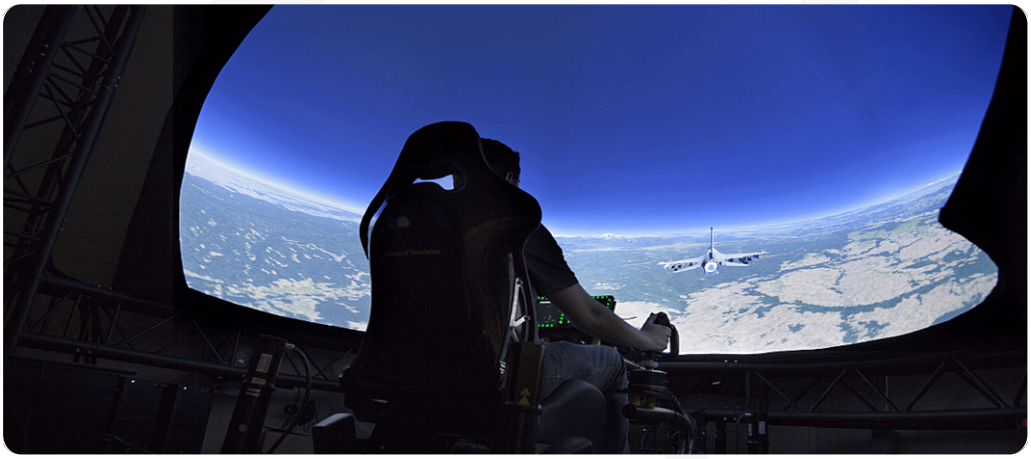
VBS Host



VBS4 24.1.1

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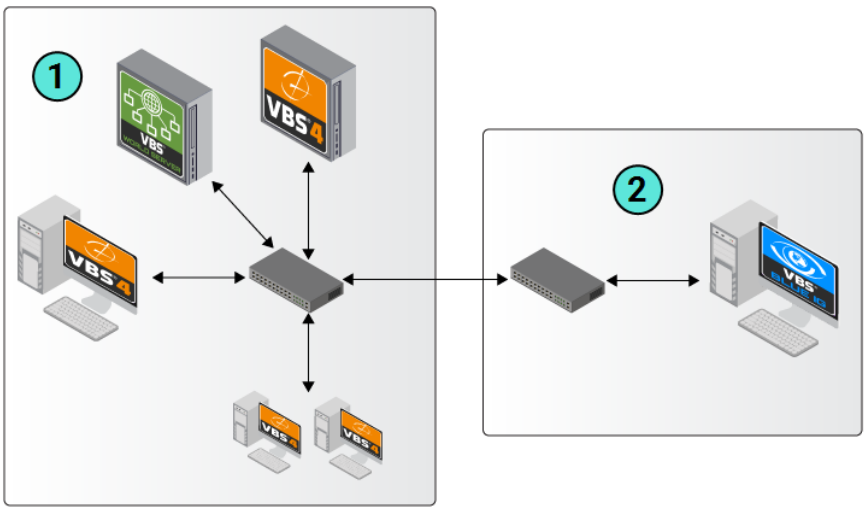
1. VBS Host Overview

VBS includes a set of capabilities to broadcast specified viewpoints to VBS Blue IG.

- VBS includes a dedicated host component to broadcast directly to VBS Blue IG.
- VBS uses IG View Objects to place viewpoints into scenarios which can then be linked to a vehicle or unit.
- Each IG View Object specifies a configuration that determines the perspectives for that viewpoint and the IG clients to broadcast them to.

Image-1: Simplified Network Diagram for Broadcast to VBS Blue IG



1	Dedicated Server running VBS
2	VBS Blue IG

These topics in the VBS Host Manual explain how to use VBS to broadcast to VBS Blue IG:

1. Create IG View Configuration Files (on the next page)
2. Add IG Viewpoints to Scenarios (on page 11)
3. If VBS is hosting an interoperable simulation with other DIS compliant products, enable VBS to broadcast the external entities to the IG product by Enabling DIS Entities (on page 17).
4. To run VBS in broadcast mode, start VBS with the appropriate startup parameter, according to the following installed application:
   - **VBS Blue IG** - Use the `-vbsHostNet` parameter.
   - **Other CIGI-compliant IG products** - Use the `-gateway` parameter.

For more information about using VBS as a host for VBS Blue IG, see Quick Start: VBS Blue IG with VBS4 Host (on page 18).

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2. Create IG View Configuration Files

VBS uses XML files to configure each viewpoint with multiple view perspectives for multiple IG clients. Each configuration defines a single viewpoint in VBS, that may contain multiple view perspectives.

View configuration files must be placed in the following folder:

`\VBS_Installation\Settings\CIGI\Views\`

Within the file, the viewpoint is defined by a `<View_Config>` tag which contains `<View>` tags for each perspective. The property tags within view define the orientation, angle, position, and size of the view as well as the IG client to broadcast to.

Follow these steps:

1. Open a new `.xml` file in a text editor.
2. Add `<View_Config>` and `</View_Config>` tags as the first and last lines of the file respectively.
3. Add a `<View>` and `</View>` tag for each perspective that the configuration needs to broadcast to an IG client.
4. Within each `<View>` tag, specify View Parameters (on the next page) to define its perspective.
5. Save the file to the `\Views\` folder:

   `\VBS_Installation\Settings\CIGI\Views\`
6. Copy this file to the same `\Views\` folder for all VBS instances in the network running in administrator mode.

   This configuration file must also be saved into the `\Views\` folder for any host device acting as the **vbsHostNet** for the IG client. The **vbsHostNet** device will likely be the **Dedicated Server** or **VWS** on a VBS network deployment, where applicable.

   > **WARNING**
   >
   > Each defined view must correspond to a configured View on an IG Client.
   >
   > To define view configurations on VBS Blue IG Clients, see Views and Render Targets in the VBS Blue IG Manual.

   For more information about configuring the IG Client, see Quick Start: VBS Blue IG with VBS4 Host in the VBS4 Administrator Manual.

The View Configuration file is ready to use to define an IG View Object as described in Add IG Viewpoints to Scenarios (on page 11).

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2.1 View Parameters

Modify the following parameters of a Viewpoint `.xml` file to define each View perspective:

XML Element	Description
`<ID>`	The unique ID for the IG client, between 0 and 65535.
`<AttachTo>`	This determines which part of the object / vehicle to use to attach the view: 0 - hull 1 - main turret (azimuth) 2 - main turret (elevation) 3 - commander turret (azimuth) 4 - commander turret (elevation) 5 - loader turret (azimuth) 6 - loader turret (elevation) 7 - first-person view (Use when attaching to a unit.) Not all vehicles have these parts. Attaching to an invalid part locks the camera to the entity origin with the camera orientation facing north.
`<AttachToBone>`	Specifies a bone by name to attach the view to. This field is ignored if empty or not present.
`<GroundClampType>`	0 - Default - Default ground clamping applied as currently configured in the IG settings. 1 - None - Ground clamping disabled. 2 - Clamp - Height ground clamping only. 3 - Conform - Conformal ground clamping only. 4 - ClampAndConform - Height and conformal ground clamping.
`<SmoothType>`	0 - Default - Default smoothing applied as currently configured in the IG settings. 1 - Disabled - Smoothing disabled. 2 - Enabled - Smoothing enabled. **NOTE** These parameters are used to override ground clamping and smoothing values set in VBS Blue IG Settings. They only take effect when the IG View Object is attached to a vehicle (so no effect if the view object is not attached to anything or is attached to a lifeform).

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XML Element	Description
`<ParentDrawMode>`	Specifies the displayed draw mode of the vehicle the IG View Object is attached to. This has no effect if the view obj is unattached. (For example, if the view is attached to a tank and the **Pilot** draw mode is provided, then the tank will be rendered in the Pilot draw mode for this view). 0 - Normal - The default view geometry that a vehicle is created with. 1 - Pilot - The visual geometry that can be seen from the pilot / driver position of a vehicle. 2 - Gunner - The visual geometry that can be seen from the gunner position of a vehicle. 3 - Cargo - The visual geometry that can be seen from the cargo position of a vehicle.
`<CrewPosition>`	Specifies a crew position by ID to attach the view to. This has no effect if the view obj is unattached. 0 - Pilot / driver, the remaining indices are vehicle-dependent. -1 - None
`<FOV_Left>`	Left half-angle of the view frustum in degrees.
`<FOV_Right>`	Right half-angle of the view frustum in degrees.
`<FOV_Bottom>`	Bottom half-angle of the view frustum in degrees.
`<FOV_Top>`	Top half-angle of the view frustum in degrees.
`<FOV_Near>`	Near clipping plane of the view frustum.
`<FOV_Far>`	Far clipping plane of the view frustum.
`<Yaw_Offset>`	Angle of clockwise rotation around the Up vector in degrees.
`<Pitch_Offset>`	Angle of clockwise rotation around the Left vector in degrees.
`<Roll_Offset>`	Angle of clockwise rotation around the Forward vector in degrees.
`<X_Offset>`	Distance from the entity origin along the Right vector in meters.
`<Y_Offset>`	Distance from the entity origin along the Forward vector in meters.
`<Z_Offset>`	Distance from entity origin along the Up vector in meters.

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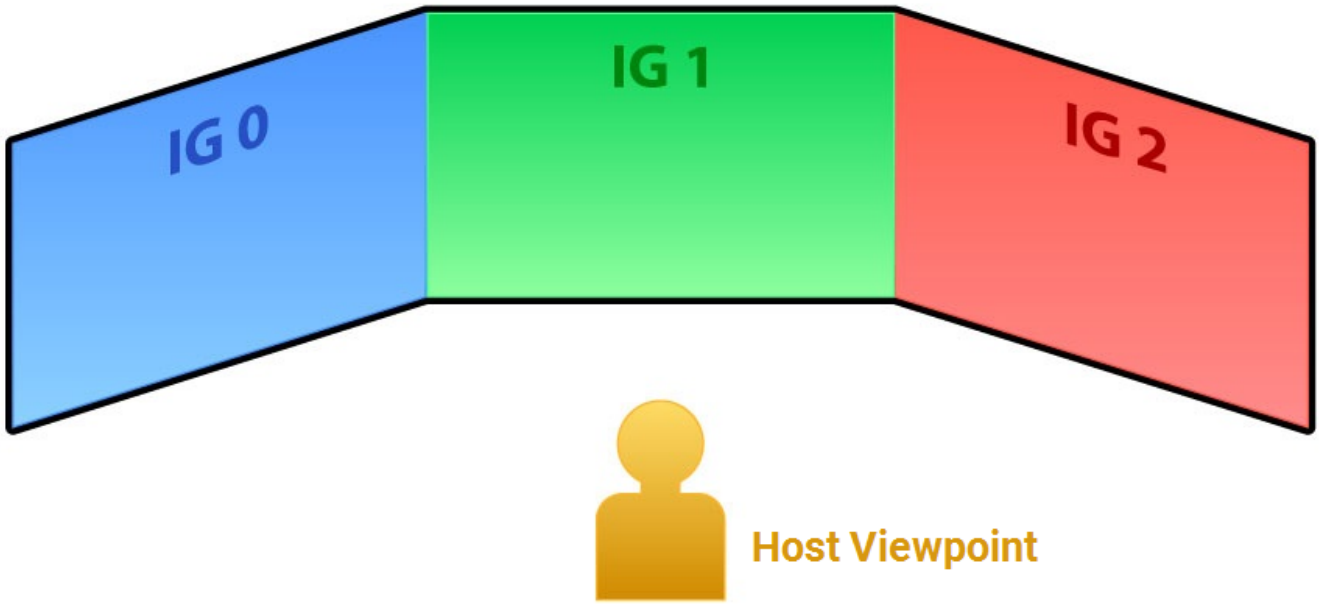
2.2 Viewpoint Example

A viewpoint with three perspectives, each displaying 50 degrees of a 150 degree field of view:



`<View_Config>` and `<View>` definitions:

```
<View_Config>
  <View>
    <ID>0</ID>
    <AttachTo>0</AttachTo>
    <FOV_Left>-25</FOV_Left><!-- negative, based on forward orientation -->
    <FOV_Right>25</FOV_Right><!-- positive, based on forward orientation -->
    <FOV_Bottom>-15</FOV_Bottom><!-- negative, based on forward orientation -->
    <FOV_Top>15</FOV_Top><!-- positive, based on forward orientation -->
    <FOV_Near>0</FOV_Near>
    <FOV_Far>0</FOV_Far>
    <Yaw_Offset>-50</Yaw_Offset>
    <Pitch_Offset>0</Pitch_Offset>
    <Roll_Offset>0</Roll_Offset>
    <X_Offset>-0.85</X_Offset>
    <Y_Offset>-0.1</Y_Offset>
    <Z_Offset>1.55</Z_Offset>
  </View>
  <View>
    <ID>1</ID>
    <AttachTo>0</AttachTo>
    <FOV_Left>-25</FOV_Left><!-- negative, based on forward orientation -->
    <FOV_Right>25</FOV_Right><!-- positive, based on forward orientation -->
```

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```
    <FOV_Bottom>-15</FOV_Bottom><!-- negative, based on forward orientation -->
    <FOV_Top>15</FOV_Top><!-- positive, based on forward orientation -->
    <FOV_Near>0</FOV_Near>
    <FOV_Far>0</FOV_Far>
    <Yaw_Offset>0</Yaw_Offset>
    <Pitch_Offset>0</Pitch_Offset>
    <Roll_Offset>0</Roll_Offset>
    <X_Offset>-0.85</X_Offset>
    <Y_Offset>-0.1</Y_Offset>
    <Z_Offset>1.55</Z_Offset>
  </View>
  <View>
    <ID>2</ID>
    <AttachTo>0</AttachTo>
    <FOV_Left>-25</FOV_Left><!-- negative, based on forward orientation -->
    <FOV_Right>25</FOV_Right><!-- positive, based on forward orientation -->
    <FOV_Bottom>-15</FOV_Bottom><!-- negative, based on forward orientation -->
    <FOV_Top>15</FOV_Top><!-- positive, based on forward orientation -->
    <FOV_Near>0</FOV_Near>
    <FOV_Far>0</FOV_Far>
    <Yaw_Offset>50</Yaw_Offset>
    <Pitch_Offset>0</Pitch_Offset>
    <Roll_Offset>0</Roll_Offset>
    <X_Offset>-0.85</X_Offset>
    <Y_Offset>-0.1</Y_Offset>
    <Z_Offset>1.55</Z_Offset>
  </View>
</View_Config>
```

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3. Add IG Viewpoints to Scenarios

VBS uses an IG View Object to define a viewpoint in the scenario. The view object is usually linked to a unit or vehicle, and uses a configuration file to determine which IG clients to broadcast to and their individual view perspectives.

Add an IG View Object for each viewpoint that you want to broadcast.

> **NOTE**
>
> Adding / deleting the IG View Editor Object in VBS Editor during a multiplayer scenario may not be reflected on other clients.

Follow these steps:

1. Open the Scenario to edit in VBS Editor in Prepare mode.
2. Select **IG View Object** from the Editor Objects List.
3. Right-click a location on the map, and select **New Object**.

   The **IG View Object Properties** panel opens.
4. Select the appropriate View **Configuration File**.
5. Click **OK** to add the IG View Object to the map.

Configuration Files	Description
1-Channel Lifeform	A single channel meant to attach to a lifeform, offset at eye-level.
3-Channel AH-64 - Attach Example	3 channels, ID 0-2, offset to display the cockpit view of the AH-64.
3-Channel Lifeform	3 channels, ID 0-2, meant to attach to a lifeform, offset at eye-level.
3-Channel M1A1 - Attach Example	3 channels, ID 0-2, with views attached to various memory points on an M1A1.
3-Channel M1A1 - Main Turret	3 channels, ID 0-2, configured in a widescreen format; attached to the tip of the main turret of an M1A1.
3-Channel Third Person - Far	3 channels, ID 0-2, configured in a widescreen format; meant to attach to a lifeform, offset 50 meters behind the unit.
3-Channel Third Person - Near	3 channels, ID 0-2, configured in a widescreen format; meant to attach to a lifeform, offset 15 meters behind the unit.
3-Channel Third Person - Top Down	3 channels, ID 0-2, configured in a widescreen format; meant to attach to a lifeform, offset 50 meters above the unit looking down.

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Configuration Files	Description
4-Channel Lifeform (FOV)	4 channels, ID 0-3, configured in a square format; meant to demonstrate advanced frustum control.
4-Channel Lifeform (YPR)	4 channels, ID 0-3, configured in a square format; meant to demonstrate rotation control.
14-Channel Scalable	14 channels, ID 0-13, used to demonstrate view groupings and scalable configuration.
Custom	Add your own View Configuration files as described in Create IG View Configuration Files (on page 6). **WARNING** The required view configuration file must exist in the following folder: `\VBS_Installation\Settings\CIGI\Views\`

Link the IG View Object to the entity that represents its viewpoint:

1. Right-click the **IG View Object.**
2. Select the appropriate **Link To** option.
3. Click the required entity.

When the scenario runs, the viewpoint defined by the IG View Object moves with the linked entity, and VBS broadcasts the defined views to the specified IG clients.

3.1 Multiple IG View Objects

Use of multiple IG View Objects in a scenario requires the creation of additional IG view configuration files. In many cases, existing configuration files can be copied, renamed, and edited.

The following example covers a scenario in which 3 IG view objects are attached to entities in a scenario, with the `1-Channel Lifeform.xml` configuration file as the base for the configuration file for each view object.

Follow these steps:

1. On the host computer, open the Views directory located in:

   `\VBS_Installation\Settings\CIGI\Views\`
2. Select `1-Channel Lifeform.xml` and right-click on it.

   Copy it and paste it twice (for a total of 3 instances of the `1-Channel Lifeform.xml` file).

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3. Rename the configuration files to:
   - `1-Channel Lifeform-0.xml`
   - `1-Channel Lifeform-1.xml`
   - `1-Channel Lifeform-2.xml`
4. Open `1-Channel Lifeform-0.xml` with a text editor.
5. Go to line 4 (`<ViewGroup>` parameter) and change `<ID>1</ID>` to `<ID>100</ID>`.

   NOTE
   This value is arbitrary, but must be unique for each view in the IG project.

6. Go to line 15 (`<View>` parameter) and change `<ID>1</ID>` to `<ID>0</ID>`.
7. Go to line 16 (`<View>` parameter) and change `<GroupID>1</GroupID>` to `<GroupID>100</GroupID>`.

   NOTE
   This value must match the value set on line 4.

```
<?xml version="1.0"?>
<View_Config>
  <ViewGroup>
    <ID>100</ID> <!-- Matches the <View> GroupID -->
    <AttachTo>0</AttachTo>
    <Yaw_Offset>0</Yaw_Offset>
    <Pitch_Offset>0</Pitch_Offset>
    <Roll_Offset>0</Roll_Offset>
    <X_Offset>0</X_Offset>
    <Y_Offset>0</Y_Offset>
    <Z_Offset>0</Z_Offset>
    <Precipitation_Radius>1</Precipitation_Radius>
  </ViewGroup>
<View>
  <ID>0</ID> <!-- Matches filename number (0 in this case) -->
  <GroupID>100</GroupID> <!-- Matches the <ViewGroup> ID -->
  <AttachTo>0</AttachTo>
```

8. Save and close the file.
9. Open `1-Channel Lifeform-1.xml` with a text editor.

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10. Go to line 4 (`<ViewGroup>` parameter) and change `<ID>1</ID>` to `<ID>200</ID>`.

    NOTE
    This value is arbitrary, but must be unique for each view in the IG project.

11. Go to line 16 and change `<GroupID>1</GroupID>` to `<GroupID>200</GroupID>`.

    NOTE
    This value must match the value set on line 4 (`<ViewGroup>` parameter).

    NOTE
    Because the default value for `<ID>` on line 15 is 1, no change needs to be made to that setting in `1-Channel Lifeform-1.xml`.

12. Save and close the file.
13. Open `1-Channel Lifeform-2.xml` with a text editor.
14. Go to line 4 and change `<ID>1</ID>` to `<ID>300</ID>`.

    NOTE
    This value is arbitrary, but must be unique for each view in the IG project.

15. Go to line 15 (`<View>` parameter) and change `<ID>1</ID>` to `<ID>2</ID>`.
16. Go to line 16 and change `<GroupID>1</GroupID>` to `<GroupID>300</GroupID>`.

    NOTE
    This value must match the value set on line 4.

17. Save and close the file.
18. Launch VBS4 and the VBS Blue IG clients.
19. Enter a mission.
20. Open VBS Editor in Execute (RTE) mode.
21. Place an IG View Object in the scenario.

    The **Object Properties** panel appears.

22. Select `1-Channel Lifeform-0.xml` from the **Configuration Files** drop-down and click **OK**.
23. Place an entity in the scenario.
24. Link the IG View Object to the entity.

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25. Create and link 2 more IG View Objects and entities by repeating steps 21-24, but select `1-Channel Lifeform-1.xml` and then `1-Channel Lifeform-2.xml` when placing the IG View Objects.
26. For each VBS Blue IG instance, set the View Configuration file to include the View IDs (`<View><ID>`) established above:
    a. Open the xml file located in the `\IG_Installation\` folder:

    `\data\BlueProduct\DefaultViewConfig.xml`

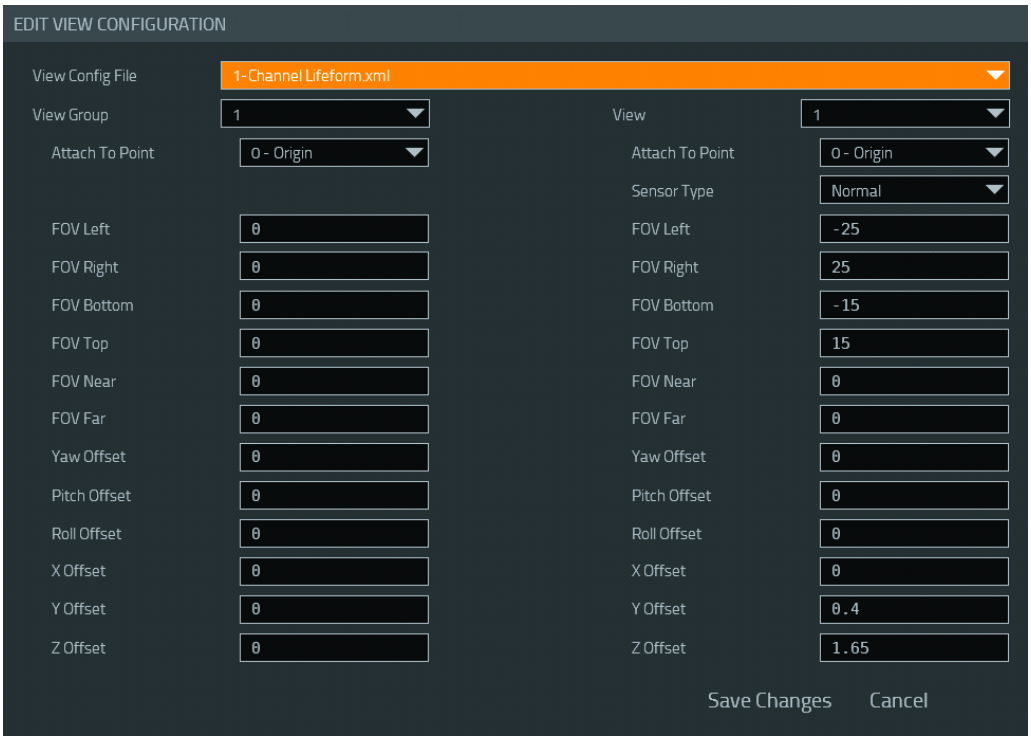
    b. Set the required `<View><ID>` parameter to match all View IDs created for the VBS4 host.
    c. Set any **Optional Fields**, as needed.

> **NOTE**
> For a more detailed procedure for setting up the VBS Blue IG View configuration file, see Views and Render Targets in the VBS Blue IG Manual.

3.2 Edit IG View Configurations

The IG View Editor allows users to modify the settings of IG View Configuration files in real-time, and is accessible in Execute (RTE) mode and C2 modes. The parameters contained in IG View configurations are explained in the Create IG View Configuration Files (on page 6) topic.

Access the **IG View Editor** from the VBS Editor **Tools** menu.



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Follow these steps:

1. Select the desired configuration file from the **View Config File** drop-down menu.
2. Enter the desired values into any fields you need to modify.

   For more information, see View Parameters (on page 7).
3. Click **Save Changes**.

If the edited IG View Configuration file is currently in use by an IG View object, the view linked to that IG View object refreshes to display the view with updated parameters.

3.3 Sensors

IG views can be modified to display as various types of sensors. Explore the following script commands to modify sensor views:

- `IG_ViewSetSensor` - Use this SQF command to change the sensor type for each defined view individually.

  A detailed explanation and example usage can be found in the VBS Scripting Reference:

  IG_ViewSetSensor (https://sqf.bisimulations.com/display/SQF/IG_ViewSetSensor)
- `IG_ViewSetSensorParameters` - Use this SQF command to further modify parameters of each sensor.

  A detailed explanation and example usage can be found in the VBS Scripting Reference:

  IG_ViewSetSensorParameters (https://sqf.bisimulations.com/display/SQF/IG_ViewSetSensorParameters)

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4. Enabling DIS Entities

VBS scenarios broadcasting to VBS Blue IG may also be communicating with other DIS-compliant simulation products hosting external entities.

Enabling DIS entity traffic within a VBS host and VBS Blue IG configuration requires the **interopForwarding** option to be enabled.

Follow these steps:

1. With a text editor, open the **VBS4.xml** file in the AppData Local folder at:
   - Default VBS4 Profile location:

     `%LOCALAPPDATA%\VBS4\Settings\VBS4.xml`
   - Other VBS4 Profile location:

     `Path``\Settings\VBS4.xml`

     Where *`Path`* is specified using the `-profiles=`*`Path`* command-line option.

     For more information, see Command Line and Launcher Options in the VBS4 Administrator Manual.
2. Modify the existing **interopForwarding** entry or add if not present.

   Use the following snippet to the `<Uncategorized>` section of the XML file:

   ```
   <Value>
       <Name>interopForwarding</Name>
       <Value>1</Value>
   </Value>
   ```
3. Save and close the file.

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5. Quick Start: VBS Blue IG with VBS4 Host

This guide explains the most basic usage of VBS Blue IG with VBS4. The following steps cover the creation of a single-view IG project with VBS4 as the host. In this example, both the VBS4 Host and the VBS Blue IG Client run on **one** computer.

WARNING

Using a single computer to run VBS4 and VBS Blue IG is not recommended for a production system.

- VBS4 Computer Setup (below)
- VBS Blue IG Computer Setup (on the next page)

NOTE

For a more detailed procedure for setting up VBS Blue IG with VBS4 and multiple computers, see Configure VBS Blue IG and VBS4 in the VBS Blue IG Manual.

5.1 VBS4 Computer Setup

Start a VBS4 Admin Client to act as the simulation host.

Follow these steps:

1. Use VBS Launcher to start the VBS4 Admin Client with the following parameters selected:
   a. In the **VBS4 > Client** tab, select:
      - **VBS4 Offline**
      - **admin**
      - Other Client parameters as required.
   b. Click the **VBS4 > Server** tab, and select the parameter `-vbsHostNet`.

      NOTE

      By default, the Exercise ID is the PC name of the VBS Host.
2. Click **Launch Modules** to start the VBS4 Admin Client.

   For more information, see Starting VBS4 in the VBS4 Administrator Manual.

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3. Prepare a Scenario that includes an IG View Object:
    a. Create a Battlespace at a selected location.
    b. Select the Battlespace, highlight **Editor** and click **Create** to open VBS Editor in Prepare mode.
    c. Add a **Unit** and an **IG View Object** to the scenario.
    d. Right-click the IG View Object, select **Link to Unit**, and click the Unit.
    e. Save the Scenario.

    For more information, see Scenario Preparation in the VBS4 Editor Manual.
4. Execute the Scenario:
    a. Select the Battlespace, highlight **Execute** and click **Host** to open the Network Lobby.
    b. Select the Unit to assign yourself control.
    c. Click **OK**, and then **OK** to start the Scenario.

    For more information, see Scenario Execution in the VBS4 Instructor Manual.

5.2 VBS Blue IG Computer Setup

Set up VBS Blue IG to act as a client to the simulation host.

Follow these steps:

1. Launch **BlueIG.exe**.
2. Press **Esc** to show the mouse cursor.

VBS Blue IG starts, and loads the scene.

If the view does not display in the expected manner or you have other connection issues, see Cannot Connect to VBS Host in the VBS Blue IG Manual.

> **NOTE**
> For a more detailed procedure for setting up VBS Blue IG with VBS4 and multiple computers, see Configure VBS Blue IG and VBS4 in the VBS Blue IG Manual.

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