Monitoring the health of your cluster nodes with Node Eligibility Service

In this article

You can monitor when nodes in a GitHub Enterprise Server cluster have been offline long enough to cause issues by using Node Eligibility Service.

> **Who can use this feature**
> People with administrative SSH access to a GitHub Enterprise Server instance can monitor cluster nodes.

GitHub determines eligibility for clustering, and must enable the configuration for your instance's license. Clustering requires careful planning and additional administrative overhead. For more information, see "About clustering."

About Node Eligibility Service

In a GitHub Enterprise Server cluster, an individual node may become unreachable by other nodes due to a hardware or software failure. After time, even if you restore the node's health, the subsequent synchronization of data can negatively impact your instance's performance.

You can proactively mitigate the impact of reduced node availability by using Node Eligibility Service. This service monitors the state of your cluster's nodes and emits a warning if a node has been offline for too long. You can also prevent an offline node from rejoining the cluster. Optionally, you can allow Node Eligibility Service to take ineligible nodes offline.

By default, Node Eligibility Service is disabled. If you enable Node Eligibility Service, your instance will alert you of unhealthy nodes by displaying a banner in the administrative web UI for GitHub Enterprise Server, and in CLI output for some cluster-related utilities, such as `ghe-config-apply` and `ghe-cluster-diagnostics`.

Node Eligibility Service allows you to monitor the health of individual nodes. You can also monitor the overall health of your cluster. For more information, see "Monitoring the health of your cluster."

About health and eligibility of cluster nodes

To determine whether to emit a warning or automatically adjust the configuration of your cluster, Node Eligibility Service continuously monitors the health of each node. Each node regularly reports a timestamped health state, which Node Eligibility Service compares to a Time To Live (TTL) duration.

Each node has a health state and an eligibility state.

- Health refers to the accessibility of the node within the cluster and has three possible states: `healthy`, `warning`, or `critical`.
- Eligibility refers to the ability of the node to work in the cluster and has two possible states: `eligible` or `ineligible`.

Node Eligibility Service provides a configurable TTL setting for two states, `warn` and `fail`.

- `warn`: The node has been offline for a short period of time. This may indicate something is wrong with the node and that administrators should investigate. The default setting is 15 minutes.
- `fail`: The node has been offline for a long period of time, and reintroduction into the cluster could cause performance issues due to resynchronization. The default setting is 60 minutes.

For each node, Node Eligibility Service determines health and eligibility for participation in the cluster in the following ways.

- If a node has been observed to be healthy, the health state is `healthy` and the eligibility state is `eligible`.
- If a node hasn't been observed to be healthy for longer than the `warn` TTL, the health state is `warning` and the eligibility state is `eligible`.
- If a node hasn't been observed to be healthy for longer than the `fail` TTL, the health state is `critical` and its eligibility state is `ineligible`.

Enabling Node Eligibility Service for your cluster

By default, Node Eligibility Service is disabled. You can enable Node Eligibility Service by setting the value for `app.nes.enabled` using `ghe-config`.

1. To connect to your GitHub Enterprise Server instance, SSH into any of your cluster's nodes. From your workstation, run the following command. Replace HOSTNAME with the node's hostname. For more information, see "Accessing the administrative shell (SSH)."

   Shell

   ```
   ssh -p 122 admin@HOSTNAME
   ```

2. To verify whether Node Eligibility Service is currently enabled, run the following command.

   Shell

   ```
   ghe-config app.nes.enabled
   ```

3. To enable Node Eligibility Service, run the following command.

   Shell

   ```
   ghe-config app.nes.enabled true
   ```

4. To apply the configuration, run the following command.

   > **Note**: During a configuration run, services on your GitHub Enterprise Server instance may restart, which can cause brief downtime for users.

   Shell

   ```
   ghe-config-apply
   ```

5. Wait for the configuration run to complete.

6. To verify that Node Eligibility Service is running, from any node, run the following command.

   Shell

   ```
   nomad status nes
   ```

Configuring TTL settings for Node Eligibility Service

To determine how Node Eligibility Service notifies you, you can configure TTL settings for `fail` and `warn` states. The TTL for the `fail` state must be higher than the TTL for the `warn` state.

1. To connect to your GitHub Enterprise Server instance, SSH into any of your cluster's nodes. From your workstation, run the following command. Replace HOSTNAME with the node's hostname. For more information, see "[Accessing the administrative shell (SSH)](#)."

   Shell

   ```
   ssh -p 122 admin@HOSTNAME
   ```

2. To verify the current TTL settings, run the following command.

   Shell

   ```
   nes get-node-ttl all
   ```

3. To set the TTL for the `fail` state, run the following command. Replace MINUTES with the number of minutes to use for failures.

Shell

```
nes set-node-ttl fail MINUTES
```

4. To set the TTL for the `warn` state, run the following command. Replace MINUTES with the number of minutes to use for warnings.

   Shell

   ```
   nes set-node-ttl warn MINUTES
   ```

Managing whether Node Eligibility Service can take a node offline

By default, Node Eligibility Service provides alerts to notify you about changes to the health of cluster nodes. Optionally, if the service determines that an unhealthy node is ineligible to rejoin the cluster, you can allow the service to take the node offline.

When a node is taken offline, the instance removes job allocations from the node. If the node runs data storage services, Node Eligibility Service updates the configuration to reflect the node's ineligibility to rejoin the cluster.

To manage whether Node Eligibility Service can take a node and its services offline, you can configure `adminaction` states for the node. If a node is in the `approved` state, Node Eligibility Service can take the node offline. If a node is in the `none` state, Node Eligibility Service cannot take the node offline.

1. To connect to your GitHub Enterprise Server instance, SSH into any of your cluster's nodes. From your workstation, run the following command. Replace HOSTNAME with the node's hostname. For more information, see "[Accessing the administrative shell (SSH)]."

   Shell

   ```
   ssh -p 122 admin@HOSTNAME
   ```

2. To configure whether Node Eligibility Service can take a node offline, run one of the following commands.

   - To allow the service to automatically take administrative action when a node goes offline, run the following command. Replace HOSTNAME with the node's hostname.

     Shell

     ```
     nes set-node-adminaction approved HOSTNAME
     ```

   - To revoke Node Eligibility Service's ability to take a node offline, run the following command. Replace HOSTNAME with the node's hostname.

     Shell

```
nes set-node-adminaction none HOSTNAME
```

Viewing an overview of node health

To view an overview of your nodes' health using Node Eligibility Service, use one of the following methods.

- SSH into any node in the cluster, then run `nes get-cluster-health`.
- Navigate to the Management Console's "Status" page. For more information, see "Accessing the Management Console."

Re-enabling an ineligible node to join the cluster

After Node Eligibility Service detects that a node has exceeded the TTL for the `fail` state, and after the service marks the node as `ineligible`, the service will no longer update the health status for the node. To re-enable a node to join the cluster, you can remove the `ineligible` status from the node.

1. To connect to your GitHub Enterprise Server instance, SSH into any of your cluster's nodes. From your workstation, run the following command. Replace HOSTNAME with the node's hostname. For more information, see "Accessing the administrative shell (SSH)."

   Shell

   ```
   ssh -p 122 admin@HOSTNAME
   ```

2. To check the current `adminaction` state for the node, run the following command. Replace HOSTNAME with the hostname of the ineligible node.

   Shell

   ```
   nes get-node-adminaction HOSTNAME
   ```

3. If the `adminaction` state is currently set to `approved`, change the state to `none` by running the following command. Replace HOSTNAME with the hostname of the ineligible node.

   Shell

   ```
   nes set-node-adminaction none HOSTNAME
   ```

4. To ensure the node is in a healthy state, run the following command and confirm that the node's status is `ready`.

   Shell

   ```
   nomad node status
   ```

   - If the node's status is `ineligible`, make the node eligible by connecting to the node via SSH and running the following command.

Shell

```
nomad node eligibility -enable -self
```

5. To update the node's eligibility in Node Eligibility Service, run the following command. Replace HOSTNAME with the node's hostname.

Shell

```
nes set-node-eligibility eligible HOSTNAME
```

6. Wait 30 seconds, then check the cluster's health to confirm the target node is eligible by running the following command.

Shell

```
nes get-cluster-health
```

Viewing logs for Node Eligibility Service

You can view logs for Node Eligibility Service from any node in the cluster, or from the node that runs the service. If you generate a support bundle, the logs are included. For more information, see "Providing data to GitHub Support."

1. To connect to your GitHub Enterprise Server instance, SSH into any of your cluster's nodes. From your workstation, run the following command. Replace HOSTNAME with the node's hostname. For more information, see "Accessing the administrative shell (SSH)."

Shell

```
ssh -p 122 admin@HOSTNAME
```

2. To view logs for Node Eligibility Service from any node in the cluster, run the following command.

Shell

```
nomad alloc logs -job nes
```

3. Alternatively, you can view logs for Node Eligibility Service on the node that runs the service. The service writes logs to the systemd journal.

   - To determine which node runs Node Eligibility Service, run the following command.

Shell

```
nomad job status "nes" | grep running | grep "${nomad_node_id}" | awk
'NR==2{ print $1 }' | xargs nomad alloc status | grep "Node Name"
```

  - To view logs on the node, connect to the node via SSH, then run the following command.

    Shell

    ```
    journalctl -t nes
    ```

Further reading

- "Command-line utilities"

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