Tungsten Dashboard for Clustering

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This training session uses an example 6-node Composite cluster named `global_composite`, with two member clusters, named `east_member` and `west_member`.

The demo uses the standard Amazon Linux AMI 2018.03.0 (HVM), SSD; in `us-east` use `ami-467ca739`.

The commands and examples in this training session are the same as those in our online documentation at [http://docs.continuent.com/tungsten-dashboard-1.0/](http://docs.continuent.com/tungsten-dashboard-1.0/)

These examples use example directories and deployment practices – your environment may vary considerably.

Tungsten Dashboard Overview

- A simple GUI management tool for Continuent Tungsten Clustering
- The Dashboard is usually installed on a standalone web server with HAProxy installed
- HAProxy routes API requests to the various database nodes running the manager API listener on port 8090.
- There is one frontend per cluster.
- Each backend contains all database/witness nodes for that cluster.
The dashboard web application sends requests to the locally-installed HA Proxy which in turn forwards the requests in a round-robin fashion to the Manager API listening on port 8090 on each database node.
Tungsten Dashboard Pre-Requisites

Continuent Tungsten Dashboard needs the following prerequisites to function:

• Continuent Tungsten Clustering v5.3.0 or v5.3.1 only as of May 8, 2018.

• Web server with PHP support – we use Apache 2.4 for this demo

• HAProxy - [http://www.haproxy.org](http://www.haproxy.org)

• Make sure to open ALL of the appropriate firewall ports listed in the steps below to ensure access; at minimum, port 8090 on all manager nodes must be reachable from the web/haproxy server for API calls to succeed.
Tungsten Dashboard Security Limitations

Continuent Tungsten Dashboard has the following security limitations:

**Warning**
THERE IS NO API SECURITY YET - If you enable the API on the Manager, anyone may connect to it. Use your firewall to block port 8090 from non-essential hosts.

**Warning**
SSL (https) is not yet supported on the Manager API endpoints.

**Warning**
Please use Apache Basic Auth to lock down access to the Tungsten Dashboard GUI.

**Warning**
SSL (https) configuration for the Tungsten Dashboard is possible, but is beyond the scope of this document.

**Warning**
Locking only works on a single web server host, so if you have installed the Tungsten Dashboard on more than one host, the lock is not shared and is therefore ineffective.
Configure the Tungsten Cluster Manager API

Add the following to `/etc/tungsten/tungsten.ini` under the `[defaults]` section:

```ini
mgr-api-port=8090
mgr-api=true
mgr-api-address=0.0.0.0
mgr-api-full-access=true
```

Inform the running manager of the changed configuration, restarting if needed:

```shell
shell> tpm update
shell> manager restart
```

Verify that the port is listening:

```shell
shell> sudo netstat -pan | grep 8090
```
Test Connectivity to the Tungsten Manager API Directly

Test connectivity to the Tungsten Manager API directly using `curl` and `jq` for formatting the json response:

```
shell> sudo yum -y install jq
shell> curl -s http://db1:8090/manager/status/east/ | jq . | less
shell> curl -s http://db4:8090/manager/status/west/ | jq . | less
shell> curl -s -X POST http://db4:8090/manager/control/west/heartbeat | jq . | less
```
Install the Tungsten Dashboard

For example, create a new user called **tungsten**, group **tungsten**, homedir **/home/tungsten**:

```
shell> sudo useradd -m -d /home/tungsten -s /bin/bash -c "Tungsten Dashboard" -U tungsten.
```

Now create the Tungsten Dashboard web root directory and all needed subdirectories:

```
shell> sudo mkdir /volumes/data/www/tungsten
shell> sudo chown -R tungsten: /volumes/data/www/tungsten

shell> sudo su - tungsten
shell> mkdir /volumes/data/www/tungsten/etc/ /volumes/data/www/tungsten/logs/
shell> chmod 2770 /volumes/data/www/tungsten/logs/
shell> chmod 2750 /volumes/data/www/tungsten/etc/
```
Install the Tungsten Dashboard - continued

Still as user tungsten, get the software and copy to the web root directory for use in the next step:

```
shell> cd
shell> wget -O tungsten-dashboard-1.0.0-27.tar.gz 'TEMP_URL_PROVIDED_BY_CONTINUENT'
shell> tar xvzf tungsten-dashboard-1.0.0-27.tar.gz
shell> cd tungsten-dashboard-1.0.0-27
shell> rsync -a tungsten-dashboard-1.0.0-27/html/ /volumes/data/www/tungsten/html/
shell> chmod 2775 /volumes/data/www/tungsten/html
shell> mkdir /volumes/data/www/tungsten/html/locks
shell> chmod 2775 /volumes/data/www/tungsten/html/locks
shell> htpasswd -c /volumes/data/www/tungsten/etc/.htpasswd erics
Password: demo
shell> exit
```
Install and Configure the Apache 2.4 Web Server

As the root user, install the Apache 2.4 web server and add the `apache` user to the `tungsten` group:

```shell
sudo yum -y install httpd24-devel php56-devel
sudo chkconfig httpd on
sudo usermod -a -G tungsten apache
sudo service httpd start
```

Create the `apache` configuration file for the Tungsten Dashboard web service, test it and then restart the web server:

```shell
sudo vim /etc/httpd/conf.d/z01-tungsten-dashboard.conf
sudo apachectl configtest
sudo apachectl restart
```

```xml
<VirtualHost *:80>
  ServerName dashboard.yourdomain.com
  DocumentRoot /volumes/data/www/tungsten/html
  DirectoryIndex index.html index.php
  ServerAdmin dashboard.apache.admin@yourdomain.com
  ErrorLog "| /usr/sbin/rotatelogs /volumes/data/www/tungsten/logs/errors.log 86400"
  CustomLog "| /usr/sbin/rotatelogs /volumes/data/www/tungsten/logs/access.log 86400" combined
  <Directory "/volumes/data/www/tungsten/html"/>
    AllowOverride All
    Options +FollowSymLinks +ExecCGI -Indexes
    Order allow,deny
    Allow from all
    #Require all granted
    <RequireAll>
      AuthType Basic
      AuthName "Tungsten Dashboard - RESTRICTED"
      AuthUserFile /volumes/data/www/tungsten/etc/.htpasswd
      Require valid-user
    </RequireAll>
  </Directory>
</VirtualHost>
```
Configure the Tungsten Dashboard

Replace the service names and ports in $jsonConfig to match your HA Proxy setup:

shell> sudo su - tungsten
shell> cd /volumes/data/www/tungsten/html/
shell> mv config.php.sample config.php
shell> vim config.php

• Host and port are required for all clusters.
• There is a one-to-one relationship between Tungsten services and HAProxy ports.
• A cluster is marked as a composite parent if it has the "children" array, even if the array is empty.
• A cluster is marked as a composite child if it has the "memberOf" key defined.
• All Composite member (child) clusters require their own definitions so we know about the host and port for each.
• Please note that the `host: localhost` should remain localhost because this tells the app to call the HAProxy server on the GUI server node, which will then handle routing to the appropriate manager/database node.
• You may add your own custom menu options to the tools menu by editing the menus->tools section in the json configuration.
Configure the Tungsten Dashboard - continued

• By default, the list of Auto-Refresh time intervals is defined as 5, 10, 30, 60, 120 or 300 seconds. You may change that by using the `autoRefreshList` setting, i.e.:

```plaintext
"autoRefreshList": [3,5,10,30,60,120,300,600]
```

**Important** PLEASE NOTE: `autoRefreshList` values less than 3 seconds are strongly discouraged!

• By default the Auto-refresh feature is disabled (i.e. set to zero). You may enable `autoRefreshDelay` by setting it to one of the Auto-Refresh time interval values.

• By default the nodes will display for each cluster. You may set `startExpanded` to 0 to have the display start in collapsed view
Configure the Tungsten Dashboard- continued

• Use lockBaseDir to change the location of the temporary lock files.
• The default is `{WEBROOT}/locks/`, (i.e. a lockBaseDir of /tmp will yield a lock directory of /tmp/locks).

```
"lockBaseDir": "/tmp"
```

• The default Tab Badge update rate is 30 seconds. You may disable it by setting tabUpdateRate to zero (0). You may change the refresh rate in seconds by specifying a non-zero value.

```
"tabUpdateRate": 60
```

• You may set dashboardMaintenanceScreen to 1 to display a Maintenance-In-Progress message.
This is a sample **standalone** cluster configuration from `config.php`:

```json
$jsonConfig = <<<EOJ
{
    "clusters": {
        "north": {
            "host": "localhost",
            "port": "8093"
        }
    },
    "menus": {
        "tools": {
            "Add your links here": "http://docs.continuent.com/tungsten-dashboard-1.0/tungsten-dashboard-configure-dashboard.html",
            "Archive Mode Docs": "http://docs.continuent.com/tungsten-clustering-5.2/operations-status-changingstates.html#operations-status-changingstates-archive",
        }
    },
    "settings": {
        "dashboardMaintenanceScreen": 0,
        "autoRefreshList": [5, 10, 30, 60, 120, 300],
        "autoRefreshDelay": 0,
        "startExpanded": 1,
        "jumpToTopOnMsg": 1
    }
}
EOJ;
```
This is a sample **composite** cluster configuration from `config.php`:

```json
$jsonConfig = <<<EOJ
{
   "clusters": {
      "global": {
         "host": "localhost",
         "port": 8091,
         "children": [ "west", "east" ]
      },
      "east": {
         "host": "localhost",
         "port": 8092,
         "memberOf": "global"
      },
      "west": {
         "host": "localhost",
         "port": 8093,
         "memberOf": "global"
      }
   },
   "menus": {
      "tools": {
         "Add your links here": "http://docs.continuent.com/tungsten-dashboard-1.0/tungsten-dashboard-configure-dashboard.html",
         "Archive Mode Docs": "http://docs.continuent.com/tungsten-clustering-5.2/operations-status-changingstates.html#operations-status-changingstates-archive",
      }
   },
   "settings": {
      "dashboardMaintenanceScreen": 0,
      "autoRefreshList": [5, 10, 30, 60, 120, 300],
      "autoRefreshDelay": 0,
      "startExpanded": 1,
      "jumpToTopOnMsg": 1
   }
}
EOJ
```
Install and Configure HAProxy

- The Tungsten Cluster Manager listens on port 8090 for API calls, so we configure the HAProxy listener ports to not conflict with that.

- There must be one frontend per cluster, so the first one starts with port 8091.

- In the example below, we assign frontend port 8091 to the composite global, frontend port 8092 to the cluster east and frontend port 8093 to the cluster west.

- It is imperative that there be one backend per cluster containing all nodes in that cluster. In the case of a composite, the backend should contain all nodes from all member clusters.

- In the below example, backend east contains member nodes db1-3, backend west contains nodes db4-6 and backend global contains nodes db1-6.

- NOTE: See haproxy.cfg in the examples directory for a more complete sample config to be used locally on a web server or jump host
Install and Configure HAProxy - continued

Install and prepare the HAProxy install:

```bash
shell> sudo -i
shell> yum install haproxy
shell> cd /etc/haproxy/
shell> cp haproxy.cfg haproxy.cfg.orig
```

Edit `/etc/haproxy/haproxy.cfg` and append the new clustering config to the bottom of the existing config:

```bash
shell> vim /etc/haproxy/haproxy.cfg
```

Configure HA Proxy to start at boot time, then restart the service:

```bash
shell> chkconfig haproxy on
shell> service haproxy restart
```
Test Connectivity to the Tungsten Manager API via HA Proxy

On the web server, validate that HA Proxy is working properly

```
shell> curl -s http://localhost:8091/manager/status/global/ | jq . | less
shell> curl -s http://localhost:8092/manager/status/east/ | jq . | less
shell> curl -s http://localhost:8093/manager/status/west/ | jq . | less
shell> curl -s -X POST http://localhost:8093/manager/control/west/heartbeat | jq . | less
```
Access the Tungsten Dashboard GUI via a Browser

Open your browser and access the Tungsten Dashboard GUI via an IP address or hostname:

Browser URL: http://{dashboard_ip}/
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Next Steps

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