

# Open Metaverse Economy

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## Contents

<b>1</b>	<b>Open Metaverse Economy</b>	<b>2</b>
1.1	Compile the Sources. . . . .	2
<b>2</b>	<b>Open Metaverse Currency</b>	<b>3</b>
2.1	Installation . . . . .	3
2.2	Register Avatars . . . . .	4
2.3	Get Toy Money . . . . .	4
2.4	Using the OMC . . . . .	5
2.5	Switch to Productive Environment . . . . .	6

# 1 Open Metaverse Economy

Under the umbrella of the Open Metaverse Economy we have developed several modules for OpenSimulator based virtual worlds.

- OMBase - this basic module is responsible for the communication with the backend server and monitors the regions and avatars on the simulator. It is required for all other services.
- OMCurrency - this module is responsible for the Open Metaverse Currency and handles all payment related functions. The module supports simple user to user transactions as well as buying objects and land, pay money to objects, and object to user transactions.
- OMDirectory - this modules monitors all buyable objects to list them in a inter-grid selling platform.
- OMFacebook.

## 1.1 Compile the Sources.

In this section we will describe the necessary steps to compile OMEconomy Services, *i.e.* OMBase, OMCurrency, OMDirectory

In order to start we have to meet the following software requirements:

- OpenSimulator Version 0.6.9, 0.7.0, or 0.7.1 and
- NAnt Version > 0.85 to compile the sources.

To compile the sources, extract the OMEconomy files from the zip archive. For the remainder of this document the directory that contains the file “default.build” is referred to as *OMEconomyRoot/*.

- Pre-built OMEconomy. If you use a pre-compiled<sup>1</sup> OpenSimulator with version 0.6.9, 0.7.0, or 0.7.1 you can user pre-compiled libraries from the directory *OMEconomyRoot/pre/*. Choose the libraries according to your Open Simulator version and put them into the directory *OSRoot/*.
- Custom OMEconomy. You can also create the needed libraries from scratch if you face problems with the pre-compiled libraries. To do so you need to execute the nant command in the directory *OMEconomyRoot/* and specify some parameters. Two mandatory parameters *OSRoot* that points to the parent directory of the file “OpenSim.exe” and *OSVersion* with value SIX\_NINE, SEVEN\_ZERO, or SEVEN\_ONE.

An example for a self compiled Open Simulator 0.7.0 is

---

```
user@OpenSimulator: ~/OMEconomyRoot/$ nant -D:OSVersion=SEVEN_ZERO -D:
OSRoot=/home/msteurer/opensim-0.7.0/bin/
```

---

<sup>1</sup><http://dist.opensimulator.org/>

Note: Please use the absolute path instead of relative paths for the value of parameter OSRoot.

The above commands create a new directory *bin/* in *OMCurrencyRoot/* that contains the generated library files (dll) to be put into *OSRoot/*.

## 2 Open Metaverse Currency

### 2.1 Installation

To enable the currency system you have to modify your *OpenSim.ini* configuration file and add the following lines:

```
[OpenMetaverseEconomy]
OMEconomyInitialize = "https://www.virwox.com:419/OSMoneyGateway/init.php"
OMBaseEnvironment = "TEST"
OMCurrencyEnvironment = "TEST"
```

Restart your OpenSimulator and check for success in the logfile *OpenSim.log*. To verify that your region is OMC-enabled please check your logs (*OpenSim.log*) and search for the entries

```
[MODULES]:      [OMBase]: Loading Shared Module.

[MODULES]: Found Module Library [/OSRoot/OMCurrency-0.01.0009-SEVEN_ZERO.dll]
[MODULES]:      [OMCURRENCY]: Loading Shared Module.

[MODULES]: Found Module Library [OSRoot/OMDirectory-0.01.0009-SEVEN_ZERO.dll]
[MODULES]:      [OMDIRECTORY]: Loading Shared Module.
...
[OMCURRENCY]: GatewayURL: http://129.27.200.58/...
[OMBASE]:      GatewayURL: http://129.27.200.58/...
```

If the currency service is NOT available or you can not find any *[OMBASE]* or *[OMCURRENCY]* entries, or your simulator does not even start please read this tutorial again and follow the steps carefully.

**Terminal Script.** In order to use the OMC you need to register your grid. To do so enter the command *OMRegister* at the simulator's command line and provide the requested information.

- Grid's Identifier - this value is taken from the parameter *GridServerURI* in the file *OSRoot/config-include/GridCommon.ini*. Ensure that the parameter is unique but common for all Simulators (all participating OpenSimulators should have the same configuration) in your Grid because we use it for identification purposes. Do not use [localhost:8001/](http://localhost:8001/) or [127.0.0.1:8001/](http://127.0.0.1:8001/) for this parameter but your real IP address or URL, e.g. <http://osgrid.org:8001/>.
- Grid's Full Name - enter a name that describes your grid, e.g. "Open Simulator Grid" or "Third Life Grid".
- Grid's Nick Name - enter a name limited to eight characters that identifies your grid, e.g. "OSGrid" or "TLG".

According to these parameters we will identify the avatars of your grid

“avatarFirstname.avatarLastname@gridNickname (gridFullName)”,

As this names and identifiers are visible on VirWoX’s webpage and in-world, we encourage you to choose these parameters carefully.

```
Region (IICM) # OMRegister
[OMECONOMY]: +-
[OMECONOMY]: | Your grid identifier is "http://login.TUGrazGrid.com:8003/"
[OMECONOMY]: | Please enter the grid's nick name: TUGraz
[OMECONOMY]: | Please enter the grid's full name: Graz University of Technology
[OMECONOMY]: +-
[OMECONOMY]: | Please visit
[OMECONOMY]: |   http://129.27.200.58/API/Simulator.php?method=getScript&gridShortName=TUGraz
[OMECONOMY]: | to get the Terminal's script
[OMECONOMY]: +-
Region (IICM) #
```

If you have provided all parameters correctly you will be provided with an LSL script. Copy this script and paste it in-world as a script into a simple box-primitive. After the script has successfully started the box should change its shape to a green V (see see Figure 1).

After reading this tutorial your simulator is ready for the OMC test system and you can continue with registering avatars. Find the instructions to do so in Section 2.2.

## 2.2 Register Avatars

In this section we will describe the registration process to link your in-world avatar with a VirWoX account to be used for OMC transactions.

Before you start with the registration please verify that your home-grid supports OMC. If you are the owner of a grid you can find instructions how to OMC-enable your regions in Section 1.1.

In order to register, find one of the in-world registration terminals (see Figure 1) and click onto it (VirWoX provides a list of terminals for the test system<sup>2</sup> and the productive system<sup>3</sup>).

Choose your preferred language in the blue dialog window and then select the “Yes” button to continue with the registration process. The entire registration is done in a web browser and so you are asked to follow a link to VirWoX’s webpage.

Fill in the forms correctly and finally “Register”. If you have provided a working email address you will receive a message with a temporary password to log into your VirWoX account. Due to security reasons we highly encourage you to immediately change this password.

To link your avatar with your VirWoX account go back to the in-world registration terminal (see Figure 1) and click onto it once more. If all data is correct, validate the connection.

## 2.3 Get Toy Money

In this section we will describe how to get toy money by using a Paysafe Card. First log into VirWoX’s test system<sup>4</sup> (see Section 2.2 for registering your avatar with VirWoX) and select

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<sup>2</sup><https://www.virwox.com:8000/terminals.php>

<sup>3</sup><https://www.virwox.com/terminals.php>

<sup>4</sup><https://www.virwox.com:8000>



Figure 1: In-world Terminal for avatars to register for the Open Metaverse Currency

*Deposit* from the side bar. Go to the section *paysafecard* and enter the amount of money to charge the account. Enter

0000 0000 0990 2423

as PIN code in the new form, tick the Terms-Of-Service agreement, and click the *Pay* button. Go back to the account overview and exchange the money by selecting *EUR/OMC* from the *Exchange* section in the side bar. Enter the amount of money to be exchanged and click the *Next* button (see Figure 2). After these steps your OMC balance should be topped up.

Logged in as  
**sophie\_sunshine**

**Account Balance**

OMC	0.00
EUR	4.00

**My Account:**

- [Overview](#)
- [Deposit](#)
- [Withdraw](#)
- [Send Money](#)
- [Transaction History](#)
- [Order Status](#)
- [Payment History](#)
- [Change Settings](#)
- [Logout](#)

**Exchange:**

- [EUR/SLL](#)
- [CHF/SLL](#)
- [SLL/OMC](#)
- [USD/SLL](#)
- [GBP/SLL](#)
- [EUR/OMC](#)

**Market Order**

Market orders are fast and simple. They are executed **immediately**, at the currently best available market price.

You can also place a [Limit Order](#).

**Exchange EUR to OMC**

Total Proceeds: **1,428.10** OMC  
Effective Exchange Rate: 357.03 OMC per EUR

I want to sell  EUR. [Next >](#)

**Current Market Depth (best 5 offers)**

	Offers to buy EUR					Offers to sell EUR				
Rate (OMC per EUR)	375.0	376.0	377.0	378.0	379.0	387.0	388.0	389.0	390.0	391.0
Volume (EUR)	200	200	200	200	171	200	200	200	200	200
Volume (OMC)	75,000	75,200	75,400	75,600	64,809	77,400	77,600	77,800	78,000	78,200

Figure 2: Exchange EUR to OMC.

## 2.4 Using the OMC

We support avatar to avatar transactions, avatar buys object or land, object pays avatar, and avatar pays object. Due to additional security measures all these payments require the user

to log into their VirWoX accounts and confirm the actual payment to complete a transaction. Upon this confirmation the money is transferred from the actual account to the recipient's account and all further actions are executed, *e.g.* consignment in case of buying an object. Objects can pay money to avatars using the LSL function `integer llGiveMoney(key destination, integer amount)`. It requires the owner to grant `DEBIT_PERMISSION` permission to this objects inside the client viewer (the yellow-colored dialog window) and an additional confirmation on VirWoX's webpage.

After granting the permissions inside the client viewer the user is redirected to a webpage that requests VirWoX login credentials. The logged in user is provided with a list of objects that require the additional permissions. Users have to tick the "enable" checkbox for the actual items to allow them to pay out money. If the box is unticked the objects reject to pay money to avatars. If the user denies the debit permission in the client viewer the permission is also rejected on the webpage.

Every time the user is requested for debit permissions in the client viewer, she also has to log into the webpage to confirm the permissions. Developers can stop this every-time-confirmation and check the "persistant" flag for the actual object. The set flag suppressed the extra confirmation and the object is always allowed to pay out money. **Attention:** Use this flag only during the development of scripts and turn it off as soon as the object pays out money to other avatars! Keep in mind that the entry in the list is not removed if you delete the object in-world.

## 2.5 Switch to Productive Environment

After successfully testing the Open Metaverse Currency with toy money you can easily switch to the productive system that supports real money. The dlls for test and productive system are the same but you have to modify the `[OpenMetaverseEconomy]` section in the file `OpenSim.ini` and restart your servers.

```
[OpenMetaverseEconomy]
OMEconomyInitialize = "https://www.virwox.com:419/OSMoneyGateway/init.php"
OMBaseEnvironment = "LIVE"
OMCurrencyEnvironment = "LIVE"
```

Further you have to change the line

```
string SERVER = "https://www.virwox.com:8001/OS_atmint.php?grid="; // test system
```

to

```
string SERVER = "https://www.virwox.com:419/OS_atmint.php?grid="; // production system
```

in the registration-terminal-script. To actually use the OMC with real money in your grid we have to manually add it to the system. To do so please send an email to [michael.steurer@iicm.tugraz.at](mailto:michael.steurer@iicm.tugraz.at) and provide the parameters *gridID*, *gridName*, *gridNickname* as described in Section 1.1.

Finally, your grid's avatars have to register again with VirWoX' productive system by clicking onto the registration terminal with the modified script.