

Introduction

A Headless Client can be used by missions to offload AI processing to a dedicated client, freeing up the dedicated server process from most AI processing. Thus more AI units can be spawned and the server process will be able to dedicate most of its processing towards communication with the clients. For a Headless Client/Dedicated Server to function together efficiently, they both need to be connected to each other via extremely low latency and high bandwidth. Effectively, they need to be on the same LAN at least, but preferably running on the same computer.

Source: https://community.bistudio.com/wiki/Arma_3_Dedicated_Server#Headless_Client

If the Arma 3 Headless Client and a Arma 3 Dedicated Server are running on the same Windows computer (VM or physical), it may be beneficial to set processor affinity to prevent execution intensive threads from being scheduled across the same (v)CPUs. The operating system will generally schedule threads efficiently, but manual CPU allocation is possible. This can be achieved by right-clicking on the process (e.g. Arma3Server.exe(*32)) in the processes tab of the Windows Task Manager and selecting Set Affinity.... Be aware that on a physical intel CPU, the odd numbered CPUs are Hyper-thread cores.

*Note: You can use automated solution for affinity assign via batch file with commandline CMD
/AFFINITY HEXvalue e.g. CMD /C START /AFFINITY 0xF3 arma3server.exe*

It has been observed that although the ARMA server and client processes will kick off multiple threads, the bulk of processing is used up by only one or two threads. For example, spawning 50 AI units does not generate 50 threads. There is one thread in the process that handles all of the AI units, irrespective of how many have been spawned. In this way, the ARMA server and client processes do not make maximal use of the processing capability found in modern processors and so AI counts do not scale easily. As such, faster CPU core speed is king and offloading the AI to multiple headless clients on the same computer will probably produce the best possible results for complex missions involving many AI units (albeit an expensive way to get the results).

Source:

https://community.bistudio.com/wiki/Arma_3_Dedicated_Server#Headless_Client_on_a_Dedicated_Server_Notes

Required/Recommended Tools:

1. Notepad ++ (Recommended): <https://notepad-plus-plus.org/download/>
2. Eliteness (Required): <https://dev.withsix.com/projects/mikero-pbodll/files>
3. PBO Manager (Required, if mission files kept as a pbo): <http://www.armaholic.com/page.php?id=16369>

Note: If you already have a basic headless client set-up, skip to Part B to set up an HC for A3EAI

Part A: Set up Headless Client

1. Edit your server's config.sqf using a text editor

- Recommended to use **Notepad++** (Notepad++ will be used in this guide).
- Typically, config.sqf is located in /SC/config.cfg

2. Add the following lines to the end of this file.

```
localClient[]={127.0.0.1};
```

```
headlessClients[] = {"127.0.0.1"};
```

```
battleEyeLicense=1;
```

3. **If this is the first time the HC is being set up on your server:** Add the provided BattlEye filters contained in the text file named "BattlEye filters for HC".

- If you are running your headless client from a different physical machine on a LAN or VM, add its IP to localClient[] and headlessClients[].
- It is recommended to run your HC on the same physical machine to minimize latency and maximize bandwidth between dedicated server and HC.

- From most ideal to least ideal dedicated/headless client setup:
 - HC on same physical machine and environment as dedicated server
 - Minimal added latency
 - HC running on a VM on the same physical machine as dedicated server
 - Some added latency compared to above scenario
 - HC running on a different physical machine on a LAN
 - More added latency compared to above scenarios
 - HC running on a VM on a different physical machine on a LAN
 - Increased latency compared to above scenarios
 - HC running on a different physical machine, not connected to the dedicated server by a LAN
 - Much higher latency, high bandwidth requirement may cause issues with other players compared to above scenarios

3. Using **Eliteness**, open your mission.sqm and decrypt mission.sqm using the below guide.

The screenshot shows the EliteNess x32 Version 3.25 application. The interface includes a menu bar (File, Edit, View, Options, Tools, Help) and a toolbar. A file explorer on the left displays a directory structure with folders like Epoch_Server, @epochhive, BEC, DB, keys, mpmissions, and SC. The 'epoch.Altis' file is highlighted under the 'mpmissions' folder. The main code editor on the right displays a mission.sqm file with various configuration parameters and class definitions. Red annotations and boxes highlight specific steps in the process.

3. Click DeRapify button

4. Save and replace file when prompted.

1. Locate unpacked mission files

2. Select mission.sqm

```

////////////////////////////////////
//DeRap: Produced from mikero's Dos Tools DII version 4.90
//Tue May 05 21:08:42 2015 : Source 'file' date Tue May 05 21:08:42 2015
//lev-heaven.net/projects/list_files/mikero-pbodll
////////////////////////////////////

#define _ARMA_

//Class G:/Downloads/Epoch_Server_0.3.0.3_b1/mpmissions/epoch.Altis/mis
version = 12;
class Mission
{
    addOns[] = {"A3_Soft_F_Car","A3_Soft_F_Quadbike","a3_soft_f_be
    addOnsAuto[] = {"A3_epoch_config","a3_map_altis"};
    randomSeed = 12032465;
    class Intel
    {
        briefingName = "Epoch Mod";
        resistanceWest = 0;
        timeOfChanges = 28800;
        startWeather = 0;
        startWind = 0;
        forecastWeather = 0;
        forecastWind = 0;
        forecastWaves = 0;
        wavesForced = 1;
        windForced = 1;
    }
  }

```

5. Using **Notepad++**, edit the decrypted mission.sqm using the below guide.

```
class Groups    Located at around Line 36
{
    items = 100;    Increase this number by 1.
                   In this case here, change it to 101.
    class Item0
    {
        side = "CIV";
        class Vehicles
        {
            items = 1;
            class Item0
            {
                position[] = {23598.076,3.19,17997.086};
                azimuth = 136.241;
                special = "NONE";
                id = 0;
                side = "CIV";
                vehicle = "VirtualMan_EPOCH";
                player = "PLAY CDG";
                leader = 1;
                skill = 0.6;
            };
        };
    };
};
```

Then, further down the file at about **Line 2019**:

```
class Item99    Take note of this number (In this case: 99)
{
    side = "CIV";
    class Vehicles
    {
        items = 1;
        class Item0
        {
            position[] = {23605.094,3.19,17998.143};
            azimuth = 130.016;
            special = "NONE";    Take note of this highlighted section
                                 enclosed in {}
            id = 99;
            side = "CIV";
            vehicle = "VirtualMan_EPOCH";
            player = "PLAY CDG";
            leader = 1;
            skill = 0.6;
        };
    };
};
```

Add the below block, refer to the image further below:

```
class Item100
{
    side="LOGIC";
    class Vehicles
    {
        items=1;
        class Item0
        {
            position[]={23605.094,3.19,17998.143};
            special="NONE";
            id=100;
            side="LOGIC";
            vehicle="HeadlessClient_F";
            player = "PLAY CDG";
            leader=1;
            skill=0.60000002;
            text="HC";
            forceHeadlessClient = 1;
        };
    };
};
```

It should look like this afterwards:

```
class Item99
```

```
{
    side = "CIV";
    class Vehicles
    {
        items = 1;
        class Item0
        {
            position[] = {23605.094,3.19,17998.143};
            azimuth = 130.016;
            special = "NONE";
            id = 99;
            side = "CIV";
            vehicle = "VirtualMan_EPOCH";
            player = "PLAY CDG";
            leader = 1;
            skill = 0.6;
        };
    };
};
```

```
class Item100
```

Ensure this number is one higher than the previous Item, highlighted in yellow above.

```
{
    side="LOGIC";
    class Vehicles
    {
        items=1;
        class Item0
        {
            position[]={23605.094,3.19,17998.143};
            special="NONE";
            id=100;
            side="LOGIC";
            vehicle="HeadlessClient_F";
            player = "PLAY CDG";
            leader=1;
            skill=0.60000002;
            text="HC";
            forceHeadlessClient = 1;
        };
    };
};
```

Name of HC, should be unique from other HCs

IMPORTANT: You must have one HC slot for each addon on your server that uses an HC. Failing to do this will cause HCs after the first connected one to fail to connect.

6. If your mission files are kept in a pbo, repack the mission files into pbo format. Otherwise, installation of the HC is done. Your next step is now to set up A3EAI on your HC (Part B).

Part B: Set up A3EAI HC

1. Inside your server's Arma 3 directory, create a new folder named @A3EAI.
2. Inside the new @A3EAI folder, create a new folder named Addons
3. Copy the A3EAI.pbo from your existing A3EAI installation inside the Addons folder you created in Step 2.
4. Copy the downloaded A3EAI.pbo.A3EAI.bisign file to the Addons folder you created in Step 2.
5. Copy the downloaded A3EAI.bikey to your server's Keys folder.
6. Edit your mission.sqm and add a new HC slot (**This was done in Part A**)
7. In A3EAI_config.sqf (inside @EpochHive), set A3EAI_enableHC = true
8. Start the HC by starting arma3server with these parameters: -client -mod=@Epoch;@A3EAI;

Inside your server's RPT log, you will see that the HC has successfully connected when you see this:

```
"[A3EAI] Headless client L Charlie 1-2:1 REMOTE (owner: 4) logged in successfully."
```

Inside your HC's RPT log, you will see this (it won't be this clean, but this is what you're looking for):

```
19:23:24 "Loading A3EAI configuration file..."
```

```
19:23:24 "[A3EAI] Reading A3EAI configuration file."
```

```
19:23:24 "[A3EAI] A3EAI configuration file loaded."
```

```
19:23:24 "[A3EAI] Verified all A3EAI settings in 0.000999451 seconds."
```

```
19:23:24 "Debug: A3EAI HC functions loaded."
```

```
19:23:24 "Debug: A3EAI HC PVEHs loaded."
```

```
19:23:26 "A3EAI Debug: Location configuration completed with 44 locations found in 1.636 seconds."
```

```
19:23:26 "Debug: Waiting for HC player object setup to be completed."
```

```
19:24:12 "Debug: Headless player object set up completed."
```

```
19:24:15 "Debug: HC player setup, creating HC unit."
```

```
19:24:15 "Debug: Created HC unit L Charlie 1-2:1"
```

```
19:24:15 "Attempting to connect to A3EAI server..."
```

```
19:24:16 "Debug: Headless client connection successful. HC authorization request granted."
```