Sonos Controller Plug-In for HS4.

Go to for on-line forum support! **Please read the help file and take traces before you post questions on-line**!

Introduction

Welcome to the HS4 compatible version of the Sonos Plugin. If you have been a user of the previous version, do read the next sections thoroughly as a bunch of things have changed, some features were deprecated.

If you run into an issue or you have a question, when you post on the forum, what is required is:

1. Recreate the issue with debug logging on, typically the log level set to "errors and events" is sufficient.
2. Log to disk! It is easy and makes sure that all info is present as using the HS log to cut/paste loses HTML tag information.
3. Post screen shots of your configuration, ie. Player table, events, HS device page.
4. Detail what exactly you are doing and what exactly is not working.

READ THIS FIRST!!

1. **The Plugin does NOT start automatically** when you start if for the first time, you MUST acknowledge the UELA. Click on: Plugins->SonosV4->Accept and read the information before you accept.
2. The first time (only) when the Plugin starts, it will check if a previous version of the PI was installed, just by looking for the Sonos.ini file in the \config directory. If it finds a previous install, you can elect (while you go through the "Accept" menu) to migrate the information. This will preserve device references and linkgroups but it will not migrate events, you still would have to redo those. **This migration is irreversible, do NOT do this unless you made a backup. After migration, all HS3 related Sonos PI data will be gone!!!**
3. A while back Sonos added a cloud-based control API. This API is officially supported whilst the UPNP interface, that this PI has been using for the last 10 year, was never officially supported. I suspect that over time, they might move their strategy to only allow player control through this API. It could mean that many functions of this Plugin will not work anymore. This new API is a cloud-based interface, so control commands come through a very secure and encrypted internet tunnel. This cloud-based connection has been there for many years, and I believe is very secure. I added support for this interface in this Plugin version, but this requires you to authenticate the Plugin with Sonos, using a secure authentication protocol. You would be asked for your Sonos credentials, but directly from the Sonos website, without any knowledge of your credentials or storage of any information (except for a random key) by the Plugin. For now, the Plugin only uses this cloud-based API to play AudioClips (see further in help

file on AudioClip info). As of early 2025, Sonos appear to have tightened their security on on-line authentication of apps that use this API. After you have successfully logged into your Sonos account and clicked on allowing this plugin access to the API functions, a security token is returned to the plugin. This is done by sending a return address as part of the authentication process. However, the Sonos implementation now only allows a return address that is public routable AND use https (which HS4 cannot support native) or a "localhost" identifier. Consequently, the authentication will only work from a browser that is physically running from the same host that runs your HS4. You only need this to authenticate, which should only happen when you install the plugin. I understand this will cause challenges for users who run HS4 on Linux based servers in a headless configuration (no keyboard/monitor directly connected to run a browser locally).

4. In almost all cases where HS is not automatically updating the state of players, the problem is that <u>you did not allow the Plugin to have full access through the firewall on the HS PC.</u> This is only a Windows issue. If not the firewall, it typically is because the Homeseer database conflicts with the Sonos.ini file, almost always due to manual intervention, such as deleting devices in HS, moving installs etc. So, make sure you allow the Plugin proper firewall allowance and do not delete devices manually from the HS devices page, use the Plugin's config (player table) to do that.

Feature differences compared to HS3

New

1. <u>Deleting of devices</u>: I added support to keep the HS data and plugin data consistent. If you now delete a device from the HS device management page, the Plugin will remove its data from its .ini file. However, I would still not recommend you use this, because **if you say delete the master device, everything will be removed, and you cannot undo it**. If you delete a device while the PI is not running, at startup of the PI, a consistency check will run and try to undo inconsistencies. If you suspect an issue, restart the plugin, a special log file <u>named \html\Sonos4\Logs\SonosVerifactionLog.txt</u> will be created an record fixed issues.

2. <u>Manual speakerclients versus automatic</u>: in HS2/3, each time you created a "Speak" event, you had to create a manual speaker client. In HS4, you will have the options to pick from a list of speaker clients, one for each group you created and one for each player. This PI will use the word grouping more as opposed to group to be more in line with the Sonos terminology.

3. <u>Support for households</u>: If you have S1 and S2 controlled players, you now have 2 households, and you cannot group these players. They are seen as totally different networks, so you cannot mix them. This Plugin will try to support that by doing things like you can only create groups with players who are in the same household or do events like play something from the database that exists only for that household.

4. <u>Browse directly on player</u>: I added an option, currently only for navigating content using the player control webpages, to navigate content directly on a player. The advantage is that any content that changed is immediately available. If Sonos were to add features, you would be able to use them without the need to change the Plugin.

However, it is a bit slower, and the selection options might be confusing or not working. Work in progress and currently disabled!

5. <u>Better access to pick ports for VLAN based networks</u>: the HS3 version already had support to nail down the listening ports but it was only accessible by directly modifying the .ini file. You can now see and modify the settings through UI support. Note this is only of importance if you use VLANs and you need to nail these down.

6. <u>More filtering capabilities for debug</u>: weeding through the logs is increasingly becoming harder for me to do. You now have options to only log a single player or use some filters.

7. <u>iFrame support of embedding the play controls into your own HTML screens:</u> one of the big changes in HS4 is the UI interface whilst for HSTouch users, the MediaAPI, which worked reasonably well in HS2, was not working well in HS3, is gone in HS4. If you look at the layout of the player control webpage, it is divided in 3 pieces (player, queue, navigation). You can drop these parts individually as iFrames into your own HTML pages and might be a good substitute for HSTouch missing functions.

8. <u>Support relative volume setting and group volume setting</u>: by adding a "+" or "-" character to your volume setting events you can indicate a relative over absolute volume adjustment. Adding a "G" character would make it a group volume command over individual player command.

9. <u>Added capability to hide paired players and non-status devices</u>. It reduces the clutter on your device management page, the PI can now mark paired devices as hidden. It is not perfect because you can still overwrite it to show hidden devices but there currently is no other option available to Plugin authors to hide devices completely.

10. <u>Added AudioClip capability</u> which helps to restore services (virtual queue based ex Amazon/Alexa ..) after the announcement is over.

11. <u>Support for categories</u>: you can now add all Sonos devices automatically to a category if you want.

12. <u>Added support for Move and Roam</u>: These battery style players will now have a device to show battery state, sleeping state, Bluetooth state and a control (W L)to wake up the player when in sleeping mode.

13. <u>Access to Sonos native tools</u> like "Network Matrix".

14. <u>Display your network information</u>.

15. Added support for Night-Mode and Dialog-Level: players who support Home Theater systems, will have two additional HS devices to turn these features on/off.

Removed

1. <u>Dropped dock support and audiobooks</u>. Not sure anyone ever used this, so I removed it.

2. <u>Dropped support for announcements where a device running a speaker client is physically connected to the input of a Sonos Player</u>. If you still have a setup like that, you will need to create an event that: Issue a group action, speak to that client, and unlink. 3 actions in one event.

Changed

1. <u>Automatic creation of music database(s) per household</u>: the settings were removed, and local music database(s) are now created automatically, either at start-up of the PI or daily at 2:05 am.
2. <u>Announcements functions are almost completely rewritten</u>, use more of JSON style information to allow better scripting. All information pertaining to an announcement is now stored as a JSON structure and intent is to make this available through scripting or virtual devices. Work in progress.
3. <u>Added summary device in JSON formatted for scripting</u>: in HS3, the control device had a XML-ish string that showed art and state. In HS4, I am trying to move away from that and created a "summary" device, encoded as a JSON string that has all the relevant info for that player. Still work in progress.
4. <u>Faster player state updates in HS</u>. In the previous version, state was updated when artwork was retrieved and/or players reached 'PLAY" state. This could sometimes lead to long delays, before the state changed. Retrieval of album art is now asynchronous so state gets updated immediately but info like track, album, art, summary will now update asynchronously as well. So, pay attention to that in your events/scripts! Moreover, when a player moves from pause/stopped state to play state, depending on the content, the player will buffer the incoming stream, which takes time. Sonos players transition from Stop->Transitioning->Play state. In the HS2/3 version of this PI, the transitioning state was suppressed making events easier, less transitions but at the cost of triggers/events firing on state transitions from Stop/Paused to Play. There is an option setting now, to take the transitional event into account which cause immediate change in the player state from Stop/Pause to Transitioning, which can be used to trigger.
5. <u>Configure what the State device shows</u>: In the previous version of the PI, the state device would hold an XML formatted string, that had art, artist, album info. This device information is also used in the HS devices page when you go to a "Grid View" and causes display issues. There is now an option setting, to select what you want this device to show. I recommend you set it to "State". For those who used this info to script, I recommend you use the JSON formatted "Summary" device to script on. It has more information, including pairing information and source information. If you set it to "Legacy", do note that this device will be updated many times as the information it holds is retrieved asynchronously.

First time acceptance

When the PI starts and it cannot find its .ini file, it assumes this is a first time install and you will have to go through the acceptance phase.

As soon as you enable the PI for the first time, you may have to refresh your browser to get the links updated, but you should see the following:
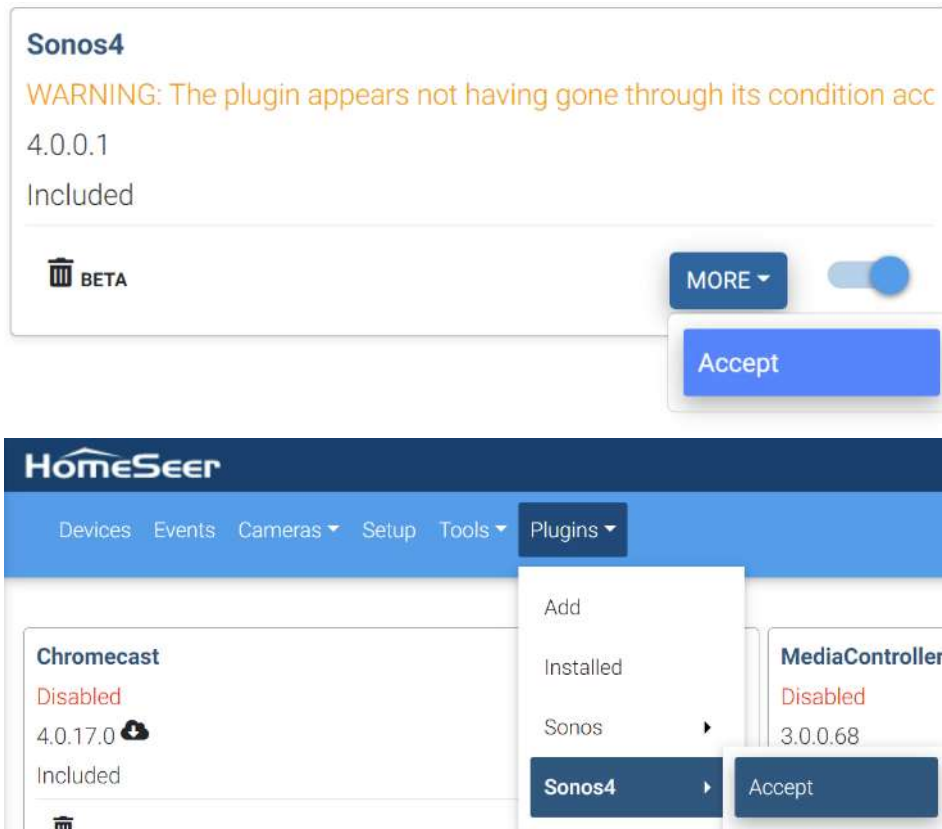
Click on Accept which will open the acceptance/init page, read the conditions before accepting them.

Step 1
Accept conditions for use

It is highly recommended that you make use of the free trial before committing to purchase. By accepting, you acknowledge that you understand what this plugin does and what its limitations are and acknowledge this plugin is provided "AS-IS". The author's support will be good faith and your purchase does not warrant resolution of reported issues, irrespective of real or perceived. Moreover, you acknowledge to understand the risk that Sonos Inc. by rolling out a new SW release may break or totally render void the functions of this plugin and no refund will be issued. You acknowledge that your purchase covers effort spend on this plugin over the last 10 years leading to this "AS-IS" product. If these conditions are unacceptable, please un-install this plugin and as an alternative you could install the free HS3 baselined version of this plugin.

[ACCEPT] [DON'T ACCEPT]

Step 2
Select a Category

Step 3
Check for migration

Step 4

In Step 2 you can select a category. Once set, any new device will be assigned to that category. You can skip this and later set it in the settings pages.

In Step 3, this step is only made available if the PI detects a previous HS3 version of this PI. It just looks at the \config subdirectory for the Sonos.ini file. If present, the PI assumes there is a previous install active.

Starting the migration is irreversible because the existing devices are converted to devices and features, and you can only go back by restoring the FULL HS setup. Moreover, once the data is migrated the HS3 version of the PI will NOT work on that migrated data, it will start a fresh configuration. Finally, you cannot start a migration if the HS3 version of the PI is still running, you have to stop the HS3 Sonos PI, make a full backup and only then start the migration!!!

Step 1
Accept conditions for use

Step 2
Select a Category

Step 3
Check for migration

If you want to migrate, make sure you **stop the HS3 version of the Sonos PI first, take a backup** because after migration there is NO path backwards. The HS3 plugin's config file is :
C:\Program Files (x86)\HomeSeer HS4/Config/Sonos.ini.

[EXIT AND COME BACK LATER] [SKIP MIGRATION] [MIGRATE]

Step 4

This is work in progress, I would recommend for now you skip this step. If you exit, rather than skip, the PI will remain in suspended state and will not start-up waiting for your decision to either skip migration of migrate.
You will have this option:
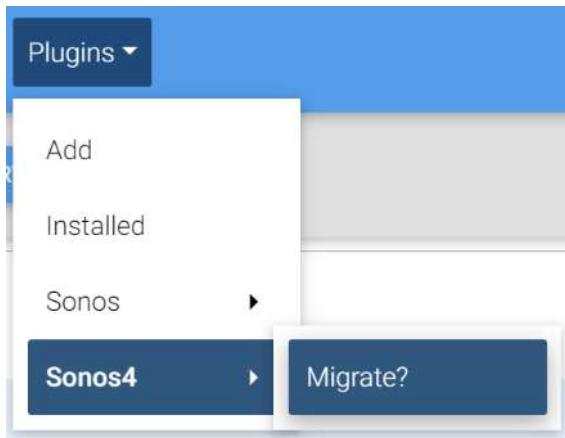
If you are having trouble discovering your players on your network or the player status is not being updated, check your firewall!! The plugin needs to have full access. The plugin also needs to run as administrator if installed in a protected Windows directory ex "Program Files x86".

If you start the plugin for the first time on a Windows install, typically a firewall pop-up will show. DON'T IGNORE IT! Make sure the plugin has full access to local and public defined networks.

Configuration Settings

On the top of the HomeSeer web page, click on the "Plugins" button, select "Sonos4" and click on "Settings". Clicking on any of the players will open the Player Control Page for that player.
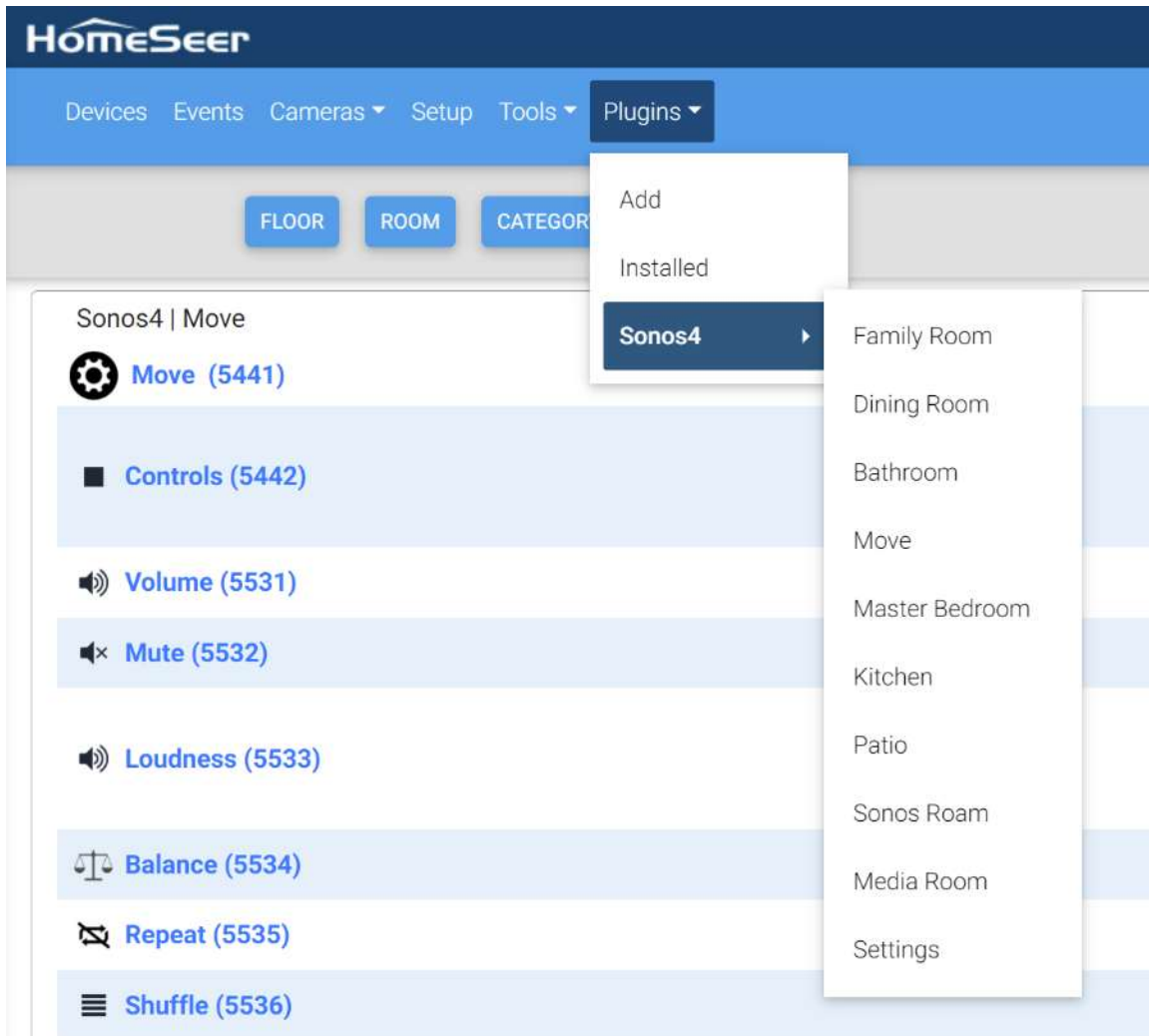
If the Sonos4 option is not showing, refresh your browser or check whether the plugin is installed properly.

Click on "Settings" and you will be presented with the configuration options. Note that on top of your screen, that you have different tabs to select from.

General Tab

Content Navigation Settings

All Sonos players have a database holding information about content they have discovered on your local network or favorites you have saved. The database does not have any information on external services, such as Pandora, Spotify or Amazon/Apple music. You cannot navigate external content except directly on the Sonos apps.

When this plugin was created a decade ago, most users would have local content and there were no such things as premium services. With slower networks and processors, this plugin would query the player, typically at night and retrieve the database information from the

player and create a local database on your HS PC. This allowed for speedy navigating of content for cases where you create events based on track, album, artist information.

As of the HS4 version of this plugin, I removed the options around how and when to create this database, this now happens automatically when the plugin starts or once a day. If you have multiple households, or a split S1/S2 controller setup, the plugin will make a database for each household.

You can find the databases in the subdirectory \html\SonosV4\MusicDB and they are named "SonosDB_<householdname>.sdb".

To support creating events based on radio stations you like, the plugin will store all information associated with a radiostation when you play them. This means that the plugin will learn about the radio stations you have played, and that information will be stored in another database, called the "radiostation database". You can find that database in the same subdirectory and named "SonosRadioStationDB.sdb".

You have the option to immediately kick off a retrieval of the database (create music database now) or delete the existing databases if you suspect a corruption.

The local music database is constructed around retrieving specific objects such as artist, albums, tracks, genre, favorites, radio stations and saved queues. As Sonos over the last few years seems to introduce a lot more services at a much higher pace, I am anticipating that they will roll out new services that will not be captured in the local database. The option "Browsing directly on player", I added to avoid that I have to rewrite the plugin each time a service is added. Currently that option is disabled as it is work in progress, right now, not giving any benefit.

The "Max Navigation Items" setting affects the player control page only. When you start navigating, and say you select tracks and you have 30,000 tracks, this will prevent that your browser sits there for many minutes trying to download 30,000 items, including their album art.

Volume Settings

Sonos has a volume range from 0 to 100. If you create events or use the volume up/down features, here you can define the volume step.

Device Display Settings

Device display Settings

Select what the State Device shows

State

Select which Category you want the assign to the new devices

Sonos

✓ Use Transitioning State
✓ Hide paired players
✓ Hide status devices

There are a few differences between the HS3 version of this plugin and this version. The "State" device, for those coming from HS3, held a bit of a summary of what was playing (track, album, artist, art, state). In HS4, there is now a device grid view and this is causing display issues. If you do like the HS3 style, select "legacy".
The default setting is "State" but if you like to show something different in the tiled-view, you can select to show Track or Track&Artist.

If you used the State information in HS3 to do scripting, you will find a "Summary" device in this version of the plugin, that is JSON formatted and holds a lot more information as compared to what was available in the HS3 version of the plugin.

Speaker Client Settings

Speaker Client Settings

Speaker User Name
default

Speaker password
•••••••

REAUTHENTICATE SPEAKER CLIENTS

When you create a "Speak Something" or "Play an Audio File" event action, in order to guide this PI where and how you want this action to be executed, you must select a Speaker Client. As of this version of the PI, you do not have to create a manual speaker client anymore and just select from the available list. This PI will create a speaker client for each announcement group you have created and for each on-line player that is not (slave) paired. However, if you have set HS to use a different userid/password from default/default and you have unselected the "No Password Required for Local (same subnet) Login" then this PI needs a matching password to create this speaker clients. You would have to enter it

here. If you change the userid/password, click on "Reauthenticate Speaker Clients" or restart the PI to make this change effective.

Announcement Settings

Announcement Settings

Maximum announcement time
100

✓ Use Audio Clip for single player announcements

When you create a Speak something event, you have a list of speaker clients to pick from. You will find each of your groups represented here, but also each individual player's name in case you want to send an announcement to one single player, and you do not care about volume or mute. The default way is that this announcement is treated as an Audio Clip. This means you need this plugin to be Registered with your Sonos account. You can override this behavior here.

The "Maximum announcement time" setting is just a safety setting in case something goes wrong, we do not want your players to hang. The time set here will force the announcement to dissolve if after that time, the source player did not signal the end of play event. This setting is irrelevant to Audio Clip type of announcements.

Debug Tab

There are two very distinct sections in this PI you can log information from:
1. The generic functions in the PI under "Sonos Plugin Debug Settings". <u>Almost all traces you will be asked to do, will be around these functions</u>. For normal operations I would recommend you set the level to "Errors Only" and <u>for debugging, you would typically set it to "Events and Errors". Hardly ever do you need the "Verbose" level</u>. So, unless I asked, do not use it, too much logging, too much effort for me to inspect log.
2. Functions specify solely to discover and communicate with the players, a protocol called UPNP or DLNA. Its functions are grouped under "UPNP Debug Settings". Hardly ever will I need information from here, so leave this to "Errors Only". So, unless I asked, do not use it, too much logging, too much effort for me to inspect log.

<u>Log to Disk option</u>: you can of course use the built in HS functions to look at log entries, cut/paste them, search in them or select parts of it. Sometimes the information is many log pages long, or more critically, in order to show the log information using HTML in your browser, XML / HTML tags are removed from the display. More often than not, this information is important, so the option to log to disk will have all data in its raw format and might be easier to grab and upload as an attachment to your forum posts.

<u>Important to know is how the checkbox selected/unselected works</u>!! When you toggle it from on->off, the memory stream will be written to disk so if you want to make sure that the last piece of info is in the file, turn it off first. When you toggle it from off->on, it will rename the current log file with extension .bak and create a fresh log file. So if you only want to capture relevant log info, you either turn it on or if it was on you toggle from on->off->on which will force a new file to be created. Once you are done, you toggle off again and now you have just the relevant information to upload, making analysis most efficient.

Group Table Tab

The plug-in supports the capability to convert text to speech and play this on any individual player or group a number of players and play it on the group. The PI will save all state of involved players before the announcement starts and restore the state after the announcement is ended. However, when Sonos introduced Cloud-Queue based services, the PI is unable to restore services after the announcement has ended. Cloud-Queue based services are services such as Spotify controlled via Alexa.

A new mechanism based on the Audio-Clip feature has been introduced in this version of the PI. This is a cloud-based service that runs on the Sonos Cloud infrastructure and will pause your (individual) player, stream the announcement and properly resume what the player was doing. To make use of this feature, you must authenticate your PI with your Sonos Account. See above under authenticate how to do that and read the section under section "Group Table Tab" to understand how you can create announcement groups.

You can create as many configurations as you want, with different group configurations or different volume settings. You can create these configurations, change them, or delete them using the configuration page under the "**Settings->Grouptable**" tab.

Sonos Configuration

General	Debug	Grouptable	Playertable	Network	UPNP	Register	Help

Grouptable Settings

Group Name	Source	Source Option	Destination	Mute override	Volume	Action
Test	Sonos Roam	ttsregular	Bathroom Sonos Roam	True False	20	✎ 🗑 📋
Audio Clip		ttsaudioclip	Dining Room	False	35	✎ 🗑 📋

ADD GROUP

Here you define how your announcements will be played. Announcements can be sent to a single player or a group of players. If you want the announcement to go to a group, you need to create the grouping information on this page. After you add a group here, you will notice that a "speaker client" will be created by this PI with your "Group Name".

Announcements are executed as part of a HomeSeer event, the selected action, when creating the event, it is either a "Speak Something" or "Play Audio File" action. As part of creating the event, you must also select a Speaker Client where you want the announcement to go.

The Sonos PI provides two distinct Speaker Clients, they are:

- One individual speaker client for each Sonos player, simple but limited (you cannot set volume etc.) You do not create a group for this, the PI automatically creates one speaker client for each active player.
- Group several Sonos players and play the announcement simultaneously through a group of players.

The settings on this page are related to defining the groups you want to use. Once a group is created, they will show up as Speaker Clients, with the name of the group. The name of the group should therefore be unique and different from your individual player names.
There are two very distinct groups that you can create:
- Regular: this is how a regular Sonos group works. Several players are combined and one player, called the source player, is the player that generates the actual content that gets streamed out of all players belonging to the group. When you create a "Regular" group, you must pick a source player, which will always participate in the announcement, and zero or as many as you want destination players, the players that will output the announcement. You can set volume per player.
- Audio Clip: A new way to control players from the cloud. You must have the Sonos PI authenticated with your Sonos account to make use of this option. The announcement will play individually on each player, not grouped. It might react faster when you want to play an announcement on many players, because each player needs to save all of its configuration and subsequently form one group. The time to establish that goes up exponentially as more players participate in the announcement. A second benefit is that some cloud-queue based services, for example when you use Alexa to play content on your Sonos player, these services cannot be resume post announcement when using the "Regular" way, but they will resume properly of you use "Audio Clip". Drawback is that you need to be connected to the internet, the delays could vary, and each player plays individually (but partly simultaneously).

When you want the announcement to be played at a different volume level from what your players currently are set to, you can specify the level per player that is participating in playing the announcement. In absence of any setting, the announcement will be at the level the player is set at. If you do want it to be at a different level, you have a few options:

1. Absolute volume level: just enter any integer value between 0 and 100
2. Relative volume level: use the characters plus (+) or minus (-) to adjust the volume of the player above (+) or below (-) the level the player is currently set at. Proper values are in the range of 0 to 100.
3. Use the value from another HS device, most likely a virtual devices. Some users want to make the volume setting more dynamic, example loader during the day, less at night. You can accomplish that by adding the following syntax in the volume field.
   a. $DVR:<HS Ref>   example $DVR:1412. This will use the VALUE (integer number) from another HS device

b. $DSR:<HS Ref>   This will use the STATE (string) from another HS Device

Note that in HS3, there was an option to physically connect a HS device with an active Speaker Client to an input of a Sonos players and play announcements that way. This was the first and oldest mechanism that was written over 10 years ago. If you are still doing it that way, I recommend you change your setup and create a "Regular" group, so much easier. If that cannot be done, use Sonos Actions as part of an event build your announcement with discrete Sonos Actions.

The copy button under Action will copy your group setting to the clipboard, formatted in JSON. For those of you who want to script announcements and make them totally dynamic, this is a help feature to draft your JSON commands.

The group configurations are stored in the Sonos4.ini file under the section [linkgroup] and they are JSON encoded. There structure is as follows:

```
<JsonObject(MemberSerialization.OptIn)>
<Serializable()>
Public Class LGInfo
    <JsonProperty(PropertyName:="name")> Public Property name As String = ""
    <JsonProperty(PropertyName:="sourcePlayer")> Public Property sourcePlayer As
String = ""
    <JsonProperty(PropertyName:="ttsOption")> Public Property ttsOption As String
= "ttsregular"
    <JsonProperty(PropertyName:="destinationInfo")> Public destinationInfo As
LGDestinationInfo()
End Class

<JsonObject(MemberSerialization.OptIn)>
<Serializable()>
Public Class LGDestinationInfo
    <JsonProperty(PropertyName:="udn")> Public Property udn As String = ""
    <JsonProperty(PropertyName:="muteOverride")> Public Property muteOverride As
Boolean = False
    <JsonProperty(PropertyName:="volume")> Public Property volume As String = ""
End Class
```

There were two functions added for scripting purpose. They are:
```
Public Function PlayerAnnouncement(text As String, player As String, volume As
String) As Boolean
Public Function GroupAnnouncement(text As String, groupInfo As String) As Boolean
```

You can use these functions to script any kind of announcement.

PlayerAnnouncement is made for a single announcement using the AudioClip function whereas GroupAnnouncement was created to perform announcements on grouped players.

The groupinfo is the JSON structure described above. Do note that you would have to replace double quote characters with single quote characters in the JSON string to allow

the script-parser to work. In case of doubt, go to the grouptable, use the UI to create your group information and use the "copy to clipboard" option to get the JSON string or look it up in the Sonos4.ini file, remember the double quote conversion!!

Examples:

nhs.PluginFunction("Sonos4", "", "PlayerAnnouncement",{ "hello world", "RINCON_949F3ED52BEE01400", "30"})

nhs.PluginFunction("Sonos4","","GroupAnnouncement",{"hello world", "{'destinationInfo':[{ 'udn': 'RINCON_5CAAFDE99A2401400', 'muteOverride':false, 'volume': '30 '}], 'name': 'Test', 'sourcePlayer': 'RINCON_5CAAFDE99A2401400', 'ttsOption': 'ttsregular'}" })

The PluginFunction can also be called through the REST/JSON interface.

Generate your own Announcement or play wave files.

The easiest way to create an action to speak something through your Sonos players is to use the "Speak Something" action from the dropdown list. Use the text field to specify what needs to be said or enter a complete pathname+filename if you want to play a file. For the latter you can use the "Play Audio File" option. If you however use the Speak Something action and enter a file name in the text field, if while trying the action, the player says the file name instead of playing the file, it means there is an error in your file name or the PI doesn't have access to the file. Stick to .wav and .mp3 files only.

If you want to have multiple announcements, or you would like to play some sound and say something, you can do this by separating text and filename(s) using the "|" character.

You may for example put something as follows in the text field:

C:\start_announcement.wav|the kitchen door is open|C:\end_announcement.wav

This would play some start sound, speak "the kitchen door is open" and play anther sound.

Announcements are queued so multiple announcements will be played with approximately 1 second in between announcements. When multiple events cause overlapping announcements, the plug-in will queue up the proxy events, group only once, play them in sequence until all announcements have been announced, only then will the zones be ungrouped.

Warning: if you use the Audio-Clip option, you cannot concatenate announcements. It appears that the cloud-based function does not queue announcements nor takes announcements in progress in account and if you send two consecutive announcements, the second announcement will interrupt the first. I have a posting on the forum to ask if

this can be fixed but I would not hold my breath. You would have to put a wait in between Speak Something actions in your event.

You can use different Voices and embed them in your text input. The TexttoSpeech application running on your HS server uses Microsoft SAPI5 nomenclature, here is an example:

> <voice required='Name=Microsoft Anna'>Hello World how are things around here said Anna</voice>

Here is an interesting link about SAPI nomenclature:
(http://board.homeseer.com/showpost.php?p=960640&postcount=33)

As soon as the plugin detects the "stop" event from the player, the plugin will ungroup and revert to its original state. As a protection, if no "stop" event is received within a specified "Maximum Announcement Time" (Settings page), the plugin is assuming that the "stop" event went missing and will automatically start ungrouping. If you have announcements that last more than 100 seconds, you can change the default in the settings screen. Under the "Speaker Proxy" setting you'll find the "Maximum Announcement Time", set it to higher value which represents seconds.

Player Table Tab

The player table is there for you to check on status of the players. It will display information about the player and if color-coded red, there will be something wrong with the database settings, potentially a corruption in the settings data. Using the delete button will be an option to resolve this but any event involving this player will need to be fixed. If the player is paired but the slave of the pair (you cannot send commands to a slave player), the player will be color-coded orange.

If you want the player hidden from the device management pages, select the "hidden" option. Do note if you have selected the "Show All" option on the devices management page settings, the player will show up.

Sonos itself has some built in tools, of importance is the network matrix (tools->review->network matrix), by clicking on the "tools" button, you will be guided to a new screen where you can find more information about the player and an option to navigate directly into the Sonos player and make use of the Sonos provided tools and information.

Sonos Configuration

| General | Debug | Grouptable | Playertable | Network | UPNP | Register | Help |

Household 1 = HHID_eGQLflqtn7IEgBdjIehFuMLHcFI

Device name	UDN	On-Line	Model	SW Gen	Audio Clip	IP - Address	Hide	Delete/Tools
Move	RINCON_48A6B8E0423E01400	True	S17	2	True	192.168.1.176	☐	🗑 ✖
Patio	RINCON_48A6B865C03D01400	True	S16	2	True	192.168.1.239	☐	🗑 ✖
Bathroom	RINCON_5CAAFDE999B601400	True	ZP120	2	True	192.168.1.223	☐	🗑 ✖
Master Bedroom	RINCON_949F3ED52BEE01400	True	S14	2	True	192.168.1.113	☐	🗑 ✖
Family Room	RINCON_48A6B8B4D8A101400	True	S19	2	True	192.168.1.164	☐	🗑 ✖
Master Bedroom_LRR	RINCON_5CAAFDEAEC7A01400	True	ZP120	2	True	192.168.1.96	☐	🗑 ✖
Family Room_LR	RINCON_7828CA05E5CE01400	True	S13	2	True	192.168.1.221	☐	🗑 ✖
Family Room_RR	RINCON_7828CA058C1C01400	True	S13	2	True	192.168.1.87	☐	🗑 ✖
Kitchen	RINCON_347E5C00D79101400	True	S16	2	True	192.168.1.145	☐	🗑 ✖
Dining Room	RINCON_5CAAFDE99A2401400	True	ZP120	2	True	192.168.1.109	☐	🗑 ✖

Household 2 = Sonos_eBZuGnvMwokO7W2PG3W9Vv64gZ

Device name	UDN	On-Line	Model	SW Gen	Audio Clip	IP - Address	Hide	Delete/Tools
Media Room	RINCON_000E5825227A01400	True	ZP90	1	False	192.168.1.235	☐	🗑 ✖

DELETE ALL

Network Information Tab

This tab is more for information purpose. It has no settable objects only information on all the network interfaces active on your system. I may come in handy when you are confused about which network interface the PI is operating on (the same as HS!!).

UPNP Tab

Sonos makes extensive use of a standardized protocol for discovery and control of home-network connected devices. Most of the information on this page is for information purpose only but on occasion I may ask you to navigate into some of the UPNP information to debug a problem.

The UPNP protocol makes use of Multicasting and Unicasting, the prior to discover devices, the latter to control them. If you have a firewall active on your HS server, the device this PI runs on, it is important to understand that this PI must have access to your local network in order to function properly. In general there is nothing that you need to do except on a Windows machine, make sure that you give allowance to the HSPI_Sonos4.exe program. A pop-up window will appear the fist time you active the PI, make sure you don't miss it or ignore it. If you don't give proper allowance, typically, players will be discovered but after 30 or 60 minutes, they either drop off-line or you are not getting any status updates.
Sometimes the problem is in your network when managed switches decide to drop packets, typically multicast packets as they mistakenly assume that the multicast group is not active on a port that has your player or HS connected to. This typically result in players not being discovered at start-up.
Sometimes, people fire up HS in containers or they start Docker on their HS machine an ethernet ports turn into bridges and all kind of private IP address start showing up, IP addresses become NAT translated and things go sideways on you. The info on this tab could help you troubleshoot.
Do pay attention to the "Received Bytes" counter, if that doesn't change over time, you are not receiving any unsolicited messages.

Unless you are using VLANS, there is absolutely nothing here that you should change!!
If you do use VLANS however and you have the HS Server in a different VLAN from the players, you must set up forwarding rules in your router to allow traffic to be forwarded between VLAN domains. This is router specific so we are not going to discuss here how you do that, you should consult your router manual for that. However, the rules will be based on absolute port numbers and in order to make that work after each restart of the PI, you must set here the ports that you want to use. If you use zero (0), it means it is dynamic and the PI will leave it to the Operating System to select the first available port.

Register Tab

Since around 2017, Sonos has made available a cloud-based API, for developers to use to control players. It is their only official and approved interface, even though hundreds of developers have created tools that make use of the local UPNP interface, the latter was never documented, nor can you ask Sonos Support any questions or report issues around the UPNP interface.

I added support for this interface because there could be the potential that over time, this will be the only interface available for us developers, even though it has a round trip from HS PC to Sonos Cloud Servers back to your player. Additionally, in 2019, the Sonos team added a feature called "Audio Clip", to support to play an announcement and it works well. Premium services will get paused properly and resumed post announcement, something which is becoming more and more impossible using the local UPNP interface.

To make use of these capabilities, you must register your Sonos PI with your Sonos account. This registration is based on standard OAuth2 protocols and is widely used in the industry. At NO point in time, is this PI aware of your Sonos userid or password, the OAuth2 protocol is designed to direct you to the Sonos server where you enter your credentials. Upon successful authentication, the PI will receive a token that can only be used against your account. Once the token is received, there is no need to re-authenticate but do keep an eye on the status of "Authenticate" feature on the Sonos "Master" device on you HS device Management page.

If you are not authenticated, you will have a screen like this:
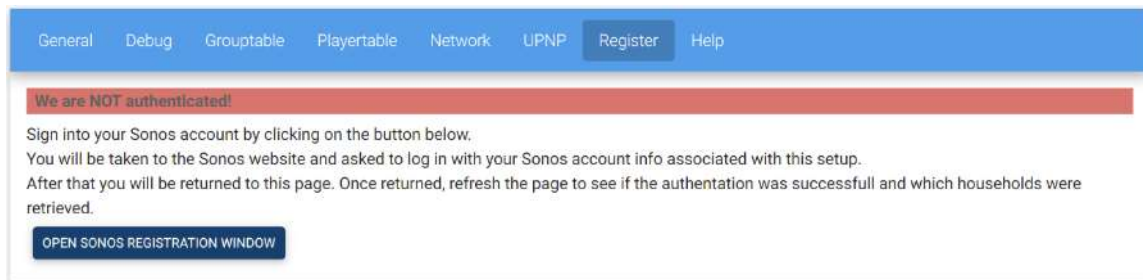
Once you click on "Open Sonos Registration Window", you will be redirected to the Sonos Authenticate Servers where you will be asked for you credentials.

After logging in. CLICK OKAY

SONOS

Allow Homeseer Control to control your Sonos system

This gives Homeseer Control permission to:

- See what your Sonos is playing
- Change playback and volume on your Sonos
- Change your Sonos rooms and groups
- Play your Sonos favorites and playlists

You agree that Homeseer Control is responsible for its use of your information according to its privacy policy. Use of Sonos products is subject to the Sonos Privacy Policy.

Okay

Don't allow

You will return to the Sonos PI page, click on Close the window and you get back in the registration page. <u>Refresh your browser to get an updated view!!</u> When successfully register you should see a screen like this:

Click on the down-arrow to inspect what Sonos has on your setup.

Device Management Page

After the plug-in is installed and activated, the plug-in will create one device per player and the features will differ depending on the player type. For example: a Move or Roam player will create features that show their battery status whereas a Playbar or ARC will have feature controls for Dialog and Night Mode.

Note that some features have controls on them, and some are just status, typically used for events. If you think there is too much information available and you just like to control things, in the settings under the general tab, there is an option that will set all status-only features to hidden.

There will be a single device called "Master" which represents actions that pertain to all the players like turning play on/off for all zones. This device also has a button to create a Music Database (BuildDB) which holds all the tracks, radiostations, albums, artists, genres as known by your Sonos system. Also, here you can find the buttons to link/unlink zones.

If you want to remove a device, you will have to do it manually by going to the Sonos PI configuration page, open up the "Player Table" and click on the delete button for the player you want to delete. This will remove all HS devices from the HS database and will remove all settings from the PI's INI file. Do note that events/actions which are stored in the HS

database will still be there, **won't work**, and will have to be removed manually! If the deleted player is still on your network, the next time a scan of the network happens, the player will be added again automatically. **Because HS' internal system works with references, deleting and re-adding a player will most likely result in different references to be allocated to the HS devices, which renders all you associated events, actions and HSTouch screens inoperable!**

Use of the Player Control Webpage

When the PI is up and running a menu link item will be created for each player in the database.
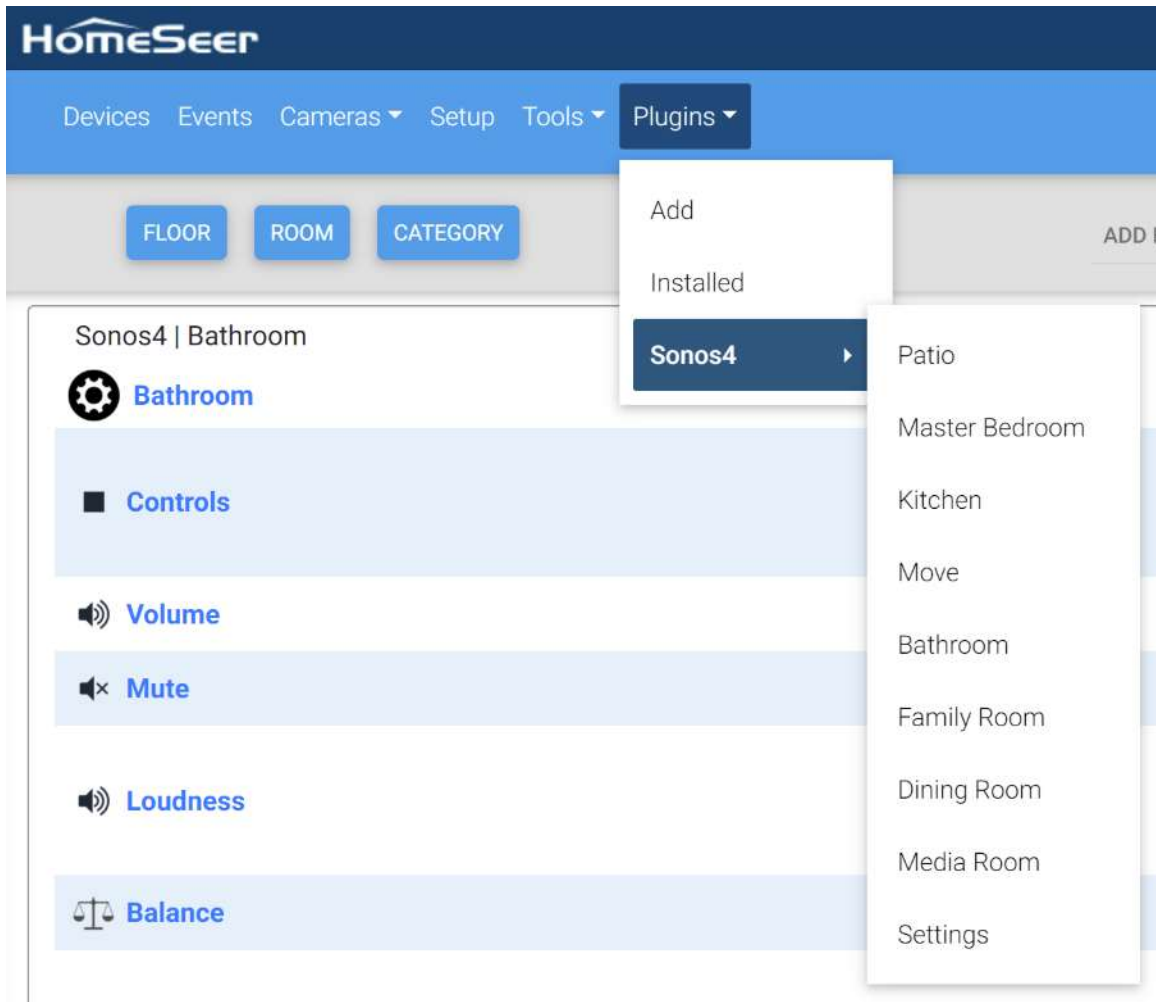
Select and click the player you want to control to get into the Player Control Page.
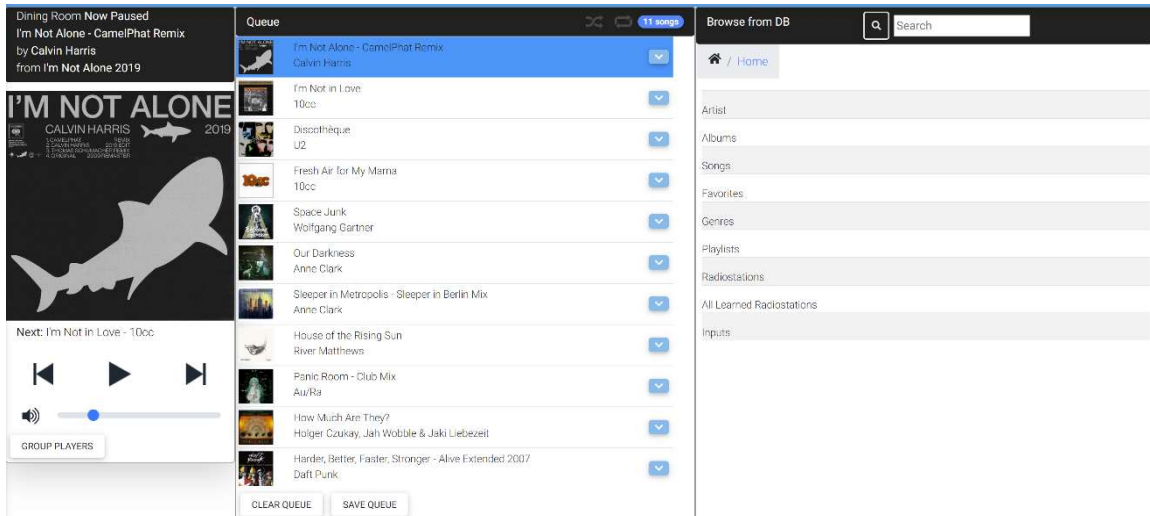
The player control page is made up of three distinct sections. On the left are the player controls with the information on what is playing. In the middle is the queue information, where you can select tracks to play, remove them from the queue or save the queue. On the right is the content navigation section. Here you can navigate in the content that your player has kept in its database. The players have NO knowledge of what content resides in the cloud for premium services such as Spotify, Apple, Amazon etc. You can only navigate what the players keep on their device.

If you like to embed these sections into your own HTML pages, you will encapsulate them into iFrames and set the source to the URL of the player control page but add an additional parameter 'control" to the URI.

There are three control parameters, they are:
1. player
2. queue
3. navigation

If you have multiple instances of browsers or iFrames controlling the same player, you must add a parameter "instance" to the URI to uniquely store the navigation path & player state.

There are two more parameters you can add, "width" and "height" and you can set them to a pixel value (example 400px) or a percentage (example 80%). If you add these parameters you can control better how the information will be displayed inside the iFrame. The height & width parameters only have an effect on the size of the art for the player control, or the queue content for the queue control and list of items in the navigation control.
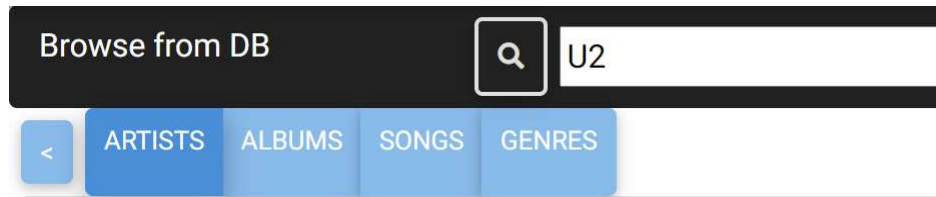
If you wanted to set the source of an iFrame to only display the player and its control your URI would look something like this:

http://192.168.1.81/Sonos4/sonos-player.html?deviceudn=RINCON_48A6B8E0423E01400&control=player&instance=1

or another example, including the iFrame tags:

  <iframe src='http://192.168.1.81/Sonos4/sonos-player.html?deviceudn=RINCON_48A6B865C03D01400&control=queue&instance=iframe&height=650px' width="400" height="750">
  </iframe>

Search function.

As soon as you enter characters in the search box, you can select whether you want to search in Artists, Albums, Songs or Genres. The search will ignore lower/uppercase characters and blanks. The syntax can be found here (https://docs.microsoft.com/en-us/dotnet/visual-basic/language-reference/operators/like-operator), your pattern options are:

Characters in Pattern	Matches in string
?	Any single character
*	Zero or more characters
#	Any single digit (0-9)
[charlist]	Any single character in charlist
[!charlist]	Any single character not in charlist

Creation of Events using Sonos Triggers, Conditions and Actions

When you create a new Event, you can now select Sonos Triggers or Sonos Conditions. Please read the HS documentation to understand the difference between Triggers and Conditions but a trigger is usually an event that leads to something whereas a condition is a passive check of a state, helping you to decide.
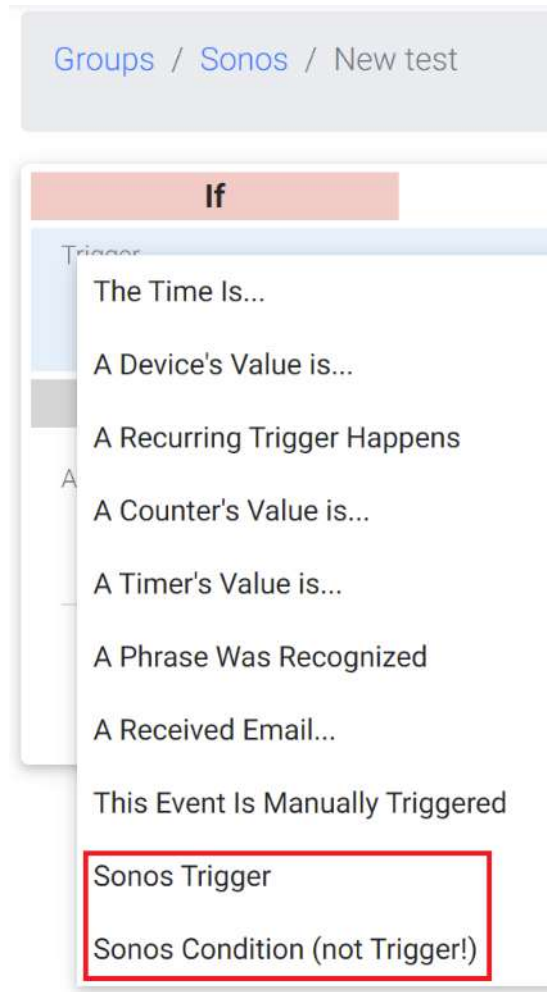
Triggers

Given the huge number of features that are created for each player, most triggers can use the HS devices themselves by selecting "A Device Value is …". There is some overlap here with device triggers due to backward compatibility but either choice work equally best. There are triggers that are not available via HomeSeer devices such as announcement related events.

Conditions

I would think speak for themselves.

Actions

You may have to scroll down when you pull the Action drop-down list to click on "Sonos Action". Do note that a lot of actions can just be performed directly on the HS Devices by using the controls on them. The Sonos actions that you find in the drop-down list are actions that would require more parameters like play a <u>specific</u> track, versus just <u>play</u>.

When you select to play something, the options will appear of how you want to play this item. Options are to clear the current queue or leave it as it. If you leave the queue as is, you have the option to add for example the track at the end of the queue (last) or insert it in the queue and play right now (Now) or play after the current item is done playing (Next). Select "No" if you just want to add items to the queue but not play them right now.

If you have an action to set the volume of a player, note the following options you can use:

1. Absolute volume level: just enter any integer value between 0 and 100
2. Relative volume level: use the characters plus (+) or minus (-) to adjust the volume of the player above (+) or below (-) the level the player is currently set at. Proper values are in the range of 0 to 100. Example: +20 will increate the level of that player by 20 units (on a scale from silent = 0 to max = 100).
3. If your player is part of a group, you can use the "G" character to set all participating players to this absolute value. Example: g30 will set all players in that group to play at the same level of 30.

Troubleshooting

If you are reading this, you must be having some issue(s), I'm sorry for that. The good news is that this plugin had been around for a decade so very rarely your issues require a plugin SW update. The bad news is that very likely the issue is in and around your setup so you will be the person who will have to spend the effort to resolve your issue efficiently and effectively. Before you post on the forum, think about the information you provide and, short of talking to a Psychic, the quickest way to resolve your issue is with (over)abundance of information.

What information should you provide?

1. A clear description of what it is you do, what your expectation is and what you experience. Document this with screenshots or details of whatever is involved. If it is an event that is the problem, screenshot the event. Take screenshots of your player table, your grouping table, your devices; anything that is involved in your issue.
2. Can you reproduce the issue at will? This is very important, even if the issue is intermittent, spend some effort to try to find a way to reproduce the issue because if you can, we can turn logging on and hunt for its cause.
3. Post information on your environment. Version of plugin, Homeseer version, Linux or Windows and in the latter case, what version of Windows. Do you use Virtual Machine technology, multiple Ethernet interfaces, VLANs, routers, switches; you cannot provide too little information, err on providing too much.
4. When you provide debug information, don't cut and paste only the error, that usually doesn't tell me a lot. What is most important is what happened before the error so we can see its cause. Use the logging to disk feature as much as you can and post the file verbatim, don't edit it with editors like Microsoft's Word, it only makes reading and searching in it a lot harder. When you have a log, illustrate at what time you were doing what exactly, so I can correlate what you were doing, and what you experienced with the information in the log.

Top list of issues and its root cause:

Firewall issue on Window's based installs:

Symptoms:
- Device status not being updated
- Announcements failing
- When you restart the plugin or HS, everything works fine but after a few minutes, the plugin stops updating device status.

Cause:
- The HSPI_Sonos4.exe program does not have proper network allowance.

Network issues:

Symptoms:
- The plugin is unable to control (play/pause..) a player
- The plugin is not reliably updating device states
- Announcements are failing or cut short

Cause:
- The messages between the plugin and the players are getting lost due to network issues.
- Cabling problems
- Network flapping issues (a network that is continuously reconfiguring itself due to network loops or link instability), usually caused between your network and the SonosNet

Virtual Machine or VLAN issues:

Symptoms:
- Players are not discovered or go off-line after 30 min

Cause:
- The use of a virtual bridge on your HS PC, combined with address translation, violates how UPNP functions (designed for a subnet). Sometimes this virtual bridge gets enabled because you installed or are trying a program that requires the use of a virtual bridge.
- If you use VLANs to segregate your network, you must set listing ports to a fixed value and assign forwarding entries in your router/switch based on those value.

Frequently Asked Questions – FAQ

1. I cannot install the plugin, it gives me an error on file locked.
   a. Restart HS4 and try again. This is a known issue but no solution yet.
2. I installed the plugin but nothing is happening
   a. Did you accept the EULA? Click plugins->Sonos4->Accept and accept
3. The plugin is running but it does not discover any player.
   a. Check which IP address is assigned to HS4 (pull up the web page and URL will show you). The HS IP address must belong to the same subnet your player is on. You can find the plugin's IP address under SETTINGS->UPNP
   b. If you are using VLANs, check the section how to set this up
   c. Do you have the right Firewall allowance for the plugin?
4. I lose communication with my players after 30 minutes
   a. There is an issue with the propagation of multicast traffic through your local network. Check you IGMP settings on your switches.
   b. Check the nbrOf412Errors counter under SETTINGS->UPNP. If this counter steadily increases, you have a network issue where the Sonos players are continuously reconfiguring themselves.
5. The plugin stops updating my Homeseer devices after a while
   a. Check your firewall!
6. My announcements are not working
   a. Is your sourceplayer still on-line?
   b. In case of AudioClip announcements, is the plugin still registered/authenticated with your Sonos account?
   c. Check your firewall!
   d. Is HS running as administrator?
   e. Stop HS and check the /html/Sonos4/Announcement subdirectory. Sometimes a file gets locked and can't be overwritten. Try to delete the respective announcement file.
   f. Are you using the Task Scheduler under Windows, if so, is HS set to run as administrator and did you specify a working directory different from where HS4 is running (which would be a problem)

Forum

If you have questions for specific configurations or the help document is not clear enough, you can always seek help on-line and search the HomeSeer or Sonos Forums or post your question.

You can find the HomeSeer, plug-in specific forum here:
    https://forums.homeseer.com/forum/hs4-products/hs4-plugins/media-plug-ins-aa/sonos4-dcorsus
The Sonos forum you can find here:
    http://forums.sonos.com/index.php

Good luck and post on the HS bulletin board if you like or dislike the plugin or what else you would like to see added.

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