

JTLS

Version Description Document

February 2014



DEPARTMENT OF DEFENSE
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JOINT THEATER LEVEL SIMULATION
(JTLS 4.1.4.0)

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ABSTRACT

The Joint Theater Level Simulation (JTLS[®]) is an interactive, computer-based, multi-sided wargaming system that models combined joint and coalition resource air, land, naval, and Non-Governmental Organization (NGO) environments.

This *JTLS Version Description Document (VDD)* describes specific features of the Version 4.1.4.0 delivery of the configuration-managed JTLS software suite.

JTLS 4.1.4.0 is a maintenance release of the JTLS 4.1 series that includes code modifications that represent corrections to known Software Trouble Reports (STRs), which are described in Chapter 3. Remaining and outstanding STRs are described in Chapter 4.

This publication is updated and revised as required for each Major or Maintenance version release of the JTLS model. Corrections, additions, or recommendations for improvement must reference specific sections, pages, and paragraphs with appropriate justification and be forwarded to:

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1.0 INTRODUCTION

1.1 SCOPE

This *JTLS Version Description Document* (VDD) describes Version 4.1.4.0 of the configuration managed Joint Theater Level Simulation (JTLS[®]) software suite. JTLS 4.1.4.0 is a Maintenance delivery for the JTLS 4.1 series of releases. JTLS 4.1.4.0 includes the entire JTLS suite of software and the SDBKOR41 Standard Database that supports a realistic scenario based on the current Korean Peninsula theater of operations. Database modifications that were accomplished to upgrade the previous JTLS Standard Database to this current version are summarized in this chapter, as well as [APPENDIX B](#). Detailed descriptions of Engineering Change Proposals (ECPs) implemented for this release are provided in [Chapter 2.0](#).

JTLS 4.1.4.0 executes on the Red Hat Enterprise Linux Version 5 or 6 64-bit operating systems. The Web-Hosted Interface Program (WHIP[®]) user workstation interface can be executed from any Java-compatible Web browser available on any operating system.

1.2 INVENTORY OF MATERIALS

This section lists documents and software that are relevant to JTLS. All JTLS documents included in this delivery are provided in PDF format within a documents subdirectory.

1.2.1 Obsolete/Outdated Documents

No documents have been removed from the JTLS documentation suite for this release.

1.2.2 Unchanged Documents

The following documentation is provided for this release:

- *JTLS Analyst Guide* (JTLS Document 01, Version 4.1.4.0)
- *JTLS ATOT User Guide* (JTLS Document 03, Version 4.1.4.0)
- *JTLS Controller Guide* (JTLS Document 04, Version 4.1.4.0)
- *JTLS Data Requirements Manual* (JTLS Document 05, Version 4.1.4.0)
- *JTLS DDS User Guide* (JTLS Document 06, Version 4.1.4.0)
- *JTLS Director Guide* (JTLS Document 07, Version 4.1.4.0)
- *JTLS Executive Overview* (JTLS Document 08, Version 4.1.4.0)
- *JTLS Installation Manual* (JTLS Document 09, Version 4.1.4.0)

- *JTLS WHIP Training Manual* (JTLS Document 10, Version 4.1.4.0)
- *JTLS Player Guide* (JTLS Document 12, Version 4.1.4.0)
- *JTLS PPS User Guide* (JTLS Document 13, Version 4.1.4.0)
- *JTLS Standard Database Description* (JTLS Document 14, Version 4.1.4.0)
- *JTLS Software Maintenance Manual* (JTLS Document 15, Version 4.1.4.0)
- *JTLS Technical Coordinator Guide* (JTLS Document 16, Version 4.1.4.0)
- *JTLS Entity Level Server User Guide* (JTLS Document 19, Version 4.1.4.0)
- *JTLS Federation User Guide* (JTLS Document 20, Version 4.1.4.0)
- *JTLS C4I Interface Manual* (JTLS Document 21, Version 4.1.4.0)

1.2.3 Updated Documents

- *JTLS Version Description Document* (JTLS Document 17, Version 4.1.4.0)

1.2.4 Delivered Software Components

JTLS 4.1.4.0 may be delivered either on a CD or as a set of compressed TAR files to be downloaded. Either method includes the complete suite of software executable code and command procedures. These software components are included with this release:

- Combat Events Program (CEP)
- Scenario Initialization Program (SIP)
- Interface Configuration Program (ICP)
- Reformat Spreadsheet Program (RSP)
- Database Development System (DDS)
- Terrain Modification Utility (TMU)

Please note that the TMU Edit button on the DDS Map component has been temporarily disabled and will be enabled again once the rebuild of the TMU editing function is completed. See entry JTLS-2014-11855 in Chapter 3 of this document.

- JTLS Symbols Application (JSYMS)

- Lanchester Development Tool (LDT)
- ATO Translator Program (ATOT)
- ATO Retrieval Program (ATORET)
- Convert Location Program (XCONVERT)
- Count Critical Order Program (CCO)
- JTLS HLA Interface Program (JHIP)
- After Action Review Client (AARC)
- Scenario Data Client (SDC)
- Order Entry Client (OEC)
- Order Verification Tool (OVT)
- JTLS Object Distribution Authority (JODA)
- Web Services Manager (WSM)
- Web-Hosted Interface Program (WHIP) and its component programs:
 - Apache Server (APACHE)
 - JTLS XML Serial Repository (JXSR)
 - Order Management Authority (OMA)
 - Synchronized Authentication and Preferences Service (SYNAPSE)
 - XML Message Service (XMS)
 - Total Recall Interactive Playback Program (TRIPP)
- Entity Level Server (ELS)
- JTLS Operational Interface (JOI)
- KML Operational Interface (KOI)
- TBMCS/ICC Interface Program (JTOI)
- JTLS Interface Network Navigator (JINN)
- JTLS Order of Battle Editor (JOBE)

- Database Configuration Program (DCP)
- DDS User Interface (DDS)

Instructions for installing JTLS 4.1.4.0 are provided in the *JTLS Installation Manual*. Installing a previous version of JTLS prior to installing JTLS 4.1.4.0 is not necessary. No other upgrade beyond installation of the compressed TAR files (or CD) is required. The software provided with this delivery is a complete release that includes all files and code required to execute JTLS.

1.2.5 Released Databases

This release includes these sample unclassified databases:

- The scenario developed as the Korea Standard Database and named SDBKOR41 is a large-scale, seven-sided scenario database reflecting the approximate starting positions of units involved in the Korea Peninsula theater of operations. This example scenario was developed using unclassified data sources and is consequently not completely accurate. Discrepancies among actual units and their locations are not detrimental to the intended purpose of this database, which is to provide a recognizable and realistic scenario that demonstrates the simulation capabilities and supports JTLS training.
- The scenario DEMSDBKOR41, which is a reduced version of SDBKOR41, has not been updated from JTLS 4.1.1 for this release.
- The scenario blank40 is the SDBKOR41 database with all force structure data removed, which can be used as a framework for building your customized database.

1.3 INTERFACE COMPATIBILITY

1.3.1 Support Software

JTLS 4.1.4.0 requires the following versions of support software, including operating systems, compilers, scripting utilities, database tools, transfer protocols, and display managers.

- Operating system for the model: Red Hat Linux Enterprise Edition Version 5 or 6 (ES), 64-bit architecture.

Security Enabled (SE) Linux must not be enabled on systems used to execute JTLS or its components. Tests reveal that SE Linux-enabled systems cause frequent and random JXSR crashes and errors. Use of SE Linux to support JTLS is currently not authorized.

Some of our users have reported having a NFS network issue related with the jdb2 process (ext4 file system journal) constantly writing on disk on Red Hat 6 file servers. This issue significantly impacts JTLS execution performance. Some Red Hat 6 users on different online forums noted that the issue does not exist if ext3 file system was used and some other users reported that the latest Red Hat 6.5 updates remedied the problem. However, until we test the impact of jdb2 process on our end, we strongly recommend executing JTLS on Red Hat 5.9 (or higher) file servers, instead of Red Hat 6.

- There are no restrictions on the operating system for client workstations, except that the operating system must have a Java-enabled web browser enabled. JTLS 4.1.4.0 has been tested on the following operating systems:

Red Hat Linux Enterprise Edition Version 5 and 6

CentOS Linux Version 5 and 6

Windows 2000, XP Professional, Vista, or Windows 7 can be used only if the workstation is an external HTTP client of the simulation network.

- Java Version 1.7.0 Update 51 is required for all platforms and must be used to support all workstations.

Because of recent incidents of intrusions into software systems, the United States Department of Defense (DoD) has implemented a strong and strictly enforced Information Assurance (IA) program. JTLS, as software that executes on DoD systems, must comply to the mandates of the IA program, along with all of the third party software used by JTLS, such as Oracle and Java.

One of the DoD IA requirements is that the software must implement a methodology that ensures that the end user keep the software up-to-date and all security patches are properly installed. Java 7 has fulfilled this mandate by implementing an expiration date for its software. After a certain date, all Java related programs will stop working, whether you are connected to an open network or not.

JTLS has decided to meet this requirement by linking our JTLS software releases to the Java 7 security updates. This version of JTLS is released using Java 7 Update 51, which expires on 15 May 2014. A new version of JTLS will be released prior to that expiration date.

JTLS has completed the IA program mandates and the JTLS 4.1 series of releases has been granted an Authority To Operate (ATO) on DoD systems.

- JTLS database tools require use of a certified Oracle database server and the full Oracle Client installation for runtime requirements. Refer to [Section 1.5.2](#) of this chapter for additional installation details.

- Windows software, X11R5 server, Motif 1.2 Library, Motif Window Manager: These items are included as part of the supported versions of Red Hat Linux ES.
- TCP/IP is required for inter-process communication between the JODA data server and all user interface programs. The version of TCP/IP included with the supported versions of Red Hat Linux ES is sufficient.
- The Perl script language is used by the JTLS system and game setup scripts. The version of Perl included with the supported versions of Red Hat Linux ES is sufficient. The Perl program is typically located in the /usr/bin directory. If Perl is installed in a another location, a link should be created from the /usr/bin directory to this program.
- SIMSCRIPT II.5 (SIMSCRIPT to C) translator/compiler: SIMSCRIPT is required for recompiling JTLS code. It is not necessary to have a SIMSCRIPT compiler to execute JTLS, because all JTLS software executables are statically linked with the SIMSCRIPT libraries. The compiler is needed only if you are a U.S. Government organization that can obtain source code and plan to re-compile JTLS SIMSCRIPT code. To obtain a SIMSCRIPT compiler, contact CACI Inc.
- ANSI C Compiler: It is not necessary to use a C compiler to execute JTLS. This compiler is used only by U.S. Government organizations that can obtain source code and intend to re-compile any of the JTLS component programs. The C Compiler version delivered with the supported versions of Red Hat Linux ES is sufficient.
- C++ Compiler: It is not necessary to use a C++ compiler to execute JTLS. This compiler is used only by U.S. Government organizations that can obtain source code and intend to re-compile any of the JTLS HLA component programs. The C++ Compiler version delivered with the supported versions of Red Hat Linux ES is sufficient
- The JTLS DDS (Database Development System) application uses these open source libraries:
 - JFreeChart, licensed under LGPL (GNU LESSER GENERAL PUBLIC LICENSE) by Object Refinery Limited, <http://www.object-refinery.com>
 - JCommon, licensed under LGPL2.1 (GNU LESSER GENERAL PUBLIC LICENSE version 2.1 or later) by Object Refinery Limited, <http://www.object-refinery.com>
 - Commons-math3-3.0.jar, licensed under Apache Software Foundation (Apache License, Version 2.0) <http://www.apache.org/licenses/LICENSE-2.0> OHLA Compliance
- KML Operational Interface (KOI)

The Keyhole Markup Language (KML) Operational Interface (KOI) server utility enables the model to feed operational simulation data to any version of Google Earth™. The display capabilities and data transfer features of this terrain viewer are sufficiently robust

to be used as a base-level operational interface. Operational Players who may be restricted from using the COP, C2PC, or other C4I systems may be able to install and use Google Earth and configure the KOI to provide a capability that resembles C4I for observing perception Force Side data.

Chapter 3 of the *C4I Interface Manual* describes requirements and procedures for using the KOI capabilities.

1.3.2 Special Consideration for the JTLS Air Tasking Order Translator (ATO-T)

The ATO-T executes in two modes:

- In the basic mode, one or more files containing the translated orders is created and the Controller is responsible for submitting an appropriate READ ORDER FILE Order that submits these orders to the model.
- In the advanced mode, the ATO-T connects to the Oracle-based Scenario Database Repository (SDR) and places the translated orders into the appropriate Order Entry Client (OEC) tables. The OEC is responsible for submitting the orders to the model.

The SIMSCRIPT and Oracle library support required by both ATO-T modes are obtained separately. The SIMSCRIPT support is currently provided with each JTLS release. The necessary SIMSCRIPT libraries are released in the ~/bin_support directory for 64-bit Linux. If running in the basic mode, the Oracle libraries are also released in the ~/bin_support directory for 64-bit Linux.

To run the advanced mode, users must have access to an Oracle server. Users must obtain, install, and configure the most current Oracle Full Client.

1.3.3 JTLS High Level Architecture Compliance

The JTLS 4.1.4.0 release is fully High Level Architecture (HLA) compliant, and includes all the programs required to run JTLS in an HLA mode. JTLS has moved to a new Federation Object Model (FOM) located in the \$JGAME/data/hla directory. Federation testing of JTLS is not complete, but some initial tests with JCATS 11 have been accomplished. Future plans include expanding the federation capabilities.

The HLA RTI (Run Time Infrastructure) executive program (rtiexec) recommended for use with this release is RTI-NG-Pro-v7.0 or Pitch pRTI Evolved 4.4.2.0. However, these programs are not included in the JTLS 4.1.4.0 delivery. Users may obtain a full installation package of the RTI software from either vendor: Raytheon Company (<http://www.raytheon.com>) or Pitch Corporation (www.pitch.se). For information about executing the HLA RTI Executive and other HLA-related software, refer to the appropriate HLA documentation and user guides.

1.4 DATABASE MODIFICATIONS

1.4.1 Database Upgrade from JTLS 4.1 Series

No database structure differences exist between JTLS 4.1.4.0 and any previous 4.1 series database, but some errors were discovered in the internally-held database procedures. For this reason, after installing JTLS 4.1.4.0, you must unload and reload any JTLS 4.1 series scenarios that you may have.

To upgrade your previously installed and modified JTLS 4.1.X.0 scenario for JTLS 4.1.4.0, you must unload and reload your scenario. This will recreate the modified stored procedures, database triggers, etc. Failing to do so will cause issues in DDS operations, such as renaming, copying, and deep copying existing records.

If you are upgrading to JTLS 4.1 from JTLS 4.0 or earlier, you must unload and reload your scenario after the modification is completed.

The JTLS Default Symbol Set delivered with this release has been modified. You must propagate this new Default Symbol Set to any of your scenarios that use the Default Symbol Set. Use the procedure that follows. You should not make any modifications to the Default Symbol Set.

Use this procedure to start the JSYMS program to update the Default Symbol Set used by one or more scenarios.

1. Enter the command "jsyms --edit-default" from a command prompt window. Do not use the JTLS Menu > Database Menu for this purpose. This message appears:

"!!! JSYMS Allows Editing and Saving the Default Symbol Set."

2. Select the Default Symbol Set from the drop-down menu and select OK.
3. Select Symbols from the menu bar, and select Save to update all scenarios that use the Default Symbol Set.
4. Close JSYMS.
5. Use the JTLS Menu Option 1 > 1 > 6 (Load Symbols) to load the current Default Symbol Set to your scenario account in the Oracle database,

1.4.2 Database Upgrade from JTLS 4.0 or Earlier

Users who currently possess a JTLS scenario (ASCII file set) compatible with a version earlier than Version 4.1.0.0 can use this recommended modification procedure after installing this new version of JTLS:

1. Create a new Oracle account for the scenario.
2. From the new JTLS account, load the scenario ASCII files to the newly created Oracle account.

This process creates the JTLS schema that matches the previous JTLS version. After all data are loaded to the database tables, the process modifies the schema to match the current JTLS version. For JTLS 4.1, this process supports JTLS 3.0 (or higher) series scenarios only. If your scenario version is older than 3.0, the scenario must be upgraded to Version 3.4 first, by using the JTLS 3.4 version upgrade process. Consult Section 1.5.2 of the *JTLS 3.4.0.0 Version Description Document* for details and procedures.

JTLS users must consider that the automatic modification program inserts default values to the new database fields. Also, a new JTLS version may use previously existing data fields in a different way. Consult the appropriate *JTLS Version Description Document* to identify data fields that must be updated. The Database Modify program is the first process to use to update your databases to the new JTLS version. Changing the values in new or changed data fields is equally important.

The JTLS scenario/database modification process requires 10.2.0.5.4 or higher full Oracle Client installation.

1.4.3 Standard Database Changes

Additional Standard Database changes that are applicable to JTLS 4.1.4.0 are described in [APPENDIX B](#).

1.5 INSTALLATION

1.5.1 Installation Instructions

The *JTLS Installation Manual* included in the documents compressed TAR file that is part of this JTLS delivery provides detailed instructions for installing a new version of JTLS.

1.5.2 Oracle Compatibility and Installation

A full Oracle Client installation (not Instant Client) that matches your database server version is currently a requirement for running JTLS applications. The Oracle Instant Client is not sufficient for JTLS applications because Oracle utilities, such as sqlldr, imp, exp, tnsping, etc., are missing. If you have applied a patchset to your database server, the same patchset should be applied to the Oracle Client installation. For the 64-bit version of JTLS, a 64-bit Oracle Client installation must be used. The JTLS scenario/database modification process also expects 10.2.0.5.4 or higher full Oracle Client installation. Some sites NFS mount their database server as Oracle Client; other sites prefer a full install of the Oracle Client to a different directory that mounts (simple NFS will suffice) to JTLS. Your system administrator can choose the appropriate installation. Assigning the full Oracle Client installation location (or mount point) as the

ORACLE_HOME in the JTLS .cshrc file allows connecting to an Oracle database server (10.2.0.5.4 or higher - including 11g XE) running on any Oracle-certified database server platform.

The new DDS application utilizes the Oracle GlassFish J2EE server, which, like the JTLS WHIP Apache server, is delivered with JTLS and requires no separate installation.

Refer to Chapter 5 of the *JTLS Installation Manual* for additional details pertaining to the Oracle installation.

1.5.3 Disabling Certificate Authority

Keeping with high security standards, R&A has opted to sign its web enabled applications with a certificate from the COMODO Certificate Authority (CA). It uses the Public Key Infrastructure (PKI) to validate the digital signature. Local area networks, intranets and standalone systems that have no outside connection to the Internet must configure their installation to disable certificate revocation checks. If this step is not taken under a closed environment, the JTLS web enabled applications will experience a significant delay in start up. The PKI attempts to validate the certification on COMODO's servers via the Internet. Because of security issues and the expiry of versions, has strongly recommended that Web Start technologies be signed by a CA to validate that an application being run comes from a trusted and registered source under the PKI.

The following outlines the step required to turn off certificate revocation checks. Again, this step should only be taken if the WHIP, TRIPP and/or DDS are going to be run in a closed environment.

Bring up the Control Panel. On Linux, typing 'jcontrol' in a terminal window will bring up the configuration panel. On Windows, go to the Windows 'Control Panel', select 'Programs' then click on '. Both Linux and Windows will display the same configuration panel.

Navigate to the 'Advanced' tab and in the list of configuration options, select the 'Do not check' radio button and click 'OK'. The image below illustrates the corresponding selection in the Control Panel.

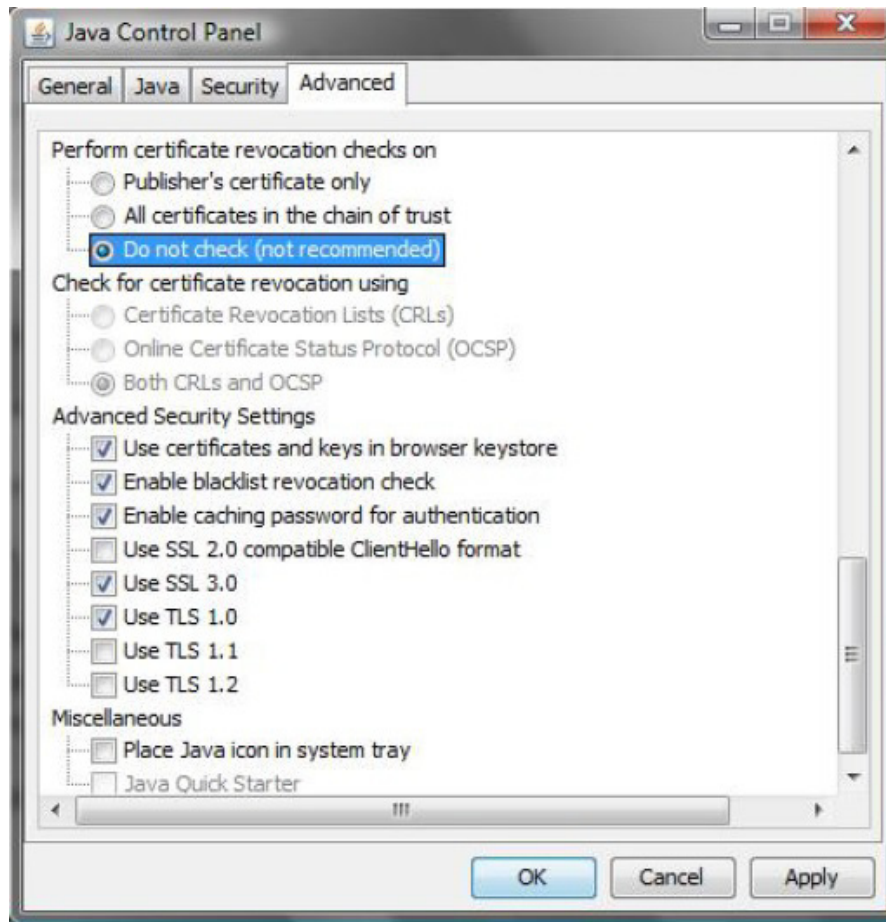


Figure 1.1 Control Panel

Completing this step will allow you to run the JTLS web enabled applications without any external checks and launch the application without the validation delay.

2.0 ENGINEERING CHANGE PROPOSALS

This chapter summarizes model capabilities added to JTLS 4.1.4.0 as a result of implementing authorized Engineering Change Proposals (ECPs).

2.1 JTLS-2013-11487 Delete Several Slides Simultaneously

Summary of Model Change Request

A WHIP user could only delete one graphics slide at a time. The desire was to highlight several slides and delete them at the same time.

Design Summary

The WHIP's Slide Manager was updated to allow multiple slides to be highlighted at once. When multiple slides are highlighted, right-clicking one of those slides will create a pop-up with a "Delete" option, prompting the user to delete the selected slides.

2.2 JTLS-2013-11745 Label National Boundaries On Map

Summary of Model Change Request

It was difficult to designate between national boundaries that were being viewed, especially when there were a large number of them.

Design Summary

The National Boundaries panel, part of the map's Filter Controls, has been updated to highlight a national boundary and display its name on the map when the mouse is hovering over the boundary's entry in the table. Right-clicking the boundary's entry in the table will generate a pop-up, allowing the user to center on the boundary's start, middle, or end point.

2.3 JTLS-2014-11859 Add Squadron JU Quick Retrieval Button

Summary of Model Change Request

On the Squadron DDS table screen, users indicated that it would be very convenient to have a Squadron JU Number Quick Retrieval button.

Design Summary

The button was implemented.

2.4 JTLS-2014-11898 ATOT Read USMTF 2004 Format

Summary of Model Change Request

The current Air Tasking Order - Translator (ATOT) could only process USMTF 2000 version Air Tasking Order (ATO) messages and Air Control Order (ACO) messages. The desire is to also read and parse the USMTF 2004 version of these two messages.

Design Summary

The code was changed to read either the 2000 version or the 2004 version of the USMTF ATO and ACO messages. The user selects which version should be translated as part of the ATOT's Main selection menu.

2.5 JTLS-2014-11909 JOI Object List Display Side Relationship

Summary of Model Change Request

The JOI object list window provides key information such as JTLS name, track name, track ID, status, and JU numbers. During an exercise, the JOI operator requested the list to also display the relationship for easier location of objects.

Design Summary

Code was modified to include the relationship information on the Object list window. Also the capability to sort by relationship was added.

2.6 JTLS-2014-11911 DDS: Font Size for the DDS Tables

Summary of Model Change Request

DDS tables' font size was fixed at size 11, but it would be improved if user can easily change the size of the font for DDS tables.

Design Summary

A font size change option was added to the preferences tool for users to manipulate, and code to implement the font size change function was added.

2.7 JTLS-2014-11912 Test JTLS Database Tools Against Oracle 12c Release

Summary of Model Change Request

The Oracle 12c (12.1) version database server was recently released. Most new JTLS users will purchase or implement the newly released Oracle 12c version instead of older 10g or 11g

versions. All JTLS database tools should be tested against this newly released database server version and JTLS-related specific instructions need to be documented.

Design Summary

All JTLS database tools, including the DDS, SDR components (sdc, aarc, oec) and the scenario load, unload and modification processes, have been tested against the newly released Oracle 12c database server version. The details of creation of JTLS related tablespaces in a pluggable database and Oracle listener service specifications for JTLS client applications were documented in Chapter 5 of the *JTLS Installation Manual*.

3.0 SOFTWARE TROUBLE REPORTS

Software Trouble Reports (STRs) describe software code errors that have been discovered by JTLS users or developers and have been corrected. The following STRs have been identified for this JTLS Maintenance release.

STRs that remain outstanding from previous JTLS versions are listed and described in [Chapter 4.0](#).

3.1 JTLS-2013-11827 Error in Rejection Message for Move Order

The model generates a rejection message when a user orders a ground unit to move to a bad location. The destination may have been unreachable because it is a small island, or there was no available route to reach it. When this happened, the message contained details on the route points. It should have shown where there was no route to the next point, but instead it incorrectly listed all route points as being valid.

The code was modified to properly mark the unreachable route points as invalid. The subsequent message showed the correct status for each of the route points. The reason for rejecting the ordered move now correctly appeared within the message.

3.2 JTLS-2013-11828 Database Embarked Units Not At Ship Location

It is possible to specify formations and units that are embarked on the formations.

For the formations the database developer specifies a formation center and for each ship in the formation a bearing and range from the formation center. In addition, each ship also has an arrival location specified within its standard ship data. Sometimes these do not match, and when the ship arrives in the game the CEP will move it to the proper bearing and range from the formation center.

For the embarked units the database developer specifies which ships in the formation the unit is embarked on. The embarked units also have an arrival location specified within their normal unit data. When the embarked unit arrives it will ignore its unit specific location information and instead will pick the first ship on which it is embarked and use its location as the icon location (note that what constitutes the first ship is determined by the CEP and not controlled by the Database Developer). This ensures that the embarked units appear onboard ships from the WHIP and COP perspective.

However, if the embarked unit arrives before the first ship it is embarked on, the model chooses the ship's database location and not the bearing and distance from the formation center. When the ship arrives it is then placed at its bearing and distance location, leaving the embarked units at the wrong location and likely giving the appearance they are floating in water. Note that this is

purely an initial picture issue since as soon as the ship moves as part of a formation movement it will also move the embarked unit icons.

The ship arrival logic was modified so that the code now checks if the ship has any embarked units. If it does, for each embarked unit that should be co-located with the ship the location of the embarked unit is updated to the location of the ship.

3.3 JTLS-2013-11829 Inform Tech Controller When CEP Reserving Unit Arrays

When initializing the Standard Database (sdbkor41) there was a large jump in the memory requirements (on the order of a 4 GB increase) when the CEP is reading in the Squadron Link16 Blocks. The Link16 Blocks should not take up that much memory.

In fact the Link16 blocks do not take up that much memory, but the model was not informing the Technical Controller that it then reserved unit arrays and initialized all the units for the scenario. It is these additional actions that are requiring the memory.

Additional screen output statements were added to inform the Tech Controller when the CEP and SIP are reserving unit arrays and performing other unit initialization functions.

3.4 JTLS-2013-11830 Add Additional Information To SIP Console

When moving in a new database it is normal procedure to run a Setup and a verification of the scenario at the same time. These are both launched via the Javamenu and each starts a terminal window that specifies the SIP is running and the scenario name. However, it is not possible, but is desirable, to tell which of the terminal windows is running which SIP option.

Add an option text to the title of the SIP console that can be used to tell which of the multiple SIP options is running. For scenario setup the console title now states SIP/Setup and for scenario verification it states SIP/SVP.

3.5 JTLS-2013-11831 Cannot Cancel Airlift Mission Under Runway Delay

Some Airlift missions cannot be canceled when they are experiencing Runway Delay. Other cancellations occurring later in Airlift Operations and under Runway Delay are handled correctly.

The code was modified to permit the cancellation of an Airlift mission when under the condition of Runway Delay.

3.6 JTLS-2013-11833 Dialog Syntax Changes Mis-Matched DCP Database

When the DCP is started, it searches for an existing file that defines the configuration parameters. This file is referred to as the DCP database, and within the file is a DCP version number. If the file version number does not match the expected version number of the DCP, a dialog pops up informing the user of the issue and providing them an opportunity to delete and

create a new database file. However, the displayed message contained English syntax errors and was overly complicated.

The message that appears within the dialog was simplified and corrected.

3.7 JTLS-2013-11834 Reorganized Orders Definition Stylesheet

The orders definition stylesheet, which processes order xml files, had many deep nest loops in the group within group in the search logic. Those searching node set use relative paths which are using the keyword: './.'. Using the relative path is not efficient to debug the code when the nest is deeper.

The template code was modified to declare the variables which specifically select each node set. Using variables to search through made the code cleaner and easier to debug.

3.8 JTLS-2013-11835 WHIP Duration Table Cells Throw Error with Empty Value

Adding an empty (null) value to a table cell that is represented as a duration caused the table to display improperly.

A check was added to the code responsible for rendering the duration table cell in order to handle empty values.

3.9 JTLS-2013-11836 WHIP - Loading Map and UOM Preferences

User preferences for the map component were not being properly loaded from the save file, so default values were being used. Location and decimal precision preferences in the Unit of Measure preferences were also not loading properly.

The loading of preferences has been fixed to preserve the previously saved user preferences for the map and units of measure.

3.10 JTLS-2013-11837 Fortify Issues (Unreleased Resource: Streams)

The government identified a number of code issues using the code analyzer Fortify. This STR addresses the issue in the category "Unreleased Resource: Streams."

Modified to close streams when no longer in use.

3.11 JTLS-2013-11838 SVP Text Output Causes DDS/SVPR Error

The Scenario Verification Program (SVP) generates an XML listing of errors for a scenario. This listing contains the error and warning numbers for the scenario, along with key pieces of scenario data for each of the errors and warnings. The XML file is combined with a stylesheet which produces a more robust XML output with readable error and correction messages and correction action items. The name of this final XML output is also written into a file,

currentErrorFile, which the DDS/SVP Reader (SVPR) checks and opens the specified file. However, the stylesheet can also be run from the command line to generate a readable text output without the correction action items. When this happens the *currentErrorFile* is updated with the name of the text file. If a DDS/SVPR is opened at this point it will find the name of a text file in *currentErrorFile* and will attempt to open it as a properly formatted XML file. Since the text file is not a properly formatted XML file this causes the DDS/SVPR to throw an exception.

The script that invokes the stylesheet was slightly modified to only update the *currentErrorFile* if the output mode is XML. In addition, the stylesheet itself is being modified to add an error/warning label and associated number to each error and warning in the text output. The error/warning label and associated number of being removed from the message attribute of the XML template file since this information is already available to the SVPR via other attributes.

3.12 JTLS-2013-11839 On Restart Tanker Mission Fuel Percentages Not Correct

An air refueling mission displays the percentage and amount of fuel it has to provide to other missions. On a Restart this data is not properly computed and displayed. The problem corrects as soon as the tanker moves, but it is not correct when restarting.

The proper computation was used on a game restart when initializing an existing mission.

3.13 JTLS-2013-11840 Cannot Create DDS User In DCP

The Technical Controller configuring the DCP deleted the last DDS user and was then unable to create any new ones. The user was instructed to remove the DCP configuration file in its entirety and start the configuration from scratch. However, despite this workaround, correcting the code was still required.

The DCP code was modified so that last DDS user can not be deleted. However, other problems were discovered in the course of this change and were also fixed:

- 1) Numerous sections of code and comments referred to the ICP instead of the DCP.
- 2) References to GIAC or WHIP existed instead of DDS.
- 3) DDS user names were being placed in a Flow Panel with the items centered instead of right justified within the left hand tree window.
- 4) Renaming a DDS user was throwing a traceback and was not renaming the user at the database level, because the user name was being changed before searching for the old database name in the HashMap to remove it, reassign it, and add it back.

3.14 JTLS-2013-11841 JINN: Upload Copied Unit Show Error

Units were copied from existing Units in the JOBE. When uploading the database to the JINN, the JINN returns a FAIL_COPY error.

The JINN and push code were modified to correct the error.

3.15 JTLS-2013-11842 DDS Unable to Save UOM Preferences

It was not possible to save Unit of Measure preferences in the DDS, despite the DDS containing the same basic functionality as the WHIP for this feature.

A file saved to the local machine is now used to save and load Unit of Measure user preferences.

3.16 JTLS-2013-11843 DDS Map Group Edit Working Incorrectly

For the 4.1.3.0 release, the DDS Map group move was fixed so that Units don't get moved to the same location. However, a bug in the fix resulted in the Units' relative positions being more dispersed after the move.

The bug was due to incorrect calculation of the Units' new locations incorporating the offsets in the DynamicUnitsEditorLayer. The bug was corrected, and the Units' relative positions are preserved after they are moved to a new location.

3.17 JTLS-2013-11845 DDS: Mouse Over Cursor Tooltip for Network

When all network codes (Pipeline, Railroad, IADs, OpArea, National Boundary, FlightPath) transferred from the GDP to the DDS, each editor layer added to MapMouseListener interface which has the same name method: mouseMoved of the super class.

Therefore, when the user did moused over the network object, the super class mouseOver method, which used to be called to receive Tooltip text, was never called. Instead, implementation of MapMouseListener mouseMoved was called.

Each network editor layer class is modified such as; Utilized the mouseMoved method in the editor layer that is implemented for MapMouseListener interface let call to get Tooltip text. Removed @Override from getToolTipTextFor method since super class never call this method.

3.18 JTLS-2013-11846 Crash Creating OPMs From Checkpoint

The SIP crashed while attempting to create OPMs (Online Player Manuals) from an existing checkpoint.

A change earlier in the year provided for removing some data (Debug Object Names) from checkpoint saves because saving it was unnecessary. This was correctly done in both the CEP read and also the write code. However the analogous SIP Read file was not also updated. The error was corrected. OPMs can now be regenerated from checkpoints.

3.19 JTLS-2013-11847 DDS: Screen Snapshot Does Not Have Menu Items

The DDS map 'Tools' menu has a Screen Snapshot menu item, but selecting this menu item does not do anything.

Added the missing code to the map internal frame class. The snapshot menu needed to be added to menu items which are provided by the SnapShot class.

3.20 JTLS-2013-11848 JOBE Targets Are Not Being Copied

In the JOBE, after some targets were copied, the data saved, and the JOBE exited, upon restarting the JOBE, the newly copied/cloned targets disappeared.

This issue was a bug that was not fixed properly in the JTLS 4.1.1.0 release. JTLS 4.1.1.0 fixed a bug preventing the save of newly created targets and HRUs. However, the fix only worked for targets that were created from scratch, i.e. with a "NEW" ReturnStatus. The problem still existed for targets which were created by copying/cloning existing targets.

The code is now fixed and tested.

3.21 JTLS-2013-11849 DDS Supply Category Table Error

The DDS "Unit Supply Category" table had an incorrect column label, and no link to the corresponding page in the Data Requirements Manual (DRM).

The Unit Supply Category table lists all the units that have unique support unit assignments for specific supply categories. These specific Supply Category (SC) assignments override the Routine Support Unit assignment when the unit requires resupply of the specified SC and submits requisitions. The column label for the column listing the units in the game that are designated as Specific SC Support Units was labeled as "Routine Support Unit". This was misleading, and the column title was changed to read "Specific SC Support Unit".

A link was created to the corresponding page (UT SPT UNIT ARRAY POINTER) in the DRM.

3.22 JTLS-2013-11850 Make for Java Not Cleaning up tmp files

The make script for Java was leaving files in the /tmp directory. If a project was compiled under one user, compiling as a different user on the same workstation would fail since the ownership of /tmp and the temporary files prevented their deletion. The script is using ant move, however it appears the files were just being copied.

The ant script was modified to delete the files after they have been copied to the appropriate dist directory.

3.23 JTLS-2013-11851 CEP Crash Creating HRU With ADA Target

The CEP entered SimDebug when a Player sent a Create HRU order. The applicable HUP required a SAM.AAA target, and the specified Parent Unit did have one of the required type and with more than enough elements.

The Parent Unit had the required type of SAM.AAA target. This target had more elements (TG.NUMBER) than the HUP target needed. The problem was an error in the code wherein the CEP subtracted the TG.NUMBER for the new target (the one for the HRU) twice from the TG.NUMBER of the old target (that of the parent unit). This caused a zero TG.NUMBER, and later in the code an attempt to reserve an array of length zero. The error was corrected.

3.24 JTLS-2013-11852 SVPR Not Handling Colon Separated Entries Correctly

Entries in the SVPR Error/Warning table containing a colon are not displaying descriptions correctly.

Elimination of duplicate error/warning references within template XML file also needed to have import code modified to eliminate keying upon those references when adding the item to the error/warning table.

3.25 JTLS-2014-11853 JINN: Setup Scenario Only Option Did Not Exist

When setting up a scenario in the JINN, the user is asked if they want to unload the database and setup the scenario. If the user does not want to unload the database and declines, the process ends. There was no option to setup a scenario without unloading the database in the JINN.

The JINN code was modified to allow the user to decline to unload the database and only setup the scenario.

3.26 JTLS-2014-11854 Illegal Formats Allowed for IFF Mode Squawks on Orders

WHIP Air Mission Orders allowed illegal text values to be entered in the MODE 1, 2, and 3 Squawk fields.

Options on Air Mission Orders under the "ATO Data" tab allow specification of MODE 1, MODE 2 and MODE 3 IFF Squawks. In real life, these are two character (for MODE 1) or four character (for MODEs 2 and 3) octal values. The WHIP allowed any text characters in the fields. The XML definition files for the related orders, a total of 21, were modified so that now only the characters 0 through 7 are allowed in each position in the 2 or 4 character Squawk entry fields.

3.27 JTLS-2014-11855 DDS Terrain Hex Data Download Inefficiency

The DDS client uses a lot of memory to download and hold the terrain hex data, so much so that it may require the user to allocate an extra large max-heap-size upfront in order to run the DDS client if the scenario has a large terrain hex file.

The terrain hex data handling was reworked, so that the DDS client will download the hex data and no longer have to hold each hex as an object in memory. As a result, the TMU Edit button on the Map component has been temporarily disabled - it will be enabled again in the future once the TMU editing rebuild is completed.

3.28 JTLS-2014-11856 Problems With Errors 415, 416, and 417

For some time users have been complaining about SVP Errors 415, 416, and 417 and in many cases the impossibility of fixing these issues especially as described in the documentation.

Error 415 was attempting to determine if a unit that was supporting other units and/or Air Defense Sites had data that would allow the unit to provide the needed supplies. To accomplish this task, the SVP first compute the daily consumption requirements of all of the supported units. It then looked at the Login Build events scheduled for the supported units and computed the average "magically" delivered supplies to these units per day. By subtracting the average magically delivered supplies from the daily consumption, the SVP assumed that the remaining daily requirements needed to come from the support unit. The design came to the conclusion that this portion of the SVP code was reasonable and worked.

The problem with Error 415 came about when the SVP attempted to determine the daily supply requirements for the supported Air Defense Sites. Since Air Defense Sites use weapons on an As Used basis there is no JTLS data that provides the SVP with a daily usage estimate. To solve this problem, the SVP assumed that a full ADA site stockage objective would be used per day. Besides being a pretty hefty assumption, in most databases ADA weapons are a highly restricted supply category and the user has no intention of giving support units the supplies needed to provide ADA site with that number of weapons. This made it impossible to solve the Error 415.

Error 416 and 417 looked at other aspects of this resupply conundrum.

To solve the problem, the JTLS database team felt that first Error 415, 416, and 417 should NOT be errors. They have nothing to do with the models ability to operate, but simply point out possible resupply issues with the database. Thus Error 15, 416, and 417 were removed. We added three new warnings: 1448, 1449, and 1450.

New Warning 1448 - this warning considers only the supply consumptions issue of the old Error 415.

New Warning 1449 - Determines if a unit that supports Air Defense Sites does not come to the theater with enough supplies to completely fill up the ADA sites, the warning is generated. This

may be exactly what the user desired to represent the exercise starting with a degraded ADA capability.

New Warning 1450 - is only generated if a unit that supports Air Defense Sites has its own support unit from which it will requisition supplies. If the Air Defense Site supporting unit does not have a stockage objective that meets the needs of all of its supported Air Defense Sites, the warning is generated. This means that the unit will never requisition enough to completely support its Air Defense Site responsibilities. Again, this is a warning because it is possible that the scenario does not want all Air Defense Sites fully stocked to represent limited weapon availability.

3.29 JTLS-2014-11857 Cleanup of AAR Reports

Some AAR reports that were not generating, while others were generating but had no data to report, of which the end-user was not informed.

Either the output of the AAR report had been modified but the stylesheet had not been updated, or the stylesheet had an error. In almost all cases for the report the accompanying text was looking in the wrong place for the language file. The errors were corrected.

3.30 JTLS-2014-11858 OPM Generator Script - Lowercase Variable Names

The Unit of Measure data for OPMs was being generated inconsistently due to case sensitivity. The data needed to be in lower case, but the generation script would not always write the data in lower case.

The script responsible for generating the UOM data for OPMs was changed to pass only the option to convert names to lower case.

3.31 JTLS-2014-11860 Errors Recalling On Demand Routes and Range Rings

On demand routes and range rings were being saved as part of a save of a Map View. The saved View caused exception errors after being recalled when the owning object of the route or the range ring no longer existed in the game.

Because on demand entities can belong to a transient object such as an Airmission, attempting to recall the on demand entity is not sensible for a non-existent object. This was corrected by removing the save and its respective load of the on demand route and range ring, thus preventing the error exceptions.

3.32 JTLS-2014-11862 Logic Error Generated Attacking Unowned Target

A logic error was generated each time an airmission attacked an unowned target. The model was attempting to determine the perceived side of the unowned target. These targets do not have a perceived side; the detecting side always knows an unowned target, such as a bridge, is unowned.

The logic was changed so the perceived side for an unowned target is always returned as UNKNOWN, meaning it is not associated with a specific side.

3.33 JTLS-2014-11863 Western Latitude Greater Than 100 Wrong In SVP

The majority of locations issues reported by the SVP were written out using a format of a total of 10 digits with 6 significant digits. Since western longitudes are negative numbers this format did not support longitudes with a value greater than 99.

The SVP code was thoroughly reviewed and all of the location error and warning statements were changed to use a consistent 11 digit format.

3.34 JTLS-2014-11864 Glassfish Script Update

Undeploy and redeploy in the Glassfish script were not working.

There was an error in the naming of a Glassfish file, which has been corrected. Shortcuts for turning debug on and off were also added.

3.35 JTLS-2014-11865 ATO Translator Load Suitability Checks Inaccurate

The ATO Translator (ATO-T) checks to determine if the select aircraft are capable within JTLS to accomplish the ATOs assigned task. To make this determination, the ATO-T looks at the database assigned load for the specific task. This check is not always accurate because the ATO-T does not consider the default load for the aircraft. This means the ATO-T may report an error when no such error exists.

The ATO-T's initialization file was changed to include the default load for each aircraft class in the database. Given this information, the ATO-T can now properly determine if the Default Load and database assigned task load can accomplish the task indicated in the ATO message.

3.36 JTLS-2014-11866 Warning 6020 Generated Even If Turned Off

All 6000 series errors and warnings are accomplished only if the user indicates that ELS data should be checked. Even with the ELS data check turned off Warning 6020 could be generated.

Warning 6020 is generated as the data is being read and when this happens the setting of the Ignore Warning Flags has still not been accomplished. The easiest method to solve the problem was to allow the generation of the 6020 messages and then delete them if the user did not indicate that the ELS messages should be generated.

3.37 JTLS-2014-11867 Squadron JU Check For Non-Used Squadrons

During an exercise build process, the Exercise Audience indicated that they wanted to zero out all of the JU Numbers for squadrons that were in the database but for which they had no

intention of using. The squadrons were not scheduled to be TPFDDed into the theater during the exercise.

This put the database developer in a "Catch-22". If the squadron JU assignments were removed from the database, the SVP generated warnings that Link-16 squadrons did not have assigned JU Numbers. If they were left in the database, the assigned JU numbers could not be used by squadrons that were going to be used in the exercise.

The squadron JU Number checks are now only accomplished for squadrons that will arrive within the first day of the exercise. This does not stop the database developer from giving these squadrons JU numbers. If they are given JU numbers, the overlap checks are still done. This change simply does not count the lack of a JU number for squadron's arriving after the STARTEX date as a reportable problem.

3.38 JTLS-2014-11868 IIR Negative Report Not Correct

The IIR report generated when there is nothing to report did not completely match the USMTF IIR format. There were a few inconsistencies between it and an IIR report that did report things.

The IIR report was cleaned up so it matches the IIR format. The report template was changed so the user can distinguish between a negative report indicating:

1. There was nothing in the area to see. In this situation the IIR reports a collection significance value of NRC (No Reportable Change)
2. There were assets in the collection area but nothing was picked up because of the random collection process. In this situation the IIR reports a collection significance value of CLC (Cloud Cover).

3.39 JTLS-2014-11869 SVPR Error/Warning Filter Not Cleared After Actions

Error/Warning List Filtering failed to clear its value when a scenario developer either makes a selection from the Error/Warning items list or when they perform an XML error file reload.

Error/Warning List Filtering now clears its editor value after a user makes an Error/Warning item selection or after performing a XML error file reload.

3.40 JTLS-2014-11870 SVPR Error/Warning Selection Duplicated Functionality

Changing a selection in the Error/Warning list performed the same function as toggling on and off the check box at the head of that selection row, populating resolutions in the Resolution list.

Toggling the check box at the head of each Error/Warning list item row no longer populates the Resolution list with resolution items.

3.41 JTLS-2014-11871 SVPR Table Editor dialog wrapper misleading

During error/warning resolutions, table editors are frequently brought up to place the scenario developer to as close to the fields associated with the issues as possible. A set of functions was then presented to the user that mislead them into believing the actions of the table editor could be undone if the Cancel button were to be selected or the table editor becoming terminated.

The dialog wrapper of the table editors have been discontinued and the toggling of an item completion has been placed at the beginning check box of each Error/Warning list item.

3.42 JTLS-2014-11872 SVPR Resolution Selection Duplicated Functionality

Changing a selection in the Resolution list performed the same function as toggling on and off the check box at the head of that selection row

The check box at the head of each Resolution row item has been discontinued.

3.43 JTLS-2014-11873 SVPR Error/Warning space stripping in description

Extraneous spaces within the Error/Warning list descriptions had been stripped, causing descriptions to periodically appear aberrated when text ran together

Space stripping in the Error/Warning list descriptions has been discontinued.

3.44 JTLS-2014-11874 SVPR UOM precision not set from Preferences Menu

UOM precision has been curtailed to one decimal point

UOM precision now accepts the value designated in the Unit of Measure Preferences options.

3.45 JTLS-2014-11875 SVPR Resolution descriptions are not fully displayable

Resolution descriptions with long text are truncated, causing the scenario developer to take action to see entire content.

Line wrap for resolution descriptions now contained under the SVPR View menu, along with line wrap for Error/Warning descriptions.

3.46 JTLS-2014-11876 SVPR Table Close All user interface inconsistent

Capability to close all table editors is placed in a location inconsistent with overall DDS design.

Close all table editors is now placed in the DDS file menu as its first item.

3.47 JTLS-2014-11877 SVPR Resolution Marking Failed Certain Items

Using the resolution item marking facility, it failed to mark item completed when reloading error XML file.

Changed how the SVPR dealt with HTML character encoding, which failed when dealing with content containing parenthesis, usually associated with items having UOM conversions.

3.48 JTLS-2014-11878 DDS Deleting Target from Command Hierarchy Not Working

When deleting a single target from the DDS client's Command Hierarchy, a gray bar appeared on the screen, but nothing else happened. The gray bar is supposed to be the splash warning that displays a message informing user the deletion is in progress, and it should disappear after the deletion is completed, but the message text was not displayed and, since no deletion request was sent to the DDS server, the gray bar stayed on the screen.

This error is due to a bug in the code logic where target deletion from Command Hierarchy was ignored. The logic was erroneous because it assumed target deletion was taken care of by the "delete_units" stored procedure. It failed to taken consideration that user can choose to delete a target without deleting its owning unit. The code is now fixed.

3.49 JTLS-2014-11879 Shutdown Exception After Opening the Message Browser

After opening a Message Browser, the WHIP would throw a null pointer exception error on exit of the WHIP. This occurred because the file that contains message status information was coming back as null during the exit. The null value came back for a status file that did not exist and was inadvertently introduced while addressing a Fortify issue. A get file call had been put in place of the correct call to create the file.

This was corrected by correctly calling the create message status file in the shutdown hook thread, thus clearing the exception.

3.50 JTLS-2014-11880 ELS Unload Not Included With Scenario Download

Under the Tools menu in the DDS, selecting Scenario Download would provide the correct scenario files, but would not create the subordinate ELS directory or its associated files.

Modified the code to run the appropriate script within the DDS to allow the Scenario Download to automatically provide ELS data.

3.51 JTLS-2014-11881 Information Not Stored in Log File

The JXSR normally sends messages to the screen for status updates and error reports. These messages should also be written to the log file. Some of the messages only appeared on the screen but were never saved in the log.

In some cases, the code used a method which only wrote information to the screen. This method was changed to also write information to the log file.

3.52 JTLS-2014-11882 Inactive Order Panel Field

An order panel field was inactive (grayed out). No entry in the field was possible and the reason for this was not immediately apparent.

Some order panel fields have an attribute that keeps the field inactive until a value is entered in another field. It is not always obvious what other field has to be completed in order for an inactive field to become active. For several of these fields, brief statements were added to the order field Help texts to tell the user what other field needed to be filled in order to make the currently inactive field active.

3.53 JTLS-2014-11883 Crash When Initializing Directed Search Area

The model crashed when a player was attempting to create a Directed Search Area (DSA). The new DSA was defined by four unique locations which form an area. The CEP crashed before the DSA was created.

When a DSA was created, the code attempted to initialize two arrays of data, one for the locations and one for the radii of pertinent objects. However, almost all types of DSAs use just one or no radius to define the DSA. Only DSAs which represent BE Facilities have multiple radii, one radius for the size of each object in the BE Facility.

When a new area-type DSA was created, the program attempted to access radii data which did not exist. This caused the crash. A code change was made to only access the relevant radii data depending on the type of DSA. This prevented the program from erroneously accessing any bad or non-existent data.

3.54 JTLS-2014-11884 Login Build Occurs Before Unit Arrive

If a database has a unit arriving at time zero and a Login Build arriving for the unit also at time zero, the Login build occurs prior to the unit arrival. This is a perfectly legal database construct, but the Login Build is designed to occur after the unit has gone through its arrival logic.

The problem was the manner in which the Login Build event was scheduled. Instead of scheduling it at time zero, the code indicated it should happen immediately, which in JTLS means before any other events occur. The code was changed to make sure that the Login Build event was scheduled at time zero and the remainder of the JTLS timing logic will make sure that it occurs after the unit arrival, also scheduled to occur at time zero.

3.55 JTLS-2014-11885 Emitter Load Initialized Before JODA

During an exercise, a checkpoint was taken and game speed was set to zero. During this pause period, the air player entered some orders which resulted in a change to the status of an air

mission's sensors. This change caused an update to be sent to the JODA. This all worked as desired.

Then, because of the exercise design, it was necessary to restart from the checkpoint and push orders. Since the orders were entered at the same time as the checkpoint, the orders were executed immediately after being read, prior to the JODA being initialized. The orders again wanted to update the JODA, but because it had not yet been initialized several JODA errors resulted.

The model now checks to make sure that the JODA is initialized before attempting to update the mission's emitter objects.

3.56 JTLS-2014-11886 JODA Error When Squadron Diverts

When a new squadron is created because an aircraft must divert to a new location, a JODA error is thrown when updating the Squadron's Unidentified Number before the squadron was initialized in the JODA.

The logic sequence was altered so the Squadron's Unidentified Number is not sent prior to the Squadron's existence message is sent to the JODA.

3.57 JTLS-2014-11887 More Efficient Check For Duplicate ICAO

The code to determine if a scenario had inappropriate duplicate ICAOs was correct but very difficult to understand and therefore maintain.

The code was simplified as part of the ongoing maintenance of all JTLS code.

3.58 JTLS-2014-11888 Easily Retrieve Runways Assigned To Airbase

In the DDS, it was easy to go to the Runway Target Table and quickly retrieve a list of airbases that could use a specific runway. The reverse was not true. It was a difficult job to determine exactly which runways a specific airbase was allowed to use.

A quick retrieval button was added to the airbase table display so the runway information could be quickly retrieved. While reviewing how to implement this minor improvement, the development team noticed that the help associated with the meaning of the data in the associated runway table was misleading. This issue was corrected at the same time.

3.59 JTLS-2014-11889 Multiple Trip Squadron Airlift

The model crashed when some aircraft were told to airlift a helicopter squadron from one location to another. This airlift took several trips. As the first load of the squadron was being delivered, the model crashed while attempting to update the new airbase status. This computation requires the model to count the total number of aircraft at the base and the model logic assumed that a squadron unit would always have an aircraft record even if there were no

aircraft left in the squadron. The first load of the delivered squadron did not include aircraft and therefore the detachment did not have an aircraft record and the model crashed.

Since this is a perfectly legal sequence of events, the model was changed to check for the existence of the squadron's aircraft record. If it does not exist, a value of zero aircraft is returned for that squadron. The situation will change as soon as a subsequent load of the squadron is delivered.

3.60 JTLS-2014-11890 Off Board Detection

One of the basic intelligence collection rules in JTLS, is that a side does not get to know about anything off the game board unless they own it. This is an important rule because the model limits the killing of things to objects on the game board and as long as we do not allow a side to see any object off the game board, the model can easily stop any possibility of combat interaction off the game board. This is such an important concept that the model generates a logic error if the intelligence model attempts to provide intelligence information to a side for a foreign object off the game board.

A user created a database where this logic error was triggered.

The update occurred because two friendly sides were sharing a runway off the game board. Side 1 indicated that Side 2 could use its runway. Within JTLS when this happens, Side 2 is told of the full condition of the runway at game start. This logic sequence did not check if the runway and the Side 1 and Side 2 airbase were off the game board. The check was added. Side 2 will not get to see the runway off the game board, but the model still allows the Side to use the runway when launching a mission of this off board location.

3.61 JTLS-2014-11891 Incorrect SVP Warning For Overlapping Track Block

The SVP was incorrectly reporting that there was an overlapping track block number of zero (0). This was incorrect because the aircraft were Link-16 Self Reporting only aircraft. The track block of zero is appropriate.

The overlapping track block check is now skipped if the block is specified from 0 to 0. This means the aircraft cannot report tracks, but can report itself using the specified JU Number.

3.62 JTLS-2014-11892 Regenerate OPM from Checkpoint Failed on Debug Data

The regenerate OPMs from a checkpoint code was still reading the removed debug object information.

The write code had already been modified to remove the debug object data. The read code was still trying to read these data. The code was modified to remove any reading of the debug object information. This code was only accessed when the user regenerated the OPM from a checkpoint.

3.63 JTLS-2014-11896 DDS: Airbase Unit Does Not Display Max AC Capacity

In the DDS Sitrep, Naval and FARP units display Max AC Capacity but Airbases do not.

Code was added so that Airbases now display Max AC Capacity on the DDS Sitrep.

3.64 JTLS-2014-11897 DDS: Logistic Hierarchy Failed Rearrange Tree

When a supply category is selected besides Regular Support and the 'No support unit' menu item was selected from a unit on the Logistic Hierarchy tree, the tree should be rearranged based on the selected supply category. However, it was automatically rearranged back to the default, which was Regular Support.

Code was modified to check the current status of the supply category and rearrange the Logistic Hierarchy Tree by the selected supply category.

3.65 JTLS-2014-11899 Crash Sending A New HRU A Future Arrive Time Move Order

If the first order given to an HRU while in a dual-capable hex is a future arrive time move order, the model crashes attempting to access the HRU's non-existent route as the logic tries to compute the length of time needed for the HRU to travel on foot and using its assigned small boat.

The model logic was corrected to expect and properly handle the crash situation.

3.66 JTLS-2014-11900 Strategic Lift Mission Errors

Strategic Lift Missions always take off immediately - no matter what start time is entered. Furthermore, the mission did not accept the planned stops entered in the order.

The order had not been properly adjusted for the new JTLS 4.1 format. The code was changed to match the order being generated by the WHIP.

3.67 JTLS-2014-11901 Bad Formatting In Convoy Asset Report

The portion of the Convoy Asset Report that lists the assets in the Convoy was obviously formatted incorrectly, making it difficult to read.

The new line character was typed incorrectly in the message. This issue was corrected and the report now reads properly.

3.68 JTLS-2014-11902 Bad ASCII Checkpoint With Future Signature Target

Signature or non-functional targets, although seldom used in JTLS, can be built in a database to represent special capabilities that a unit owns that may identify the unit. For example, you could give a unit a Signature Vehicle target that represents a Mobile Chemical Distribution truck. If an

opposing force ever detected the target, the intelligence staff would immediately identify the unit.

There are six different types of Signature Targets: Aircraft, Combat Arms, Vehicles, Ships, Small Boats, and Supply Types. An ASCII checkpoint problem was experienced for a database that had a Signature Small Boat Target scheduled to be created in the future as part of an exercise Major Event. The model would crash reading in the ASCII checkpoint whenever there was a Signature target scheduled to be created in the future.

The model did not properly ask which type of Signature target was scheduled to be created in the future. Each type belongs in a different file. The code was putting the single Signature target in each of the six target files. The code was corrected to output the future target information only once by placing the information in the proper Signature Target Type file.

3.69 JTLS-2014-11903 Improve OPM Minefield Type Page

The OPM page for Minefield Types was not organized well and was missing the Unit Of Measure button for the Minefield Type Radius.

The code was rewritten to make the Minefield Type page more user friendly.

3.70 JTLS-2014-11904 Inconsistency In Submarine SUP and Unit Parameter

A Ship Unit Prototype has a parameter called SUP TYPE, which can take on the values of .CARRIER, .COMBATANT, .SUPPLY.SHIP, .AMPHIB, .HELO.CAPABLE, .SUPPLY.HELO.CAPABLE, AMPHIB.HELO.CAPABLE, and .SUBMARINE.

A unit has a parameter called UT BASIC TYPE, which can take on the values .SURFACE, .SUBSURFACE, .FISHING.VESSEL, .MERCHANT, .CARRIER, .COMBATANT, .SUPPLY, .AMPHIB, .SMALL.BOAT, .UNKNOWN. This parameter is primarily used for C4I reporting.

In a recent exercise, there was a Submarine. Its SUP had a SUP TYPE of .SUBMARINE but its unit had a UT BASIC TYPE of .SURFACE. This inconsistency was not reported by the SVP.

Five new Error and Warning messages were added to the SVP - Errors 446 and 449, and Warnings 1439, 1451, and 1452.

3.71 JTLS-2014-11905 Bugs in FileCache Class on Resource Release

Two bugs were found in FileCache.java:

URLConnection opened to fetch a file from a remote server, but was not disconnected properly when an exception happens. This results in a socket not being released and a remote file locker not being released.

ProgresFrame.complete() was not properly called. This can incorrectly toggle a few swing update timers that control refreshing of the WHIP GUI.

Both errors were corrected.

3.72 JTLS-2014-11907 SVPR Item Selection Does Not Retain Highlighting

When an item is selected in the error/warning list or the resolution list, the scenario user would lose focus of what items were selected when other components obtained focus.

Highlighting now correctly maintains what item was last selected in both the error/warning list and the resolution list.

3.73 JTLS-2014-11908 Hull Number Too Long in OTH Gold Message

In OTH-Gold message specification, the hull number field for a naval unit allows up to 6 characters. Depending on the database entries, the JOI was sending more than 6 character long hull numbers.

Code was modified to limit the field to 6 characters.

3.74 JTLS-2014-11910 DDS Users Could Not Nullify DOWNED.AIRCREW.HUP Field.

DDS users could not nullify the DOWNED.AIRCREW.HUP data field of the Global Values table.

The related DDS xml file for the Downed Aircrew HUP data field had the "null entry not allowed" tag by mistake. The old tag was removed and re-defined as "null allowed" to correctly match the schema definition.

3.75 JTLS-2014-11913 Pending Order IMT Does Not Display HRU Patrol Posture

The posture column on the Pending Order screen for an HRU was blank.

The screen was designed to only display Basic Unit Postures. It was changed to display either Unit or HRU postures.

3.76 JTLS-2014-11914 Airlift Unit Not Here Message Has Incorrect Latitude

If an airlift mission gets to its pickup point and the unit is not there and it is not moving, a problem report is sent to the player. Periodically after the initial message, the model checks if the unit has arrived. If the unit still has a speed of zero and is not at the desired pickup location, another problem message is sent. This continues until either the unit arrives, the mission automatically gives up and goes home, or the user cancels the mission.

The second subsequent reminder messages show a poor latitude for the mission - the longitude looks correct.

The format of the subsequent message was incorrect, causing the issue. In addition, the original message was a Zero time Delay message, but the subsequent reporting messages were going through the JTLS communication module. The design team believes that this non-real world message should not be delayed.

To make sure that the messages are generated in a consistent manner, the code was centralized. The Airlift Problem message code was put in its own subroutine which was called from the initial message code location and the repeat subsequent message code location. This solved the format issue and the inconsistency concerning whether the message should or should not be delayed.

3.77 JTLS-2014-11915 DDS Launch Error When JDPI Is Assigned as a Small Boat

The DDS client startup threw exceptions when a JDPI target category was changed to "SMALL_BOAT". The exceptions caused the DDS client to fail to launch properly.

The problem was caused by small boat, ship, vehicle, and supply type targets being unable to be displayed on the map. But those types of targets are all valid for JDPI's. These targets, and their corresponding target category data, are now downloaded and added to map display.

4.0 REMAINING ERRORS

Every effort has been made to correct known model errors. All reproducible errors that resulted in CEP catastrophic software failures (crashes) have been corrected. Other corrections were prioritized and completed according to their resource cost-to-benefit relationship.

Correction of the remaining STRs, however, must be postponed to a later version due to time and resource constraints. These problems may be corrected prior to the next release of JTLS. If an immediate need arises for code corrections to remedy any of these outstanding STRs, such as an exercise planned to occur before the next release, contact the JTLS Development Team Leader. Refer to the Abstract of this document for the current address.

Code errors described in this chapter should be noted specifically because they affect the basic functionality of JTLS. Information is provided regarding the extent of the error, as well as suggestions to avoid or minimize the effects of the problem.

4.1 JTLS-0942 Air Transport Cannot Combine Wet And Dry Supplies

When both wet and dry supply categories are included in the same Transport Instructions List for an Air Transport mission, they will not be transported at the same time. The first supply category shipment type will be loaded, but the second will not. If both are included in the same Supply List, the wet category is preferred. The aircraft go through the motions as if loading and delivering the denied category, including MISREP confirmation. No pickup or delivery is made, although an empty storage area may be created. There is no documentation to support this situation, and the user is not notified of the problem.

4.2 JTLS-0956 MPP Messages For Canceled Missions In Error

If an airbase is magic moved with several squadrons on active missions that need to be canceled or with squadrons in the middle of a self lift, the subsequent message generated for the situation has several errors. The changes required are too risky during the exercise. The problem will not cause a crash, but will cause the MPP to incorrectly display the message contents.

4.3 JTLS-0961 Group Ground Move Delayed To Lead Unit

There is a problem when a group ground move is sent. The directive is delayed to the lead unit. When the lead unit learns about the move, it immediately tells the units in the follow-on group. This could lead to directives being received out of order. Assume the user sends a directive at 0100 and the CEP determines the lead unit should receive the message at 0200. The lead unit cannot receive any other directives until after 0200. The CEP ensures that directive receipt is in the same order as the user sent the directives. This is not true for the follow-on units. If the user sent an order at 0115 directly to one of the follow-on units, the follow-on unit could receive the 0115 directive prior to the order sent at 0100. If this error is causing problems for upcoming exercises, the Configuration Manager should be contacted for a code fix to solve this problem.

4.4 JTLS-0968 Inconsistency Between Regular Run And Pusher

There is a major inconsistency between a regular run and a run created using pusher. When an order with ASAP is sent, the READ KEYWORD routine sets the data parameter to TIME.V. When pusher reads in the order, TIME.V is much earlier than it was when the order arrived in the first place. For orbiting missions and alert missions, this alters when they will go off alert by a great deal. This must be fixed and made consistent. It appears that both TIME.V and order receipt time must be saved to the ci1 file to accomplish this task.

4.5 JTLS-0971 Ship Continuous Tracking Not Working

The new unidentified object design indicates that ships which are continuously tracked will not have unidentified objects created. A continuously tracked Naval unit and all of its targets are creating unidentified objects. They should not be doing this.

4.6 JTLS-0973 Periodic Report Air Supplies And Fuel Not Correct

The arrays which hold air supply usage are not being maintained correctly given the new MISSION RESOURCE ALLOCATION event.

4.7 JTLS-0974 Submarine Detection By Ground Sensors

A moving submarine does not get full credit for coverage time by sonars on board other ships or submarines. It gets full coverage time for airborne sensors but not ground based sensors.

4.8 JTLS-0981 Formation With No Posture

The model crashed when a formation reached a Destination Two hex and the formation no longer had a posture. Therefore it did not know what to do. A Destination Two hex indicates that the Formation should conduct its assigned Amphibious Operation, drop off its Sealifted supplies or clear mines from a minefield. The posture of the formation is used to tell the formation which of these three tasks should be accomplished.

When the formation reached its Destination Two hex, the posture of the formation was zero; therefore, the formation did not know which of the three tasks should be accomplished.

4.9 JTLS-1384 Area, Target, And Unit Report Documentation

Some users have indicated that the documentation of Area Report, Unit Report, and Target Report similarities and differences are incomplete or inaccurate. A review of this documentation is needed.

4.10 JTLS-2005-1457 Target Auto Assign Errors In Orbiting OAS

An Orbiting OAS mission was created with Auto Assigned allowed and search target category as SSM. An SSM was magic moved to the area of the orbit. Perception of the SSM was given to the

mission's side using the controller Target Report order. The mission saw the target and immediately attacked it. When the OAS mission returned, the Mission Report said it was assigned to attack target UIO11816U but the target could not be found. It appears that mission was previously holding the target as unidentified and it was not found after it was assigned a specific target number.

4.11 JTLS-2011-10810 SE Linux Causes JSXR Crashes

Frequent and random JSXR Web Service crashes occurred while executing JTLS 3.4.3 in an exercise network configuration supported by a Security Enhanced Linux-enabled platform. The system configuration included 7 JSXRs and 125 WHIPs. Java 1.6.0.16 was used to support workstations. Accumulation of numerous core.jsxr files in the `$/game` directory and `logic_error` files in the `$/debug` directory was observed. Server CPU resources and system memory were adequate and not adversely affected.

This issue did not occur after SELinux was disabled on the system servers. Until this issue is resolved, executing JTLS or its components on SELinux-enabled systems is not authorized.

APPENDIX A. ABBREVIATIONS AND ACRONYMS

Terms are included in this Appendix to define their usage in JTLS design, functionality, and documentation.

AAA	Anti-Aircraft Artillery
AADC	Area Air Defense Commander
AAL	Air-to-Air Lethality
A/C	Aircraft
ACP	Air Control Prototype
ADA	Air Defense Artillery
AEW	Airborne Early Warning
AFB	Air Force Base
AG	Air-Ground (Air-to-Ground)
AI	Air Interdiction
AIM	Air Intercept Missile
AIREF	Air Refueling
AKL	Area Kill Lethality
AMMO	Ammunition
AO	Area of Operations
AOC	Air Operations Center
APC	Armored Personnel Carrier
ARECCE	Armed Reconnaissance
ARTE	Air Route
ARTY	Artillery
ASC	Automatic Supply Calculation
ASCII	American Standard Code for Information Interchange
ASW	Anti-Submarine Warfare
ATC	Aircraft Target Category
ATGM	Anti-Tank Guided Missile
ATK	Attack
ATO	Air Tasking Order
ATORET	Air Tasking Order Retrieve Program
ATOT	Air Tasking Order Translator
AWACS	Airborne Warning And Control System
AZ	Altitude Zone

BADGE	Bilateral Air Defense Ground Environment (used by Japan Defense Agency)
BAI	Battlefield Air Interdiction
BDA	Battle Damage Assessment
BDE	Brigade
BN	Battalion
C3	Command, Control, and Communications
C3I	Command, Control, Communications, and Intelligence
C4I	Command, Control, Communications, Computers, and Intelligence
CA	Civil Affairs
CADRG	Compressed ARC Digitized Raster Graphics
CAP	Combat Air Patrol
CAS	Close Air Support
CAT	Category
CCF	Central Control Facility
CCP	Command Control Prototype
CCU	Controller Change Unit
CEP	Combat Events Program
CMDR	Commander
COP	Common Operational Picture
CP	Combat Power
CS	Combat System
CSP	Combat System Prototype
CTAPS	Contingency Tactical Air Planning System
CTG	Commander Task Group
CTRL	Control keyboard command
DCA	Defense Counter Air
DCL	Digital Command Language
DDS	Database Development System
DEMSDB	Demonstration Standard Database
DISA	Defense Information Systems Agency
DIV	Division
DMA	Defense Mapping Agency
DoD	Department of Defense
DOS	Days of Supply

DPICM	Dual Purpose Improved Conventional Munitions
DS	Direct Support
DSA	Directed Search Area
DTG	Date Time Group
EC	Electronic Combat
ECM	Electronic Counter Measure
ECP	Engineering Change Proposal
EEL	Essential Elements of Information
ELINT	Electronic Intelligence
ELS	Entity Level Server
EODA	Entity Level JTLS Object Data Authority
ETA	Estimated Time of Arrival
FARP	Forward Arming and Refueling Point
FLP	Fire Lethality Prototype
FLOT	Forward Location of Troops
FOL	Forward Operating Location
FWL	Frederick W. Lanchester (originated a differential equation model of attrition)
GAL	Gallon
GCCS	Global Command and Control System
GRTE	Ground Route
GS	General Support
GSR	General Support Reinforcing
GUI	Graphical User Interface
HARM	High-speed Anti-radiation Missile
HE	High Explosive
HELO	Helicopter
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HQ	Headquarters
HRU	High Resolution Unit
HTML	Hypertext Markup Language
HTT	High resolution unit Target Type
HUP	High resolution Unit Prototype
ICM	Improved Conventional Munitions
ICP	Interface Configuration Program

ICPLogin	Interface Login Program
ID	Identifier
IFF	Identification Friend or Foe
IIP	Intelligence Information Prototype
IMT	Information Management Tool
INFO	Information
INTEL	Intelligence
JCATS	Joint Conflict And Tactical Simulation
JDA	Japan Defense Agency
JDPI	Joint Desired Point of Impact (formerly DMPI: Desired Mean Point of Impact)
JDS	JTLS Data System
JDSP	JTLS Data System Protocol
JEDI	JODA Entity Data Identifier
JMCIS	Joint Maritime Combat Information System
JMEM	Joint Munitions Effectiveness Manuals
JODA	JTLS Object Distribution Authority
JOI	JTLS Operational Interface
JPL	Jet Propulsion Laboratory
JRSG	Joint Rapid Scenario Generation (formerly JIDPS: Joint Integrated Database Preparation System)
JSDF	Japanese Self-Defense Force
JTLS	Joint Theater Level Simulation
JTOI	JTLS Transaction Operational Interface
JXSR	JTLS XML Serial Repository
KIA	Killed In Action
KM	Kilometer
KNOTS	Nautical miles per hour
LA	Lethal Area
LAN	Local Area Network
LAT	Latitude
LB	Login Build (JTLS order type)
LDAP	Lightweight Directory Access Protocol
LDT	Lanchester coefficient Development Tool
LOG	Logistics
LOGIN	Logistics Input

LOGREP	Logistics Report
LONG	Longitude
LOTS	Logistics Over The Shore
LR	Long Range
M&S	Modeling and Simulation
MAPP	Modern Aids to Planning Program
MB	Megabyte
MCP	Mobility Counter-mobility Prototype
MCR	Model Change Request
MG	Machine Gun
MHE	Material Handling Equipment
MIP	Model Interface Program
MOGAS	Motor Gasoline
MOPP	Mission-Oriented Protective Posture
MOSAIC	NCSA user interface software
MOTIF	X Window System graphical interface
MP	Maneuver Prototype
MPP	Message Processor Program
MSC	Major Subordinate Command
MSG	Message
MTF	Message Text Formats
MUREP	Munitions Report
MUSE	Multiple Unified Simulation Environment
NCSA	National Center for Supercomputing Applications (University of Illinois)
NEO	Noncombatant Evacuation Operations
NFS	Network File Server
NGO	Non-Governmental Organization
NIS	Network Information Service or Network Information System
NM	Nautical Mile
NTSC	Naval Telecommunications System Center
OAS	Offensive Air Support
OBS	Order of Battle Service (formerly UGU: Unit Generation Utility)
OCA	Offensive Counter-Air
OJCS	Organization of the Joint Chiefs of Staff

OMA	Order Management Authority
ONC	Operational Navigation Chart
OPM	Online Player Manual
OPP	Order Preprocessing Program
OTH	Over The Horizon
OTH Gold	Over The Horizon message specification
OTH-T	Over The Horizon-Targeting
pD	Probability of Detection
pE	Probability of Engage
pH	Probability of Hit
pK	Probability of Kill
PKL	Point Kill Lethality
POL	Petroleum, Oil, and Lubricants
POSIX	International operating system standard based on System V and BSD
PPS	Postprocessor System
PSYOPS	Psychological Operations
RAM	Random Access Memory
RDMS	Relational Database Management System
RECCE	Reconnaissance (air missions)
RECON	Reconnaissance (ground missions)
REGT	Regiment
RNS	Random Number Seed
ROE	Rules Of Engagement
RPT	Report
RSP	Reformat Spreadsheet Program
SAL	Surface-to-Air Lethality
SAM	Surface-to-Air Missile
SAM/AAA	Surface-to-Air Missile/Anti-Aircraft Artillery
SC	Supply Category
SCP	Simulation Control Plan
SDB	Standard Database
SEAD	Suppression of Enemy Air Defense
SIMSCRIPT	Simulation programming language (product of CACI, Inc.)
SIP	Scenario Initialization Program

SITREP	Situation Report
SLP	Sustainment Log Prototype
SOF	Special Operations Forces
SP	Survivability Prototype
SQL	Structured Query Language
SR	Short Range
SRP	Start/Restart Program (a JTLS component)
SRTE	Sea Route
SSM	Surface-to-Surface Missile
STR	Software Trouble Report
SUP	Ship Unit Prototype
SVP	Scenario Verification Program
SYNAPSE	Synchronized Authentication and Preferences Service
TADIL	Tactical Digital Interface Link
TCP/IP	Transmission Control Protocol/Internet Protocol
TEL	Transporter Erector Launcher
TG	Target entity attribute prefix
TGS	Terrain Generation Service (formerly TPS:Terrain Preparation System)
TGT	Target
TMU	Terrain Modification Utility
TOE	Table of Organization and Equipment
TOT	Time Over Target
TOW	Tube-launched Optically-tracked Wire-guided missile
TPFDD	Time-Phased Force Deployment Data
TTG	Target Type Group
TTL	Target Types List
TUP	Tactical Unit Prototype
TW	Targetable Weapon
UBL	Unit Basic Load
UIM/X	GUI builder tool
UNIX	POSIX-compliant operating system
UNK	Unknown
UOM	Unit Of Measure
USA	United States Army (U.S. and U.S.A. refer to United States and United States of America)

USAF	United States Air Force
USCG	United States Coast Guard
USMC	United States Marine Corps
USMTF	United States Message Text Format
USN	United States Navy
UT	Unit entity attribute prefix
UTM	Universal Transverse Mercator
VIFRED	Visual Forms Editor
VMS	Virtual Memory System
VTOL	Vertical Take-Off and Landing aircraft
WAN	Wide Area Network
WDRAW	Withdraw
WEJ	Web Enabled JTLS
WHIP	Web Hosted Interface Program
WIA	Wounded In Action
WPC	Warrior Preparation Center
WPN	Weapon
WT	Weight
WW	Wild Weasel
XMS	XML Message Service

APPENDIX B. Version 4.1.4.0 STANDARD DATABASE CHANGES