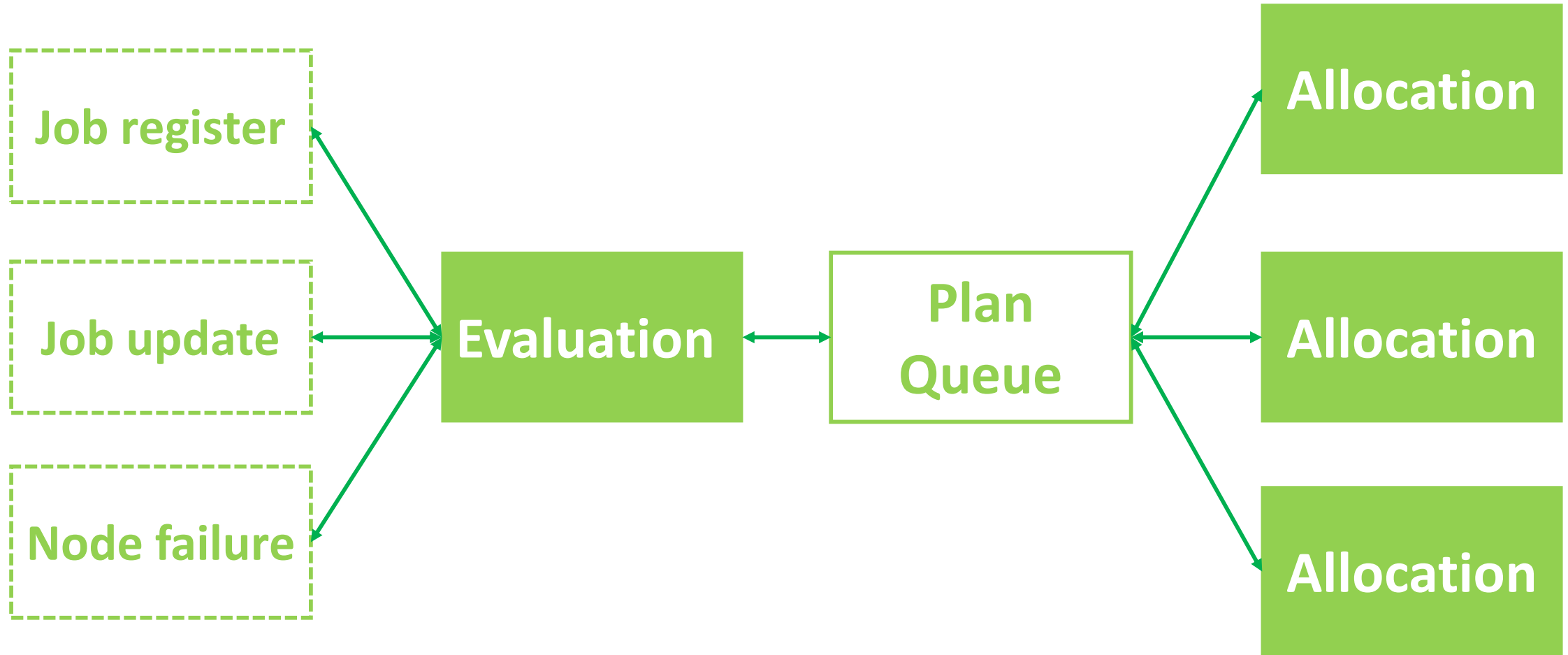
e.g. Java, Docker, QEMU, exec

```
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

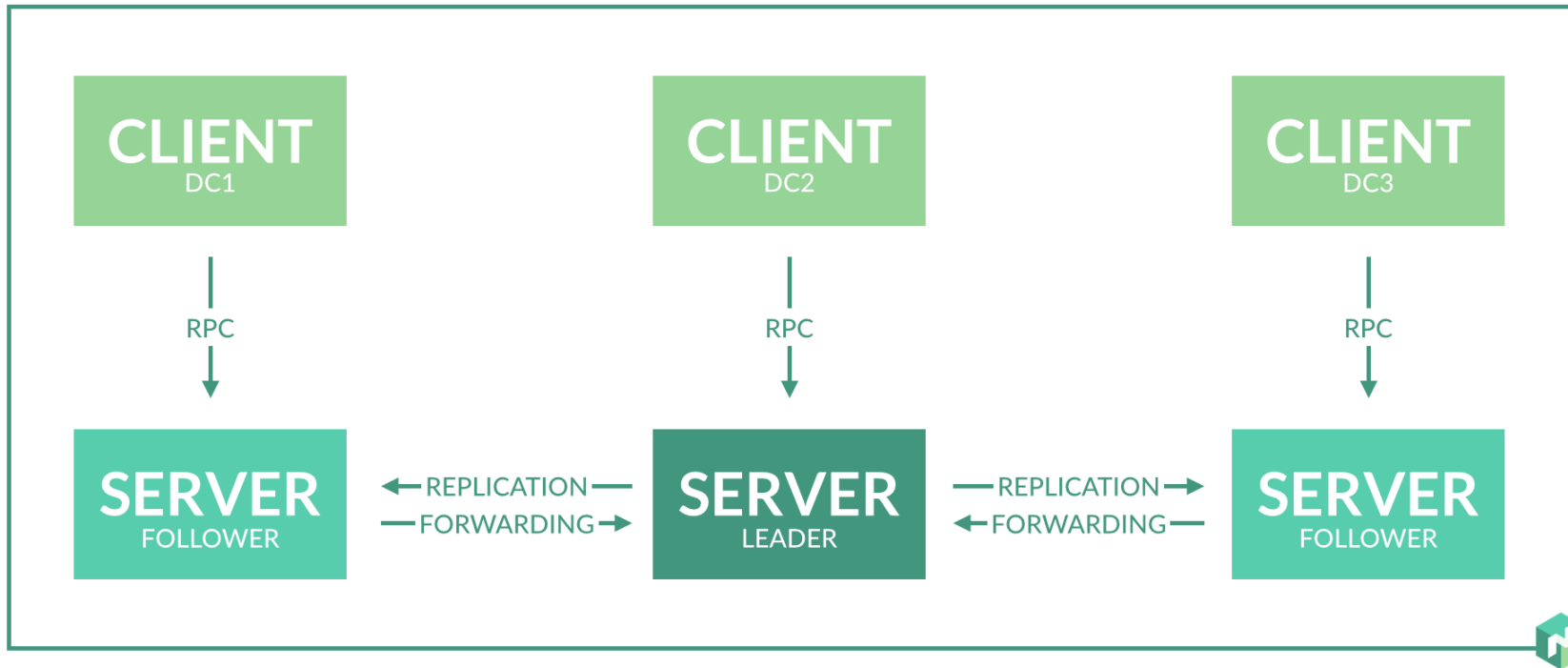


# Agenda

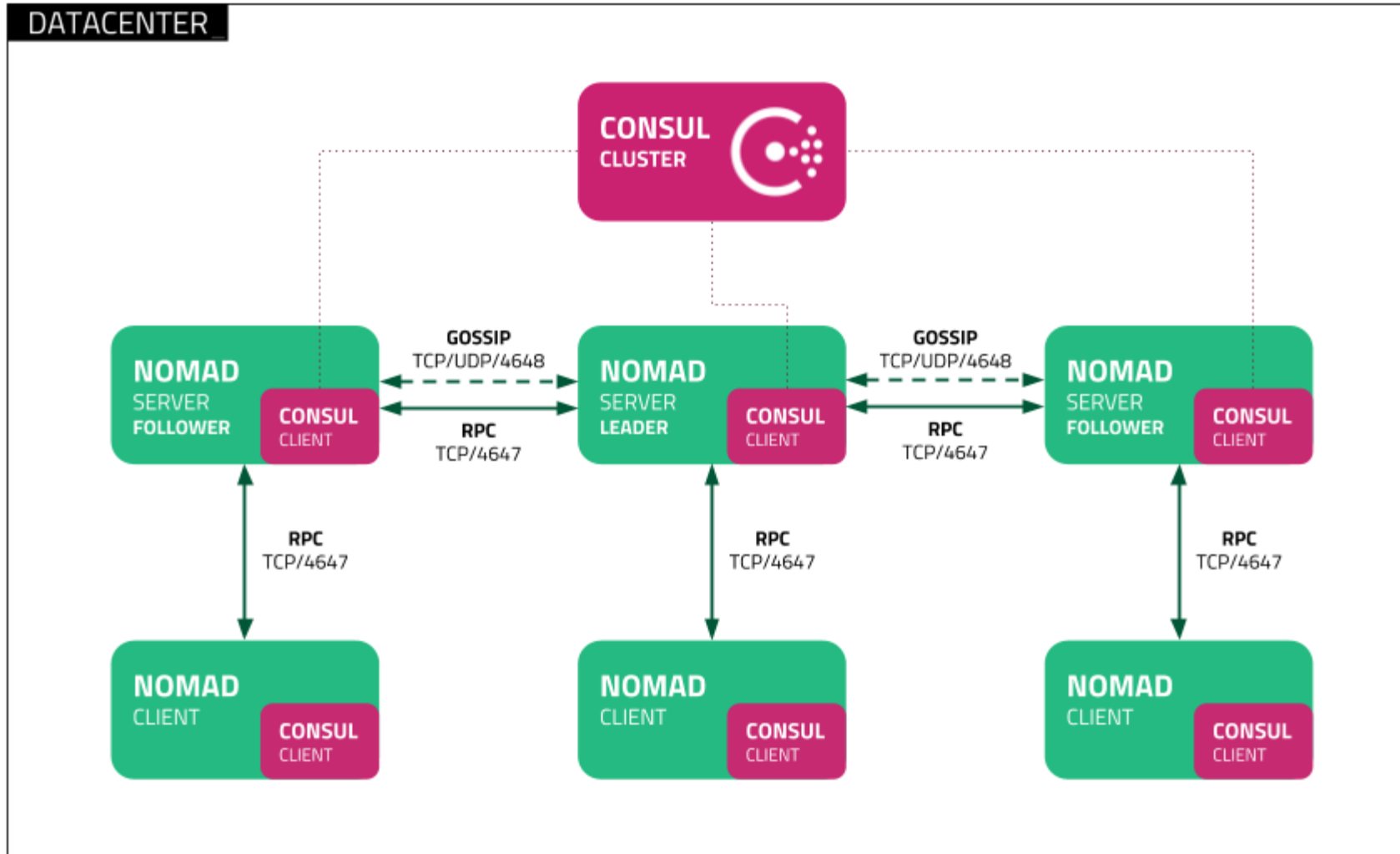
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# Architecture

- **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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