Engine Challenge Operating Instructions

Overview

The purpose of this document is to provide a brief description of the Engine Challenge applications, as well as guidance in connecting the PCs, starting the applications and operating each component.

For detail regarding the login details, IP addresses, hostnames and the like, refer to section:
Appendix A - Hardware List

Connecting up

All laptops and the Raspberry Pi connect to the office 3G router. Please note the sequence of connection listed below, as this is important.

1. Database Server

The database server should be connected first, via the network cable, to the office 3G router. Once connected and started the other components can be connected and powered up.

2. Raspberry Pi

The Raspberry Pi connects automatically to the office 3G router, via wifi. Once the database server is connected and started, the Raspberry Pi can be started by simply plugging in the power.

3. User Registration Laptop

The user registration laptop connects to the office 3G router, via wifi. Once the database server is connected and started this laptop can be started.

4. Queue Manager and Dashboard

The Queue Manager and Dashboard laptop connects to the office 3G router, via wifi. Once the database server is connected and started this laptop can be started.

5. Controller

The Controller laptop connects to the office 3G router, via wifi. Once the database server is connected and started this laptop can be started.

Pre-Launch Configuration Checks

Config Checks: MySQL Database Server

Make a note of the IP address as shown on the TurnKey MySQL appliance services, **as this address will be used to update the application config files** in later steps, if required.
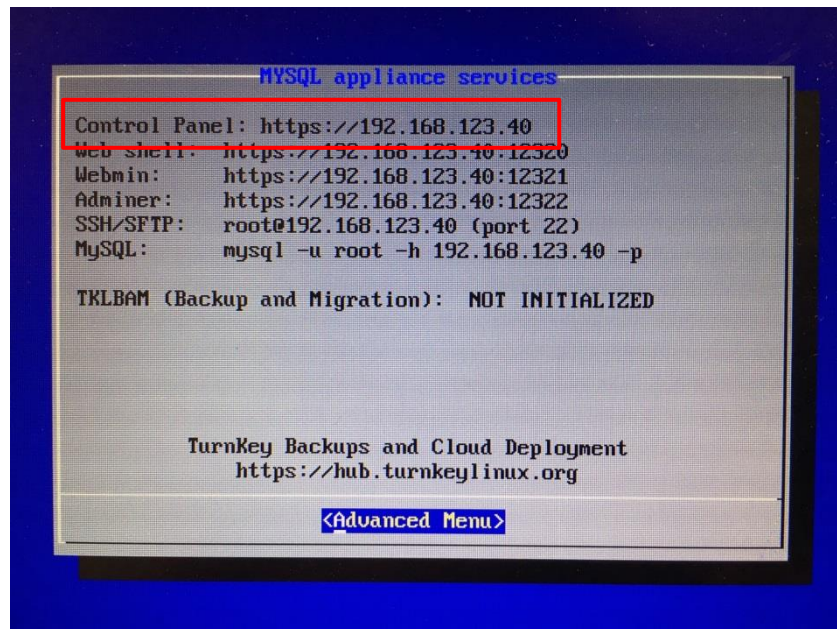
Figure 1 - MySQL Server IP Address

Config Checks: Digital Engine Simulator Application

The IP address shown in Figure 1 must match the value in the `digitalenginesimulator.cfg` config file on the Raspberry Pi, which is located in the `~/enginechallenge` directory.

To check / update this setting, simply type:

```
> cd ~/enginechallenge
> nano digitalenginesimulator.cfg
```

If the value against the `hostname` key **does not** match the IP address as shown on the TurnKey MySQL appliance services then it must be updated.

To update:

1. Navigate to the end of the line using the cursor keys and modify the IP address
2. Once finished press `CTRL+X` (to exit) then type `Y` (to save)

If the IP address shown in the config file **is already correct** simply type `CTRL+X` to exit without saving.

Config Checks: Registration Application

Check the **IP address** and **database credentials** for the MySQL database server listed in the database config file.

To check / update these settings, type:

```
> cd ~/enginechallenge/des_registration
> nano db_config.json
```

Check (and **update if required**) the following config values, using the values in Table 1:

database	digitalenginesimulator
host	[IP address of the MySQL server]
password	[database password]
user	[database user]

To update:

1. Navigate to the end of the line using the cursor keys and modify the values
2. Once finished press CTRL+O ENTER (to save) then type CTRL+X (to exit)

To exist without saving, type CTRL+X.

Config Checks: Queue Manager and Dashboard Application

Check the **IP address** and **database credentials** for the MySQL database server listed in the database config file.

To check / update these settings, type:

```
> cd ~/enginechallenge/des_scoreboard
> nano db_config.json
```

Check (and **update if required**) the following config values, using the values in Table 1:

database	digitalenginesimulator
host	[IP address of the MySQL server]
password	[database password]
user	[database user]

To update:

1. Navigate to the end of the line using the cursor keys and modify the values
2. Once finished press CTRL+O ENTER (to save) then type CTRL+X (to exit)

To exist without saving, type CTRL+X.

Config Checks: Profiler Application

Check the **IP address** and **database credentials** for the MySQL database server listed in the database config file.

To check / update these settings, type:

```
> cd ~/enginechallenge/des_profiler
> nano db_config.json
```

Check (and **update if required**) the following config values, using the values in Table 1:

database	`digitalenginesimulator`
host	[IP address of the MySQL server]
password	[database password]
user	[database user]

To update:

1. Navigate to the end of the line using the cursor keys and modify the values
    2. Once finished press `CTRL+O ENTER` (to save) then type CTRL+X (to exit)

To exist without saving, type `CTRL+X`.

Check the **output paths for the profile graphs** which are created and displayed on the dashboard. For deployed applications, the paths should be as listed in the table below.

To check / update these settings, type:

```
> cd ~/enginechallenge/des_profiler
> nano config.json
```

Check (and **update if required**) the following config values, using the values in Table 1:

dir_graph	`"../des_scoreboard/static/images"`
dir_graph_player	`"../des_scoreboard/static/images/player_images"`

To update:

1. Navigate to the end of the line using the cursor keys and modify the values
    2. Once finished press `CTRL+O ENTER` (to save) then type CTRL+X (to exit)

To exist without saving, type `CTRL+X`.

Operating Instructions

The sections below contain the operating instructions for the four applications. Again, **the order of application start-up is important**, so please start the applications in the order of the steps below.

Operation: MySQL Database

To start up, perform the following steps:

1. Using the **MYSQL appliance services** window (see Figure 1), press `ESC`
2. When prompted to really quit, select `Yes` and press `Enter`
3. This will bring up the login screen. Stop here.

Operation: User Registration Application

The following steps are to be carried out on **piclublaptop02**.

Launching the Application

Via the terminal, navigate to the application directory and start the app:

```
> cd ~/enginechallenge/des_registration
> python app.py
```

Watch for the IP address and port to be output to the console, as this will be the address used in Firefox to load the interface[1].

Using Firefox:

1. Open a new tab and enter the host's IP address and port (as observed when starting the application) into the address bar
   a. For example: `192.168.123.62:5000`
2. Press `F11` to change the browser to full-screen mode
3. Zoom in/out so the page content fits on a single page, without scrolling

Application Operation

The players may now register their user aliases and select an avatar. The player will choose the following items:

Colour	required
Animal	required
Number	required
Guardian's email address	optional
Guardian's phone number	optional
Avatar	required

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[1] If 0.0.0.0 is displayed as the IP, then use the PC's IP address in the browser. If 127.0.0.1 is displayed, use 127.0.0.1 in the browser. As an aside, 0.0.0.0 indicates the app is configured for 'public' access, i.e.: can be accessed from portable devices on the network.

Once the selections have been made, the player will click the **Register!** button. This action will store the user's information to the database, along with a status of 'QUEUED' and a gamehighscore of 0.

Operation: Queue Manager, Dashboard and Profiler Applications

The following steps are to be carried out on **piclublaptop01**.

Tip: As both the Scoreboard and Profiler
applications are run from this PC, it might be
useful to first start a **TMUX** session to launch and
control both applications.[2]

Launching the Applications

Via the terminal, navigate to the application directory and start the app:

SCOREBOARD
```
> cd ~/enginechallenge/des_scoreboard
> python app.py
```

Watch for the IP address and port to be output to the console, as this will be the address used in Firefox to load the interface.

In a new TMUX pane, or a new terminal session:
PROFILER[3]
```
> cd ~/enginechallenge/des_profiler
> python profiler.py
```

Using Firefox:

1. Open a new tab and enter the localhost IP address and port (as observed when starting the application) into the address bar
   a. For example: `127.0.0.1:5001`
2. Press `F11` to change the browser to full-screen mode
3. Zoom in/out so the page content fits on a single page, without scrolling

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[2] TMUX is already installed on the both the i3 and i5 PCs. If you have questions on how / why to use TMUX, see authors

[3] If controlling Profiler from an ssh session, the ssh session must be opened with an -X argument to enable X11 forwarding. For example: **> ssh -X user@111.111.111.11**

Application Overview

This dashboard is set to refresh every (*2*) seconds[4]; which will automatically pick up new players added to the queue, new high scores and the profile of the player who has just completed the game.

Queue Management: Options

Three options have been built into queue for easy management.

1. **Set a player's status** to **PLAYING**
2. **Move** a player to the back of the queue
3. **Remove** a player from the queue

Queue Management: Use

The following items provide further detail on the queue management options listed above.

1. Set a player's status to PLAYING
   o **In THE QUEUE section, click the QUEUED label**
     ▪ This action will update the player's status to PLAYING, make the player appear in the NOW PLAYING section, and send the player to the Pi to begin the game
2. To move a player to the back of the queue:
   o **In THE QUEUE section, click the player name**
     ▪ This option will update the queueposition value in the database with the current epoch time; thus moving the player to the back of the queue
3. Remove a player from the queue
   o **In THE QUEUE section, click the player's avatar and select Yes to the prompt**
     ▪ This action will change a player's status to DELETED; while **keeping** the player's record in the database

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[4] The refresh rate on initial deployment is 2 seconds, and can be updated using the
`<meta http-equiv='refresh' content='2'/>` line in `./templates/scoreboard.html`.

Operation: Digital Engine Simulator Application

Application Overview

The Digital Engine Simulator application is controlled via the Queue Manager and Dashboard application.

Launching the Application

The following steps are to be carried out on the Raspberry Pi.

To launch the Digital Engine Simulator application, simply double-click the `Launch Pi.sh` icon on the Desktop. When prompted click on "Execute".

If this does not work correctly, then you can launch the application from the command prompt by typing:-

```
> cd ~/enginechallenge
> sudo python digitalenginesimulator.py digitalenginesimulator.cfg
```

Application Operation

Once invoked, the application will wait until a player is selected for play.

A player is selected for play using the Queue Manager and Dashboard Application. (For further instruction refer to section 'Queue Management: Use')

To start the game for a selected player, the player must press the "START" button on the handlebars of the bike.

The game will run for 90 seconds. When complete, the player's score is displayed, and the program resets and waits for the next player.

Function keys are used to control the behaviour of the application.

- ESC = Exit the application and close.

Appendix A - Hardware List

FUNCTION	MACHINE TYPE	HOSTNAME	IP ADDRESS	USERNAME	PASSWORD
MySQL Database Server	Dell Latitude E5530	n/a	192.168.123.40	root	Password!1
Digital Engine Simulator	Raspberry Pi 3	raspberrypi	192.168.123.50	pi	raspberry
Queue Manager / Scoreboard	HP Probook 6560b core i5	piclublaptop01	192.168.123.61	piclub	Clubber5!
User Registration	HP Probook 6560b core i3	piclublaptop02	192.168.123.62	piclub	Clubber5!
Controller / Monitor	Dell Latitude E5530	piclublaptop03	192.168.123.63	piclub	Clubber5!

Table 1 - Hardware and Access