This is the read me document for Philos' PEPS and AI.
It goes over how to use the systems.

********** Acknowledgements **********

Bioware - We build upon the shoulders of giants!
Beemdog - I never would have thought it could get better, but it did!
clippy, Daz, Jasperre, Liareth, niv, shadguy, Soren, Squatting Monk, tinygiant, virusman - Keep up the great work!
Special thanks to Jasperre - This project would not be as good as it is without the work on the spell scripts and other AI type improvements within the core game.

Finally thank you to those who have added to this project.
Allanon - Testing and feedback and ideas.
Cypher - Testing and helping get the Mobile version working.
Demoix - Testing the PC AI and putting up with issues, giving detailed feedback, and ideas to improve the AI and menus!
Dunahan - Testing and giving feedback and issues.
MINOS - Playing a ton of modules and giving a lot of feedback and ideas to help improve the AI and menus.
weird fishes/arpeggi - Testing and giving feedback and ideas.
Anufis - Testing and requesting new options.

********** Description **********

Philos' Enhancing Player System is a collection of menus and systems to enhance the player's experience while playing Neverwinter Nights Enhanced Edition.

- Replaces the original neverwinter nights AI for monsters and associates.
- Adds menus for the player to control their associates.
- Adds options and RULES to change how the game is played.
- Adds enhancements to the player's character by allowing them to auto fight, auto buff, and auto loot.
- Adds a quick way to run independent scripts from a quick menu.

********** Installation **********
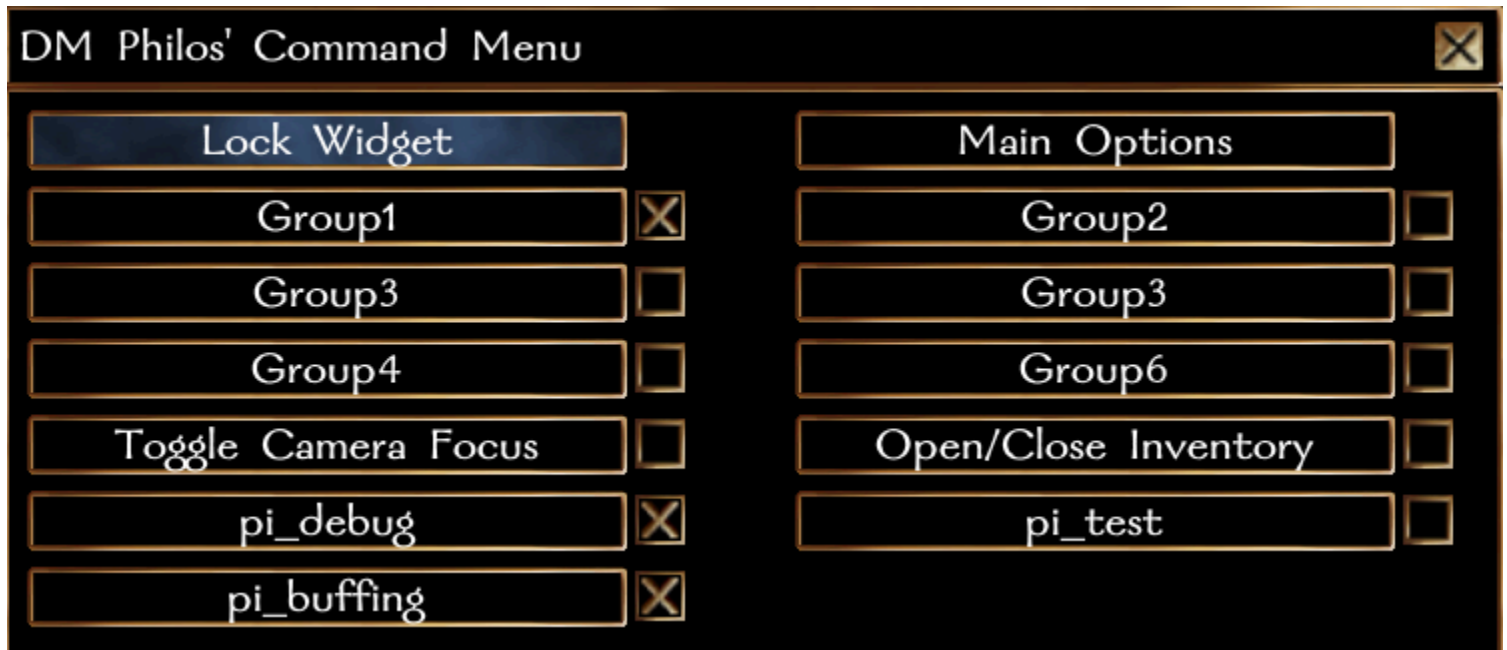
See the PEPS Server AI Read.txt file for server installation.

********** How to use **********

Once you have entered as a DM you will see a small picture of your character in a widget at the top left of your screen.

Left clicking on the picture will open the Command Menu.
Right clicking on the picture will open the Main menu
Clicking the picture with a menu open will close them.

The DM's command menu is different from the players.

- **Lock Widget:** Locks the widget to the current location on the screen and reduces it to just the buttons to take up less screen space.
- **Main Menu:** Allows for more customization of the module AI.
- **Group #:** This button has two functions.
  - Right clicking the button will allow you to select creatures to add to the group. The first creature you select will change the button's name to them so it is a good idea to select a creature that you want to describe the group as.
  - Left clicking the button puts the group into Action Mode allowing you to have them use all of the actions from Action Mode above.
- **Toggle Camera Focus:** Allows you to select any object to place the camera focus onto.
- **Open/Close Inventory:** Allows you to select a creature to Open/Close their inventory.
- **Plugins:** Any added buttons below this will be any plugins you have loaded. Examples above are pi_debug, pi_test, pi_buffing. The X denotes that the DM has placed it onto the widget. Note putting x's in these boxes only make the plugins show up on the DM widget. Go to the Plugin Manager to allow players to use them.

Philos' Enhancing Player System (PEPS) version:04.03.25 [Server]

Monster AI working, Associate AI working, Player AI loaded.

| Plugin Manager | | Widget Manager |

AI RULES

6 | Max number of henchmen that is allowed in your party.

0 | Modules experience scale. ☒ scale to party. | Default |

☒ Creatures will use advanced combat movement.

☐ Use item level restrictions for creatures [Default is off].

☒ Creatures can use the skill Use Magic Device.

☒ Creatures can use Healing kits.

Spells the AI will not use: ☐ Darkness ☐ Dispels

50 | % chance monsters will attack the weakest target.

30 | meters is the distance a monster can respond to allies.

☐ Monsters can prebuff before combat starts.

☒ Monsters can use summons before combat starts.

☒ Monsters can use tactics (ambush, defensive, flanker, etc).

Add 0.00 | monsters per spawned encounter monster.

0 | % increase in all monster's hitpoints.

***** WARNING! The options below may break the module! *****

☒ Monsters can wander upto 30 | meters and ☒ open doors.

☐ Monsters can summon companions.

☐ Summoned associates to remain after masters death.

☐ Make enemy corpses remain.

Monster perception: Default [Monster's default values]

Allows a player to change many options for the current module they are playing.
- **Version:** The top line shows the version of PEPS.
- **AI TEST:** The next line will show if the AI is working. See troubleshoot section.
- **Plugin Manager:** Opens the plugin manager. See below.

- **Widget Manager:** Opens the widget manager. See below.

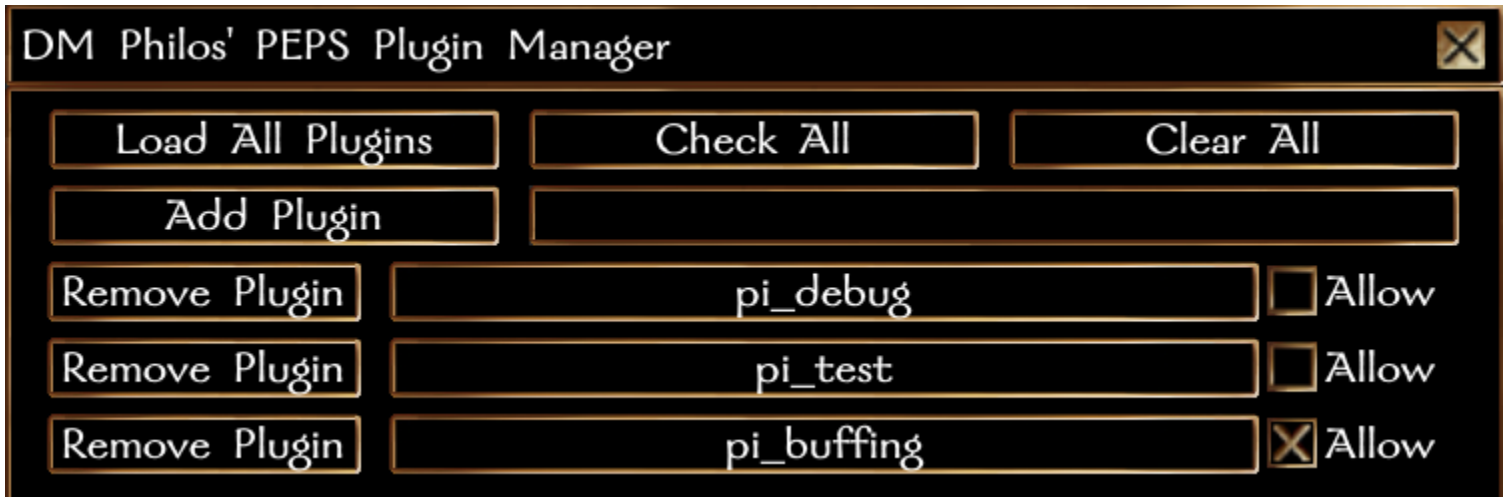Options you can use to change how the module plays!

- **Max Henchmen:** Can be from 1 to 12 and allows the player to have more henchmen than normal in the Original Campaign and maybe other modules.
- **Modules experience scale:**
  - This is the scale the module uses to base how much experience to give out. The Wailing death for example is 10. This can be changed to adjust how much experience the module gives.
  - The checkbox scale to party will adjust the module's experience scale based on how many associates you have. This balances out the experience penalty you get for having associates. When you put an x in the box is when it will take the value in the first box and keep the module xp adjusted to that value. To change the value just uncheck the box, set the value in the module experience scale and then check this box again.
  - The Default button keeps the module's original value in case you want to put it back to the original value.
- **Creatures will use advanced combat movement:** Creatures will attempt to move away from melee if not being attacked and are casting or are using a ranged weapon. Also allows creatures with sneak attack to position ranged attacks for maximum damage. Sometimes you may want to turn this off if fights are in small areas.
- **Use item level restrictions for creatures:** Makes creatures respect the item level restrictions.
- **Creatures can use the skill Use Magic Device:** Creatures can use all types of magic items and this allows them to use the skill Use Magic Device to use restricted magic items.
- **Creatures can use Healing Kits:** Creatures can now use healing kits that they have in and out of combat. You may want to turn off if a module changes how healing kits work or you don't want them to be used.
- **Moral checks, wounded creatures may flee during combat:** When a creature is wounded they make a moral(Will) check to see if they flee from battle.
- **Spells the AI will not use:** If Darkness or Dispels is checked then the AI will ignore these spells and not use them.
- **% Chance monster will attack the weakest target:** Increases the chance a monster will ignore the closest enemy and attack a weaker target. Increases difficulty!
- **Meters is the distance a monster can respond to allies:** This defines how close a monster must be to the player before they will respond to an ally's shouts. Lowering this value will keep monsters from coming to and attacking the player. For example if it is set to 30 meters then when an enemy sees the player only other monsters within 30 meters of the player will respond.
- **Monsters can pre buff before combat starts:** Enemy monsters will begin combat with any long duration defensive spells cast on them and nearby allies. This will increase the difficulty of encounters!
- **Monsters can use summons before combat starts:** Enemy monsters will begin combat with any creatures they can summon including familiars and animal companions if they are allowed to summon them. This will increase the difficulty of encounters!
- **Monsters can use tactics (ambush, defensive, flanker, etc):** This allows monsters to use advanced combat tactics. For example if a creature has a good Move silently skill then they may get the ambush tactics allowing them to hide and attack from the shadows!
- **Add X monsters per spawned encounter monster:** Copies X number of monsters for each encounter monster spawned. An encounter monster is a monster spawned via the encounter system. If the module does not use the encounter system then this will do nothing. For example if you put 1.5 as X then if an encounter has 3 monsters then this will spawn 4 extra monsters increasing the encounter to 7!
- **% Increase in all monster's hit points:** Increases the hit points of all monsters from 0 to 100%. Thus 50% would increase a monster with 50hp to 75hp. This

includes all monsters such as bosses and special creatures!

- ******* WARNING! The options below need to be tested with your module! *******
- **Monsters can wander up to X meters:** Enemies will wander around when not in combat up to x meters from their spawn location. This may break your module by putting creatures in the wrong location for scripted events or battles!
- **Open Doors:** This allows monsters to open doors either while wandering around or if they are trying to get to an enemy. This may break a module by allowing creatures to attack important NPC's at the wrong time.
- **Monsters can summon companions:** Enemies can summon familiars and animal companions. These are randomized for each enemy. This can break a module due to how this ability works. Each monster must be copied and destroyed to change the type of companion summoned and if the module tracks them it will break!
- **Summoned associates to remain after the master's death:** If an enemy summons a creature and they die the summoned creature doesn't get removed but instead stays and continues to fight! This may increase an encounter's difficulty!
- **Make enemy corpses remain:** Enemies will not fade out after they die. Some may still fade, but the majority of them will remain. Good for immersion! This can break a module due to how this ability works. Each monster must be copied and destroyed to change the corpse's fade duration and if the module tracks them it will break!
- **Monster perception:** This is the range a monster can see and hear in meters.
    - Default: This will be different for each monster.
    - Long [35 Sight / 20 Listen] The longest distance a monster can see.
    - Medium [20 Sight / 20 Listen] The average distance most monsters normally can see or hear.
    - Short [10 Sight / 10 Hear] This will reduce monster's reactions!

Increasing this to Long will increase the difficulty of the module as monsters will see you at longer distances and more will attack at a time. Reducing this to short will make many encounters trivial especially if you have a ranged weapon.

This can break a module due to how this ability works. Each monster must be copied and destroyed to change the perception range and if the module tracks them it will break!

********* WIDGET MANAGER **********

The widget manager allows the dungeon masters and administrators the ability to restrict the use of buttons and widgets for all players.

You don't want them to be able to click through monsters then just check that button

and then the players will not see or be able to add that button to their widget.

A plugin is an executable script *.ncs file that you have loaded into the game via patching, adding to the override or development folder. Your player character is passed to the script as OBJECT_SELF.
The plugin manager is where you can load, remove, or add them to the player's widget.

- **Load All Plugins:** This will load all of my plugins if they are loaded into the game. Examples are pi_buffing, pi_debug, pi_test.
- **Check All:** Sets all plugins to allow the players to use them.
- **Clear All:** Removes all of the plugins for the player's usage.
- **Add Plugin:** Type the name of an executable script without the ncs extension into the text box and hit the Add plugin button to add it to the manager. If the script file is loaded into the game then a button will appear below. You can now execute the script by clicking its name. You can also check the box to the right and add it to the player's widget.
- **Remove Plugin:** Removes the plugin from the manager and player's widget if it has been check marked to be there.
- **Allow:** This check box is for letting your players use the plugin. DM's can use any plugins loaded.

I've included a debug plugin "pi_debug".
This plugin allows diagnosing PEPS while it is running.

Sulinus Haightaingorn's PEPS Debug Menu

Philos' Enhancing Player System (PEPS) version 0.1

Monster AI (nw_c2_default1): OVERRIDE:

Monster AI (x2_def_heartbeat): OVERRIDE:

Monster AI (j_ai_onheartbeat): OVERRIDE:

Associate AI (nw_ch_ac1): OVERRIDE:

Summons AI (nw_ch_summon_9): OVERRIDE:

Display Target Info   Fix Associate Scripts

Dump Object's Json to Log   List Object's Variables

Delete Variable   Set Variable   Get Variable   int

Name:

Value:

Debug Creature   Clear Debug

Nothing is sending AI debug to the log file.

- This shows the version number of PEPS as well as where the AI scripts are being loaded from.
  If you have them in the override folder it should show OVERRIDE:
  If you have them in the development folder it should show DEVELOPMENT:
  If you have them in a patch it should show PATCH:peps (or the name of your hak).
- **Display Target Info**: Shows information about an object. ResRef, Tag, UUID, Conversation file, and the event scripts are displayed to your in-game log screen. It also shows where the event scripts are being loaded from. If you select the ground it will also show you the area scripts as well as the module scripts.
- **Fix Associate Scripts**: This brings up a targeting screen where you can select one of your associates to "fix" their event scripts to use Philos' AI.
- **Dump Objects Json to Log**: This will dump the object's values in Json form to the log file. This is good for debugging an object.
- **List Object's Variables**: Displays the object's variables to the in-game log screen. Shows the variable's name [Type] and value.
- **Delete, Set, Get Variable**: You can type the name of a variable in the text box next to Name: and a value into the text box next to Value:. These buttons will Delete, Set, or Get the variable you have defined. Use the combo box to change the type of variable. Object and location variables do not use the value box.
- **Debug Creature**: This selects a target creature to begin sending AI debug code to the games log file.

- **Clear Debug:** Removes the target creature and stops sending AI debug code to the games log file.
- **Log file location:** The default log location and file is: Documents/Neverwinter Nights/logs/nwclientLog1.txt

********** How the AI works **********

For now this will be a basic understanding of how the AI works and I will hopefully flesh it out more as time goes on.

A) Philos' AI replaces the creature's event scripts.
B) During heartbeat scripts they will see if they are wounded and will attempt to heal themselves or ask an ally to heal them.
   They will also check for enemies and wander around if set by Philos' AI constants or Bioware wandering system.
B) Once a creature's OnPerception script fires and they "hear" an enemy it will enter combat mode and begin searching for the enemy.
C) Once a creatures OnPerception script fires and they "see" an enemy then it will do the following;
   1) It sets up a talent array with any spells, special abilities, and items that it can use in combat.
   2) It sets up a combat state for each creature giving them information about each enemy and ally in the battle.
      such as distance, health, combat rating, if they are disabled, and if they can see them for each combat round.
   3) With the combat state and talent array it goes through a script set on the creature based on its class to determine its action.
   4) Once the action has finished it will start at #2 doing each turn until all enemies are dead or they do not perceive any more enemies.
D) Once combat is over they will check if they are wounded and attempt to heal themselves or ask an ally to heal them.

********** EDITING FOR YOUR SERVER **********

Adjusting the AI for your server. Below is how you can change things to have the AI behave differently or how to add functionality to your unique server.

********** CONSTANTS **********

If you have added the nss files to your module you can also change some constants to adjust how PEPS AI works with your module. To change a constant you will need to open the 0i_constants script there you can change any value and then compile to finalize the changes. Below is a list of constants that you can change:

********** ADJUSTABLE CONSTANTS **********

- **AI_DEBUG:**
  - TRUE debug will be turned on and a DM could send the AI debug to the logs.
  - FALSE debug is turned off, saving some processing.
  - NOTE: Debug is very extensive and will fill many log files if left on.
- **AI_SERVER:** Should always be TRUE when used in a server.
- **AI_HENCHMAN_WIDGET:**
  - TRUE allows the players to use the widget on associates.
  - FALSE keeps the widgets from appearing for the players.
- **AI_MAX_CLASSES_PER_CHARACTER:** Default 3, If your server allows more than 3 classes per character then change this value.
- **AI_TAUNT_COOLDOWN:** Default 3, The number of rounds before the AI will try to use Taunt again.
- **AI_EMPATHY_COOLDOWN:** Default 3, The number of rounds before the AI will try to use Animal Empathy again.
- **AI_ASF_WILL_USE:** Default 15, This tells the AI what % of Arcane Spell Failure is ok to attempt to cast a spell with.
- **AI_MONSTER_HEAL_IN_COMBAT_CHANCE:** Default 70, defines at what % of health a monster will attempt to heal themselves in combat.

- **AI_MONSTER_HEAL_OUT_COMBAT_CHANCE:** Default 70, defines at what % of health a monster will attempt to heal themselves out of combat.
- **AI_HENCHMAN_WIDGET:** Default TRUE, A server can completely turn off all henchman, summon, familiar, and animal companion widgets if set to FALSE.
- **AI_BASE_CUSTOM_TOKEN:** Default 1000, If you use 1000 in your module for the custom token change this to something that you are not using.
- **AI_HENCHMAN_BUFF_DELAY:** Default 0.2, This is the number of seconds between each spell cast by a henchman when they are buffing the party, you may want to increase the duration between spells, but 0.2 is the lowest you should go.

********** SERVER RULES CONSTANTS **********

These only set the base rules when PEPS is first run in a module. Once it has been run it will use the Database values. The Main Options is where DM's can change the rules.

********** CONVERSATION CONSTANTS **********

- **AI_IGNORE_ASSOCIATES_ON:** Players can tell their associates to ignore enemy associates during combat.
- **AI_TAUNTING_ON:** Players can tell their associates to use taunt.
- **AI_COUNTERSPELLING_ON:** Players can tell their associates to use counter spell.
- **AI_IDENTIFY_ON:** Players can ask associates to identify their magic items.
- **AI_SCOUT_AHEAD_ON:** Players can ask associates to scout ahead.
- **AI_OPEN_INVENTORY:** Players can ask associates to open their inventory.
- **AI_PICKUP_LOOT:** Players can ask associates to pick up loot.
- **AI_REMOVE_HENCHMAN_ON:** Players can ask a henchman to leave the party.

********** ai_spells.2da **********

Row No.	Label	ImmunityType	SaveType	SpellResist	Category	HostileSetting	Buff_Duration	Buff_Target	Buff_Group
0	Acid_Fog	Acid	****	1	I	1	****	****	****
1	Aid	****	****	****	E	0	2	9	****

This file is required to use the AI. All spell functions check this 2da for what should be done during combat and how or when to buff. The AI will not function if ai_spells.2da is not found by the server!

If your server has unique spells or has altered some original spells you can change this file to match up with your changes and make the AI use your adjustments!
Note: that the ai_spells.2da should have the spells in the exact same order as the spells.2da as it uses the same spell numbers as the spells.2da
Below is a description of what you need to add or change.

- **Immunity Type:** Used by the AI to decide if a spell should be used or not based on enemy immunities. These must match the ones already defined in the file.
- **SaveType:** Used by the AI to decide if a spell should be used or not based on an enemy's saves. Must be one of the following: Fortitude, Reflex, or Will.
- **SpellResist:** Used by the AI to decide if a spell should be used or not based on an enemy's spell resistance. 1 defines that the spell is subject to spell resistance.
- **Category:** This is a defined category that the spell falls into so the AI can decide when it should attempt to use a spell or what targets the spell should be used on. The categories are as follows:
  - **E:** Enhancement - The spell enhances a creature.
  - **P:** Protection - The spell protects a creature.
  - **I:** Indiscriminate - An offensive AOE spell that targets everything!
  - **D:** Discriminante - An offensive AOE spell that only targets enemies.
  - **R:** Range - A non AOE spell that has a range of Long, Medium, or short.
  - **T:** Touch - A spell that has a range of touch.
  - **S:** Summons - A spell that summons a creature or object for combat.
  - **H:** Healing - A spell that heals its target.
  - **C:** Cure - A spell that cures the creature from a negative effect.
- **HostileSetting:** This defines the spell as hostile or not. Used in the buffing scripts to cast non-hostile spells.

- **Buff_Duration:** Used by the AI to define if a spell has a long duration or a short duration. This allows the AI to select appropriate spells to use when buffing.
  - **2:** This defines a spell to have a short duration.
  - **3:** This defines a spell to have a long duration.
- **Buff_Target:** This defines who is the best target for a buff spell. This way the AI can make better decisions. The meanings of the numbers are as follows:
  - **0:** Can only be cast on the caster. i.e. personal.
  - **1:** Creature with the highest Strength Score.
  - **2:** Creature with the highest Dexterity Score.
  - **3:** Creature with the highest Constitution Score.
  - **4:** Creature with the highest Intelligence Score.
  - **5:** Creature with the highest Wisdom Score.
  - **6:** Creature with the highest Charisma Score.
  - **7:** Creature with the lowest Armor Class.
  - **8:** Creature with the Armor that has the lowest Armor Class.
  - **9:** Creature with the Highest Attack bonus.
  - **10:** Creature that is the most wounded.
  - **11:** Creature with the lowest Fortitude Save.
  - **12:** Creature with the lowest Reflex Save.
  - **13:** Creature with the lowest Will Save.
  - **14:** Creature with the lowest total Saves.
  - **15:** The spell targets an item instead of a creature.
- **Buff_Group:** This defines a group of spells that should only allow one of the spells on a target at a time. This keeps lower level buff spells from being cast on a target that already has a better spell. The values are as follows:
  - **-1:** Elemental resistance spells.
  - **-2:** Summons spells.
  - **-3:** Non armor AC buffing spells.
  - **-4:** Armor AC buffing spells.
  - **-5:** Chance to Miss.
  - **-6:** Regeneration.
  - **-7:** Globes of Invulnerability.
  - **-8:** Damage Reduction.
  - **-9:** Mantles.
  - **-10:** Alignment vs Chaos.
  - **-11:** Alignment vs Evil.
  - **-12:** Alignment vs Good.
  - **-13:** Alignment vs Law.
  - **-14:** Attack bonus for weapons.
  - **-15:** Light effects.
  - **-16:** Haste effects.
  - **-17:** Polymorph effects.

********** ai_messages.2da **********

You can change or remove the ai_messages.2da file. If you don't want random messages at the bottom of the menus you can remove the file and they will not show up.

If you would like to change them then just overwrite what is in the file. Do note that on a server the first 25 lines are only visible in the players menu, but all 43 lines are visible in the DM's menu.

********** AUTO LOOTING **********

Auto looting is an advanced feature to bring the game up to more modern gaming systems and a huge quality of life for your players. But to get this functionality to work on some server you may be required to change your treasure generation script. The issue is that NPC's can't reliably open chests and to get the loot system to work quickly and smoothly it uses a hack. If your OnOpen events for treasure objects check for the PC in the function GetLastOpenedBy() then you will need to add the following

to those scripts. This allows the NPC to open the chest and pass the player to the script. This assumes that you are using object oLastOpener = GetLastOpenedBy(); If you define the object with a different name just change the one below.

```
// ******************** ADD AI CODE FOR LOOTING ****************************
// *************** SHOULD NOT CHANGE ORIGINAL BEHAVIOR *********************
    object oPC = GetLocalObject(OBJECT_SELF, "AI_GET_LAST_OPENED_BY");
    if(GetIsObjectValid(oPC)) oLastOpener = oPC;
// ******************** ADD AI CODE FOR LOOTING ****************************
```

********** Henchman Dialog **********

If you have a unique henchman dialog it will still work with the PEPS henchman dialog system. PEPS will start its dialog when you talk to a henchman, but there is a node that will call a henchman's original dialog file so the server can have a unique dialog for any henchman. It is the line: Let us talk about something completely different.

********** FILES **********

Here I will go over the files and the naming convention so adding them to your server will be easier to understand and allow you to change them to your needs.

- **Naming Convention:** Below is how I have identified the script's usage.
  - 0c_ - Conversation file used in the Actions Taken event.
  - 0c_if - Conversation file used in the Text Appears When event.
  - 0e_ - Event script, see the remarks on where they are used.
  - 0e_c2 - monster event scripts.
  - 0e_ch - associate event scripts.
  - 0e_nui - NUI event scripts to control the menus.
  - ai_a - Associate ai scripts that define how a creature should act in combat.
  - ai_ - Monster ai scripts that define how a creature should act in combat.
  - default - The basic script used by many events within the game.
  - nw_ - Core Bioware scripts used to take over the AI system.
  - pe_ - A plugins event script to control that plugins menus.
  - pi_ - A plugins menu definition and starting script.
  - x2_ - Core Bioware scripts used to take over the AI system.
  - xx_pc - The player's AI that is inserted to a player's events.
- **Customizing the AI:** You can write your own AI scripts to be used on unique creatures or bosses. There are two example scripts included to show how this can be achieved.
  - ai_bloodmane - A Orc Warlord(Barbarian) taunts then goes into a rage!
  - Ai_dragon_boss - This dragon lives deep into a dark cave and will strike at the players as he moves deeper into his cave using allies to heal him!

********** TROUBLESHOOT **********

1) The widgets don't stay in place when I lock or unlock them.

The NUI menu system has a built-in delay for updating the menu location to the game. If you move a widget then lock it before it is updated this will cause the widget to move back to the previous location. You need to wait around 6 seconds after moving a widget to try and lock it. Also if you have the game paused the menu locations don't update correctly and will not be saved as well. The game cannot be paused when moving menus.

2) My associates go into hold mode on their own.

If an associate sees a trap they will change to hold mode to keep from accidentaly tripping the trap. Once the trap has been dealt with they may be put back into another mode. This can be set to Ignore in the AI menu, see Ignore Floor Traps button.

****

Talk to me in the Vault Discord, Channel peps-ai-enhancement:
https://discord.com/channels/255017439371329537/1368322521501532170

All my work is on Github:
Github: https://github.com/Philos-Harak/nwn_content

If you have any other issues or find a bug while playing please let me know. I also love ideas and am willing to add new systems or controls. I'm on the Vault discord as well as the Vault forums. All input is valuable and helps make our community better!
Thank you for your interest in PEPS!
PHILOS