

JTLS-2016-12703 Multi-Side Functionality For WHIP/TRIPP

Jose M. Torres

1.0 Summary of Model Change Request

A Player Web-Hosted Interface Program (WHIP) instance only allows viewing and interacting from one Force Side frame of reference at a time. This is also true of a Controller WHIP which provides the ground truth perspective and interactions of a theater of battle or a humanitarian relief scenario. A Controller WHIP does not provide the frame of reference of each individual Force Side's perceptions.

Additionally, a Controller WHIP does not allow interacting with forces organically from the underlying Force Side, to manage its combat systems and supplies and order its force structures. These restrictions serve a well defined capability.

It is, however, desired to include an additional capability for a specialized WHIP that will allow tailoring it whenever there is a need to interact or order units of different Force Sides, such as all Coalition Forces, all Opposition Forces or all Situational Forces, all capable of being done from one WHIP. Currently to fulfill that need, a WHIP representing each desired Force Side would need to be accessed to view information such as perceptions or send orders to its units.

This task can not only be simplified for an operator responsible for multiple Force Sides, but also simplified for the host machine requiring the capacity to run multiple WHIPs simultaneously. The need to configure multiple WHIP instances each representing a Force Side for a single operator will in turn be alleviated by this design.

2.0 Design Summary

The proposed capability will allow starting a single WHIP or Total Recall Interactive Playback Program (TRIPP) and permit viewing different perceptions on the map, command hierarchy and other WHIP component interfaces individually. The other main concept of the design includes the ability to submit orders to units of different Force Sides.

Technical Controllers will be able to easily configure a multi-sided WHIP from the Interface Configuration Program (ICP). There will be several additional steps required from a functional point of view in the configuration process to enable the new capability that will allow the view and interaction of multiple Force Sides from a single WHIP, or TRIPP during playback. The creating and configuring of WHIPs is currently done in the ICP, and the ICP will allow Tech Control to create a WHIP and configure it to be a multi-sided or Super WHIP. This new configuration will enable the

capabilities of endowing the WHIP with the ability to turn on different perceptions and submit orders to the multiple Force Sides enabled while using the Super WHIP.

3.0 Detailed Design

3.1 Configuration

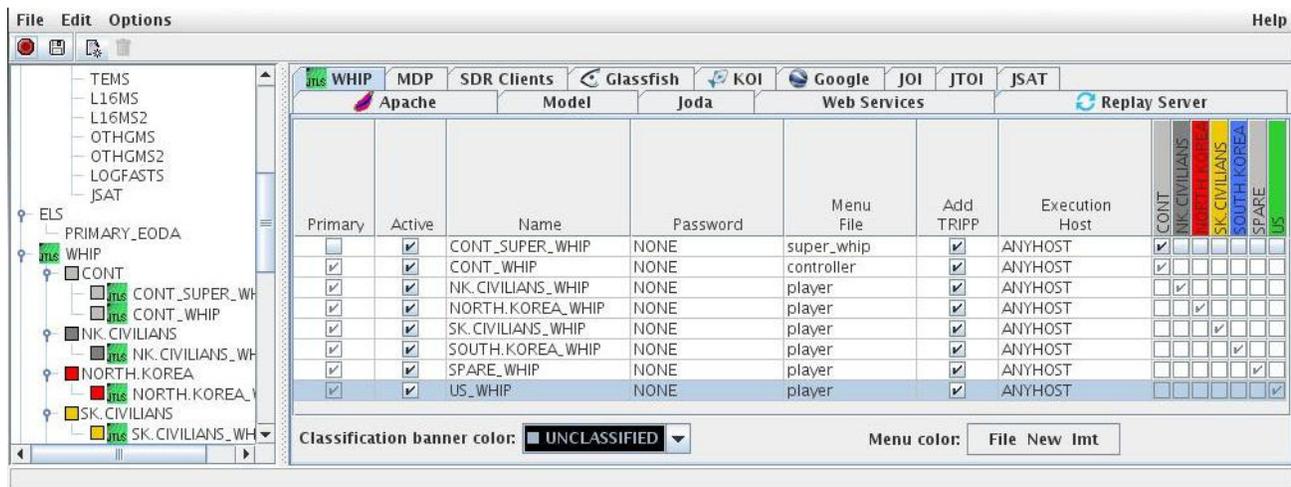


FIGURE 1. New ICP Force Side Selections

When configuring a WHIP there exists the concept of a Primary WHIP and optional Secondary WHIPs that can be set up on each Force Side. Primary WHIPs have command authority over their respective units. This means a Primary WHIP can send orders to any unit on its side. Any created Secondary WHIPs must be given command authority over a unit, a set of units (e.g. a commanding unit and its subordinates) or all units on its side to be able to send orders to these units from that given WHIP. Passing command authority is done through sending the Change Command Authority order after the game has been started.

Since there can only be one Primary WHIP in each Force Side, a Super WHIP will need to be given command authority to the units of the Force Sides it will be responsible of sending orders to. The new ICP configuration process will allow assigning the command authority to any WHIP. This will be achieved by changing the 'Primary' column in Figure 1 to a 'Command Authority' type selection on each WHIP. Command authority will be assigned by selecting one item from a drop-down list of three possible options (Table 1). This will enable Tech Control to set command authority to Super WHIPs including any standard WHIP before game start. Sharing command authority will also continue to be accomplished through player orders from Primary WHIPs with command authority at anytime after game start.

Table 1. Assignable Command Authorities

AUTHORITY TYPE	DESCRIPTION	SHARING AUTHORITY
NO AUTHORITY (default)	No command authority	No sharing command authority
PRIMARY	Command authority on all Force Side units	Sharing command authority
SHARED	Command authority on all Force Side units	No sharing command authority

All configured WHIPs are registered with the CEP via the <scenario>.cif file. A Super WHIP will need to do the same and will need to include the representing Force Sides. The CIF file's (Figure 2) Force Side column will need to change to allow a bit mask of Force Sides to set the multiple sides to be enabled for the Super WHIP. In addition, the command authority column will need to allow for a third value to represent the Shared Authority selection from the ICP. This will allow the model to know the Force Sides a Super WHIP is allowed to use and the know what command authority a WHIP has at game start.

Table 2. CIF File Command Authority Values

COMMAND AUTHORITY	VALUE
NO AUTHORITY	0
PRIMARY	1
SHARED	2

```

8
CONT_SUPER_WHIP          $      11  0  3
CONT_WHIP                 $      11  1  3
NK.CIVILIANS_WHIP        $       1  1  3
NORTH.KOREA_WHIP         $       2  1  3
SK.CIVILIANS_WHIP        $       3  1  3
SOUTH.KOREA_WHIP         $       4  1  3
SPARE_WHIP                $       5  1  3
US_WHIP                   $       6  1  3
    
```

FIGURE 2. Sample scenario CIF File

The JTLS Web Services, including the JXSR, OMA, Synapse and XMS will need to also register the multiple Force Sides a Super WHIP is configured to operate. The side information will be part of the ICP <scenario>.icp_db.xml file for every WHIP entry. It will include a listing of the scenario

Force Sides and denote with a boolean value which Force Side or Force Sides have been enabled for the WHIP. These Force Side entries will also be used to write the WHIP's user data and enable a Super WHIP capable of making requests to the corresponding web services and retrieve the respective perception data. The change will also include the aforementioned 'Command Authority' entry value, replacing the 'Primary' entry and will denote the value as the string selection made on the ICP instead of a boolean true or false currently used for 'Primary'. Entry values for 'Side', 'SideName' and 'SideColor' will no longer be required in the new configuration.

```
<whip>
  <EntryType value="whip" />
  <Name value="CONT_SUPER_WHIP" />
  <SideTruth value="true" />
  <Side1 value="true" />
  <Side2 value="true" />
  <Side3 value="true" />
  <Side4 value="true" />
  <Side5 value="true" />
  <Side6 value="true" />
  <Active value="true" />
  <Primary value="false" />
  <Password value="NONE" />
  <Side value="11" />
  <SideName value="CONT" />
  <SideColor value="GRAY" />
  <MenuFile value="menu_super_whip" />
  <Tripp value="true" />
  <SuperWhip value="true" />
  <ExecutionHost value="ANYHOST" />
</whip>
```

FIGURE 3. ICP WHIP Configuration Tags

When a WHIP is configured to be multi-sided, it will communicate with the services by only needing to pass the Super WHIP name in its request (see details in [Web Services Communication, Section 3.2](#)). Each service will respond by returning each of the Super WHIP's Force Side data. The set of data will enable the Super WHIP to view each side's perceptions as it would be available in a standard, single-sided WHIP. Controls on the Super WHIP will then allow users to turn-on perceptions based on a Force Side selection. The perception controls will be a list of Force Side selection options with radio buttons in a pop-up selection window (see [Figure 5](#)). Each WHIP component such as the Map, Command Hierarchy, IMT, etc. will be allowed to control its own Force Side settings (see [Orders, Section 3.4](#)).

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<userdata>
<name>CONT_SUPER_WHIP</name>
<status>>true</status>
<primary>>false</primary>
<side>11</side>
<sidename>CONT</sidename>
<sideColorName>GRAY</sideColorName>
<menu_file>menu_super_whip</menu_file>
<execution_host>ANYHOST</execution_host>
<password>NONE</password>
<scenario>jose50</scenario>
<classification>UNCLASSIFIED</classification>
<!-- Super WHIP configuration and representing sides. -->
<superWhip>>true</superWhip>
<sideRequests>
<side>11</side>
<side>1</side>
<side>2</side>
<side>3</side>
<side>4</side>
<side>5</side>
<side>6</side>
</sideRequests>
</userdata>
```

FIGURE 4. WHIP Configuration File

In the ICP's WHIP tab, once a WHIP has been configured to be multi-sided the WHIP will be allowed to be set back to be a single-sided WHIP. This will re-write the configuration files with a single Force Side set. Duplicating WHIPs in the ICP will not need to change for this design.

3.1.1 ICP User Interface Force Side Selection

The ICP WHIP configuration tab will require changing the interface Side selection column from having an un-editable side indicator to be a series of side color-coded checkboxes for each of the scenario's Force Sides and will include Controller as a selection option for a Super WHIP. The default Primary WHIPs will not be editable by Force Side. Their set Force Side will stay fixed. The ICP will only allow the creation of Secondary WHIPs to be configurable as a Super WHIP and the desired command authority can be assigned there. Tech Control will need to check the boxes for the Force Sides the Super WHIP will be enabled to view and submit orders to. Selecting Controller will permit viewing Ground Truth for all sides on the WHIP components and permit submitting both Controller and Player orders.

3.1.2 Menu File

A menu file with WHIP menu definitions is assigned to each WHIP in the ICP. Typically a Player WHIP is assigned a player centric menu that will list the menu definition and structure for the WHIP menu bar to display the structure and the included IMT screens, Orders and context-sensitive menus that will be found on the assigned Player WHIP. A Controller WHIP will be assigned a controller centric menu with its controller menu structures. When a Super WHIP is configured to include Controller as a side, a special menu file will need to be created in order to access and send Controller type orders. The menu files are user modifiable and can easily be tailored to contain the Orders, IMTs and context-sensitive menus desired.

In order to verify that a selected menu file corresponds to the assigned WHIP, a new menu type identifier will be added to the top of the menu file. This identifier will ensure that, for example, a standard Player WHIP cannot be assigned a controller menu in the ICP. The menu files are defined in XML and the additional identifier will be a new XML tag enclosing the corresponding type of three possible menus types: player, controller and super, with super being a menu file that is composed of both player and controller menus.

3.2 Web Services Communication

The transaction handling of the requests and responses between a Super WHIP and the web services will change in the processing of more than one Force Side for the Super WHIP. Standard WHIP service request handling will not need to change. The Web Services will need to be able to fulfill a Super WHIP's request for data in much the same way a standard WHIP does. However, for a Super WHIP the response will need to take into account that servicing will include, in the case of providing data, more than one Force Side's information. This means that in particular the JXSR, Synapse and XMS will need to know to handle the Super WHIP's name contained in the HTTP service request. The WHIP composes a HTTP service request string based on information it needs to process or retrieve data for display. The request URL string contains an 'interface' attribute that is the requesting WHIP's name to know which WHIP to direct the response to.

As a WHIP is logged in, it sends out request information to the Synapse and JXSR in order to log in the WHIP and get the initial state of the data. The Synapse responds with listings of Synapse directories containing user preferences and saved data. The JXSR responds with scenario related data that corresponds to the WHIP's Force Side and is used to populate the WHIP's components. The requests will be same when a Super WHIP logs in. Each service will know by the configured Super WHIP name that multiple Force Sides correspond to the request. The Super WHIP will maintain collection of the data in separate Force Side collection data structures. This will allow the user after log in to select a Force Side's perception data to display and not require a request to go out to the JXSR when changing Force Sides. The Super WHIP will then only need to the update data being held. The Super WHIP will have on hand the data to readily display and support user Force Side toggling.

The XMS will need to also do the same to permit displaying messages in the Message Browser pertaining to the different Force Sides that make up the Super WHIP. Since Orders will continue to be submitted from one Force Side's perspective, the OMA will not need to do anything different when verifying the Orders submitted comply with model requirements.

3.3 Perception Control And Display

Turning on and off perception data on a Super WHIP needs to be performed by the user as simply as selecting buttons in a pop-up window for the individual Force Sides. The proposed pop-up window containing the Force Side selections will be able to be brought up from either, a menu item, context-menu or plain button in each candidate WHIP component. The Super WHIP will keep each Force Side's perception data in a separate collection. The separation of the perception data by Force Side will allow the user to select a Force Side and have the perception data be readily displayed on the WHIP component, in for example the map by highlighting those units according to their side color. Only one Force Side perception will be allowed to be turned on at one time. This will prevent the potential multiple display of a unit or target as they are perceived from different Force Side perceptions. Each WHIP component, and instance, will be capable of setting its own Force Side perception control according to the user selection. These control settings will only be available to components in a Super WHIP.



FIGURE 5. Sample UI Force Side Selections

Table 3. Component And Module Perception Data Retrieval

COMPONENT/MODULE	PERCEPTION DATA SOURCE
Map	Force Side Data Collections
Command Hierarchy	Force Side Data Collections
Logistics Hierarchy	Force Side Data Collections
IMT	JXSR Request
Sitrep	Component Perception Setting
Message Browser	XMS Request
Orders	Side Selector

Table 3. Component And Module Perception Data Retrieval

COMPONENT/MODULE	PERCEPTION DATA SOURCE
ATOG	Force Side Of Commanding Unit
ATOT	Multiple Linking Files
ATOV	Force Side Data Collections
OTH Gold	JOI Request
Link 16	JOI Request

3.4 Orders

Orders in a Super WHIP will need to be handled in a special a manner because some orders are side dependent. The orders that display foreign units and/or foreign targets will need to be identified and provide an indicator such as a boolean 'side_selector' attribute in the order's definition file. The 'side_selector' will need to be an attribute of the order's unit field that will be used to determine the side the order is intended for, and in these cases the 'side_selector' attribute will be set to a value of 'true'. When an order with the 'side_selector' field set to true is opened, the 'side_selector' attribute will indicate that it is the only field to be initially filled with unit names by the JXSR in the order. The unit names available will comprise of all unit field respective units of each configured Force Side enabled for the Super WHIP. The other fields in the order that require filling by a JXSR request will be postponed until the unit 'side_selector' field is given a value. Upon selection of a unit name, JXSR requests will be sent out to fill the remaining unfilled fields based the selected unit's foreign unit and target perceptions. This will ensure the order correctly verifies and can be submitted.

Since the designated 'side_selector' field will need to have a value set before any other JXSR fields are filled with corresponding values in the order, the field will need to be identifiable to users and indicate that it is to be assigned an entry first before moving down to assign other JXSR related fields in the order panel. Until then the other JXSR related fields will be blank. There are two ways this requirement will be conveyed to users. One is the natural ordering of the fields in the order panel that goes from top to bottom that will aid in driving the flow of user assigned entries. The 'side_selector' field will always be the first field of the JXSR fields that will require a user entry. For orders that contain fields with perception related data, these perception related data fields will always come after in terms of order to a 'side_selector' field, allowing users to naturally first provide an entry to the 'side_selector' field. However this may not be enough to guarantee ease of understanding, therefore in addition to assisting users identify the 'side_selector' field on Super WHIP orders, the field will also be highlighted with a visual indicator on the field for the order.

```

<field name="UNIT" pow="UNIT" oec-name="Squadron" label="Squadron:"
  side_selector="true" require="MANDATORY">
  <class is="UT" allow-none="false" input="map, list, keyboard"
    unit-checks="on_the_same_side, acknowledge_the_receipt, dead, inactive"
    default="NE"/>
  <help>
    <line>The short name of the squadron that is to fly the</line>
    <line>mission. If a Target Type List is specified, the</line>
    <line>squadron's aircraft should have a standard air-to-</line>
    <line>ground load defined and available for at least one of</line>
    <line>the target types on the list.</line>
  </help>
  <fill using="name">
    <with types="squadron">
      <not-equal a="UNIT.command_authority" b="NONE"/>
      <and/>
      <is-true a="UNIT.is_active"/>
      <and/>
      <equal a="UNIT.external_model" b="JTLS_ONLY, JTLS"/>
    </with>
  </fill>
</field>
<field name="NUMBER" pow="INTEGER1" oec-name="Number Aircraft"

```

FIGURE 6. Side Selector Field On OAS Order

3.4.1 Saving And Recalling Orders

Saving and recalling orders will not work differently than now. During configuration of a multi-sided WHIP in the ICP, the created Super WHIP will have its own Synapse profile and save Super WHIP user preferences and orders there. Currently each created WHIP has its own profile found in the \$JGAME/<scenario>/webroot/synapsedata/player_data/<side>/<whip_name> directory. When recalling orders, the Synapse will not need to do anything different in order to provide the Super WHIP with a listing of all the orders that were saved and sent using the Super WHIP. After an order is opened the related saved orders will appear in the order's 'Reference' field drop-down listing allowing users to continue to have the ability of recalling any previously saved order. Saved orders in a Super WHIP will only be available for recall on the Super WHIP.

3.4.2 Order Group Editor

In a similar way that the orders are recalled for an order panel, the Super WHIP will build its order listings for the Order Group Editor with same saved order information from the Synapse's Super WHIP profile. Order groups will be similarly saved as well. After the Super WHIP retrieves the full list of orders then those orders and order groups will be available in the Super WHIP's Order Group Editor. All Order Group Editor features will be available to the Super WHIP.

3.5 WHIP/TRIPP Login

The login screen displays each Force Side in a scenario, and every Force Side lists the WHIP names of the ICP configured WHIPs that are available for login. After a Super WHIP is configured in the ICP the Synapse will register the Super WHIP to allow its login from the standard WHIP or TRIPP login screen. When the Super WHIP is available for login, or is not currently in use, the Super WHIP name will be displayed in each of the Force Side selection lists that the Super WHIP was configured to use in the ICP. This means that the Super WHIP name will be added to each Force Side list of the login screen if the Super WHIP is setup to view that Force Side perception. This will have no impact on and preserve the user interface of the login screen without the need to create a special category or login screen for Super WHIPs. During the login of the Super WHIP, the Synapse will make the login unavailable in the login screen until the Super WHIP is exited.

3.6 TRIPP Display

The TRIPP shares a lot from the WHIP base and because of that, many of the features on a Super WHIP will be available to a Super TRIPP with the exception of orders and messages. The Logging JODA will capture all perception data during recording of the scenario game events in the TRIPP files. Just like a JXSR will know which Force Sides have been configured for a Super WHIP, a Replay JXSR will provision the Force Side perception data so it is available for display allowing users to turn on and off side perceptions during playback for the map, IMT screens, command hierarchy and the other WHIP components available on a TRIPP, as is similarly accessed on a Super WHIP. TRIPP Reports should not be affected by this design.

4.0 Data Changes

No data changes are required for this ECP.

5.0 Order Changes

A 'side_selector' attribute will be added to orders that can be affected by the selection of a Unit in a unit field to determine the unit's foreign units and foreign targets and fill that data in any of the order's foreign unit and/or foreign target fields list.

6.0 JODA Changes

No JODA Data System parameter, structure, or protocol changes are required to implement this design.

7.0 Test Plan

Text *[Describe the basic test objectives and procedures. This Test Plan section may be published as a separate document.]*

7.1 Test 1 Title

Purpose: *[Describe the specific feature, function, or behavior to be tested or measured.]*

Step 1: Text

Step 2: Text

Expected Results: *[Describe the specific model behavior to be observed.]*

7.2 Test 2 Title

Purpose: *[Describe the specific feature, function, or behavior to be tested or measured.]*

Step 1: Text

Step 2: Text

[Describe the specific model behavior to be observed.]

