

TEST METHOD AND ENVIROMENT:

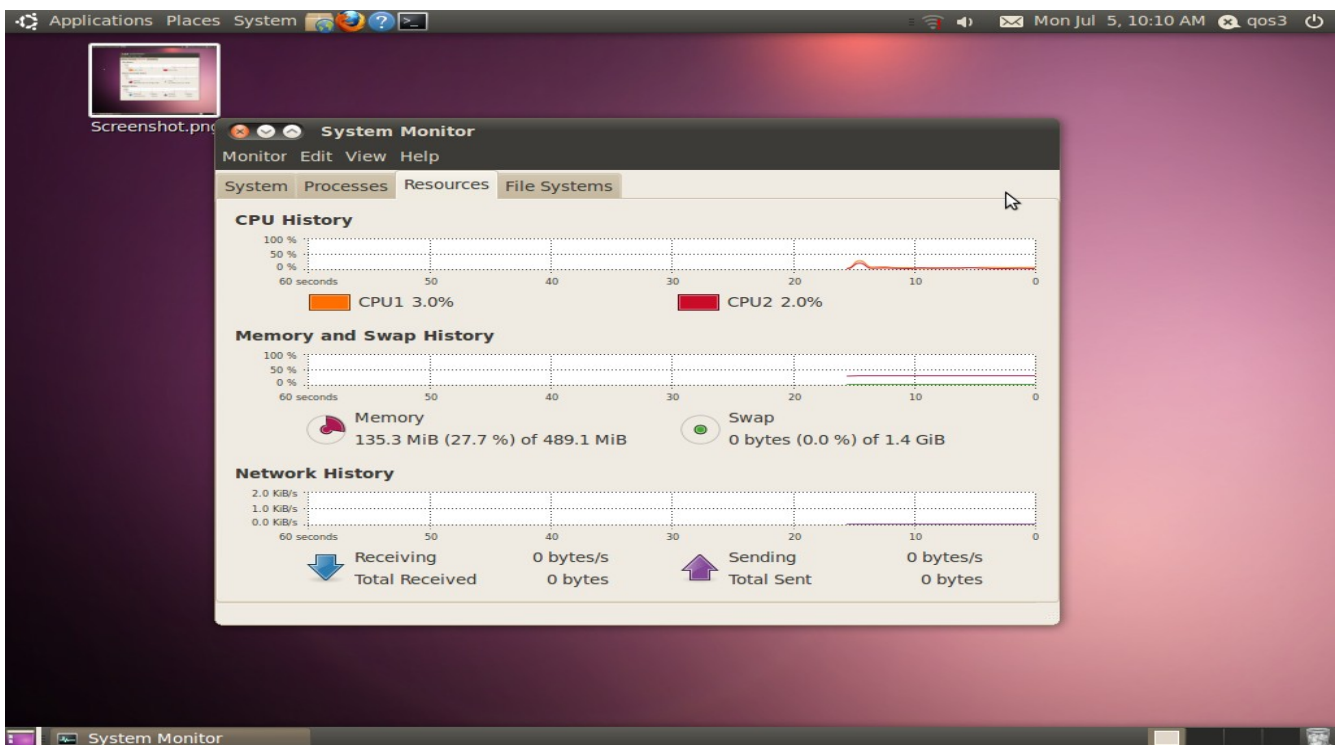
- The phoronix test suite tests were installed and run on one of the ordinary dmet lab pcs.
- All tests were run at idle without any processes or work running at the background. Only the default processes were running.
- the tests were run before installing any updates for ubuntu.
- There wasn't any sort of settings tweaking or extra processes killing before the tests were run.
- All tests were run back to back in series in the following sequence: ffmpeg, aio-stress, compress-7zip, compress-gzip, encode-mp3, encode-ogg, openssl, video-cpu-usage and video-extensions.
- All tests run many times and then they automatically estimate the results by the taking the average. Therefore the possibility that one test may affect the other is eliminated. However some tests heavily utilized the memory and the swap memory and this might have had a little impact on the preceding test results. (These tests were compress-7zip and compress g-zip)

TEST MACHINE SPECIFICATIONS:

- ◆ OS: Ubuntu Lucid 10.0.0.4 with Gnome interface.
- ◆ Processor: Intel pentium 4 with hyperthreading technology (two CPUs) 2.8Ghz @ 3.2Ghz
- ◆ Memory: 512Mb of DDR2 RAM
- ◆ HDD: 78GB of harddisk storage space.
- ◆ Swap Memory: 1.4GB of the harddisk were partitioned as swap memory.
- ◆ All partitions were in ext4 file system and partitioned under the main linux path “/”

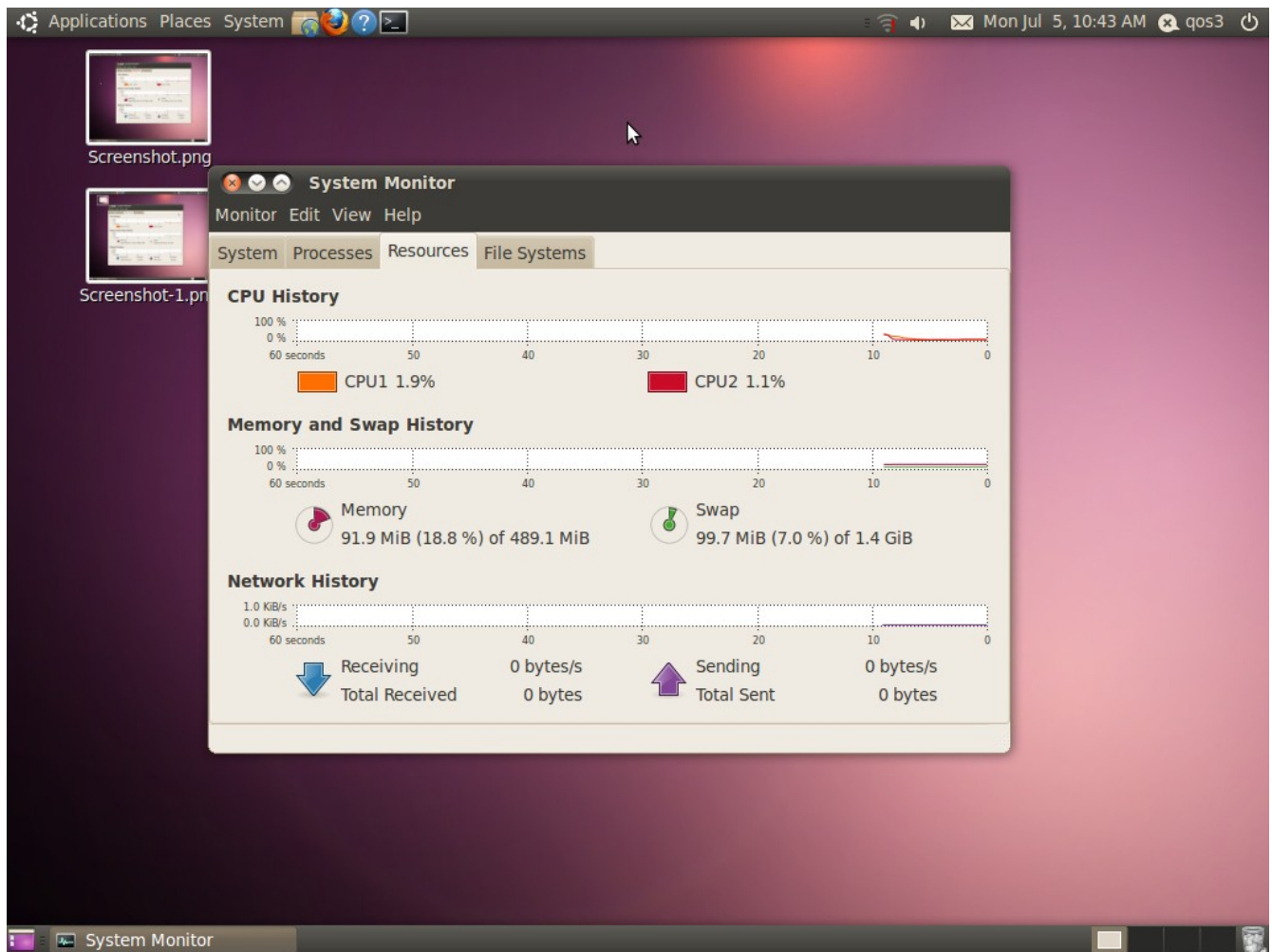
SYSTEM HEALTH BEFORE AND AFTER THE TESTS:

Below is a screenshot indicating memory and processor utilization at idle before running any tests or benchmarks :



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Below is a screenshot indicating the cpu and memory utilization but after running all tests and running a few applications after that. (such tests heavily utilized the memory and tortured the processor)



APPLICATIONS AND NETWORKING TESTS:

The ubuntu machine smoothly ran wireshark, ekiga softphone and vlc media player without any problems. Only a couple of media codecs were necessary to be downloaded and installed.

We tested the qos, media streaming and VoIP experiments through out the network between the ubuntu machine and the OpenSUSE machine and we had no problems in network configuration or with network protocols at all. All networking packages and protocols were just right there without the need to download any extra packages or patches.

I. Ping and Primary testing with wire shark:

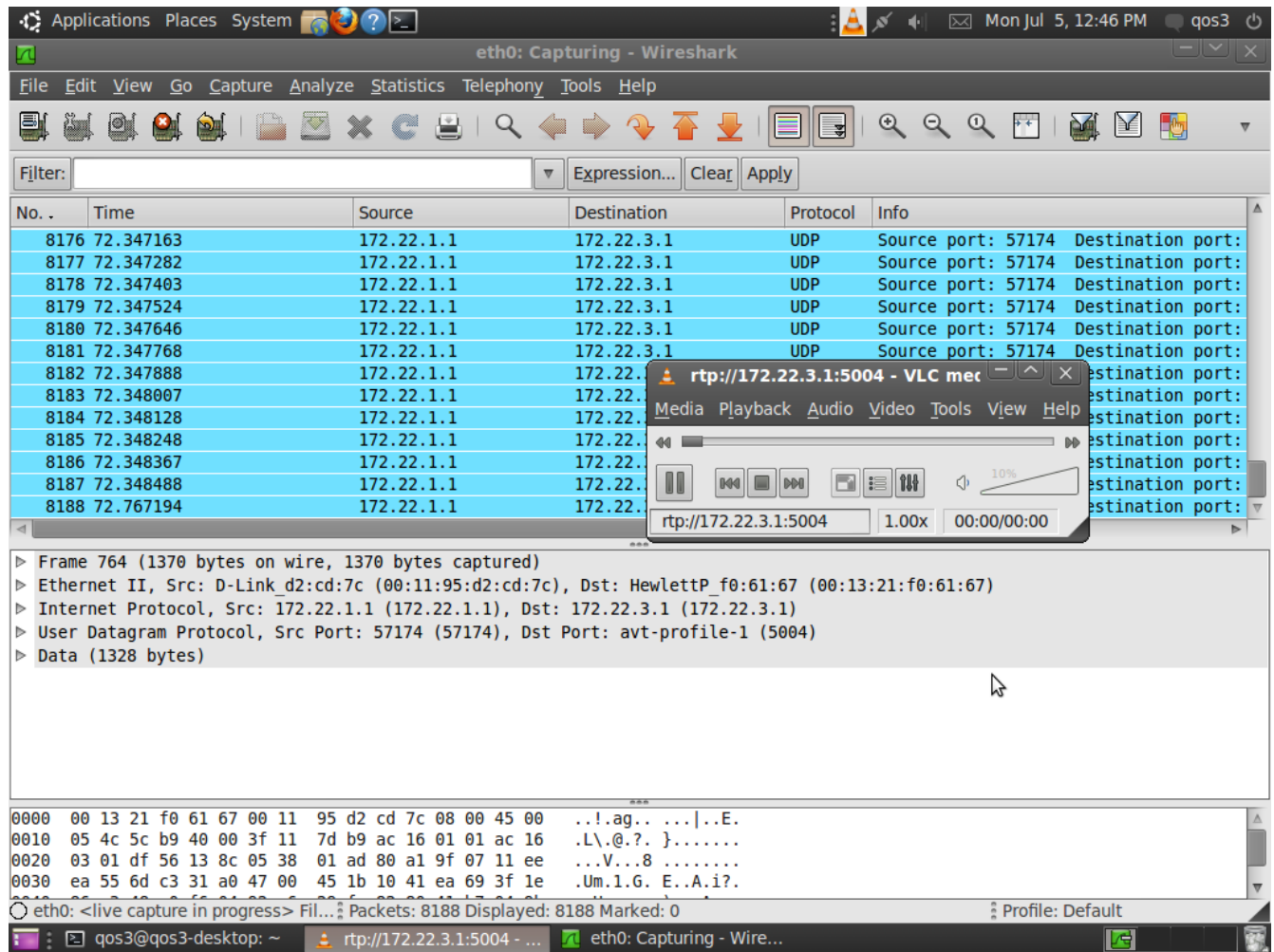
The screenshot displays a terminal window on the left and the Wireshark network traffic analysis tool on the right. The terminal shows two ping tests to 172.22.1.1. The first test shows a 2999ms round-trip time, and the second test shows a 2998ms round-trip time. Both tests show 4 packets transmitted and 4 received with 0% packet loss.

The Wireshark interface shows a capture on the eth0 interface. The packet list pane displays 37 packets. Packet 37 is highlighted in red, showing a destination of 224.0.0.251. The packet details pane for packet 37 shows the following structure:

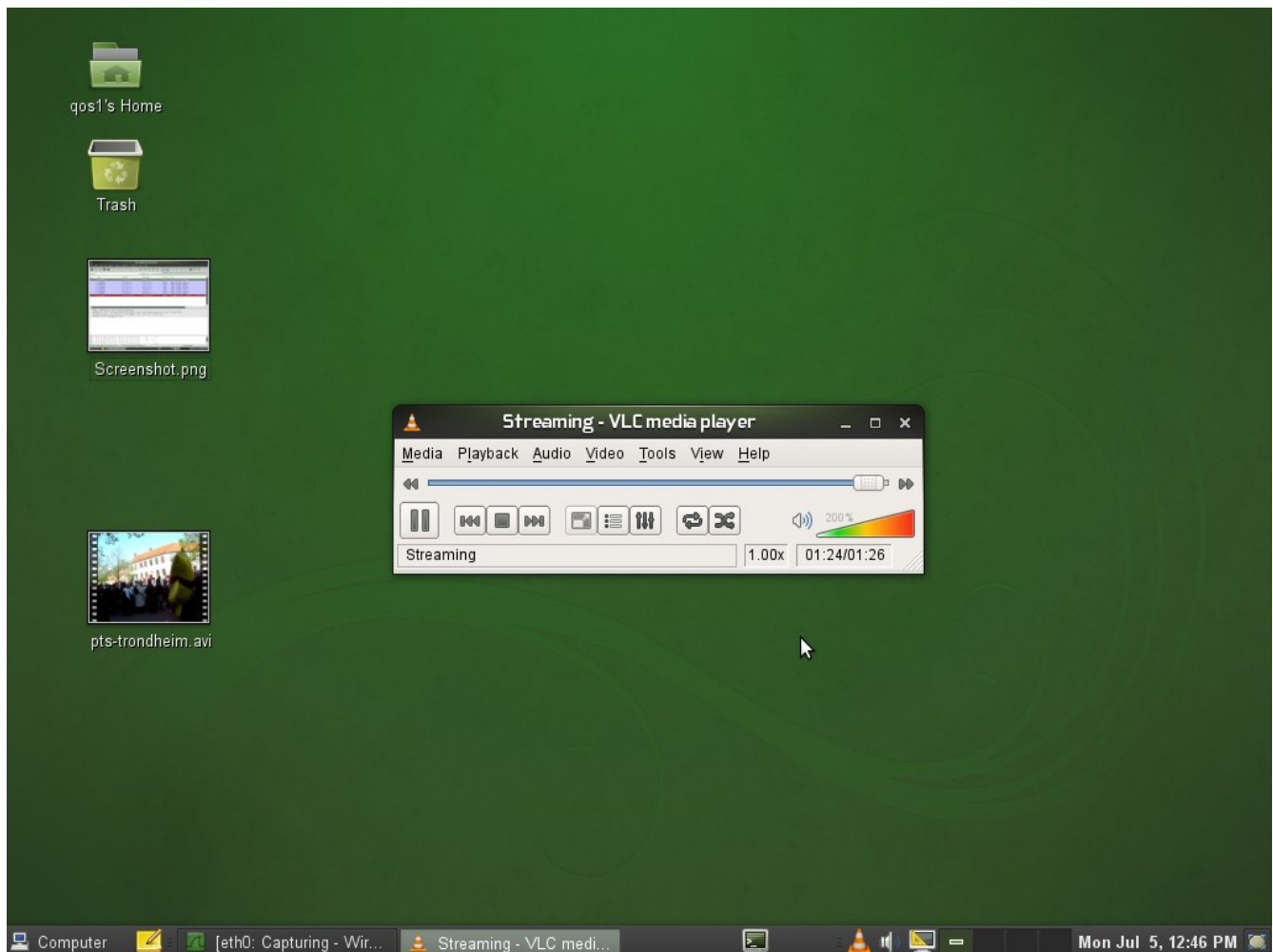
- Frame 15 (123 bytes on wire, 123 bytes captured)
- Ethernet II, Src: D-Link_d2:cd:7c (00:11:95:d2:cd:7c), Dst: IPv4mcast 00:00:00:00:00:01
- Internet Protocol, Src: 172.22.3.254 (172.22.3.254), Dst: 224.0.0.251 (224.0.0.251)
- User Datagram Protocol, Src Port: mdns (5353), Dst Port: mdns (5353)
- Domain Name System (response)

The packet bytes pane shows the raw hex and ASCII data for the selected packet.

II. VLC and Media Streaming:

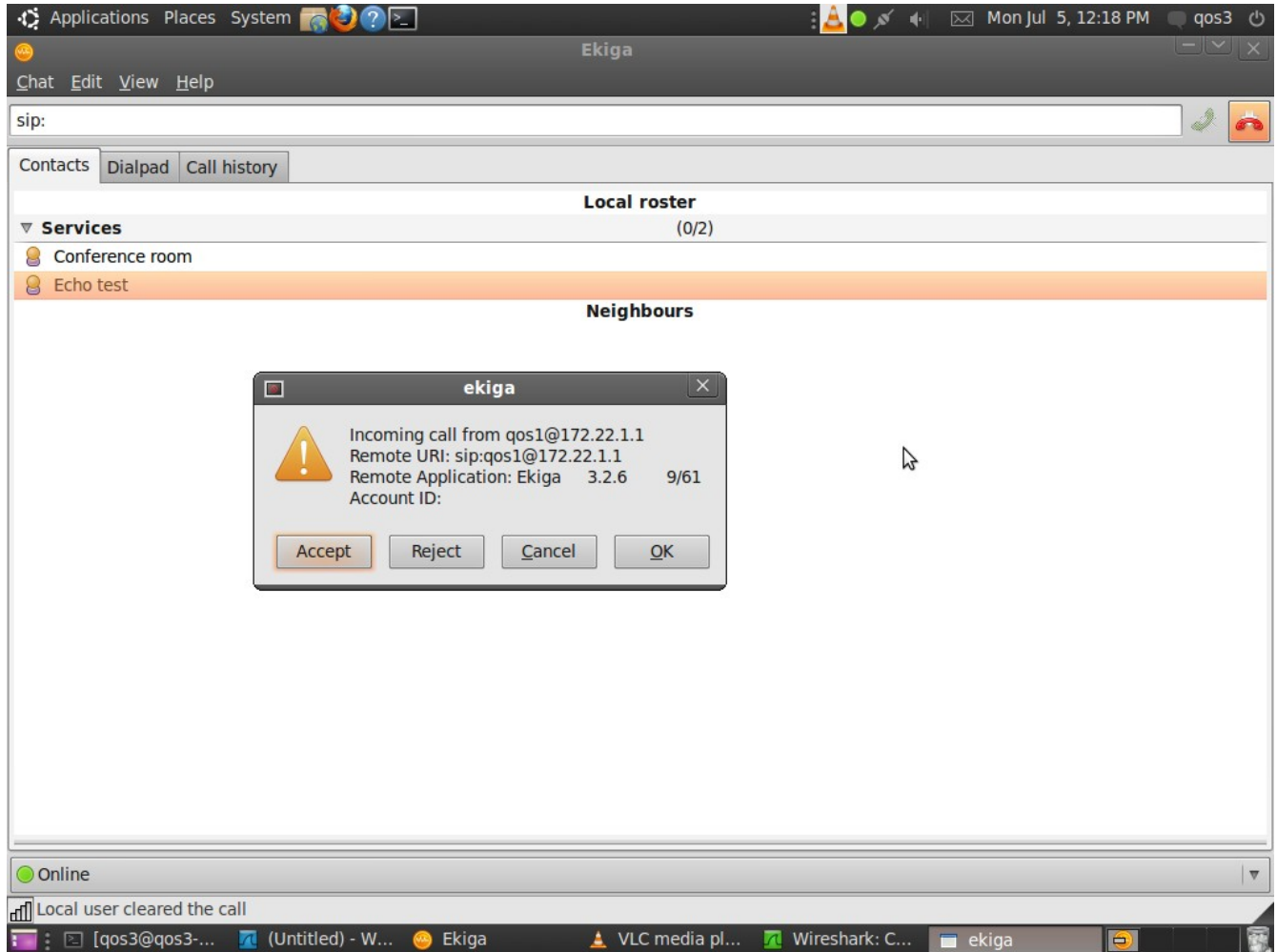


(the ubuntu PC receiving RTP packets from the OpenSUSE PC)



(The OpenSUSE PC Streaming live over the network)

III. Ekiga Softphone and VoIP:



(The Ubuntu PC received a call from the OpenSUSE pc)

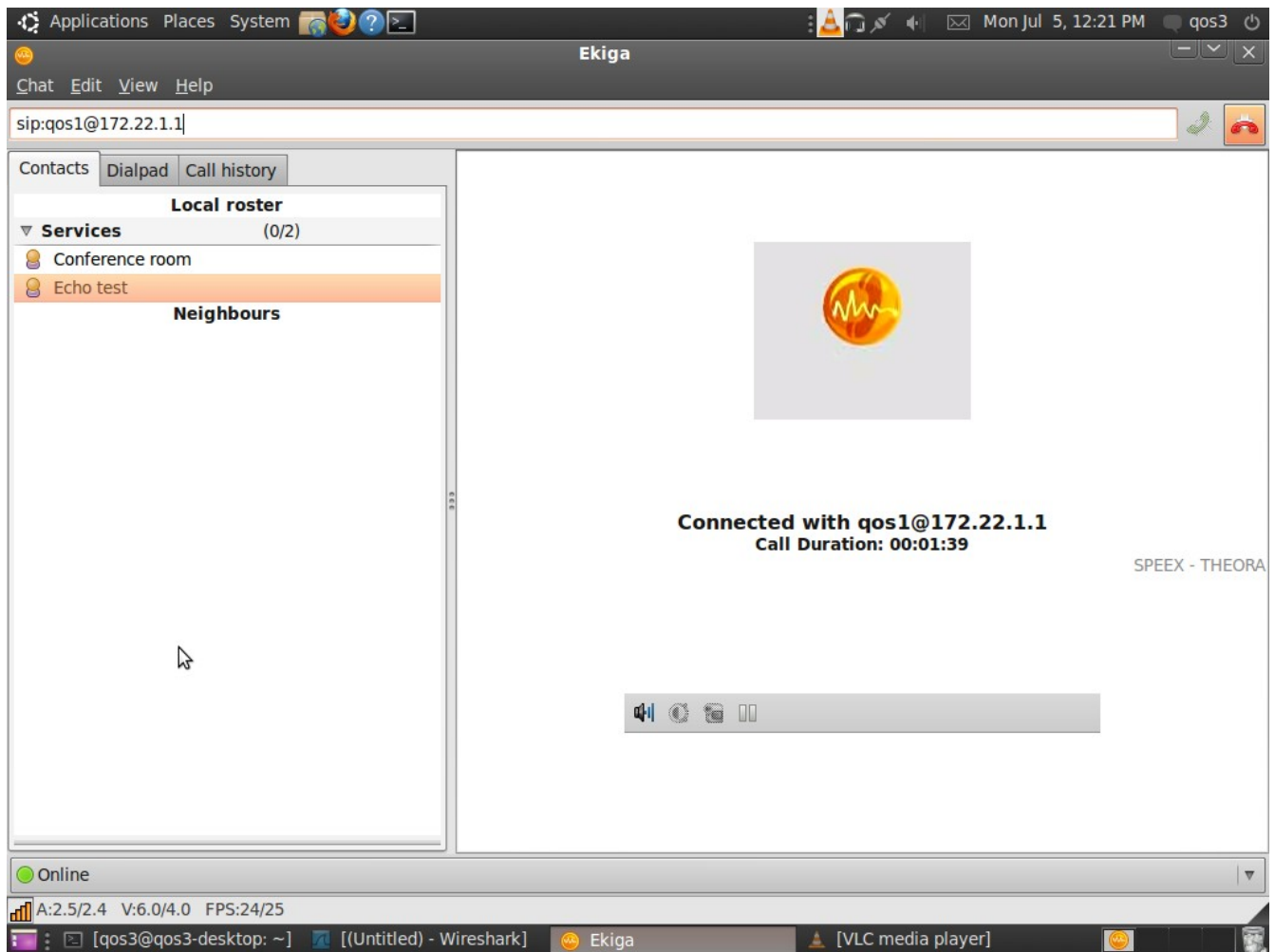
The image shows a Wireshark network traffic capture on the eth0 interface. The main pane displays a list of captured packets. The selected packet (No. 45) is an INVITE message from 172.22.1.1 to 172.22.3.1. The packet details pane shows the following structure:

- Frame 45 (1164 bytes on wire, 1164 bytes captured)
- Ethernet II, Src: D-Link_d2:cd:7c (00:11:95:d2:cd:7c), Dst: HewlettP_f0:61:67 (00:13:21:f0:61:67)
- Internet Protocol, Src: 172.22.1.1 (172.22.1.1), Dst: 172.22.3.1 (172.22.3.1)
- User Datagram Protocol, Src Port: sip (5060), Dst Port: sip (5060)
- Session Initiation Protocol

The packet bytes pane shows the raw data for the selected packet:

```
0000 00 13 21 f0 61 67 00 11 95 d2 cd 7c 08 00 45 00  ...!.ag...|..E.
0010 04 7e 00 00 40 00 3f 11 db 40 ac 16 01 01 ac 16  ...~.@.?..@.....
0020 03 01 13 c4 13 c4 04 6a b4 34 49 4e 56 49 54 45  ....j..4INVITE
0030 20 73 69 70 3a 31 37 32 2e 32 32 2e 33 2e 31 20  sip:172.22.3.1
```

(Packets coming from the OpenSUSE pc to the Ubuntu PC)



(The ubuntu PC and the OpenSUSE pc are now live and talking to each other, got a webcam?)

BENCHMARKING TEST RESULTS (Ubuntu Lucid 10.0.0.4 vs OpenSUSE 11.2):

Test	OpenSUSE	Ubuntu	Winner
aio-stress	FAIL	FAIL	N/A
compress-7zip	1656 MIPS	1544 MIPS	OpenSUSE
compress-gzip	38.41 secs	40.11 secs	OpenSUSE
encode-mp3	60.64 secs	61.52 secs	OpenSUSE
encode-ogg	40.83 secs	40.24 secs	Ubuntu
ffmpeg	34.22 secs	35.51 secs	OpenSUSE
openssl	10.2 signs/sec	9.67 signs/sec	OpenSUSE
video-cpu-usage	42.00%	47.80%	OpenSUSE
video-extensions	FAIL	FAIL	N/A

As obvious, OpenSUSE won against ubuntu In most of the tests. However the performance delta between both isn't big and the performance results are nearly the same. In fact, the difference was some times in fractions of a second. This implies that both Operating system are still in the competition. And yet to be considered.

Moreover, I believe ubuntu is still better than openSUSE for deploying on the GUC pcs for many reasons:

1. The GUI is pretty compact, handy, very useful, usable and pretty much similar to windows. Easy for the naïve user/student coming from the windows with no linux experience.
2. The Ubuntu community is pretty active and full of easy detailed solutions + documentation just in case we face any problems.
3. Ubuntu also have the gnome awesome safe mode that is very useful in cases of PC crashes and configuration errors. We can undo almost anything and can easily go through terminal even if the normal login don't work. (I remember I once mis-partitioned my boot drive at home and I easily undo'd what I did in a fly... PS: It was my 4th day ever on ubuntu)
4. Installation time and size is way better and more easier than openSUSE. 699MB vs 3.4GB installation media size, less steps vs more steps, handy optimized defaults vs manual specifications at some times and less installation time vs more installation time.
5. Ubuntu liveCD is a life saver and allows us to test-run ubuntu without actually installing it and therefore we can pretty much make use of the awesome tools that come ready in ubuntu. For example we used the ubuntu dd backup utility via liveCD to backup the old data on the hard disks onto another NTFS external hard disk (Yes, it was NTFS filesystem and readable in ubuntu and we didn't need to mount it or repartition it to another file system. Also, it was windows style plug and play. We just plugged the usb cable and magically the external drive icon appeared on desktop and we were browsing it right away <Recall older linux usb devices manual installation through terminal and compatibility problems>)
6. No need to heavily rely on terminal anymore (linux for human beings =D). During the whole process, I didn't even use the terminal once (well I used it once when I had to ping and that's it).

I configured the network with just a few clicks from the GUI , installed and deployed packages and programs the same way without facing any problems at all.

7. Less problems in ubuntu vs more problems in OpenSUSE. Ubuntu was always two steps ahead of OpenSUSE. I remember we had to update the OpenSUSE machine just to overcome some problems and install some necessary libraries, dependencies and packages. However these stuff were already available and feasible in ubuntu without any updates. Moreover, we also faced a problem connecting the OpenSUSE machine to the Internet through the GUC proxy today. And it took around 2.5 hrs of search, geeking and terminal troubleshooting to solve the problem. On the other hand ubuntu was just configured with a few clicks via the GUI and every thing was smooth and perfect.
8. The Ubuntu software center and package manager is pretty awesome such that we don't need to manually add source repositories any more. The repositories are automatically fetched from the servers and added once we choose a program or package to install. Once we click install all dependencies are automatically resolved , extra need packages auto downloaded and installed as well. This also gives us the advantage that updates for these programs will automatically be downloaded via automatic updates when ubuntu checks periodically for updates. Moreover the ubuntu package manager supports .deb packages (OpenSUSE doesn't) as well as all other kinds of linux package extensions. On the other hand OpenSUSE annoyingly checks all repositories every single time we need to install some package or program. Also sometimes manual adding of source repositories was needed. Also in case of ubuntu, there are many packages and softwares that are customized just for ubuntu which just implies that the ubuntu community checks these linux packages, test them and make sure they are bug free on ubuntu. We are in safe hands !
9. There are many useful ubuntu tweaks spread out there to squeeze the most performance out of the PCs and more tips as well. For example I managed to access the protected system directories and create a new folder through the GUI !!! (Yes, not through terminal) I just sudo -s through terminal . Became a root, launched the nautilus process (similar to explorer in windows) and GUI window popped up and now I can do whatever I want through the GUI , no more access denied! Such tricks can ease our life during troubleshooting in the future. And such tricks specifically the one I just stated didn't work with OpenSUSE even though they are both using the gnome Interface/session.

CONCLUSION:

Ubuntu is such a nice Operating system and better the OpenSUSE to deploy on the DMET lab PCs. Especially with easiness, usability, performance, less problems and active community + “OpenSource as it should be” combined and balanced in one Place (Oops I mean operating system)