WP6 (from 2-3-2010 to 30-4-2010)

Much of the work has been done in parallel with WP5. Dispatching over the Internet has been implemented and tested. Usability tests have been run together with system tests. About community building, on the 30th of april an article has been submitted to the IV Italian Conferece on Free Software (ConfSL), an important appointment of people working on Free Software, as regards research, development, promotion and diffusion (www.confsl.org); on the 11th of May they will issue the acceptance/rejection notice. We are also planning to write more articles for specialized magazine (such as Linux Journal, :login; or LWN). We reviewed a list of similar projects (see attached document "Related Projects"). We need to look carefully at them, in order to understand where technology and market are going. This is essential for tuning the roadmap. Anyway, the following is an anticipation of some possible future works:

- Clustering (evaluate Ganeti)
- Load Balancing
- Optimize client bandwidth
- Evaluate LTSP-Cluster project architecture
- Account management (openLDAP)
- Configuration management (simplify)
- Reporting (event logging system)
- Automatic Application Server Cleanup
- Security model: evaluate Truecrypt (armour privacy vs CPU saving)
- iTalc support
- Using Launch pad for tracking the project

WP5 (from 11-1-2010 to 16-4-2010)

In WP5 we faced a big issue: performance. We did several tests and analysis. Experience and results are summarized in the "Mapping system level to desktop level performance" report. This is meant to be a metodology to be used for understanding system behaviour from user's point of view and hence dimensioning components whenever a specific deployment of VDD is needed. The work was underestimated or, better, our formulation of the problem was probably too complex, that's why closing it required quite a long time. On top of that, such work has been useful to improve system as soon as new perfomance insights were gained. This slowed down the process too, but we deemed it necessary. As we realized that we needed a long time to close the deliverable, we anticipated WP6 works, by running usability tests in parallel with system tests and implementing and testing the dispatching over the Internet. This way, Deliverable 6 is going to be handed in in close succession.

Debugging and tuning of system and its components have also been done. Two more machines, with three Desktop Environments each, have been set up: Gentoo 10 and Ubuntu Karmic. The full list of available machines is: Debian Lenny, Ubuntu Jaunty, Ubuntu Karmic, Centos 5, Fedora 11, Gentoo 10 (all of them including Gnome, KDE and XFCE Desktop Environments), Windows XP and Windows 7, for a total of 20 different desktops available for single or multiple selection from terminal. On all of them, packages and libraries needed for the tests were installed (see performance report for details). All the system was passed to 64-bits, including the host and every single virtual machine. This was also an opportunity to revise and validate the whole installation procedure (Xen, LTSP, virtual machines, privacy solution, launching scripts, etc.) from scratch. As terminals are not 64-bits machine, specific 32-bits kernels have been set for bootstrapping. This is configurable even in a mixed situation and with all sorts of kernel. After the bootstrap, terminals are ready for receiveing 64-bits desktops dispatchment, even if they are 32-bits. We did not register a considerable improvement of perfomance with such a change of system architecture (tests are mainly desktop-oriented, and hence more I/O bound, than CPU-bound). During tests, instead, a leakage in network was noticed (too many packets dropped). One host network card was indeed mulfunctioning. We needed to exclude it to avoid leakage.

Some improvements on GUI has also been done (see screenshots on the website), also thanks to feedback received from usability tests.

Finally, serv2 has been made reachable from the outside, both for working remotely (our community is small, but still some helps arrive from people not on the project at the moment) and for testing dispatchment over the Internet.

About community building, we kept updating the site, the blog, the development session, we

answered forum posts (still very few). We understood that the process of community creation is much longer than what we imagined. We believe it will work if good relationships will be pregressively established. The contact with Linux Revolution could be one of those, both from a technical and a commercial point of view. Common components are numerous: boot, load-balancer, account management, configuration management, reporting, security model. Both us and them are now concentrated on ours/their own project. But our future-work check list is already populated with several points from LTSP Cluster project. Besides, it seems that things are moving fast in the field of desktop virtualization. In particular, RedHat is developing something very similar to VDD (http://www.redhat.com/virtualization/rhev/desktop) and Ulteo too (http://www.ulteo.com

). Another relevant signal is that Microsoft announced changements to their desktop licences: "Beginning July 1, 2010, Windows Client Software Assurance and new Virtual Desktop Access license customers will have the right to access their virtual Windows desktop and their Microsoft Office applications hosted on VDI technology on secondary, non-corporate network devices, such as home PCs and kiosks" (http://www.microsoft.com/Presspass/press/2010/mar10/03-18DesktopVirtPR.mspx).

WP4 (from 2-11-2009 to 23-12-2009)

Time to fulfil this work package has been particularly long. A complex work has been done on bundling the whole product under graphical interfaces and tools. The final result, hereby presented, is quite satisfactory. After a first phase of development on the web-based GUI, we found more effective to focus on the host-based GUI. Here are the reasons:

1.Easy integration with the scripts host-side;
2.Less resources involved (e.g., apache web server is rather demanding in terms of resources);
3.Better user management (no need to use suexec and mod_fcgid, which, in their turn, need one virtual host for each user);
4.Zenity, the tool used for developing the GUI, just needs Gtk support and a few more, all already included in LTSP.

The result is a very good and fast host-based GUI, plus a simple and trivial web-based GUI. On top of that, we also found a very interesting tool we intend to integrate in VDD, virtual machine manager, that can help in the creation of virtual machines from scratch. It is not web based, but

it has got a client-server facility:
http://virt-manager.et.redhat.com/

About desktop level performance and testing, we started to test the following qualitative and quantitative parameters we defined.

Qualitative:
 a. start up GUI (Gnome, KDE, XFCE);
 b. responsiveness of menus (Gnome, KDE, XFCE);
 c. start up user programs (Gimp, OpenOffice, Firefox).

Quantitative:
 a. time start up della distro;
 b. time DE;
 c. time applicativi (Gimp, OO, FF);
 d. time cp, mv (100, 10, 1 M).

For the qualitative tests, we also intend to give out a questionnaire to "guinea pig" users. The results in the next deliverable.
Consolidation and debugging of system components have also been done, in particular, tuning on the machines ready to dispatch, which at the moment are: Debian Lenny, Ubuntu Jaunty, Centos 5, Fedora 11, Slackware 13 (only KDE, still some stability problems to solve), Windows XP, Windows 7. On all machines, common-use applications have been installed.

About community building, we have not seen at all the interest we expected. Probably the process is longer and must be supported by strategy we have not understood. Anyway, we worked on the article about VDD for Computer Programming, that have been finally published this month, instead of the previous one. It has been paged on the 10th of decembre and probably published today, the 23rd of december. As the magazine is quite important, we expect good feedback soon. Then, on sunday the 20th of december 2009, VDD has been presented at L'Altradomenica, an event dedicated to Open Communication and Free Software. There was quite a bit of public interested in the system and in the demo. VDD worked fine and people seemed impressed. The public was mainly composed of journalists, politicians and "intellectuals" of Free Software. This can maybe help to attract interest and funds.

Deliverables 4: (Web-based) GUI implemented. Documentation.

WP3 (from 17-09-2009 to 30-10-2009)

Most of the technical work has been put on implementing a system for preserving the privacy of VDD user (details in the following). Also, refinement on the system components assembly has been done, new types of OSs and Desktop Environments created and tested, scripts for automating the launch of VDD components developed. The GUI has been designed, including menus, fields, buttons and related functionalities. Based on this, scripts have been developed that constitute the bone structure of the GUI. They have been published in the web site, in the dowload section.

Work has been done on community building. Changelog tools, news, howtos on the website are constantly updated. News have been spread in order to find people and organizations willing to collaborate, promote, develop, discuss. A speech at Linux Day 2009 has been done to present VDD and open a call for partecipation. The speech received quite a bit of attention by the people present at LD. About a hundred people filled the venue of our speech. In particular, people from industry came. Questions, comments and declarations of interest in collaborating have been done by people working on industrial research for firms such as Engineering, RFI and Ent-it. Engineering is currently working on Eucalyptus middleware and they believe VDD could be integrated in it. People from RFI are working on precisely and dynamically allocating system resources (optimization) and believe their engine could be an enhancement for VDD, that, at present, can only allocate resources based on a machine granularity. A person from Ent-it focused on privacy isssues and suggested to include also navigation footprints in protected mode, besides personal data.

An important journal editorialist, Emmanuele Somma, Founder and Chief Editorialist at Linux Magazine (Italy), invited us to write an article on VDD to be published in Computer Programming, from 1991, a solid point of reference for developers, thanks to its independence and quality of the articles.

http://www.gruppoinfomedia.it/

It will be handed in on the 4th of november, to be published on the 22nd of the same month.

On the academic front, a paper has been accepted at Cloudcomp 2009 conference and we went to Munich on the 19th of October to present it. Some researchers argued that systems exist that do what VDD does, such as advanced features in VMware suite. But, to the best of our knoledge, nobody uses our approach and, above all, VDD is Free Software, whereas VMware is not. Other useful comments on bandwidth and latency of the streaming have been done (compressing Xorg data transfers is a possibility we are already investigating). Finally, we will surely take into accout suggestions on using Rocks clustering suite.

In this time slot, we also start to reason on performance. We already have lots of data on system level performance analysis, that we obtained through tests performed in previous research projects. We now intend to focus on desktop level performance analysis and, possibly, to understand how these two are related. At desktop level, parameters can be quantitave, for example, time for opening Firefox browser, time for saving a file in OpenOffice, etc, and

qualitative, reactivity of operations such as windows switching, minimizing, maximizing, menus popping-up, etc.. This work will prepare the performance testing.

Deliverables 3: Privacy solution implemented. Documentation.

WP2 (from 01-08-2009 to 17-09-2009)

We encountered problems with the new architecture, so we needed to change it and start again. This slowed us down a bit, but at the end we succeded in carrying it through. We also implemented the high availability clustering solution within the new architecture. An interesting aspect of the new architecture is that the GUI should now be easier to implement. We then worked on the new web site and introduced web tools useful for the community building process.

Deliverable 2: High availability clustering is working. Web site and tools are ready.

WP1 (from 01-07-2009 to 31-07-2009)

The main activity during the first month of the project has been to set up the laboratory and the base system. The room has been furnished. Two servers, ten PCs, network equipment, cables, power strips and other hardware have been bought, assembled and positioned. A separate LAN has been created, all computers have been installed and connected to such LAN and to the Internet. VDD base system has been set up and tried out in this new environment. Remarks have been done about managing physical and virtual disk resources in a more efficient way and new features have been introduced in VDD, which can be found in this report and in the documentation so far produced. Also the High availability clustering issue has been addressed. A particular system has been designed and should be fully implemented within the next work package. Some more details about this can be found in this report. Finally, work on the web site has been started. New structure, sections and categories have been defined and tools have been introduced based on the designed community-building process. The ultimate version of the web site will be online within the next work package and will be accompanied by details on such community-bulding process.

Deliverable 1: The laboratory is set up. Hardware is ready. Operating systems are installed. VDD base system is working.