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C5.154 Testing report on installation of a MapViewer Tool mirror

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Dissemination Level		
PU	Public	X
PP	Restricted to other program participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

This report is to get an idea of the time, hardware and Software requirements for setting up and installing a MapViewer Tool mirror. It includes recommendations for the future use and sustainability of the service. This report has been compiled by James Davy and Franck Theeten with input from Patricia Mergen, and colleagues of the EDIT project.

Introduction

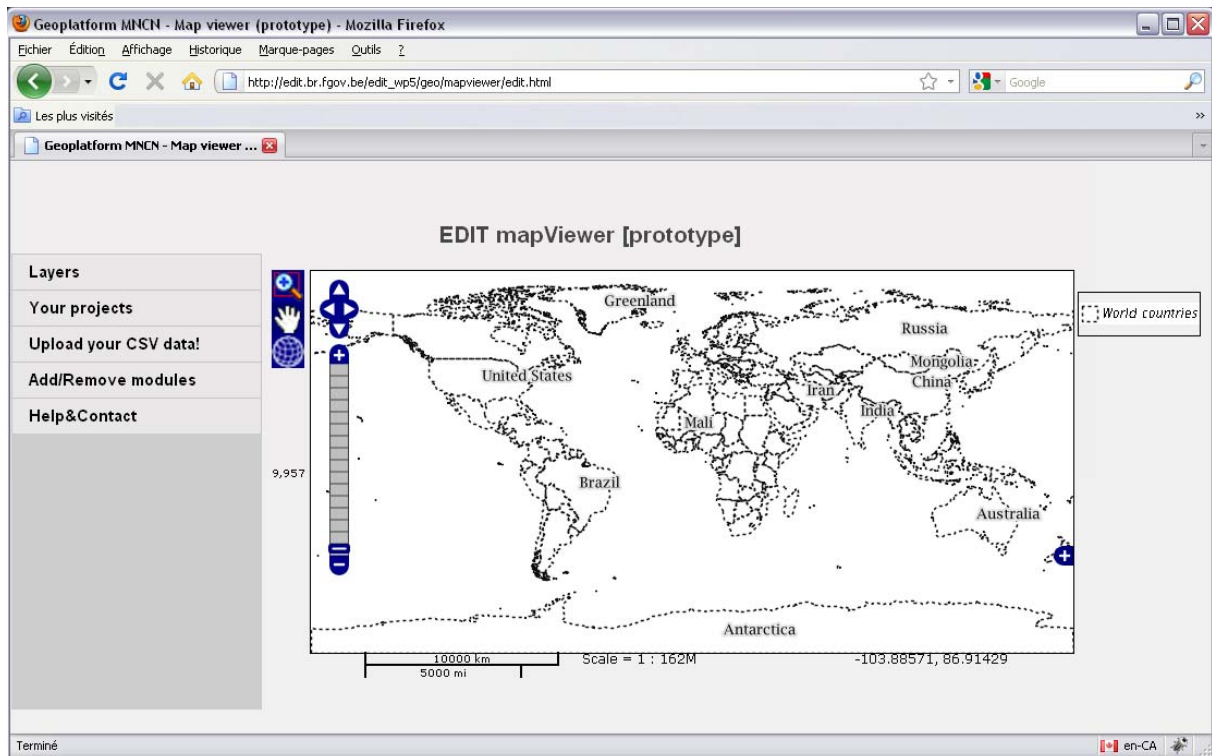


Image 1 – The MapViewer Tool

The MapViewer Tool, mainly developed by Pere Roca Ristol from the CSIC Madrid (Image 1) is used for geographic information mapping. It includes the necessary utilities for mapping data across any area of the world. Benefits include high precision map images for indicating lakes, rivers, coastal lines, and WWF global Ecoregions. The tool is commonly used to map different species and their habitat locations, and compare data provided by the user with ecological and GIS data coming from external resources (GBIF, Google Maps). It also allows the production and documentation of distribution maps for ecological analysis that can be used in paper publication.

The MapViewer is thus a powerful mapping tool which has a high value for scientific institutions for displaying data in an accurate environment. As the tool is largely interactive it can require a large amount of server processing resources. This can cause problems when increasing numbers of users are accessing the service, as anticipated. Therefore mirrors of the MapViewer Server installations are to be made available so that other institutions are enabled to host it on their own servers. This will spread the load and make the Tool stronger and more reliable.

Description of the MapViewer Tool Mirror Requirements and installation

There are only two mandatory requirements in hosting a MapViewer mirror image as provided by EDIT-BeTAF: A dedicated server with an AMD 64bit, Intel Xeon, or Nehalem processor (which are by far the most common processors for large web servers) and the use of VMware ESXi 4 virtual server hyper visor. The software is free upon registration with VMware and compliant with the OVF (Open Virtualization Format) shared by several other hosts for virtual machine. At least 2GB of RAM is also recommended, issues begin to arise with less than 1GB of RAM used.

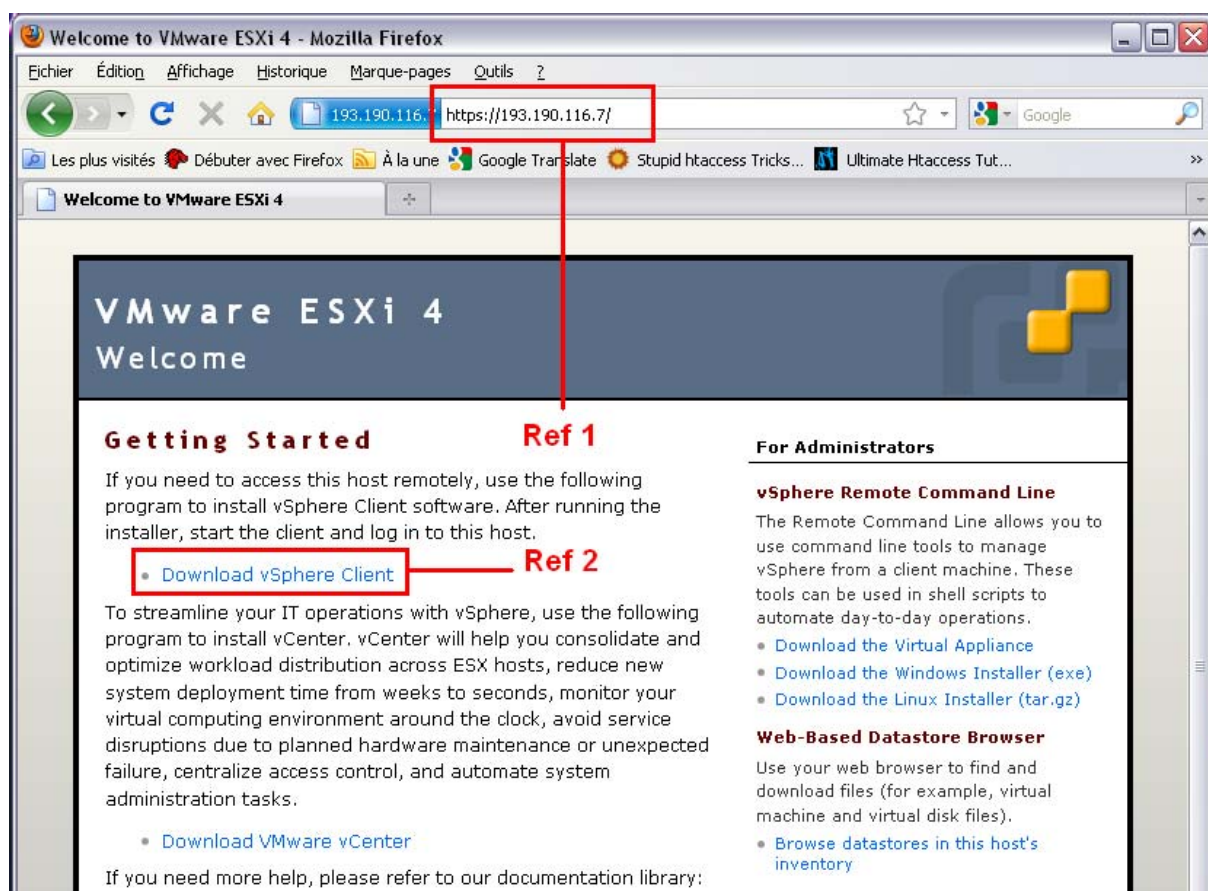


Image 2 – VMware hyper visor web portal

The VMware hyper visor must have a connection to the Internet. Then an administration tool (vSphere Client) can be installed from any computer with an Internet connection. The user types in the IP address of the server into an internet browser (Image 2 – Ref 1) and selects the link to download vSphere Client (Image 2 – Ref 2). vSphere requires only a windows computer with an Internet connection, and must be installed by an account with administrator privileges. Once vSphere is downloaded and installed the user can run the Client with a shortcut found on the desktop. They must then login by entering the IP address of the vSphere hyper visor and the username and password they created during the hyper visor installation.

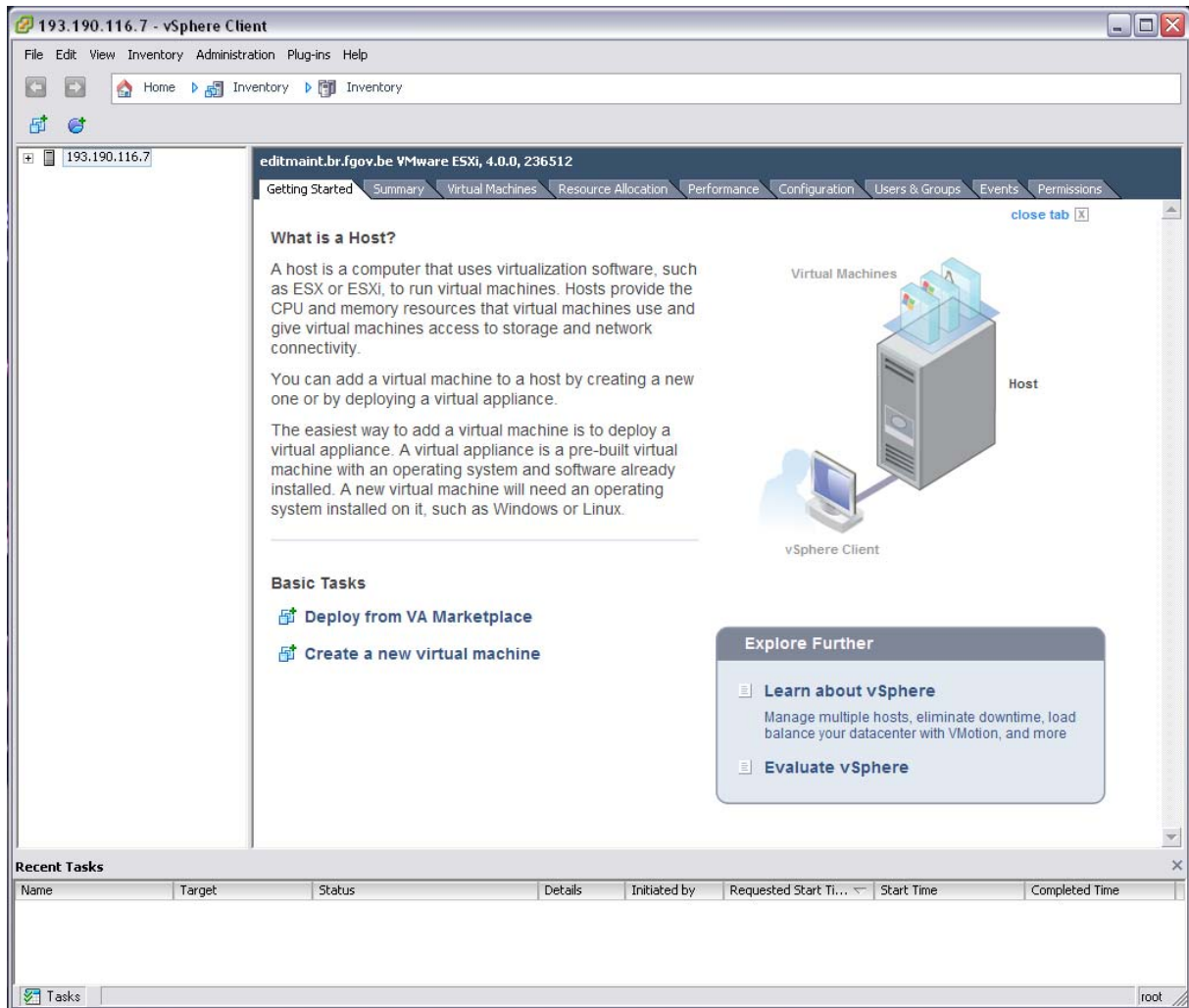


Image 3 – vSphere Client

After logging in an interface allows the user to control any virtual servers created in the hypervisor (Image 3). With a fresh install there will be no servers listed. In order to create the mirror an OVF template can be deployed from a file or a URL that will be supplied to the institution. This is accomplished by selecting 'File' > 'Deploy OVF Template...' and selecting 'Download OVF template from URL' and entering in the supplied URL in the menu that opens. This installs the basic mirror image and takes up approximately 10 GB. Upon completion there will be an exact replica of the main MapViewer tools portal.

The image is very large (10GB) and thus will be made available through various options. Either the user can download the image with their browser as a single compressed file from a URL that will be provided later in development. Alternatively they can copy the image directly uncompressed from the server by following the steps outlined in the above paragraph. Or finally, an optional method will be to use a file sharing software (to be determined later in development) to download the image. This third option will be more desirable in areas where the Internet connection is slow or unstable, it allows for stopping/resuming download as needed.

The image of the EDiT server is based on Ubuntu 10.04 LTS (long term support) with the graphical desktop interface. An IP address must be configured along with a hostname. A file containing the instructions to setup the IP and Hostname will be found on the desktop along with a list of which ports will need to be opened on the institutions firewall that is to be sent to their ICT person responsible for the firewall. Once the IP and hostname are defined the user can update the MapViewer data files with these settings by running a search and replace. A search and replace tool is pre-installed on the mirror image. The image has a default stored IP of 193.190.116.10 which will need to be replaced by the IP provided by the institution. After that the image hostname, which by default is 'mirror', will need to be searched and replaced by the hostname provided by the institution (the current version of the MapViewer contains a single PHP file centralizing all the URLs used by the tool).

Upon completion of these steps the institution must send the IP and hostname it used to the RMCA to be added to a list of providers. The mirror setup will then be complete. The institution can use the VMware hyper visor to create other servers as they wish while hosting their own copy of the MapViewer tools.

The RMCA will add the institutions IP and hostname to a load balancing DNS list. It will ensure that the service is provided across institutions with no single point of failure. If one mirror goes down the Server requests will be automatically re-directed to another mirror.

An issue that still needs to be resolved is how to keep all the mirrors up to date if any changes are made the MapViewer tools. This is expected to be resolved in the coming months.

Conclusions and suggestions

The mirroring is easy to setup as long as the basic requirements are met. Once finished it only requires being kept running. In the event of a problem any server requests will seamlessly be directed to another mirror.

The current mirroring solution is easy to setup and maintain. However, many potentially interested parties will perhaps be put off by the dedicated server requirement for the hyper visor software. However, we would like to point out that they are able to support multiple other virtual machines on the same physical server, and that virtualisation of servers is today a standard and recommended procedure for server setup.

It is still possible to host a mirror in a server environment that is not compliant with the needs outlined above, by installing all the necessary software directly on the server. However, this requires much more time (closer to 1 full week instead of 1 half day) and direct support by the BeTAF team. It would also greatly complicate later updates, so this is clearly not recommended.

Next Steps

- Create a detailed user guide for the mirroring process.
- Implement options for sharing the mirror image
- Install a mirror in Madrid
- Test and implement a system for keeping mirrors updated and synchronized
- Follow up with other EDiT institutions who would like to host a mirror.