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# I-95 CORRIDOR COALITION

## VIRTUAL INCIDENT MANAGEMENT TRAINING

### Server Guide

An in-depth server installation and administration guide for the I-95 Corridor Coalition's Virtual Incident Management Training application, powered by the Online Interactive Virtual Environment (OLIVE) platform.

# TABLE OF CONTENTS

<b>1. Preface</b>	<b>4</b>
<b>2. About</b>	<b>4</b>
<b>3. Minimum System Requirements</b>	<b>5</b>
<b>3.1. Hardware</b>	<b>5</b>
<b>3.2. Software</b>	<b>5</b>
<b>4. Pre-Installation</b>	<b>6</b>
<b>4.1. License Key</b>	<b>6</b>
<b>4.2. Required Files</b>	<b>6</b>
<b>4.3. Installation Variables</b>	<b>6</b>
<b>4.4. Non-Root User olive</b>	<b>7</b>
<b>4.5. Hostname</b>	<b>7</b>
<b>4.6. Firewall Ports</b>	<b>7</b>
<b>4.7. Mobile Server</b>	<b>7</b>
<b>4.8. Prepping Installation Files</b>	<b>8</b>
<b>5. Installations</b>	<b>9</b>
<b>5.1. OLIVE</b>	<b>9</b>
<b>5.2. CATT Pack</b>	<b>10</b>
<b>5.3. CATT Plugins</b>	<b>11</b>
5.3.1. Traffic A.I.	11
<b>5.4. Avatar Templates</b>	<b>12</b>
<b>5.5. Initial Avatar Location</b>	<b>13</b>
<b>6. First Time Setup</b>	<b>14</b>
<b>7. Server Administration</b>	<b>14</b>
<b>7.1. Server Status, Start, and Stop</b>	<b>15</b>
<b>7.2. Server Reset and Object Database Update</b>	<b>15</b>
<b>7.3. Adding User</b>	<b>15</b>
<b>7.4. Adding Scenes</b>	<b>16</b>

# List of Tables

TABLE 1 - INSTALLATION VARIABLES .....6  
 TABLE 2 - I95VIM AVATAR TEMPLATES .....15

# List of Figures

FIGURE 1 - MYSQL REQUIREMENT .....5  
 FIGURE 2 - PERL PACKAGES .....5  
 FIGURE 3 - LIBSTDC++.I686 .....5  
 FIGURE 4 - NON-ROOT USER .....7  
 FIGURE 5 - EDITING HOSTNAME.....7  
 FIGURE 6 - HOSTS FILE .....7  
 FIGURE 7 - PREPPING FILES.....8  
 FIGURE 8 - ONE-TIME SETUPS AS ROOT .....9  
 FIGURE 9 - INSTALL OLIVE .....10  
 FIGURE 10 - INSTALL CATT PACK .....10  
 FIGURE 11 – INSTALL CATT PLUGINS .....11  
 FIGURE 12 - REGISTERING TRAFFIC A.I. AS OLIVE ROLE.....11  
 FIGURE 13 - TRAFFIC A.I. DEPENDENCY FILES.....12  
 FIGURE 14 - TRAFFIC A.I. SCRIPTSU .....12  
 FIGURE 15 - ADDING AVATAR TEMPLATES .....13  
 FIGURE 16 - AVATAR DEFAULT LOCATION.....13  
 FIGURE 17 - FIRST TIME SETUP .....14  
 FIGURE 18 - SERVER ADMINISTRATION REQUIREMENT.....15  
 FIGURE 19 - STATUS, START, AND STOP .....15  
 FIGURE 20 - RESET AND OBJECT UPDATE .....15  
 FIGURE 21 - ADD USERS.....16  
 FIGURE 22 - ADD SCENES.....16

# 1. PREFACE

This document is written as a guide for the server software installation of The I-95 Corridor Coalition Virtual Incident Management (I95VIM) program.

The intended audience of this document is IT person with Linux experience who has root access to the intended server.

# 2. ABOUT

Funded and envisioned by the I-95 Corridor Coalition, Virtual Incident Management Training application was developed by the University of Maryland's CATT Lab to be used as a safe, accessible, and low cost alternative to first responders' incident management and safety training. The application is powered by OLIVE (Online Interactive Virtual Environment), a virtual world software platform initially designed for military training simulation purposes. OLIVE was developed by Forterra System Inc.

The I-95 Virtual Incident Management Training features:

- Interchangeable Roles
- Face-to-face and Radio communication
- Emergency vehicles and equipment models
- Traffic AI that reacts to cone placement and donned safety vests
- Various props and geographic locations that enable infinite custom incident scene possibilities

It is actively being used for cross-discipline, cross-agency, first responder training by members of the I-95 Corridor Coalition and beyond.

## 3. MINIMUM SYSTEM REQUIREMENTS

### 3.1. HARDWARE

CPU	Intel XEON (Core 2) 2.66+ GHz Dual Core CPU, 1k+ FSB with 4MB Cache
Main Memory	4 GB RAM (at least 667 MHz DDR2)
Hard Drive	160GB Hard Drive (7200rpm or faster, 16+ MB buffer)
Network Bandwidth	Broadband, 100kbps to 200kbps per user connected to server

### 3.2. SOFTWARE

- **RHEL/CentOS 5.0** (or newer).
- **MySQL Server 4.1** (or newer).

Ensure that the new password hashing algorithm is used by editing the `/etc/my.cnf` file and set/append `old_password=0`. If you have to make this change, you should then run the `mysql_fix_privilege_tables` upgrade script.

```
//install mysql-server
# yum install mysql-server

//open my.cnf file and add "old_password=0"
# nano /etc/my.cnf

//ensure that changes in my.cnf takes into effect
# etc/init.d/mysqld restart
# mysql_fix_privilege_tables
```

FIGURE 1 - MYSQL REQUIREMENT

- **Perl Packages**

The following Perl packages (or newer) are required to be installed:

- perl-5.8.5-9
- perl-DBI-1.40-5
- perl-DBD-MySQL-2.9007-1
- perl-XML-Parser

```
# yum install perl perl-DBI perl-DBD-MySQL perl-XML-Parser
```

FIGURE 2 - PERL PACKAGES

- **libstdc++.i686**

OLIVE is a 32-bit application that requires the 32-bit version of libstdc++. If your server is a 64-bit RHEL/CentOS machine, you might need to manually install it.

```
# yum install libstdc++.i686
```

FIGURE 3 - LIBSTDC++.I686

## 4. PRE-INSTALLATION

### 4.1. LICENSE KEY

A license key is required to install OLIVE. You can submit a license key request to [training-admin@i95vim.com](mailto:training-admin@i95vim.com). Please include the following information in the email:

- Title
- Full Name
- Business E-Mail
- Office Phone Number
- Agency/Organization Name
- Agency/Organization Address

On approval, the provided email may be subscribed to receive future updates notifications.

### 4.2. REQUIRED FILES

The following files are required to install I95VIM server application:

- OLIVE Base Content : *base\_content.tar.gz*
- OLIVE Server : *2009\_08\_24\_r22\_2.2.2\_olive\_linux\_server\_sdk.tar.gz*
- I95VIM Custom Assets : *catt\_pack\_v11.2.15.zip*
- I95VIM Custom Libraries : *catt\_plugins\_v11.2.15.zip*

### 4.3. INSTALLATION VARIABLES

During the installations process you will be asked to provide several variable names. These names should be consistent. If you decided to generate your own custom value, replace any occurrence of default value with custom value for the rest of the document. If needed you can fill in the custom value column on **Table 1** below and use it as a reference.

	Default Value	Custom Value
<b>Non-Root User</b>	olive	
<b>Cluster ID</b>	i95vim	
<b>Hostname</b>	olive.i95vim.com	
<b>Database Username</b>	olive	
<b>Database Password</b>	olive	
<b>Root Installation Directory</b>	/olive	

TABLE 1 - INSTALLATION VARIABLES

**Note:** A **Cluster ID** can contain only lower-case letters, numbers, and underscores.

## 4.4. NON-ROOT USER OLIVE

OLIVE requires a unique non-root user to execute the installation and runtime commands. This account needs to be created on all machines on which you want to install OLIVE server. The default username for this user is `olive`. Otherwise refer to **Table 1**.

```
//create the non-root user olive
# /usr/sbin/adduser olive

//change user olive's password
# passwd olive
```

FIGURE 4 - NON-ROOT USER

## 4.5. HOSTNAME

Server hostname will be asked couple times during the installation process. The recommended hostname value is `olive.i95vim.com`.

```
//change the current hostname value
# hostname olive.i95vim.com

//edit network file to ensure persistent change on server reset
# nano /etc/sysconfig/network

HOSTNAME=olive.i95vim.com
```

FIGURE 5 - EDITING HOSTNAME

OLIVE has a unique server architecture with modules that often communicates with each other using the server actual IP address. Mapping between hostname and server's IP address needs to be added to the hosts file. Replace **[server IP]** with your actual server IP address for the following command snippet.

```
# nano /etc/hosts

127.0.0.1 localhost.localdomain localhost
[server IP] olive.i95vim.com //[server IP] [hostname]
```

FIGURE 6 - HOSTS FILE

## 4.6. FIREWALL PORTS

OLIVE server-client architecture uses multiple firewall ports. To ensure that there is no server-client communication problem, please disable the firewall.

## 4.7. MOBILE SERVER

If you are installing this on a laptop with the intention of having a mobile server solution, you need to set your laptop IP to be static.

## 4.8. PREPPING INSTALLATION FILES

All four required files listed in section 4.2 need to be located in a folder accessible by the non-root user `olive`. Typically this means `/home/olive`.

```
//extract OLIVE server install file
# tar xvzf 2009_08_24_r22_2.2.2_olive_linux_server_sdk.tar.gz

//create installOlive.log
# touch installOlive.log

//set file permissions to be executable
# chmod 755 *

//ensure that these files are owned by the non-root user
# chown olive.olive installOlive.sh \
    installOlive.log \
    catt_pack_v11.2.15.zip
```

FIGURE 7 - PREPPING FILES



## 5. INSTALLATIONS

### 5.1. OLIVE

OLIVE requires one-time initial setups run as the `root` user. A shell script named `bootstrapOlive.sh` is handling these setups. This script is part of the extracted OLIVE server install file.

```
# ./bootstrapOlive.sh

Enter the olive root installation directory. \
Cannot contain capital letters (enter for default: /olive):

//enter the cluster id as defined in Table 1
Enter a cluster id. \
Valid characters include 'a-z', '0-9' and '_' \
(enter for default: "sandbox"): i95vim

//the non-root user as defined in Table 1
Enter the OLIVE setup user (enter for default: "olive"):

//the non-root user as defined in Table 1
Enter the OLIVE runtime user (enter for default: "olive"):

//see Section 4.1 on how to obtain License Key
Enter the license key:
```

FIGURE 8 - ONE-TIME SETUPS AS ROOT

At minimum, your current folder should now have:

- `base_content.tar.gz`
- `install_bin_release.tar.gz`
- `install_assets.tar.gz`
- `install_util.tar.gz`
- `installOlive.sh`

As the non-root user `olive`, run the `installOlive.sh` script. When prompted, make sure variable values entered are consistent with what was decided in [Table 1](#).

```
# su olive
$ ./installOlive.sh

//press enter if you did not set any MySQL root password in the past
MySQL root password (enter for none):
  testing root password ... OK
  testing mysql password format ... OK

Enter the OLIVE root installation directory. \
Cannot contain capital letters (enter for default: "/olive"):

Enter a cluster id. \
Valid characters include 'a-z', '0-9' and '_' \
(enter for default: "sandbox"): i95vim
```

```
//use the default value here
Enter a build id. \
Cannot contain capital letters (enter for default: "release2.2.2"):

Enter the OLIVE setup user (enter for default: "olive"):
Enter the OLIVE runtime user (enter for default: "olive"):
Enter the OLIVE database user (enter for default: "olive"):
Enter the OLIVE database user password (enter for default: "olive"):
```

FIGURE 9 - INSTALL OLIVE

Installation will take several minutes, please be patient. Once the installation is complete, you should have a running vanilla OLIVE server now. [Section 7.1](#) explains how to check OLIVE server status. We will now install I95VIM custom assets.

## 5.2. CATT PACK

The I95VIM OLIVE custom assets are contained in a zip file called CATT Pack (`catt_pack_v11.2.15.zip`). These custom assets include, but not limited to, custom models, buildings, city plans, and user interface.

Install CATT Pack using the following commands:

```
# su olive

//go to OLIVE cluster directory
// [root installation directory]/cluster/[cluster id]cd
$ cd /olive/cluster/i95vim

//set olive script to use release environment settings
$ source setenv.sh release

//install using install_patch.ocs command
//replace --staging_host value with the server hostname (Section 4.5)
//replace --staging_dir value with the files location (Section 4.8)

$ cs install_patch.ocs \
  --asset_tar_file=catt_pack_v11.2.15.zip \
  --patch_id=catt_pack_v11.2.15 \
  --staging_host=olive.i95vim.com \
  --staging_dir=/home/olive \
  --is_zip=1
```

FIGURE 10 - INSTALL CATT PACK

You will be prompted for non-root user `olive`'s password. Once entered, the installation will take some time.

## 5.3. CATT PLUGINS

I95VIM also requires CATT Plugins, a collection of custom OLIVE binary plugins. These plugins were developed to allow training features that are not available in the base OLIVE program. Some features requiring CATT Plugins are traffic A.I., trainer control panel, and special object interactions. Current CATT Plugins are compressed as `catt_plugins_v11.2.15.zip` file.

Most of the plugins setup simply requires copying over extracted files to the correct OLIVE folder, with the exception of Traffic A.I.

```
//extract CATT Plugins
//see Section 4.8 for where this file is located
# unzip catt_plugins_v11.2.15.zip

# cd catt_plugins_v11.2.15

//set ownership to olive
# chown olive.olive libcatt_center.so \
    catt_aar_reader \
    libavatarrole.so \
    traffic_ai

//make sure they are executable
# chmod 755 libcatt_center.so \
    catt_aar_reader \
    libavatarrole.so \
    traffic_ai

//copy the files to OLIVE binary folders
// [root installation directory]/bld/release2.2.2/release
# cp libcatt_center.so /olive/bld/release2.2.2/release
# cp catt_aar_reader /olive/bld/release2.2.2/release
# cp libavatarrole.so /olive/bld/release2.2.2/release
# cp traffic_ai /olive/bld/release2.2.2/release
```

FIGURE 11 – INSTALL CATT PLUGINS

### 5.3.1. Traffic A.I.

Traffic A.I. plugin requires additional setup because it is an external application that communicates with OLIVE.

First we need to register it as an OLIVE module (also known as *role*) so it auto starts on OLIVE restart.

```
//run mysql as root user
# mysql -u root

//your OLIVE database should have the same name as the Cluster ID
> use i95vim;
> insert into roles (ROLETYPE,ROLENUM,HOST,NOTES) values \
    ("traffic_ai","1","olive","");
> exit;
```

FIGURE 12 - REGISTERING TRAFFIC A.I. AS OLIVE ROLE

The A.I. is dependent of road and vehicle definition files (txt files), which we need to copy over to the appropriate folder.

```
//create the directory for the new Traffic A.I. role
// [root installation directory]/cluster/[cluster id]/traffic_ai1
# mkdir /olive/cluster/i95vim/traffic_ai1

//copy over the dependency definition files to the new directory,
//and make sure that all belongs to the non-root user
//files are located in the folder where you extracted CATT Plugins
//see Section 4.8
# cd /home/olive/catt_plugins_v11.2.15/traffic_ai_files/
# cp *.txt /olive/cluster/i95vim/traffic_ai1
# chown olive.olive -R /olive/cluster/i95vim/traffic_ai1
```

FIGURE 13 - TRAFFIC A.I. DEPENDENCY FILES

The execution of the Traffic A.I. plugin is handled by `rc_traffic_ai.pl` script, which we need to copy over to the appropriate folder as well. Before copying, some minor editing is required based on your installation variables. The script file is located in the extracted `traffic_ai_files` folder.

Locate where `$argument_list` variable is defined (couple lines before end of file), and make sure the following arguments are valid based on **Table 1**:

- `clumanDbName` (Database name is the same as Cluster ID)
- `clumanDbUsername` (Database Username)
- `clumanDbPassword` (Database Password)

```
//run this snippet as non-root user,
# su olive

//once edited, copy over the script
// [root installation directory]/util/release2.2.2/tool/rc.d/
$ cp rc_traffic_ai.pl /olive/util/release2.2.2/tool/rc.d/
```

FIGURE 14 - TRAFFIC A.I. SCRIPTSU

## 5.4. AVATAR TEMPLATES

Each user is assigned to an avatar template, which will be their default look on first login. More on this will be covered in [Section 7.3](#). This section will guide you in adding I95VIM custom avatar templates.

```
//this snippet section should be run as the non-root user
# su olive

//go to OLIVE cluster directory
// [root installation directory]/cluster/[cluster id]
$ cd /olive/cluster/i95vim

//set olive script to use release environment settings
$ source setenv.sh release
```

```

$ cd /olive/util/release2.2.2/legacy/src/Tool/AvTemplates
$ chmod 644 templatemap.csv //allow write permission
$ nano templatemap.csv

//replace all lines with the following:
3000001,i95female,av/fma/fma,i95female,none
3000002,i95male,av/mta/mta,i95male,none
3000003,trainerfemale,av/fma/fma,trainerfemale,trainer
3000004,trainermale,av/mta/mta,trainermale,trainer

$ chmod 444 templatemap.csv //revert file permission
//create new inventory files for I95VIM trainer
$ nano Inventory/trainer.txt

//write this one word to it:
trainerObject

//generate new query for Avatar Templates, and replace the old one
//olive is root installation directory in snippet below
$ perl GenAvTemplates.pl -outdir . -templatemap templatemap.csv
$ mv MoreAvTemplates.sql more_AvTemplates.sql

$ cd /olive/util/release2.2.2/legacy/resources/database/avmandb
$ chmod 644 more_AvTemplates.sql //allow write permission
$ cp /olive/util/release2.2.2/legacy/src/Tool/ \
  AvTemplates/more_AvTemplates.sql .
$ chmod 444 more_AvTemplates.sql //revert file permission

```

FIGURE 15 - ADDING AVATAR TEMPLATES

## 5.5. INITIAL AVATAR LOCATION

When users logged in to OLIVE for the first time, their avatar will be teleported to a default location. We need to edit this so that the default location will be at I95VIM custom scene.

```

//this snippet section should be run as the non-root user
# su olive

$ cd /olive/util/release2.2.2/tool/clusterscripts
$ chmod 644 add_avatars.ocs //allow write permission
$ nano add_avatars.ocs

//edit default_initialpos to the following value:
default_initialpos: -111553,199630,6374016

$ chmod 444 add_avatars.ocs //revert file permission

```

FIGURE 16 - AVATAR DEFAULT LOCATION

## 6. FIRST TIME SETUP

There are a few things that you need to do setup before you can use the server as intended. At this point all OLIVE roles should be running. The following list of steps uses server commands that are further explained in [Section 7](#).

```
//this snippet section should be run as the non-root user
# su olive

//go to OLIVE cluster directory
// [root installation directory]/cluster/[cluster id]
$ cd /olive/cluster/i95vim

//set olive script to use release environment settings
$ source setenv.sh release

//reset server to ensure all I95VIM custom installations takes
//into effect.
$ cs reset_cluster.ocs

//edit avatars.txt (see Section 7.3)
$ nano avatars.txt

    //replace all content with the following
    //this creates user Oliver and Olivia with 'temp' password
    Oliver i95male temp
    Olivia i95female temp

$ cs add_avatars.ocs

//add I95VIM custom scenes
$ cs add_scenes.ocs --scene_sub_dirs="blueland,metro_station,\
    traffic_operations_center,training_grounds,\
    utopia_city,utopia_highway,utopia_suburbs"

//ensure custom objects are loaded
$ cs update_products.ocs
```

FIGURE 17 - FIRST TIME SETUP

## 7. SERVER ADMINISTRATION

The following commands are commonly used during day to day operation. All server administration must be done as the non-root user in release environment settings, at cluster id folder level.

```
//All server administration should be run as the non-root user
# su olive

//go to OLIVE cluster directory
// [root installation directory]/cluster/[cluster id]
$ cd /olive/cluster/i95vim

//set olive script to use release environment settings
```

```
$ source setenv.sh release
```

FIGURE 18 - SERVER ADMINISTRATION REQUIREMENT

## 7.1. SERVER STATUS, START, AND STOP

```
//to check OLIVE status
$ olivectl status

//to stop OLIVE
$ olivectl stop

//to stop specific OLIVE role, e.g. traffic_ai.1
$ olivectl stop traffic_ai.1

//to start OLIVE
$ olivectl start

//to start a specific OLIVE role, e.g. traffic_ai.1
$ olivectl start traffic_ai.1
```

FIGURE 19 - STATUS, START, AND STOP

## 7.2. SERVER RESET AND OBJECT DATABASE UPDATE

Server reset will remove all objects and return the world back to its original state. All scenarios setup will be cleared.

```
//to reset OLIVE world back to its original state
$ cs reset_cluster.ocs

//to update object database
$ cs update_products.ocs
```

FIGURE 20 - RESET AND OBJECT UPDATE

## 7.3. ADDING USER

Adding avatar logins should be done while OLIVE is running. You can edit login information by editing `avatars.txt`. Each line adds an avatar with the following format: **[username] [avatar template] [password]**.

Use I95VIM custom avatar templates added in [Section 5.4](#):

Avatar Template Name	Gender	Description
i95male	Male	For trainee
i95female	Female	For trainee
trainermale	Male	For trainer
trainerfemale	Female	For trainer

TABLE 2 - I95VIM AVATAR TEMPLATES

```
//edit list of avatars
```

```
$ nano avatars.txt  
  
//make sure OLIVE is running before adding avatars  
$ cs add_avatars.ocs
```

FIGURE 21 - ADD USERS

## 7.4. ADDING SCENES

Adding scenes can be done through `add_scenes.ocs` cluster script, using the `scene_sub_dirs` parameter to indicate which scenes to load. The value of this parameter is a comma-separated list of directories in the scene asset directory (e.g. `/olive/assets/catt_pack_v11.2.15/scene/`).

```
//to load scenes after reset  
$ cs add_scenes.ocs --scene_sub_dirs="blueland,metro_station,\  
    traffic_operations_center,training_grounds,\  
    utopia_city,utopia_highway,utopia_suburbs"
```

FIGURE 22 - ADD SCENES