

Earshot User Guide

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Product Name: Voisus

Earshot User Guide

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Revision history

Date	Revision	Version	Comments
02/21/2017	В	0	Updated "Viewpoints," "Earshot Statistics," Envir- onmental Sounds," and "Earshot Sound Files" sec- tions. Added new "MetaVR Terrain Data," "Custom Mappings," and "VR-Forces Weather" sections. Edited content for grammar and accuracy.
07/13/2017	С	0	Updated screenshots in "Custom Mappings" and split content into "Add a custom mapping" section. Added new "Define custom fire and detonation overrides" and "Export custom mappings to spreadsheet" sec- tions.
03/20/2019	D	0	(7.2.0) Updated Speakers table in "Viewpoints" and documented FIPS warning message in "MetaVR™ Terrain Data." Removed broken hyperlink in "Add a custom mapping."
6/25/2019	E	0	(7.3.0) Added "VoisNet Synchronization."
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9/18/2020	F	0	Updated screenshots in the Voisus web interface.
10/26/2020	F	1	Updated the restricted rights statement in the front matter.
8/10/2021	G	0	Updated "Enable VoisNet Synchronization on the Voisus server" to include the new Features page. Updated all screenshots of table header styles.
3/8/2023	G	1	Added Red Hat Enterprise Linux subscription and export statement to front matter.
4/25/2025	н	0	(8.7.0) Updated the Features page screenshot in "Enable VoisNet Synchronization on the Voisus server." Documented Transmit Audio on Radio in "Broadcast audio on a radio."

Contents

1.0 Introduction	1
2.0 Viewpoints	2
2.1 Broadcast audio on a radio	4
3.0 Earshot Sound Files	5
4.0 Custom Mappings	6
4.1 Add a custom mapping	7
4.2 Define custom fire and detonation overrides	10
4.3 Export custom mappings to spreadsheet	11
5.0 Environmental Sounds	15
6.0 MetaVR™ Terrain Data	17
7.0 VR-Forces Weather	19
7.1 Rain Intensity	19
7.2 Sea State	19
7.3 Wind Speed	21
8.0 Earshot Statistics	22
Appendix A: VoisNet Synchronization	25
A-1 Enable VoisNet Synchronization on the Voisus server	25
A-2 Enable Sync Mode on the Al-Delta	26
A-3 Verify VoisNet Synchronization	28

1.0 Introduction

Earshot creates a virtual auditory environment that distributes sound based on sound sources and listener locations. Built for training in an open area, it allows trainees to move around in their environment and experience a full, realistic sound scape. Earshot is compatible with any training medium, including domes, ship bridge simulators, and serious games.

As shown in the figure below, the entity generator sends Distributed Interactive Simulation (DIS) protocol data units (PDUs) that represent fire, detonation, entity, and environmental sound effects to Earshot running on the Voisus server. Earshot then generates sound by detecting a listener on the network and identifying nearby sounds he or she would hear (e.g. trucks, planes, gunfire in the distance, explosions).

Earshot calculates the source's volume based on its position in the virtual environment. Based on this calculation, it distributes the sound among the speakers, which tells the listener where the sound is coming from. To distribute sound in the 3D environment, Earshot needs to know the number of speakers and their locations. If a new speaker is added to the setup, Earshot automatically adjusts the sound coming out of all speakers to compensate.

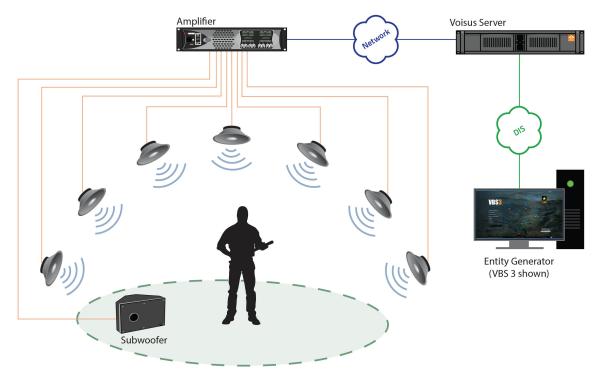


Figure 1: Earshot theory of operation

Intended for maintenance technicians and/or users, the *Earshot User Guide* explains how Earshot works and describes how to set up a viewpoint, add sound files, create custom mappings, and complete other configurations. Additionally, this user guide explains how to monitor the system's connectivity on **Earshot Statistics**.

2.0 Viewpoints

Viewpoints is the primary configuration tool for Earshot. On this page, you can create a viewpoint, assign it to a virtual entity, and set up speakers. To add a new viewpoint, follow these steps:

1. From the top-left navigation bar, go to **Earshot** (-2) >**Viewpoints**.

	e 🕅 Configure 👻	Scenarios		s/ • @ •
	DIS	HLA Federates	Radio Settings	
Earshot			\$\$ }	
Custom Mappings	Earshot Sound Files	Environmental Sounds	MetaVR Terrain Data	Viewpoints (?)
VR-Forces Weather				

Figure 2: Viewpoints navigation

- 2. From the left toolbar, select Add Viewpoint (+).
- 3. In Name, enter a new name if desired.
- 4. Select **DIS Exercise**, and choose an exercise.



Figure 3: Viewpoint Network Settings

- 5. Under **Location**, assign the viewpoint to a virtual entity using one of the following options:
 - *X*, *Y*, *Z*: enter the location of the viewpoint using the geocentric X, Y, and Z coordinates as well as a heading.
 - *Lat, Long, Elevation*: enter the location of the viewpoint using the geodetic latitude, longitude, and elevation coordinates as well as a heading.

- *DIS Entity Location:* examines the DIS network entity state protocol data units (PDUs) for the Site ID, Application ID, and Entity ID. Earshot then uses the location and orientation fields of the PDU.
- **BSI MACE® Display Lock Location**: refers to a set data PDU that attaches to the MACE display lock entity. Define **Site**, **App**, and **Entity ID**, which range from 0–65,535. Within MACE, on **Visual**, these values must match the **Ownship/Man-in-the-Loop** values.
- 6. In **Default Audio Volume**, enter a volume percentage.
- Under Public Address, select Net, and choose the net on which you will broadcast. To add or delete nets in the Comm Plan, select Edit Nets (>). For more information about the Comm Plan, go to "Comm Plan" in the Voisus Client User Guide.
- 8. Under **Speakers**, add a speaker location for each speaker that will connect to Voisus, including subwoofers. Measure the distance of the speaker from the listener's position.

Speakers						
+ 🗹 🖄 🗇	Play Noise	equence Noise				
Channel Name	Relative X (Forward)	Relative Y (Right)	Relative Z (Down)	Balance	Subwoofer	Lowpass Frequency (Hz)
Output 1	N/A	N/A	N/A	Center		100
Output 2	0	0	0	Center		N/A
Output 3	0	0	0	Center		N/A
Output 4	N/A	N/A	N/A	Center		100
Output 5	0	0	0	Center		N/A

Figure 4: Viewpoint Speakers

- 9. To balance the speaker output's audio, under **Balance**, choose Left, Right, or Center.
- 10. To designate the speaker as a subwoofer, select Subwoofer.
- 11. To set the cutoff frequency of a subwoofer channel's lowpass filter, select **Lowpass Frequency (Hz)**, and specify a frequency between 20–300 Hz. The default value is 100 Hz.
- 12. To test the speaker setup, choose a channel, and select Play Noise. This button plays sound out of all the speakers that are selected with a check mark. To stop the speaker test, select Stop Noise.
- 13. To test each selected speaker one at a time and then repeat, select **Sequence Noise**. When cleared, all speakers play noise simultaneously.

2.1 Broadcast audio on a radio

Transmit Audio on Radio enables you to broadcast Earshot audio through a Distributed Interactive Simulation (DIS) radio. This functionality captures Earshot audio and mixes it into a mono stream. It then inserts the audio into a DIS radio and transmits it over the network, where the Comms Logger can record it for after-action review.

To broadcast audio on a DIS radio, follow these steps:

- 1. Configure nets in a Voisus Comm Plan, as described in "Add a net" in the *Voisus Client User Guide*.
- 2. Add and configure a subwoofer speaker, as described in Section 2.0, "Viewpoints" on page 2.
- 3. On **Viewpoints**, under **Transmit Audio on Radio**, select **Radio Net**, and choose a Comm Plan net.

Speakers						
+ 🗹 🖓 🏛	Play Noise	Sequence Noise				
Channel Name	Relative X (Forward)	Relative Y (Right)	Relative Z (Down)	Balance	Subwoofer	Lowpass Frequency (Hz)
Subwoofer Speaker	N/A	N/A	N/A	Center		100
Transmit Audio on Radio						
	Radio Net 🚯	EXT_NET_12	2 ÷ /	•		

Figure 5: Transmit Audio on Radio

3.0 Earshot Sound Files

	RB Configure - Scenarios		5/ • ⊛ • <i>µ</i> •
Comms Comm Plan	DIS HLA Federate	s Radio Settings	
	Earshot Sound Files	J Data	Viewpoints (?)
VR-Forces Weather			

Figure 6: Earshot Sound Files navigation

Use **Earshot Sound Files** to upload and install sound files that Earshot uses for custom mappings and environmental sounds.

Earshot Sound Files						
Upload						
Choose file	Browse					
Installed Sound Files (1)						
Preview Select sou	und 💠 🕨	0:00 / 0:00				
Filename	Sample Rate	Duration (H:M:S)	Samples			
atc-01-boston-app.wav	8,000	0:00:04.632	37,059			

Figure 7: Earshot Sound Files

Under Upload, select Browse, and choose a file. Installed Sound Files automatically organizes the files alphabetically.

To preview sounds, under Installed Sound Files, select Preview Sound.

4.0 Custom Mappings

The **Custom Mappings** page maps DIS entities and events to sound effects within the simulation. Earshot creates these mappings using the **DIS Entity Type**, a combination of seven numbers identifying the entity's unique features (i.e., kind, domain, country, category, subcategory, specific, extra). When Earshot locates an entity or event matching one of these types values, it plays the associated audio.

Available sound effects include **Fire** (e.g., gunfire, missile launches, misfires) and the associated **Detonation** events (e.g., bullet impact, gas bombs, grenades, other explosions). Sound files are managed on the **Earshot Sound Files** page. For more information about Earshot sound files, go to Section 3.0, "Earshot Sound Files" on the previous page.

Entity State allows you to define the sound model for an entity (e.g., Tank Medium, Transport Helicopter). ASTi provides these sound models.

With the exception of missiles, most mappings do not require you to set the ammunition events and entity state at the same time. In the figure below, **DIS Entity Type** is mapped to **61mm Mortar Fire** and **Detonation** sound files, but **Entity State** is blank.



Figure 8: Custom Mappings

4.1 Add a custom mapping

To add a custom mapping, follow these steps:

1. From the top-left navigation bar, go to **Earshot** (-2, -) >Custom Mappings.

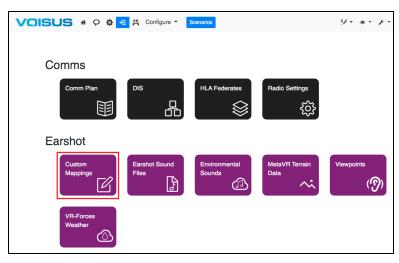


Figure 9: Custom Mappings navigation

- 2. To add a new mapping, under **Custom Mappings**, select the plus sign (+). The mapping appears in the list.
- 3. In **Name**, enter a descriptive name for the new mapping.
- 4. Under **DIS Entity Type**, enter the following values:
 - a. *Kind*: kind of entity; ranges from 0–255.
 - b. *Domain*: domain of entity (e.g., air, surface, subsurface, space, etc.); ranges from 1–255.
 - c. *Country*: country to which the design of the entity is attributed; ranges from -1–65,535.
 - d. *Category*: category of entity; ranges from -1–255.
 - e. *Subcategory*: subcategory of entity; ranges from -1–255.
 - f. Specific: specific information based on subcategory field; ranges from -1-255.

g. *Extra*: additional specification for **DIS Entity Type**; ranges from -1–255.



Figure 10: DIS Entity Type values

As stated at the top of **Custom Mappings**, a -1 value specifies a "wild card," which means that any value is applicable to that field. Once you set a field to -1, subsequent fields must also be -1, as shown in the figure above. All boxes except for **Kind** accept wild card values. Boxes with invalid numbers are outlined red.

5. *(Optional)* Under **Fire**, select **Sound File**, and choose a fire event. Asterisks display next to custom sound files:

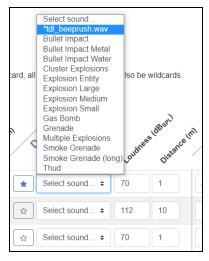


Figure 11: Custom sound file

To add custom sound files, go to Section 3.0, "Earshot Sound Files" on page 5.

- 6. Loudness (dB_{SPL}) and Distance (m) measure the intensity of the firing sound at a specified distance from the entity. Loudness is measured using sound pressure level in decibels, while distance is measured in meters.
 - a. In Loudness (dB_{SPL}), enter a value ranging from 50 dB–200 dB.
 - b. In **Distance (m)**, enter a minimum value of 1 meter.

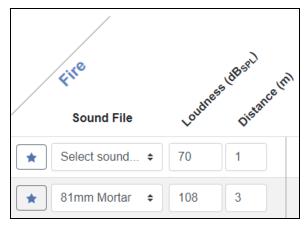


Figure 12: Fire sound effect settings

- 7. (Optional) Under Detonation, select Sound File, and choose detonation event.
- 8. Loudness (dB_{SPL}) and Distance (m) measure the intensity of the detonation sound at a specified distance from the entity. Loudness is measured in decibels, while distance is measured in meters.
 - a. In Loudness (dB_{SPL}), enter a value ranging from 50 dB–200 dB.
 - b. In **Distance (m)**, enter a minimum value of 1 meter.

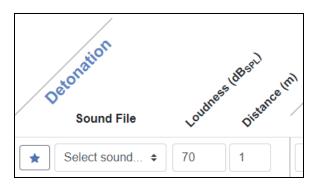


Figure 13: Detonation sound effect settings

9. *(Optional)* Under Entity State, select Sound Model, and choose a model for the entity state.

4.2 Define custom fire and detonation overrides

On **Custom Mappings**, you can define custom overrides for individual fire warheads or detonation results. To define custom overrides, follow these steps:

In Fire or Detonation, select the star icon (☆). A blue star (★) means that overrides currently exist. A pop-up window shows the default settings and any existing overrides:

tine custom override	es for individual fire warheads.		
Warhead	Sound File	Loudness (dB _{SPL})	Distance (m)
Default	Select sound ¢	70	1
0	Select sound \$	70	1
1	81mm Mortar 🗢	70	1
2	Select sound ¢	70	1
3	Select sound ¢	70	1

Figure 14: Fire Warheads custom settings

- 2. To add a new override, select the plus sign (+).
- 3. In the first column, enter a new value for the override.
- 4. To view common warhead or result values, select View Warhead Values or View Result Values.

Fire Wa	Fire Warheads		Detonation Results			
Warhead field	values (standard: IEEE 1278.1)	^	Detonation res	ult field values (standard: IEEE 1278.1)		
Value	Description		Value	Description		
0000	Other		0	Other		
0010	Cargo (Variable Submunitions)		1	Entity Impact		
0020	Fuel/Air Explosive		2	Entity Proximate Detonation		
0030	Glass Blads	-	3	Ground Impact		
← Return to	Editing		← Return to	Editing		

Figure 15: View Warhead/Result Values

5. Next to the new override, select Sound File, and choose a sound file.

- 6. Loudness (dB_{SPL}) and Distance (m) measure the sound's intensity at a specified distance from the entity. Loudness is measured using sound pressure level in decibels, while distance is measured in meters.
 - a. In Loudness (dB_{SPL}), enter a value ranging from 50 dB–200 dB.
 - b. In **Distance (m)**, enter a minimum value of 1 meter.
- 7. When finished, select Save Changes

4.3 Export custom mappings to spreadsheet

When you're finished creating custom mappings, export your finished work to a spreadsheet in comma-separated values (.csv) format. To export your custom mappings, follow these steps:

1. On Custom Mappings, select Export Custom Mappings (***** Export).

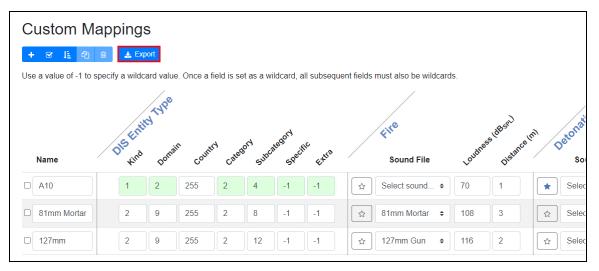


Figure 16: Export Custom Mappings

A .csv file downloads to your local computer in *scenario*_custom_mappings.csv format, where *scenario* represents your current scenario's name. An on-screen message states, "Successfully generated custom mappings file."

2. Find the file in your **Downloads** folder, and save it to your computer.

3. Open the file in a spreadsheet program such as Microsoft Excel, Open Office Calc, or Google Sheets. The spreadsheet lists each custom mapping component (i.e., DIS Entity Type, Fire, Detonation) and its associated value:



Figure 17: Custom Mappings spreadsheet

Column A shows the mapping's name, while Columns B-H show the DIS Entity Type settings:

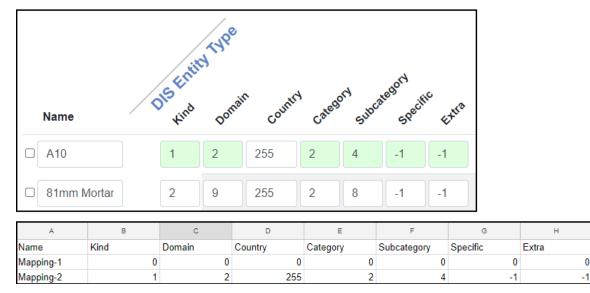


Figure 18: Name and DIS Entity Type view

0

Columns I–K show Fire settings on Custom Mappings, while Columns M–O show Detonation settings:

File		Loudness la	osell	Detonation	Loudness (dBsn)	ace (m)
Soun	d File	Loudi	Distan	Sound File	Loudin Dist	EL
★ Select s	sound 🗢	70		Select sound ¢	70 1	
\star 81mm I	Mortar 🗢	108	3 🗘	Explosion Smal ¢	112 10	
☆ 127mm	Gun 💠	116	2	Explosion Large \$	70 1	
I.	J	к	L	м	N	0
Fire Sound File	Fire Loudness	Fire Distance	Fire Warheads	Detonation Sound File	Detonation Loudness	Detonation Distance
	70	1			70	1
81mm_mortar.wav	108	3	2000, 9500	explosion_small_01.wav	112	10
127mm_gun.wav	1 16	2	1630	explosion_large_01.wav	70	1

Figure 19: Fire and Detonation view

Columns L and P show the fire warhead and detonation result overrides in order of appearance:

Warhead Sound File Loudness (dB _{SN}) Distance (m) Default 81mm Mortar 108 3 2000 *alc-01-bodom-apply.* 70 1 6500 81mm Mortar 70 1	e Warhea	ads			C	Detonation	Results			
Warhead Sound File Loudness (dB _{SPL}) Distance (m) Default 81mm Motor 108 3 2000 *ste-01-beaders-spp.v = 70 1 9500 81mm Motar 70 1 9500 81mm Motar 70 1 vWertheed Velues Cancel Save Changes L M N O P Fire Warheads Detonation Sound File Detonation Loudness Detonation Distance 70 1 70 1 1	e custom overndes	s for individual fire warheads.			υ	efine custom override	es for individual	detonation result	15.	
Lefault Stimm Motar 105 3 2000 *aic.01.dxeatur-args x = 70 1 8500 Bitrem Mortar 70 1 wr Viethaad Values Cancel Seve Changes Viet Nesult Values Cancel Seve L M N O P Fire Warheads Detonation Sound File Detonation Loudness Detonation Distance Detonation Results 70 1 1 1 1 1 1 1	828				_ !					
2000 *atc.01.4xcstorr-app x * 70 1 B500 B trens Montas 70 1 we Wee thead Values Cancel Save Changes L M N O P Fire Warheads Detonation Sound File Detonation Loudness Detonation Distance Detonation Results 70 1	Warhead	Sound File	Loudness (dB _{SPL})	Distance (m)		Result	Soun	d File	Loudness (dB _{SP1})	Distance (m)
Bitreen Murilar * 70 1 Bitreen Murilar * 70 1 We Viethaad Values Cancel Save L M N O P Fire Warheads Detonation Sound File Detonation Loudness Detonation Results 70 1	Detault	81mm Mortar +	108	3		Default	Exp	losion Lerg +	70	1
L M N O P Fire Warheads Detonation Sound File Detonation Loudness Detonation Distance Detonation Results 70 1	2000	*alc=01=beston=app v.+	70	1			(Ihu	d +	70	1
L M N O P Fire Warheads Detonation Sound File Detonation Loudness Detonation Distance Detonation Results 70 1	9500	B1mm Mortan 🛛 🗢	70	1		1 25	Ghe	ster Explose +	_ ×6	1
L M N O P Fire Warheads Detonation Sound File Detonation Loudness Detonation Distance Detonation Results 70 1	our Worthard Volume		Land	al Save Chen		Vew Result Values				Cancel Save Ch
Fire Warheads Detonation Sound File Detonation Loudness Detonation Distance Detonation Results	W WEITIGED VEIDES		Cark	Save Char	²⁶²					- Sancor
Fire Warheads Detonation Sound File Detonation Loudness Detonation Distance Detonation Results										
70 1		L	М		Ν	0		1	P	
		Fire Warheads	Detonation So	und File	Detonation Loudness	Detonation	Distance	Detonatio	on Results	
2000, 9500 explosion small 01.wav 112 10 3, 4					70		1			

70

1 25, 4

Figure 20: Fire Warhead and Detonation Result override view

1630 explosion_large_01.wav

Column Q shows entity state sound model settings:

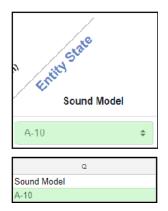


Figure 21: Entity State Sound Model view

5.0 Environmental Sounds

To go to the Environmental Sounds page, go to Earshot (-?) > Environmental Sounds.

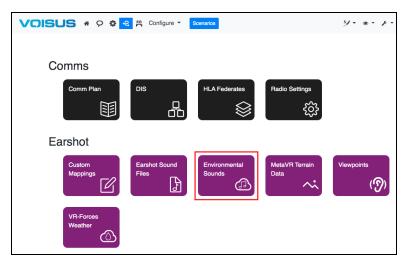


Figure 22: Environmental Sounds navigation

Environmental sounds generate sound in a specific area. An environmental process protocol data unit (PDU) determines the sound's intensity and location. You can insert sounds into the simulation that do not have an associated Distributed Interactive Simulation (DIS) entity (e.g., background noise from a market area, wind noise in an open field). An environmental process PDU also defines the sound's spherical shape and position. Specifically, the system responds to Sphere 1 and Bounding Sphere types.

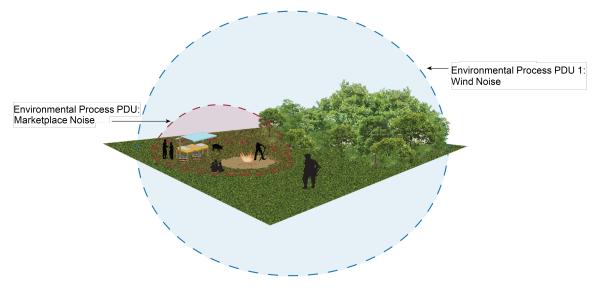


Figure 23: Earshot concept

To use this element, match the DIS parameters to those of the desired environmental process PDU on the network. Once the system detects the PDU, the audio file in **Sound File** plays.

Select from uploaded sounds in the **Sound File** library. The sound continues to play as long as the environmental process persists on the network.

Example Environmental Sound						
Name	Example Environmenta					
DIS Mapping						
Kind	0					
Domain	0					
Country	0					
Category	0					
Subcategory	0					
Specific	0					
Extra	0					
Sound File	Select sound +					
Sound File Volume	1					

Figure 24: Environmental Sounds page

Use the **Sound File Volume** control to adjust the level to a desired value ranging from 0–2.0.

6.0 MetaVR™ Terrain Data

MetaVR Terrain Data links the Voisus server to a customer-furnished PC sharing terrain data via Samba network-sharing protocol. To enable MetaVR terrain data access, follow these steps:

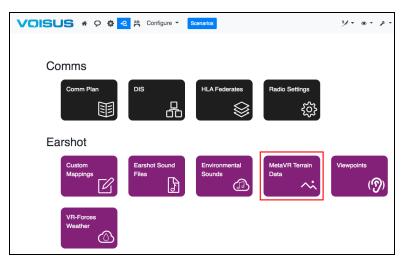


Figure 25: MetaVR Terrain Data navigation

- 2. In Server IP Address, enter the IP address of the computer hosting MetaVR terrain data.
- 3. **Directory on Network Share** points the Voisus server to a shared directory folder on the host computer. Enter the directory folder's name.
- 4. In **Username** and **Password**, enter the login credentials of the computer hosting MetaVR terrain data.
- 5. When finished, select ^{Connect}

6. Confirm **Status** displays a green check mark (✓):

MetaVR™ Terrain Data						
Enter configuration for accessing MetaVR [™] terrain data shared on the network: Server IP Address						
Directory on Network Share	sample_terrain_tiles					
Username	method					
Password	(mailine)					
	Connect					
Status	~					

Figure 26: MetaVR Terrain Data page

A red X (*) indicates that the Voisus server is disconnected from the host computer. If Federal Information Processing Standards (FIPS) mode is enabled, the Voisus server may not be able to authenticate the network share. To manually disable FIPS mode, contact support@asti-usa.com.

MetaVR [™] Terrain Data Enter configuration for accessing MetaVR [™] terrain data shared on the network:							
This system has FIPS mode enabled, which may prevent authentication with the network share.							
Server IP Address							
Directory on Network Share	sample_terrain_tiles						
Username	bearwaan						
Password							
	Connect						
Status	×						

Figure 27: FIPS mode warning

7.0 VR-Forces Weather

VR-Forces® **Weather** allows you to customize weather sounds. Specifically, you can differentiate levels of rain intensity, sea state, and wind speed.

To add sound files to **Earshot Sound Files**, select **Edit Sounds** () at the top of the page. For more information about Earshot sound files, go to Section 3.0, "Earshot Sound Files" on page 5.

7.1 Rain Intensity

To customize rain intensity sound effects, follow these steps:

- 1. Under Rain Intensity, select Sound File corresponding with Light, Medium, or Heavy, and choose an effect.
- 2. In **Gain**, enter a gain value.
- 3. In Range (%), enter percentage values ranging from 0–100 percent.

Rain Intensity								
	Sound File		Gain	Range (%)				
Light	None	\$	1	0	- 30 %			
Medium	None	\$	1	30	- 70 %			
Heavy	None	\$	1	70	- 100 %			

Figure 28: Rain Intensity settings

7.2 Sea State

To customize sea state sound effects, follow these steps:

- 1. Under Sea State, select Sound File corresponding with Low, Medium, or High, and choose an effect.
- 2. In Gain, enter a gain value.

3. In **Range (Douglas Sea State)**, enter low, medium, and high values according to the Douglas Sea Scale:

Value	Description
0	Calm (glassy)
1	Calm (rippled)
2	Smooth (wavelets)
3	Slight
4	Moderate
5	Rough
6	Very Rough
7	High
8	Very High
9	Phenomenal

Table 1: Douglas Sea Scale

Sea State							
	Sound File		Gain	Range (D	ouglas Sea Scale)		
Low	None	\$	1	0	- 3		
Medium	None	\$	1	3	- 7		
High	None	\$	1	7	- 9		

Figure 29: Sea State settings

7.3 Wind Speed

To customize wind speed sound effects, follow these steps:

- 1. Under Wind Speed, select Sound File corresponding with Low, Medium, or High, and choose an effect.
- 2. In **Gain**, enter a gain value.
- 3. In Range (km/h), enter wind speed values ranging from 0–118.5 km/h.

Wind Speed								
	Sound File		Gain	Range (kr	n/h)			
Low	None	\$	1	0	- 30	km/h		
Medium	None	\$	1	30	- 80	km/h		
High	None	\$	1	80	- 118.5	km/h		

Figure 30: Wind Speed settings

8.0 Earshot Statistics

From the top right, go to **Monitor** $(\textcircled{\bullet}) >$ **Earshot**.

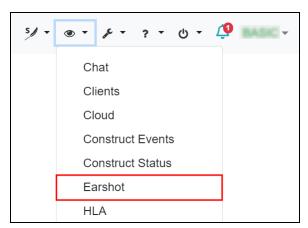


Figure 31: Earshot Statistics navigation

As Earshot's main troubleshooting utility, **Earshot Statistics** lists detected viewpoints and virtual entities close enough to hear, showing their status within the simulation.

Earshot Statistics						
Viewpoint	: Viewpoin	nt-1 🗢				
Viewpoint	Status					Active Entities
Linked	х	Y	z	Volume (%)		No Active Entities
Yes	0.00	0.00	0.00	100		Active Environmental Sounds
Simulatior	n Time					No Active Environmental Sounds
	N	lo Simulatio	on Time Det	tected		VoisNet Synchronization
DIS Rx Co	DIS Rx Counters					 Synchronized
DIS Entity P	PDUs				0	
DIS Fire PDUs 0						
DIS SetData PDUs 0						
DIS Detonat	tion PDUs				0	
DIS Environ	mental Proc	ess PDUs			0	

Figure 32: Earshot Statistics



Note: Earshot Statistics only shows features enabled in the license file. Depending on your configuration, some features may not display.

At the top of the page, **Viewpoint** allows you to choose from the available Earshot viewpoints. For more information about viewpoints, go to Section 2.0, "Viewpoints" on page 2.

Viewpoint Status indicates whether the selected viewpoint is linked to its corresponding DIS entity received from the network. Once linked, the X, Y, Z values represent the viewpoint's location.

Simulation Time shows the current time and date within the simulation. If the simulation time is not provided, the display shows "No Simulation Time Detected."

DIS Rx Counters shows the total received protocol data units (PDUs) categorized by type.

Viewpoint Speaker Locations indicates whether the user-created speaker locations are connected to a corresponding amplifier channel.

Active Entities displays DIS entities received from the network that are currently producing audio. The following information displays in this area:

- *Entity:* shows the virtual entity's ID number and type; the simulation automatically generates the ID, and the type is derived from ASTi's built-in library or **Custom Mappings**.
- *Range (m)*: shows the relative distance in meters from the viewpoint.
- Loudness (dB_{SPL}): shows the entity's volume using sound pressure level in decibels.
- *Terrain Factor:* if enabled, shows the terrain's level of sound obstruction; ranges from 0–1, where 0 represents full sound obstruction, and 1 represents no sound obstruction; works in conjunction with the Earshot terrain server.
- Forward (m): displays the entity's X coordinate distance from the viewpoint.
- *Right (m)*: displays the entity's Y coordinate distance from the viewpoint.
- Up (m): displays the entity's Z coordinate distance from the viewpoint.

Active Environmental Sounds displays actively playing environmental sounds based on Environmental Process PDUs received from the network. For more information about active environmental sounds, go to Section 5.0, "Environmental Sounds" on page 15.

Fire Events and Detonation Events show the last 20 sound effects as they occur in real time. Currently playing sounds light up green and show a green speaker (\triangleleft), while delayed sounds display a clock (\bigcirc).

Fire	e Events		
@=	Sound Delayed	∢) = Sound	Playing
Munition Type		Range (m)	Loudness (dB _{SPI})
0	AK47	61.62	86.24
40	AK47	61.62	86.24
	AK47	61.62	86.24

Figure 33: Fire Events

Munition Type shows the weapon type (e.g., AK-47), including custom weapons created on **Custom Mappings. Range (m)** shows how far away the weapon was fired from the listener, while **Loudness (dB_{SPL})** displays the sound's volume using sound pressure level in decibels.

MetaVR Terrain Data Network Status shows the Voisus server's connection status to the computer hosting MetaVRTM simulation software. For more information about MetaVR terrain data, go to Section 6.0, "MetaVRTM Terrain Data" on page 17.

Appendix A: VoisNet Synchronization

VoisNet Synchronization outputs Earshot aural cue audio using an AI-Delta audio distribution device instead of an Ashly Power Amplifier. Each Voisus server requires one AI-Delta. Because an AI-Delta only uses two channels, this configuration is ideal for programs seeking a smaller hardware footprint.

Before starting, you'll need to complete a few setup tasks:

- Plug in the AI-Delta, and connect it to the Voisus server's network. For more information about the AI-Delta's network configuration, go to the <u>AI-Delta Technical User</u> <u>Guide</u>.
- Set up the AI-Delta, add it to the Voisus cloud, and give it a channel identifier on Hardware Devices. To add and name hardware clients in the Voisus web interface, go to "Manage hardware devices" in the <u>Voisus Client User Guide</u>.
- 3. Add a viewpoint, as described in Section 2.0, "Viewpoints" on page 2. Make sure the AI-Delta's **Chan A** identifier on **Hardware Devices** matches the corresponding speakers' **Channel Name** on **Viewpoints**.

This chapter discusses how to:

- Enable VoisNet Synchronization on the Voisus server
- Enable Sync Mode on the AI-Delta
- Verify VoisNet Synchronization

A-1 Enable VoisNet Synchronization on the Voisus server

To enable VoisNet synchronization, follow these steps:

1. From the top right, go to Manage (>> Features.

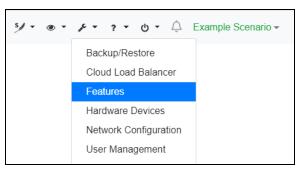


Figure 34: Features navigation

2. On System Features, turn VoisNet Synchronization .

Syste	em Features	
O Cha	anges to features require a Reboot	
Feature		Description
	ACENet	Supports ACENet devices (e.g., ACU2, RIU)
OFF	Al-Delta Routing	Supports connecting to AI-Delta devices over wide-area networks (WAN)
	Chat	Text chat for software clients
	Crew Intercom	Custom intercom behaviors in the Voisus Client for Desktops & Tablets
OFF	Hand-Held Terminal	Supports the Hand-Held Terminal (HHT)
	HLA	Supports High-Level Architecture (HLA) protocol
ON	Hot Spare Failover	Forces all processing onto a single server in the cloud, and provides failover to hot spares
OFF	PRC-117F Panel	Supports the PRC-117F hardware panel
OFF	Radio Bridge Security Levels	Enables radio bridge security functionality
ON	Radio Monitor Remote Access	Allows clients to view radios on the network
OFF	Remote Live Radios	Enables remote live radio functionality
OFF	RTSP Server	Enables RTSP server listening for connections
OFF	Simscribe DIS Replay	Sends Distributed Interactive Simulation (DIS) packets during playback
ON	Simscribe VBS	Allows Virtual Battlespace (VBS) administrators to control Simscribe
OFF	SINCGARS Panel	Supports the SINCGARS hardware panel
OFF	Software Client - Comms Logger	Enables clients to publish audio (received and transmitted) for Comms Logger
OFF	Software Client - Load Balancing	Allows software clients connecting to this server to be load balanced to other servers in the same cloud
	TOCNET® CAU	Supports the TOCNET® CAU Client
	VoisNet Synchronization	Synchronizes the system frame rate with a VoisNet device (e.g., Al-Delta)

Figure 35: turn on VoisNet Synchronization

3. To activate changes, select Reboot.

A-2 Enable Sync Mode on the Al-Delta

To enable Sync Mode on the AI-Delta, follow these steps:

- 1. Open a web browser on a computer or tablet sharing a network with the Voisus server.
- 2. In the address bar, enter the Voisus server's IP address.
- 3. Log into the Voisus server using the following default credentials:

Username	Password
admin	astirules

4. From the top right, go to Manage (>> Hardware Devices.

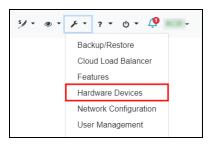


Figure 36: Hardware Devices navigation

- 5. Under AI-Delta assigned to Cloud *ID*, where *ID* is the cloud ID, find the new device, and select show Options.
- 6. To sync the AI-Delta with the Voisus server, under **Device Audio Settings**, select **Sync mode**.

Harc	lware Devi	ces								
ACU2	ACU2 AI-Bravo AI-Delta AI-S Amplifier Panel RIU									
AI-Delta assigned to Cloud vs_0007b8dca54e Click the solution to remove the selected AI-Delta from this cloud. Click any channel identifier to change its name.										
	6 🖺 🖸				Q	Search				
	MAC ¢	Chan A 💠	Chan B ≑	Firmware Version 💠	Status 🛊					
	B827EBB7CE38	vbs2-dev-764-PC	vbs2-dev-764-PC-2	v1.6.2	Ready	Hide Start Options FindMe				
		Channel Settings Mic Power:	Channel Settings Mic Power:	IPv6 Info Link-local address: fe80::ba27:ebff:feb7:ce3	38	Device Audio Settings Sync mode: 🗹				
	Preamp(dB): 0 or 10 to	Preamp Gain (dB):	Preamp Gain (dB):			Buffer size (ms):				
	65 Sidetone(%): 0 to 100			IPv4 Settings Mode:		8 \$				
	Gate Threshold(dB): -140 to 0	hold(dB): Sidetone (%): Sidetone (%):	Sidetone (%):	Static	\$					
				IPv4 Address:						
		Enable Gate: 🗹	Enable Gate: 🗹							
		Gate Threshold (dB):	Gate Threshold (dB):	Netmask:						
		-20	-20	255.255.0.0						
				Gateway:						
				10.2.0.254						

Figure 37: Enable Sync mode

7. Select Save Changes (🖹).

A-3 Verify VoisNet Synchronization

To verify that the AI-Delta successfully synced with the Voisus server, follow these steps:

1. From the top right, go to **Monitor** (•••) > **Earshot**.

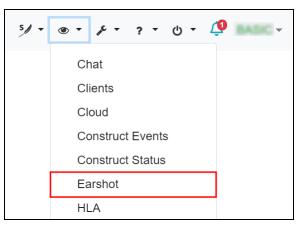


Figure 38: Earshot Statistics navigation

2. Under VoisNet Synchronization, confirm that ✓ Synchronized appears:

Earshot Statistics								
Viewpoin	Viewpoint: Viewpoint-1 +							
Viewpoint	t Status					Active Entities		
Linked	х	Y	z	Volume (%)		No	Active Entities	
Yes	Yes 0.00 0.00 0.00 100					Active Environmental Sounds		
Simulatio	n Time					No Active E	Environmental Sounds	
	N	lo Simulatio	on Time Dete	ected		VoisNet Synchronization		
DIS Rx C	DIS Rx Counters					 Synchronized 		
DIS Entity	PDUs				0			
DIS Fire PI	DUs				0			
DIS SetData PDUs					0			
DIS Detona	ation PDUs			0				
DIS Enviro	nmental Proc	ess PDUs			0			

Figure 39: Confirm VoisNet Synchronization

If **X** displays or **VoisNet Synchronization** is missing, check the following:

- VoisNet synchronization is enabled on the Voisus server.
- On **Hardware Devices**, the AI-Delta is connected to the cloud, and **Sync Mode** is enabled.
- On Viewpoints, the Channel Name of one or more speakers match the AI-Delta's Chan A name on Hardware Devices.

If you're still unable to synchronize VoisNet, contact ASTi at <u>support@asti-usa.com</u>.