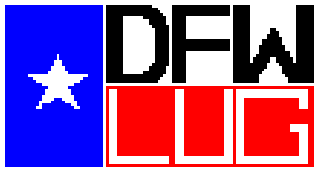
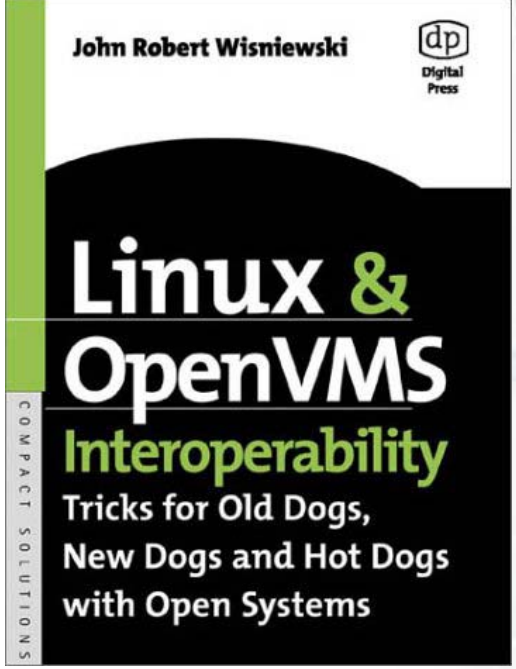
Linux and OpenVMS Interoperability

John Robert Wisniewski
Senior Systems Architect
Hewlett Packard

Session # 2453
Room B403
8/15/03 8:00am

HP WORLD 2003
Solutions and Technology Conference & Expo

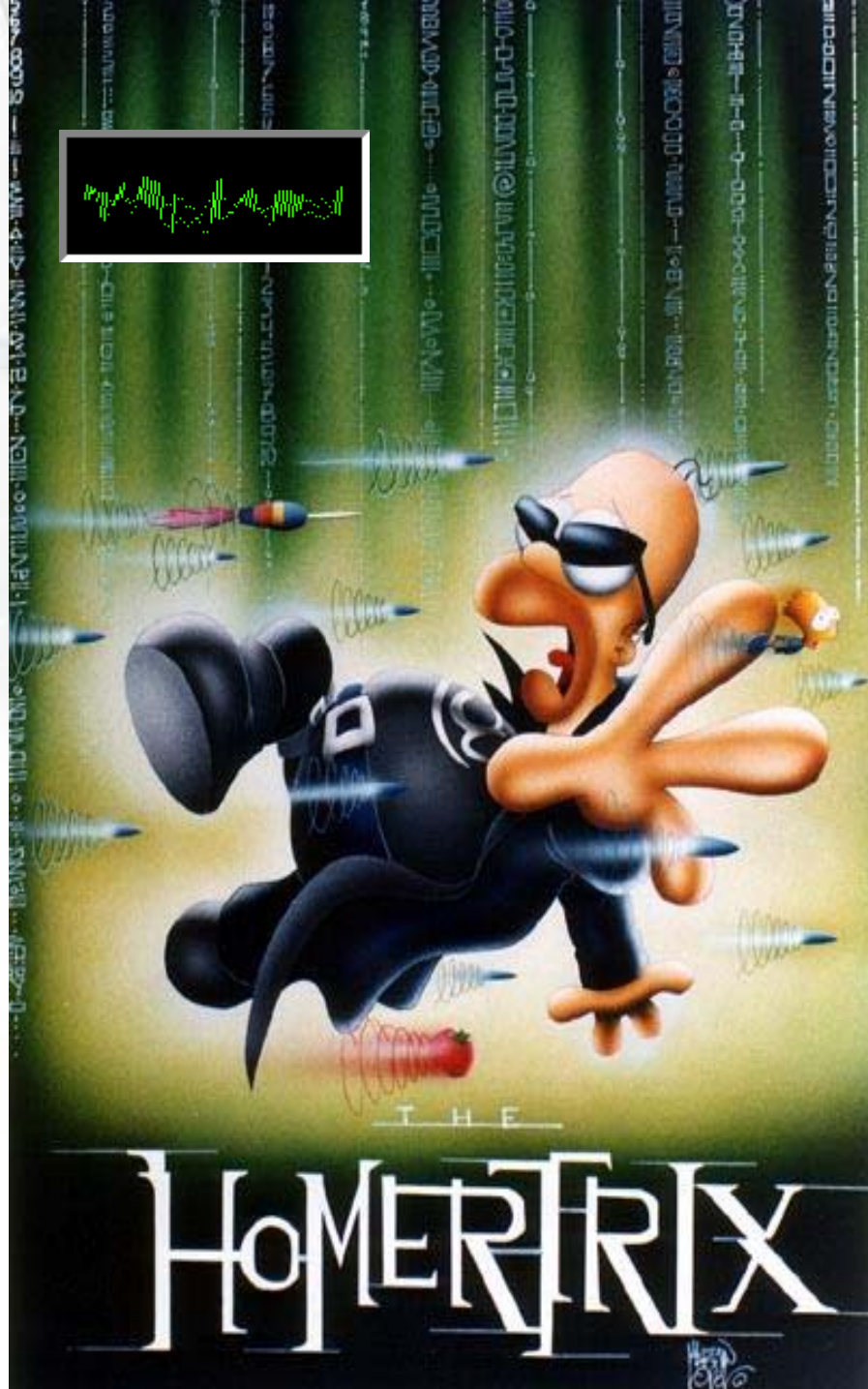




John Robert Wisniewski

http://vmsone.com

John.wisniewski@hp.com



The rest of the story from Digital Press

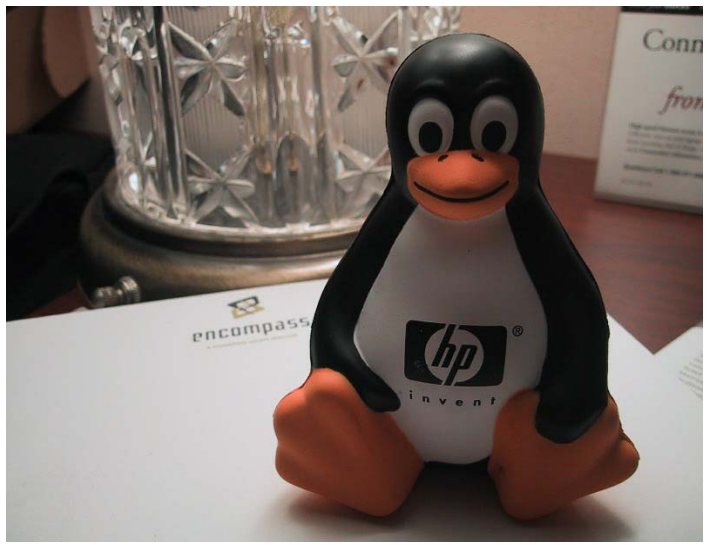
- **Linux and OpenVMS Interoperability**
- Tricks for Old Dogs, New dogs, and Hot Dogs with Open Systems

- ISBN 1-55558-267-2
- Chpt1 Linux and OpenVMS Similarities, Differences, and Common Features
- Chpt2 Breaking into OpenVMS and Linux Systems
- Chpt3 TCP/IP Networking between OpenVMS and Linux
- Chpt4 OpenVMS and Linux Security
- Chpt5 Linux and OpenVMS Xwindow interoperability
- Chpt6 OpenVMS and Linux E-mail
- Chpt7 OpenVMS Advanced Server and Linux SAMBA with Windows Clients
- Chpt8 Apache web server for OpenVMS and Linux
- Appendix OpenVMS to Linux Compendium of Open Source Tools:-)

Some OSes are not just a lifestyle

TUX vs Albert

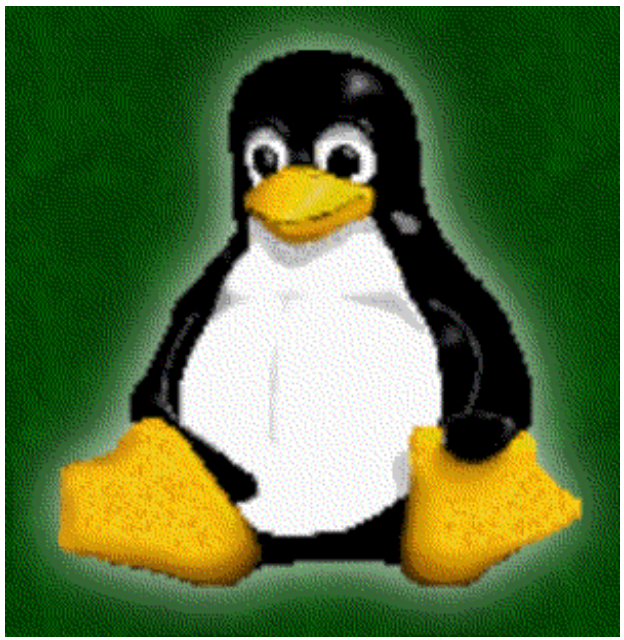
- **BATTLE OF THE 32-Bit MASCOTS**
  - Figuring the Odds:
  - Penguins are almost chickens
  - Cats freeze to death in the Artic.



TUX vs Vernon

Battle of 64-bit OS mascots

There is this natural relationship between Sharks and Penguins enough said.



OpenVMS and Linux Together on the same network?

OpenVMS and Linux

- SIMILIARITIES
- Rabid loyal installed base of users
- Internet Ready
- Standard Environments
- Standard Protocols
- Xwindows Not MS Windows
- And both have a rabid, loyal installed base of users!

OpenVMS and Linux

- DIFFERENCES
- Vendor Maintained Vs Open Source
- Scaling and Performance
- Native File Systems
- VMS / Unix design differences
- VMS Clustering and Beowulf clusters
- Rabid loyal installed base of Users

OpenVMS and Linux

- AREAS OF INTEROPERABLITY
- File Exchange File Systems blending
- Terminal / CLI
- Email
- Xwindows

OpenVMS and Linux

File Exchange File Systems blending

- TCP/IP FTP
- DECnet for Linux (and DECnet copy)
- NFS (Network File System from the Unix world)
- SAMBA (For VMS and Linux from the MS world)
- Advanced Server (for VMS from the MS world)

OpenVMS and Linux

Terminal Interchange

- Telnet VT Terminal support
- Terminal sessions can control VMS and Linux Systems
- Most Utilities work from a Command Line Interface
- Shell languages are different (DCL/BASH)
- Editors are different (EDT-TPU / VI – EMACS)

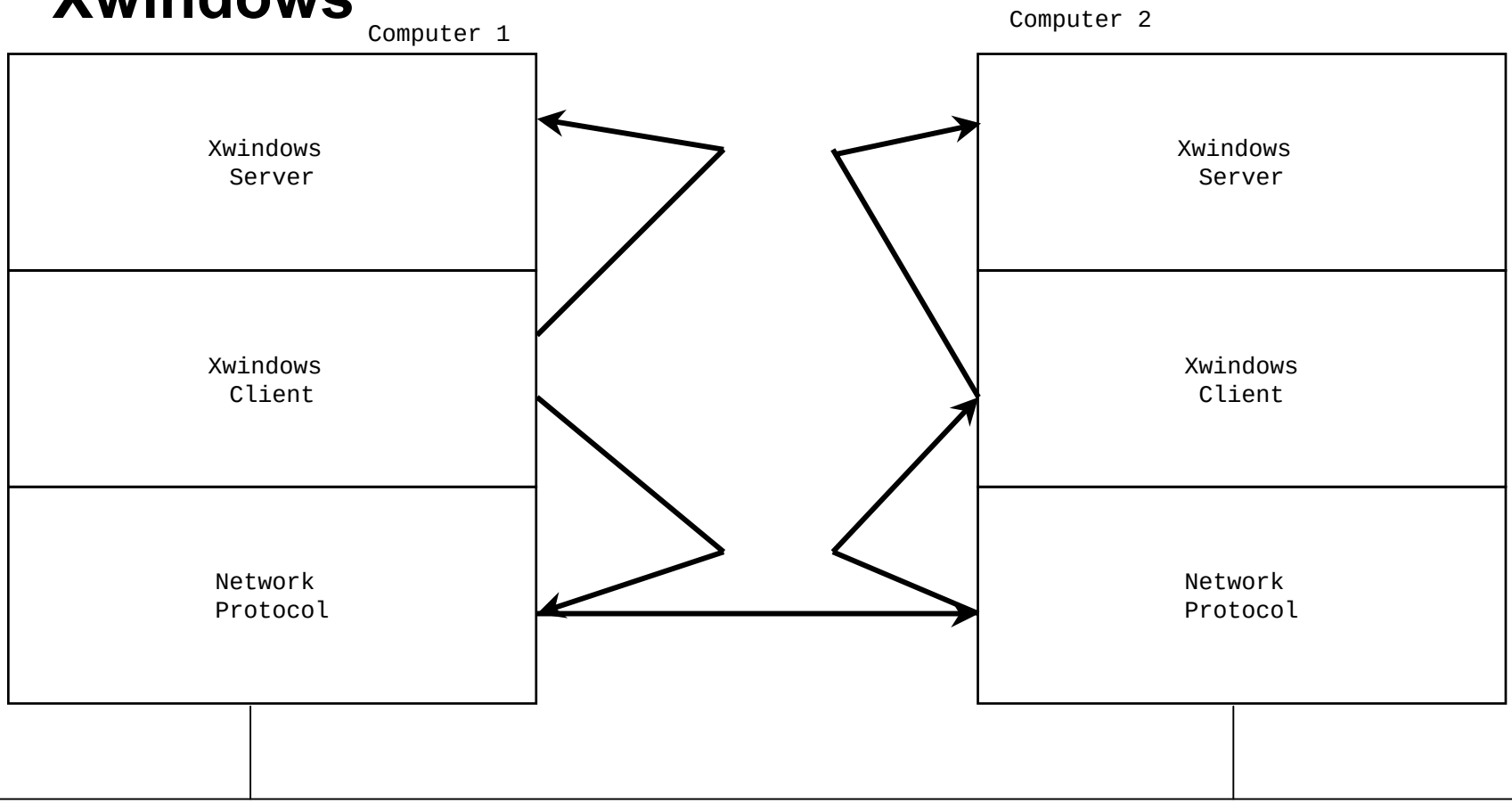
OpenVMS and Linux

Email

- Both systems come with SMTP
- NETscape/Mozilla are excellent Free Email Clients
- http://www.bynari.com/ Bynari Systems of Dallas Texas has Linux (Open Source) Exchange Clients and Exchange Servers for use with Exchange Mail systems

Xwindows Network Paths

- Xwindows



OpenVMS and Linux

- Xwindows

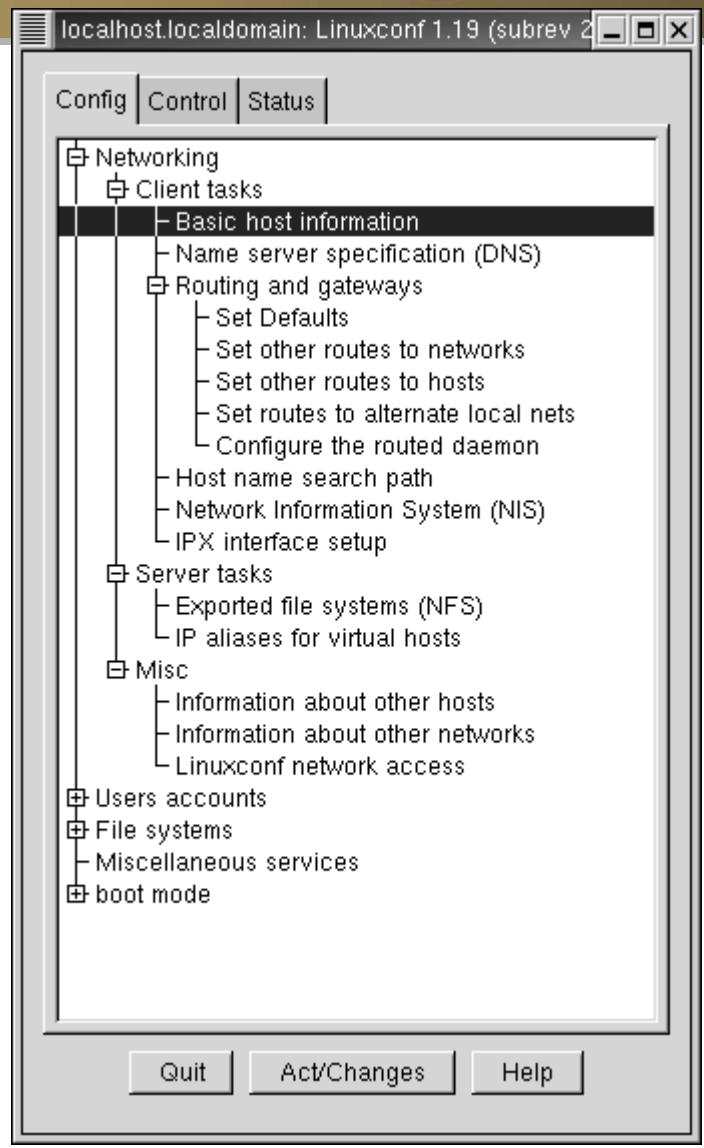
System Management

From a Menu

Linux – Linuxconfig

VMS – TNT Agent

InsightMgr XE Agent

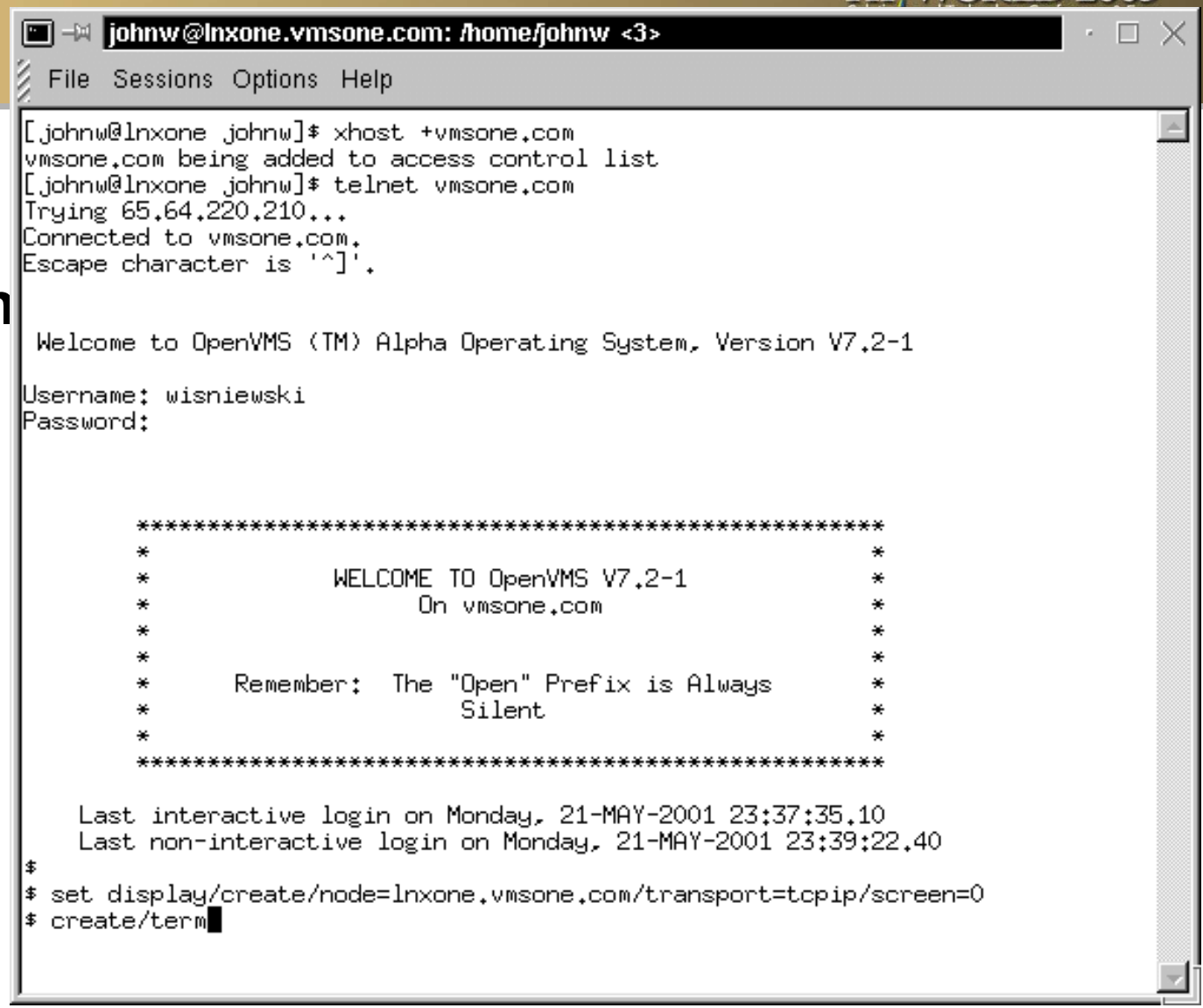


OpenVMS and Linux

- **Xwindows Application Example**
- **Step 1 Authorize OpenVMS Xserver to display**
  - **With the xhost command on your Linux box controls who can write to your Xwindow Server display.**
  - **xhost + allows every host in your network to send Xwindow displays to your screen**
  - **xhost - allow no one in your network to send Xwindow displays to your screen**
  - **xhost +nodename.com allows just "nodename.com" to send Xwindow displays to your screen.**
  - **xhost with no arguments tells you who is authorized to send Xwindow displays to your screen**
  - **Remember you can always block all Networked Xwindow Displays by typing "xhost –" on a local Linux terminal window**

OpenVMS

- On your Lin
- xhost +
- telnet

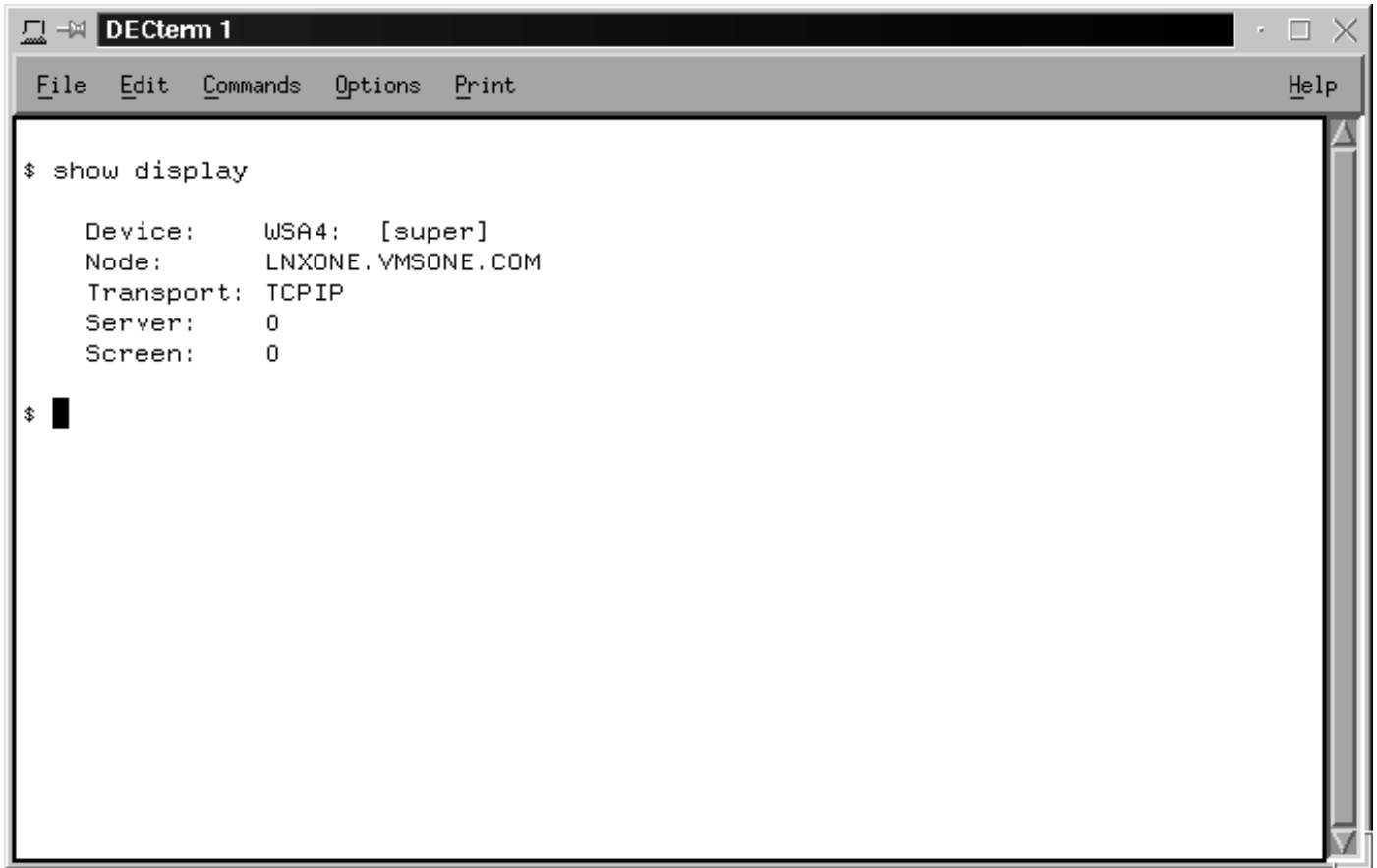


OpenVMS and Linux

- Xwindows then as you are logged into VMS window
- $set display/create/node=lnxone.vmsone.com-
/transport=tcpip/ screen=0

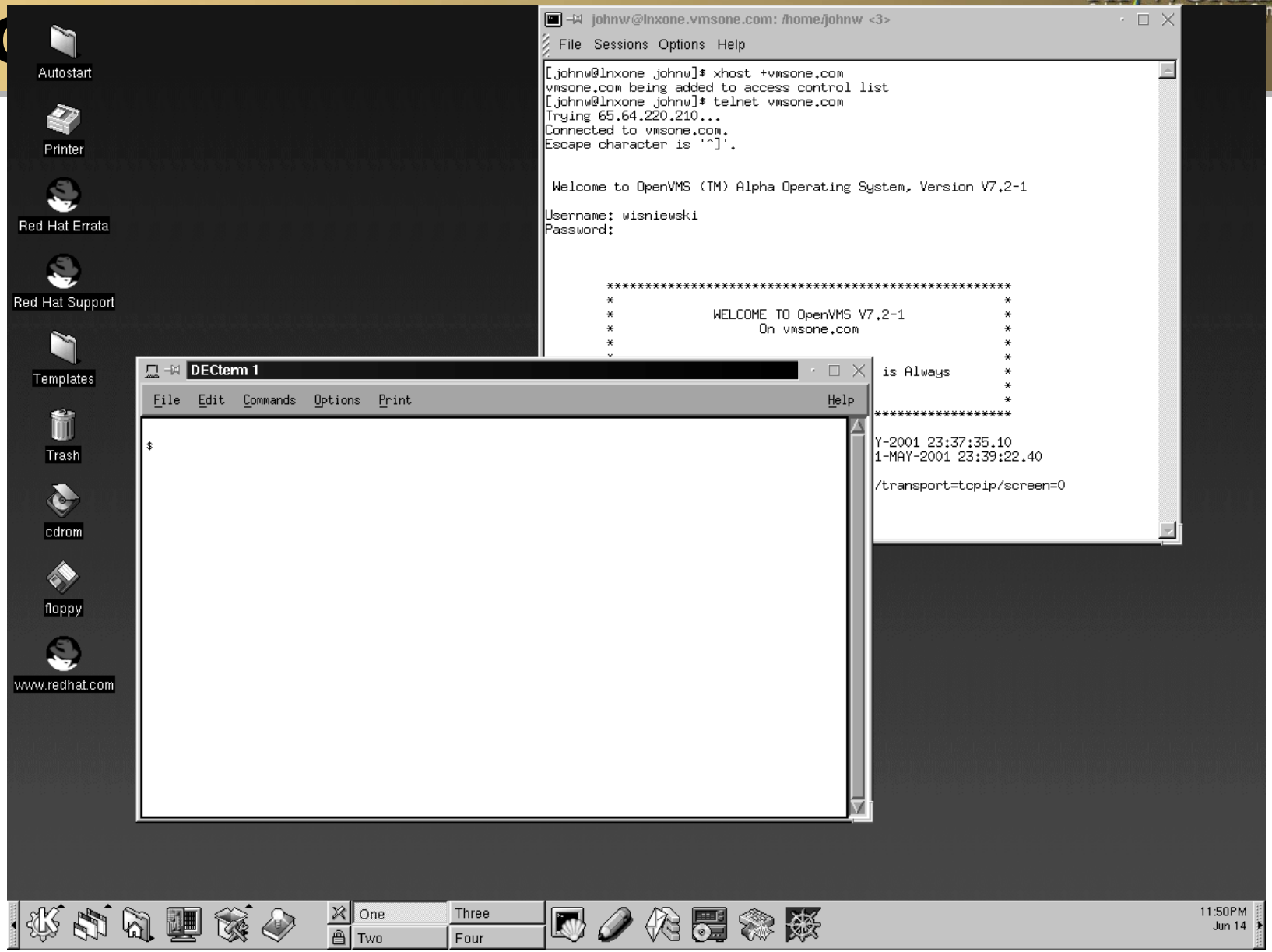
OpenVMS and Linux

- Xwindows VMS $SHOW DISPLAY



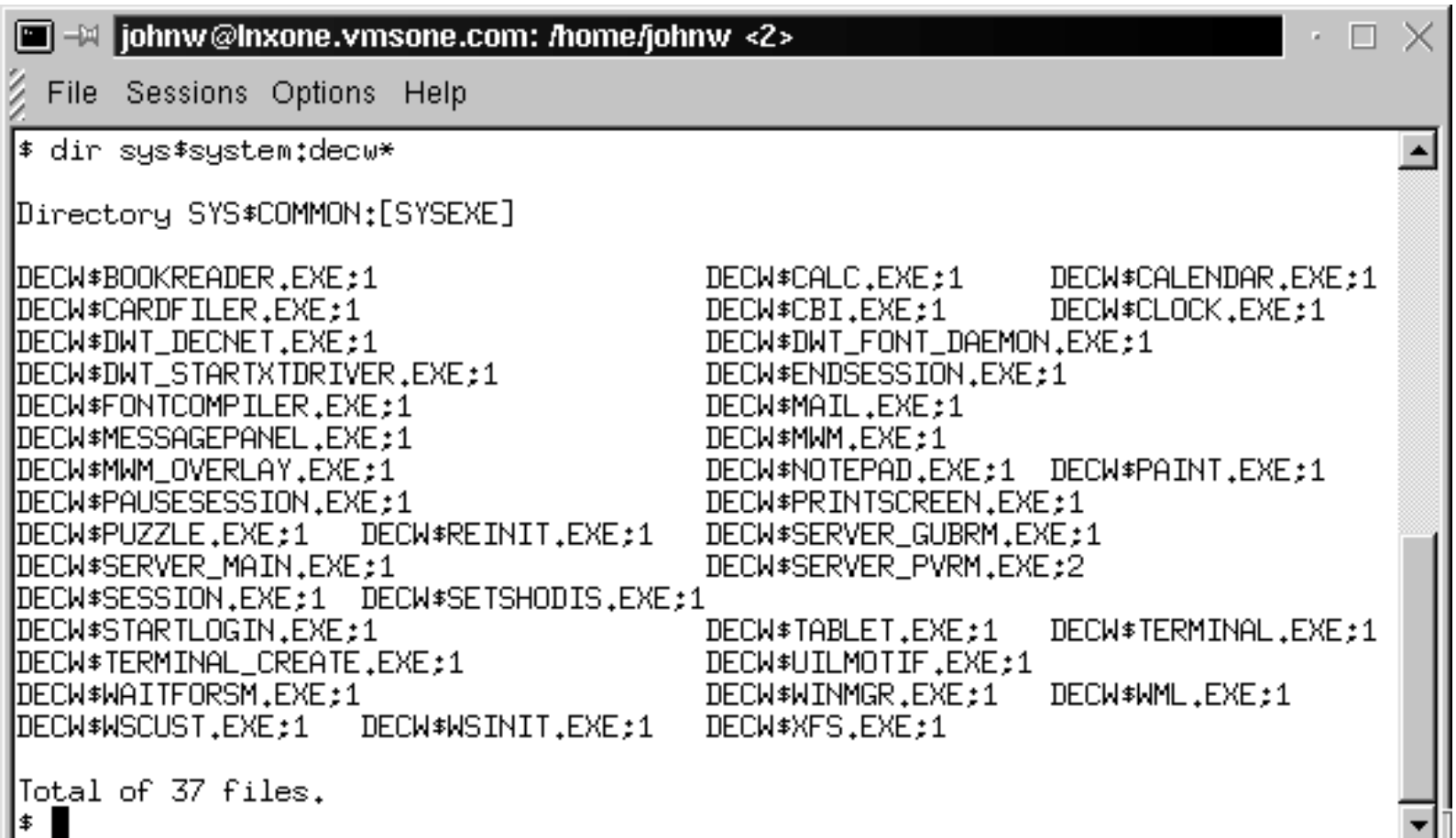
OpenVMS and Linux

- Xwindows then as you are logged into VMS window
- $CREATE/TERM


Autostart
Printer
Red Hat Errata
Red Hat Support
Templates
Trash
cdrom
floppy
www.redhat.com
johnw@lnxone.vmsone.com: /home/johnw <3>
File Sessions Options Help
[johnw@lnxone johnw]$ xhost +vmsone.com
vmsone.com being added to access control list
[johnw@lnxone johnw]$ telnet vmsone.com
Trying 65.64.220.210...
Connected to vmsone.com.
Escape character is '^]'.
Welcome to OpenVMS (TM) Alpha Operating System, Version V7.2-1
Username: wisniewski
Password:
WELCOME TO OpenVMS V7.2-1
On vmsone.com
is Always
Y-2001 23:37:35.10
1-MAY-2001 23:39:22.40
/transport=tcpip/screen=0
DECterm 1
File Edit Commands Options Print Help
$
One
Two
Three
Four
11:50PM
Jun 14

OpenVMS and Linux

- **Xwindows & VMS Applications**



OpenVMS and Linux

- Xwindows Summary
- Set Linux Xwindow write security Xhost +
- Login to VMS

On VMS system

$set display/create

run application or create terminal e.g.

$run sys$system:decw$clock

$create/term

Have fun redisplaying VMS Xwindows

Break into Linux in 10 steps!

- **Linux / Redhat Root Password change**
- **1) Have physical access to the Linux system**
- **2) boot Redhat Linux CDrom distribution disk 1**
- **3) type in "linux rescue" as the boot choice**
- **4) choose English (or your local language)**
- **US Keyboard (or your local varient)**
- MESSAGES:
- running anaconda -- please wait ...
- **5) Choose "Continue" when asked to mount your linux installation**
- **(don't chose "read-only")**
- MESSAGES:
- Searching for Redhat Installation...
- Your image has been mounted under
- /mnt/sysimage/

Break into Linux in 10 steps

- **6) Enter a return to get a shell "Ok"**

- Prompt
- sh-2.05a#

- **7) Change root to the mounted file system**

- sh-2.05a# chroot /mnt/sysimage

- **8) change root password**

- sh-2.05a# passwd root
- New Password:Welcome1 (not echoed)
- Retype new password:Welcome1 (not echoed)
- passwd: all authentication tokens updated successfully

- **9)Exit the shell and shutdown the system**

- sh-2.05a# exit

- **10) remove the Redhat Install CDrom and reboot from the Hard drive.**
- **The Root Password will now be Welcome1**

- When the linux system reboots login as root.
-
- **Congratulations, you've just broken into a Linux System!**

Breaking into an OpenVMS System

- **1) Have physical access to the OpenVMS system**
- **2) Reboot / Hault the boot process (find the reset button on your Alpha) and**
- **find yourself at a three chevron prompt ">>>"**
- **3) For most Alphas boot with the "Conversational Boot" Flag set**
- >>>boot -flag 0,1 (!0 refers to the cluster "system software" directory you want to boot from)
- **4) At the "SYSBOOT>" prompt you can change any VMS SYSGEN PARAMETERS BEFORE THE SYSTEM RUNS!**

But John, How can I share Files?

File and Printer Sharing

- SMB Disk Sharing, Not just for Windows Anymore
- SAMBA for OpenVMS and Linux
- Advanced Server for VMS (from VMS Engineering)

What is Samba?

sam·ba (sam’ ba) n.

1. A Brazilian ballroom dance of African origin.
2. Music in 4/4 time for performing this dance.
3. An OpenSource SMB server

One more time in English

Just what in the heck is Samba:

Open Source (under the GNU License) SMB Server for Linux, VMS, and Unix.

Windows File and Print Services for non MS Operating Systems

For the recently initiated

- SAMBA is a free implementation of an SMB (Server Message
- Block Protocol)

- Windows PCs utilize SMB Protocols (recently renamed by Bill and
- Company to CIFS (Common Internet File System) to access
- remote file systems and printers.

- These resources are also known as shares or services in
- Bill speak.

Samba's Features

- 1) Act as a NetBIOS nameserver
- 2) Participate in NetBIOS browsing and browse master elections
- 3) Act as an SMB client and access shares or printers on other
- SMB servers
- 4) Backup local SMB shares to remote SMB shares
- 5) A CLI for limited remote administration for WNT servers
- and other SAMBA servers.
- 6) Be a Domain Controller for Windows 9x, and WFW clients.
- (Work is underway for NT 3.51/4.0 Domain Control too!)

So what do you do with Samba?

- 1) Replace a WNT file/print server and save the license cost
- 2) Provide a gateway for synchronizing Linux and Windows Passwords.
- 3) Act as a single “Home Directory” server Linux and Windows home directories exist in a common space
- 4) Act as a print gateway between Linux and PC networked printers
- 5) Allow Linux machines to access Window based file shares.

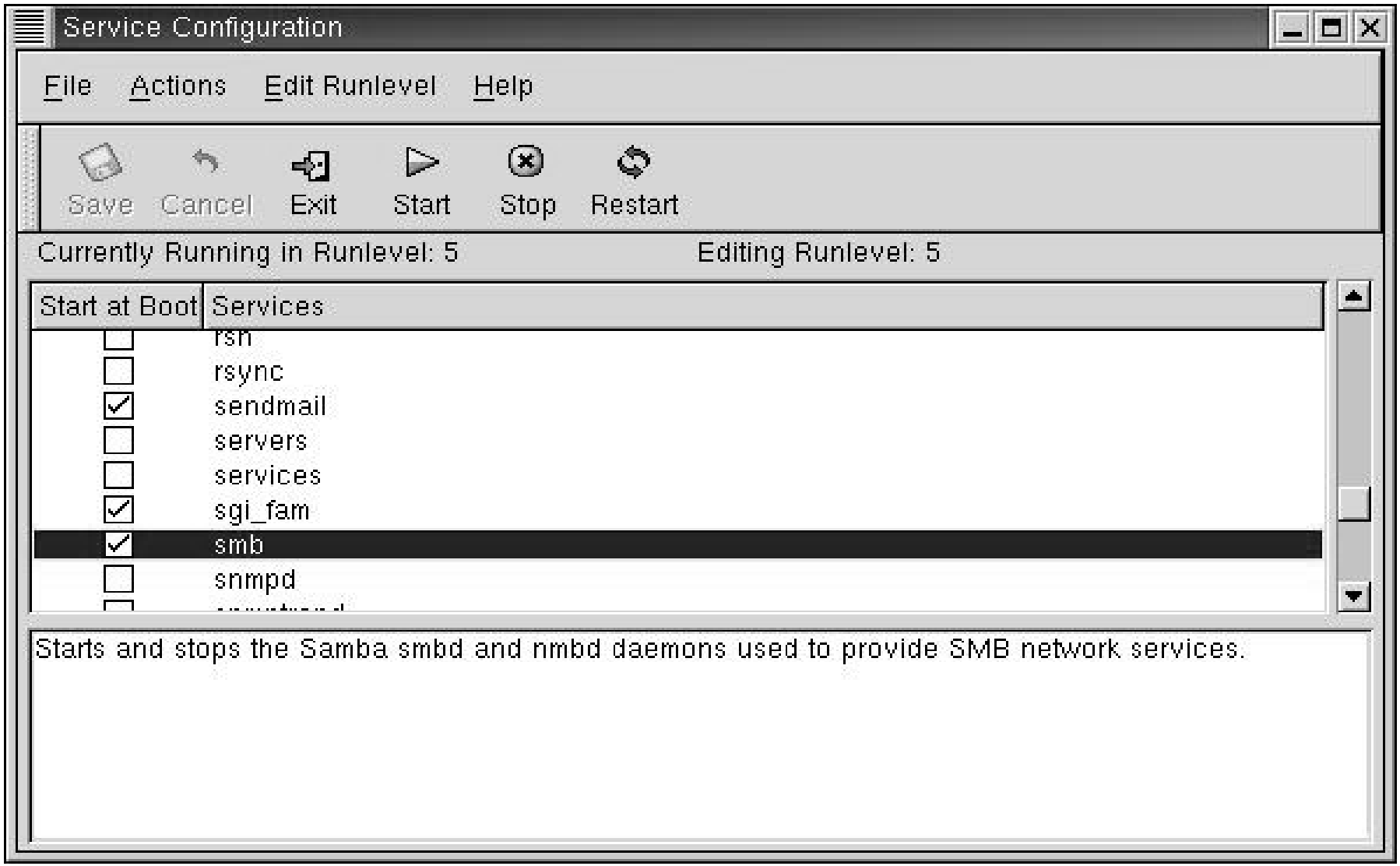
Where Can I get SAMBA?

- Http://www.samba.org/
- -- The SAMBA homepage for Linux

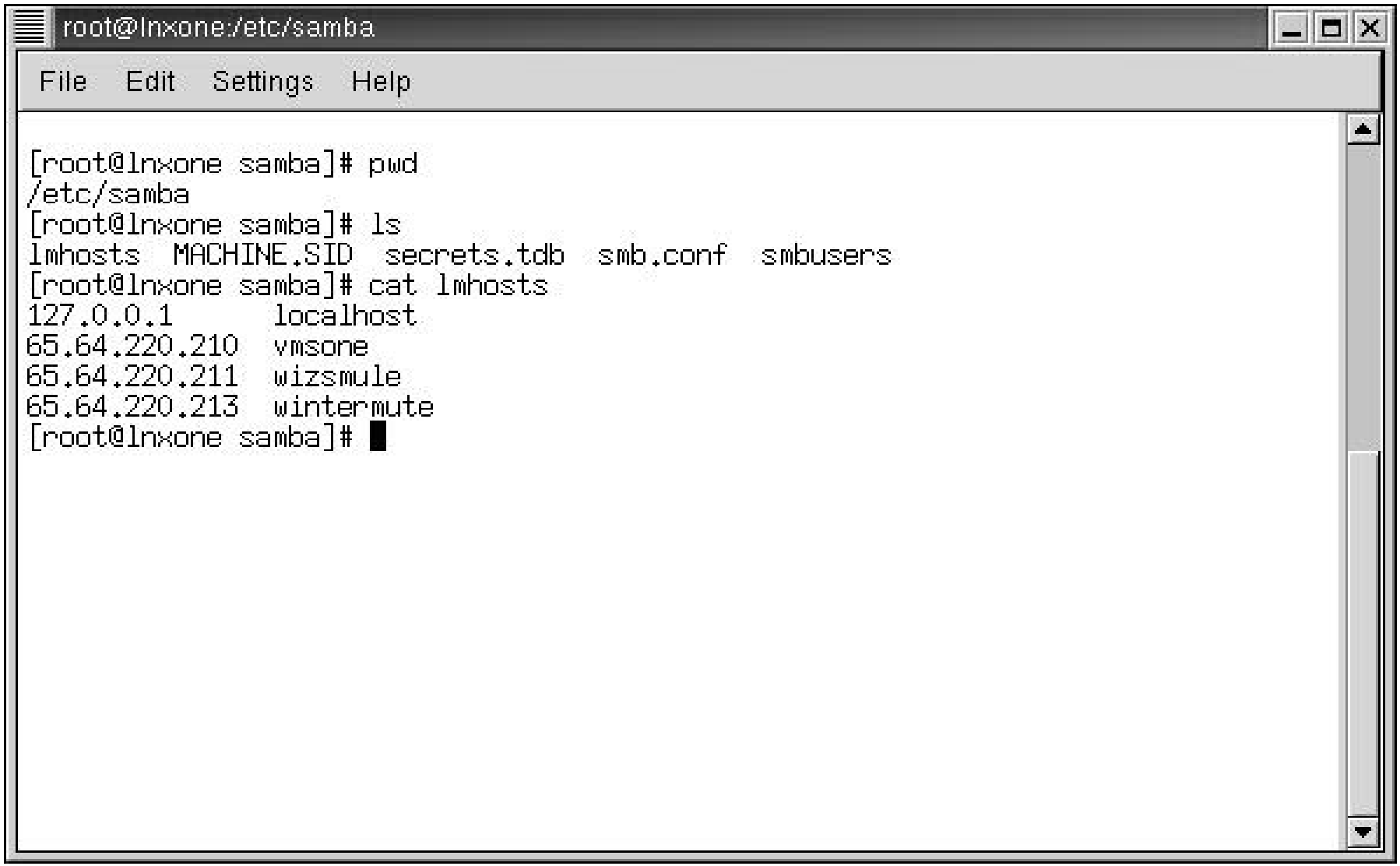
- http://ifn03.ifn.ing.tu-bs.de/ifn/sonst/samba-vms.html
- -- The Samba OpenVMS Hompage

- The CD in the back of one of those expensive Barnes and Noble Computer books...

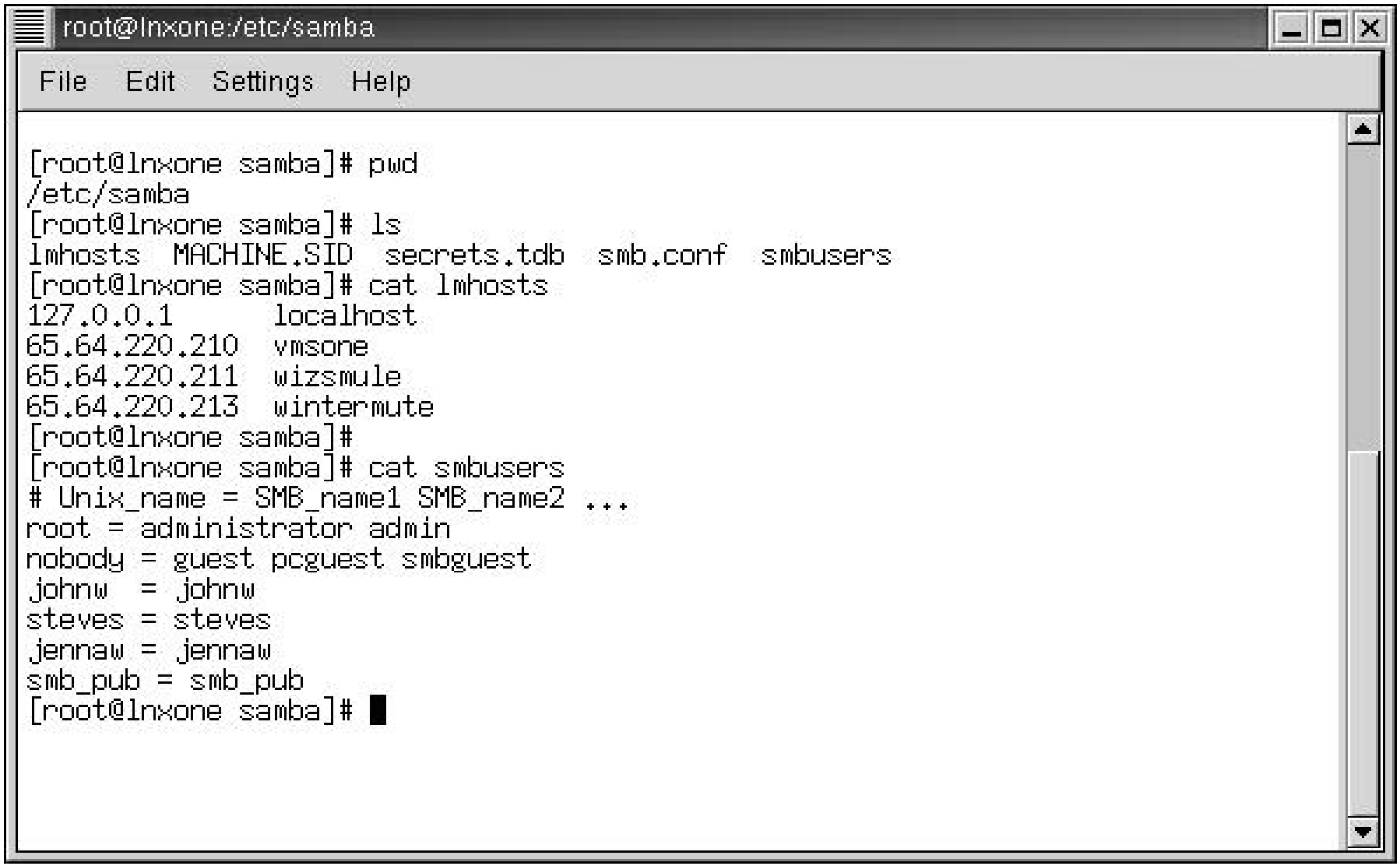
Configuring Samba on Linux



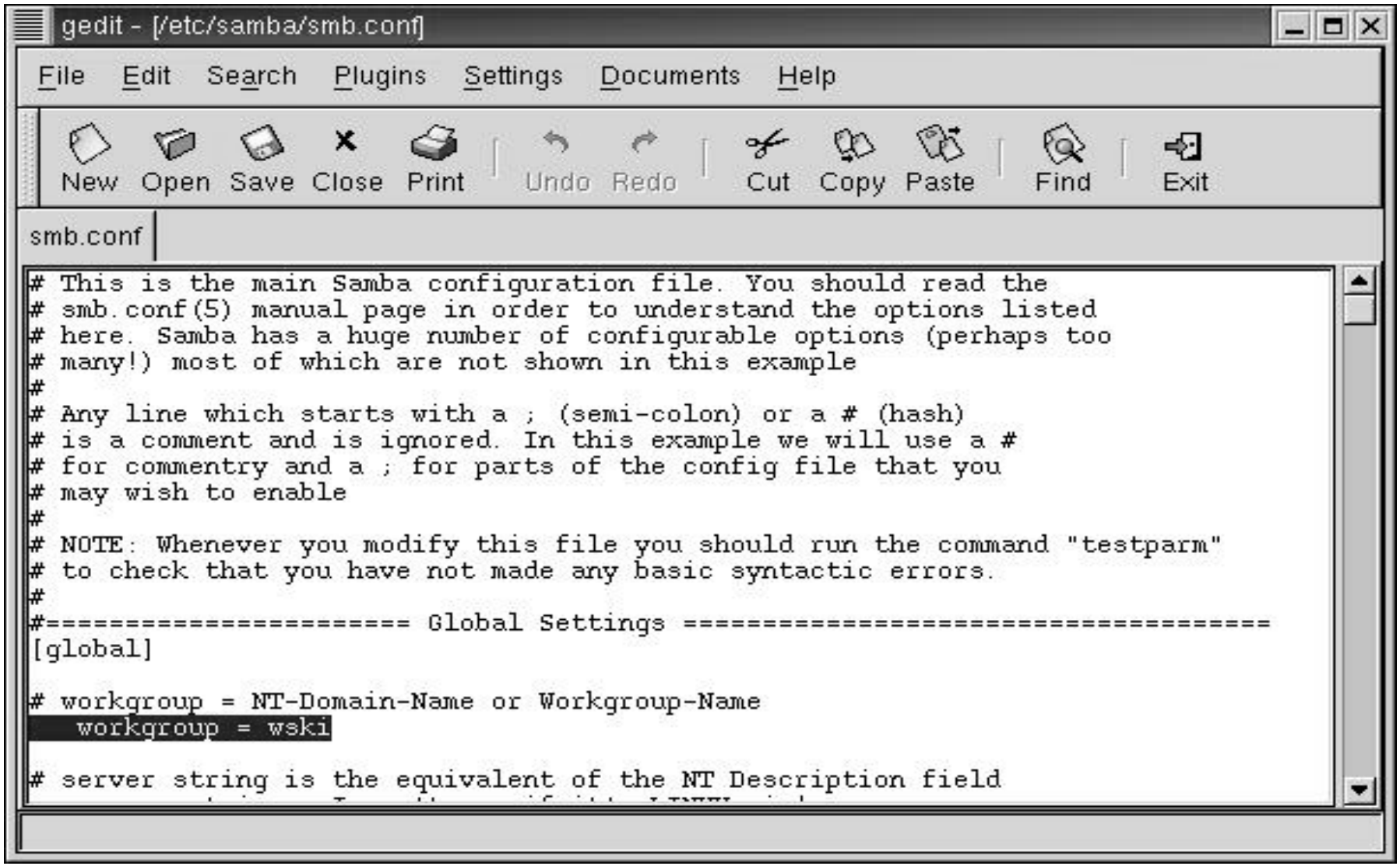
Step 2 add Authorized Systems



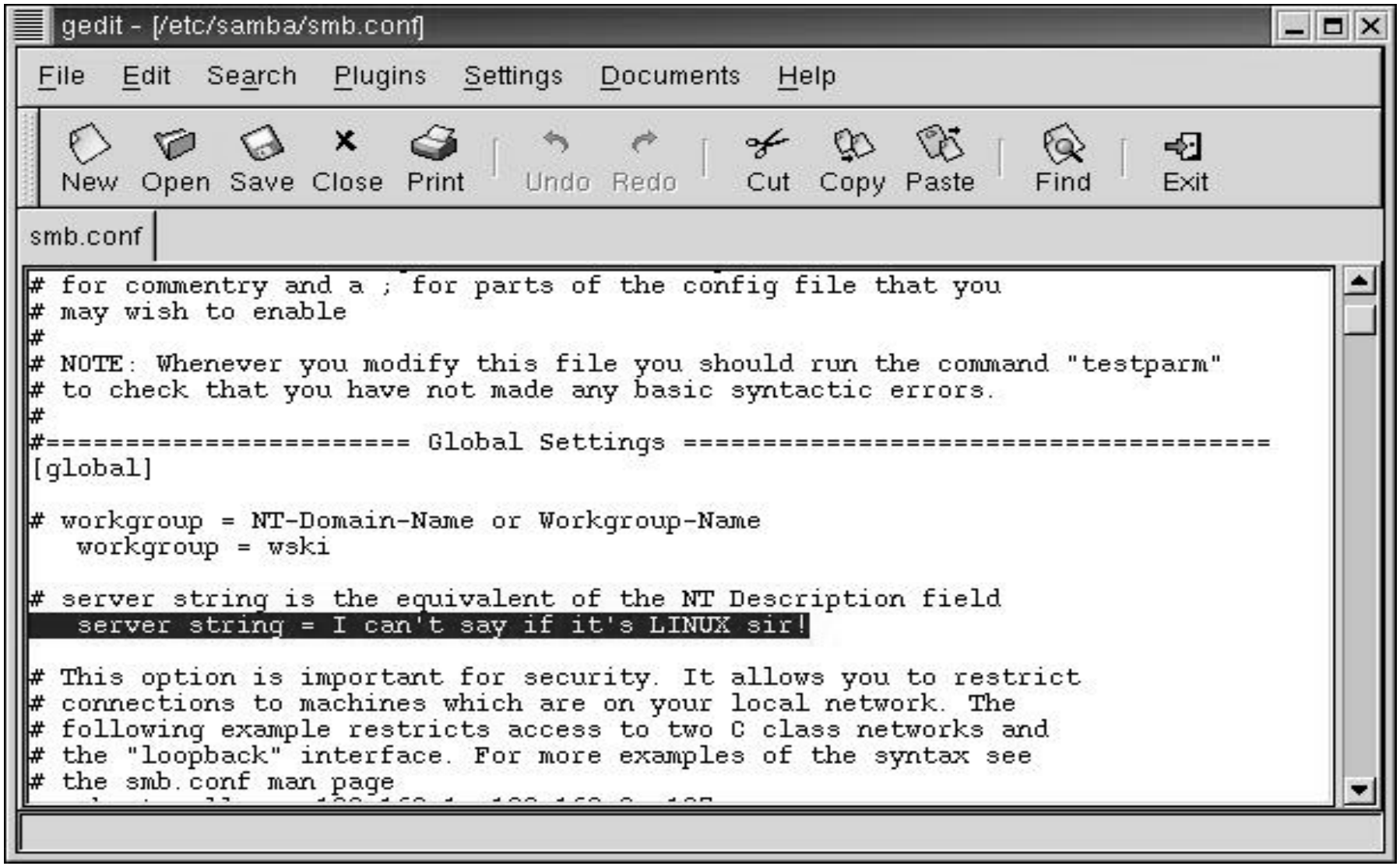
Step 3 add SMB users(map to Linux Unsers)



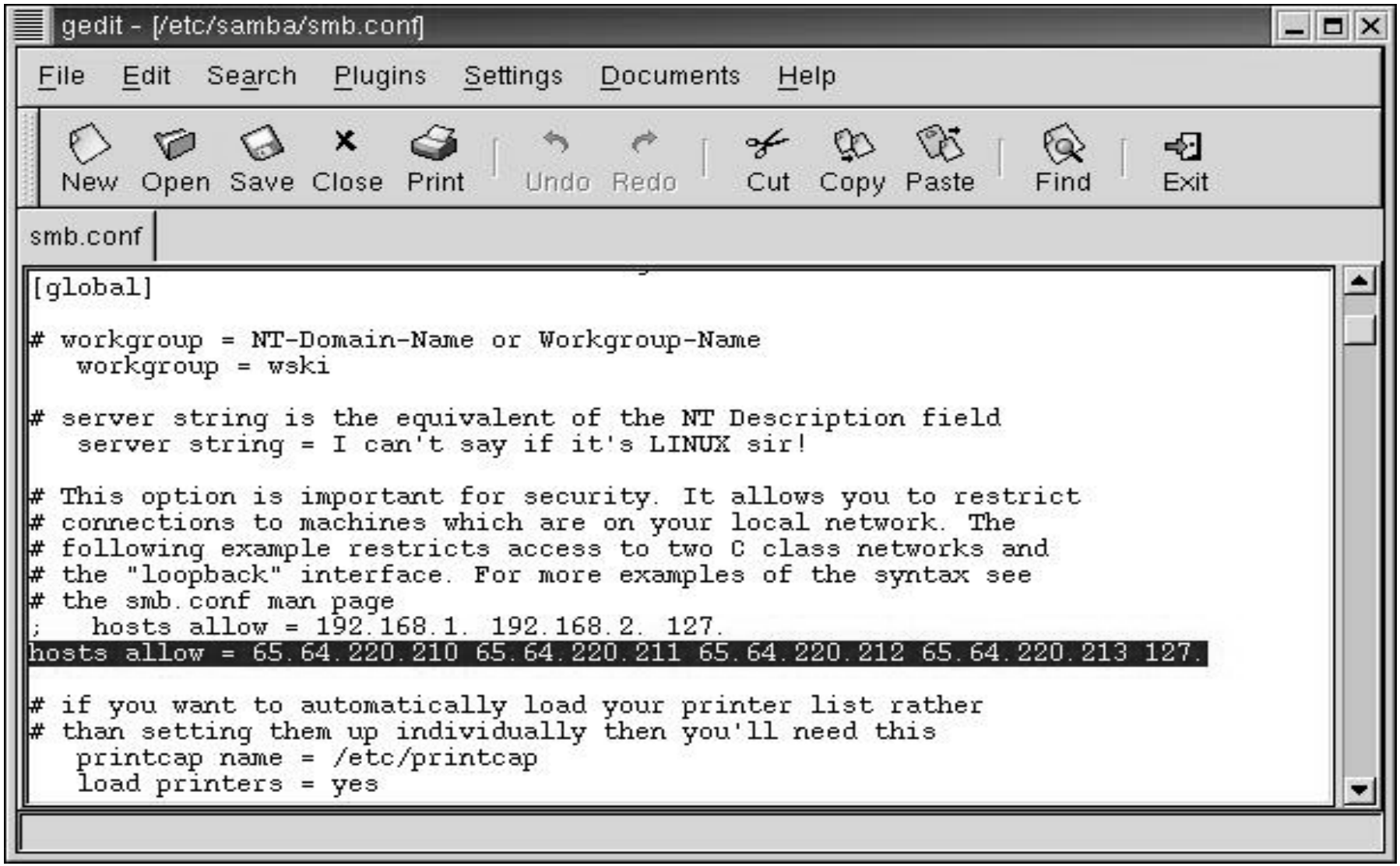
Step 4 Edit the smb.conf file



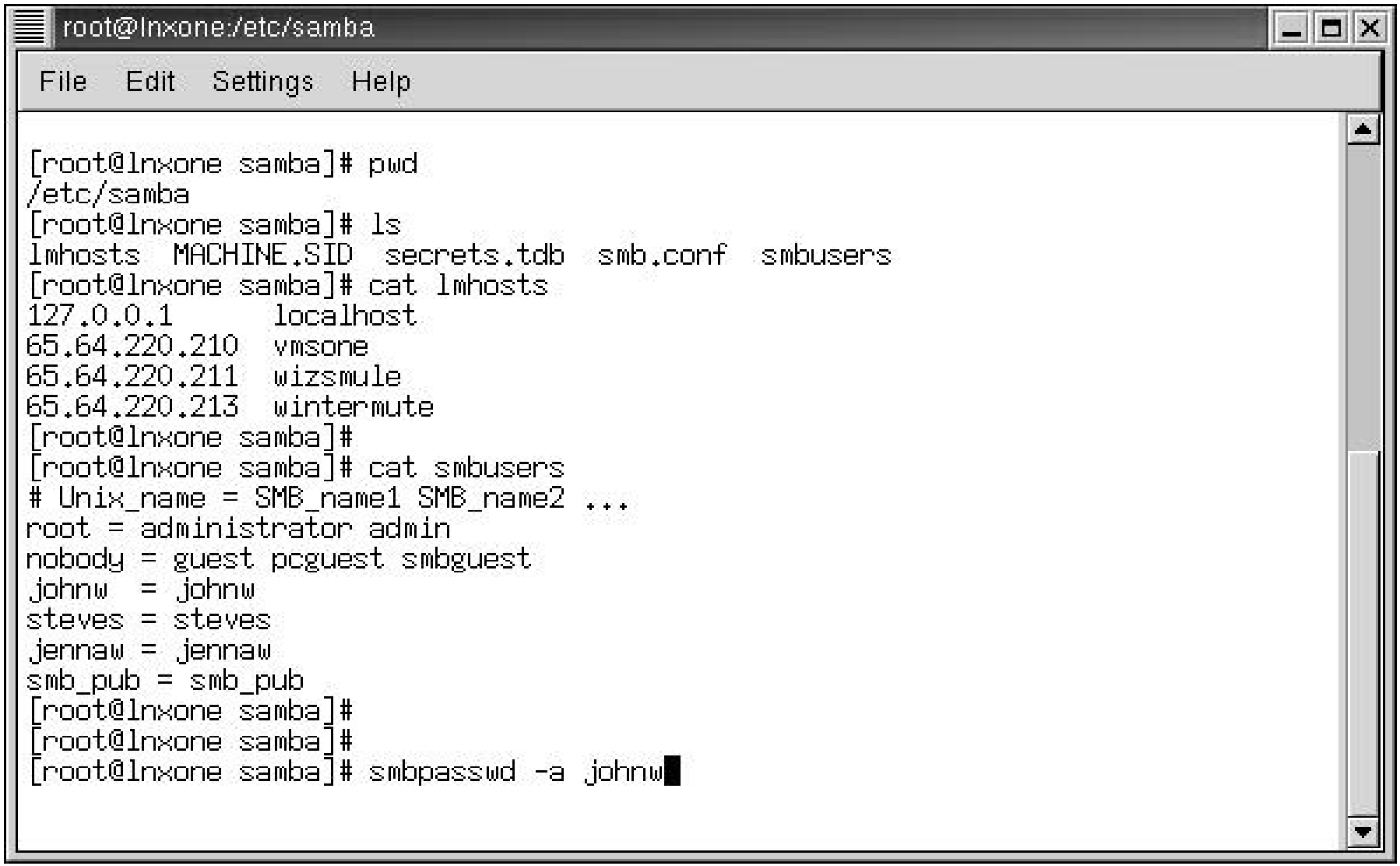
Smb.conf (cont)



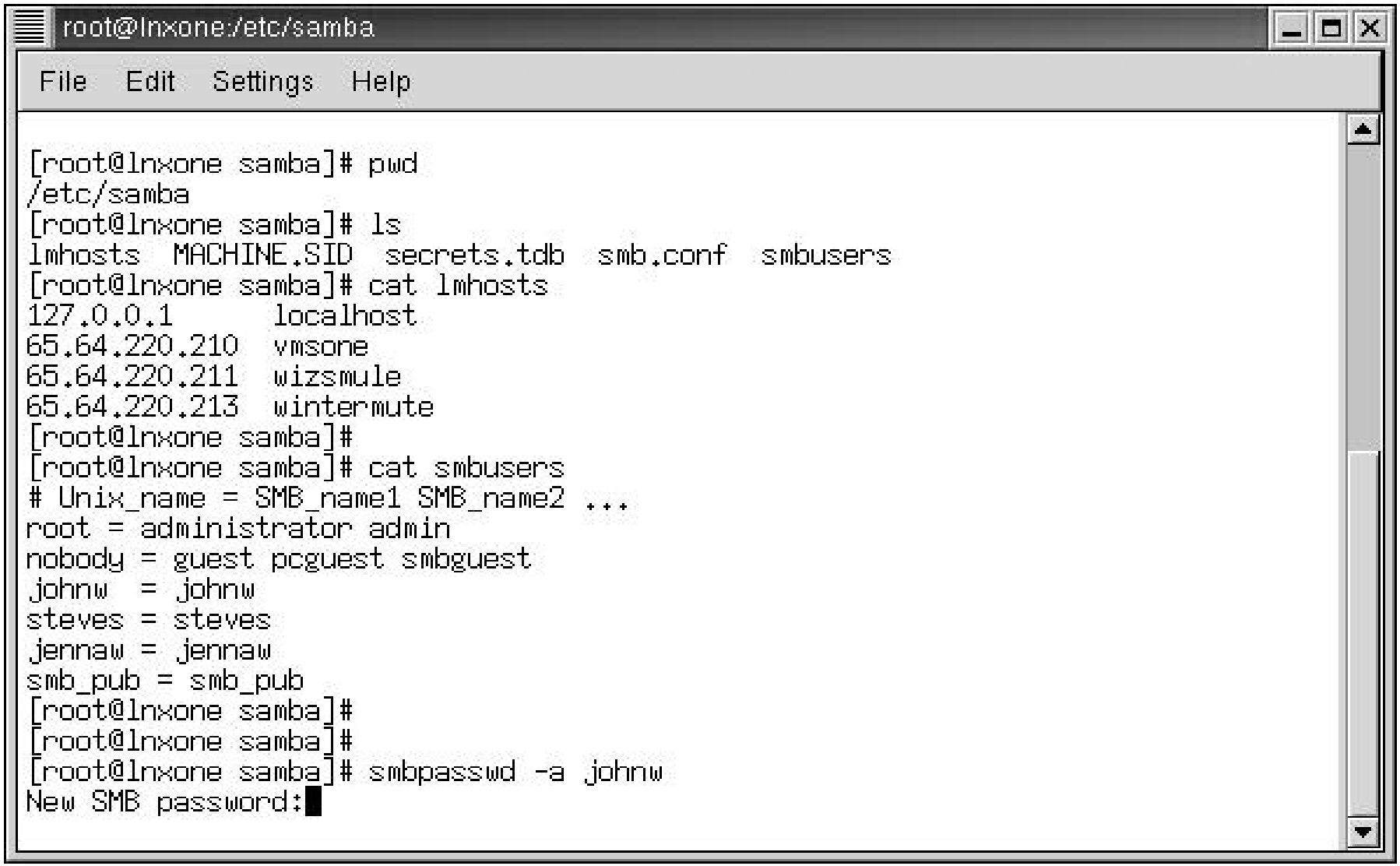
Smb.conf (cont)



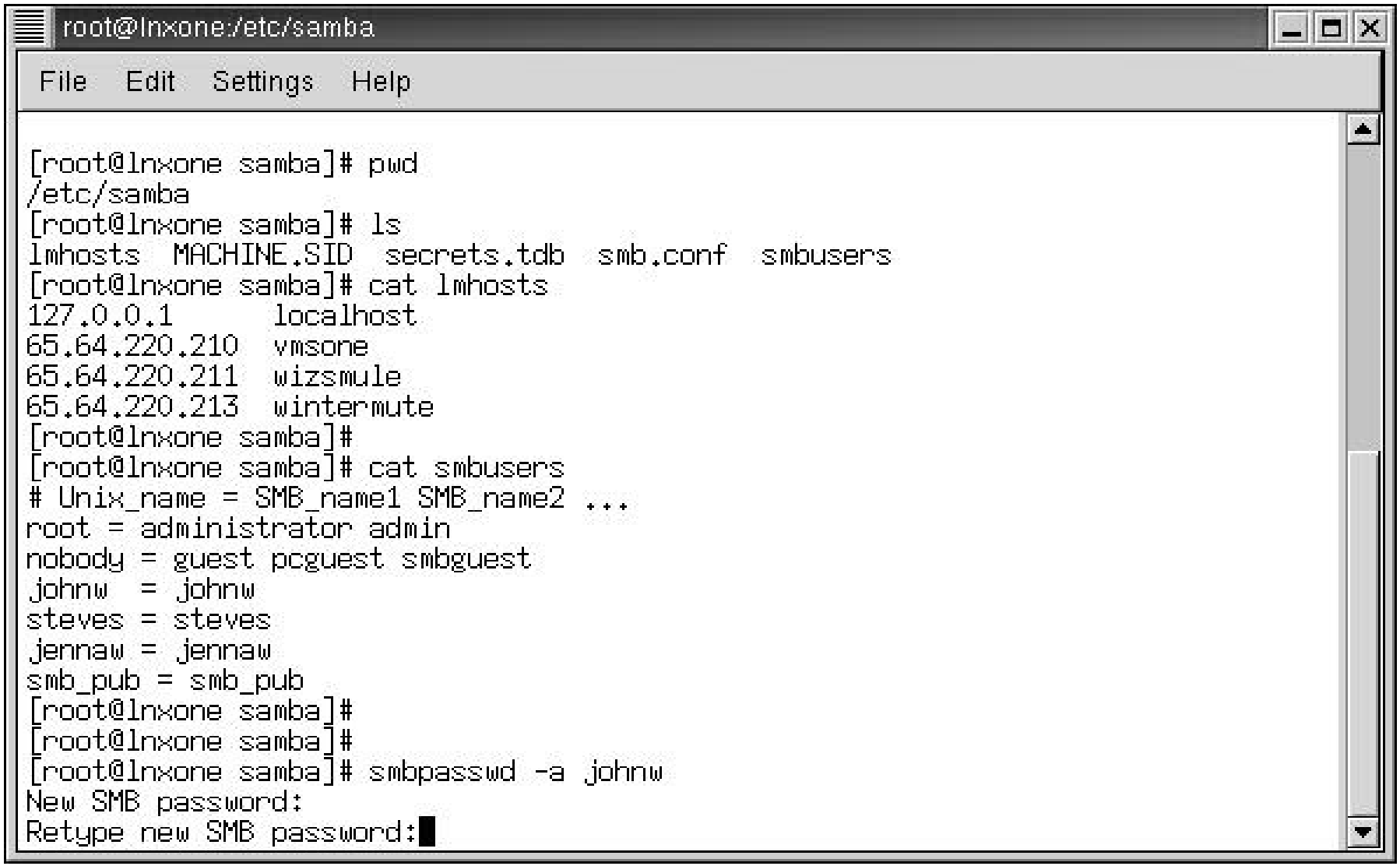
Step 5 create/add to the Linux smbpasswd file



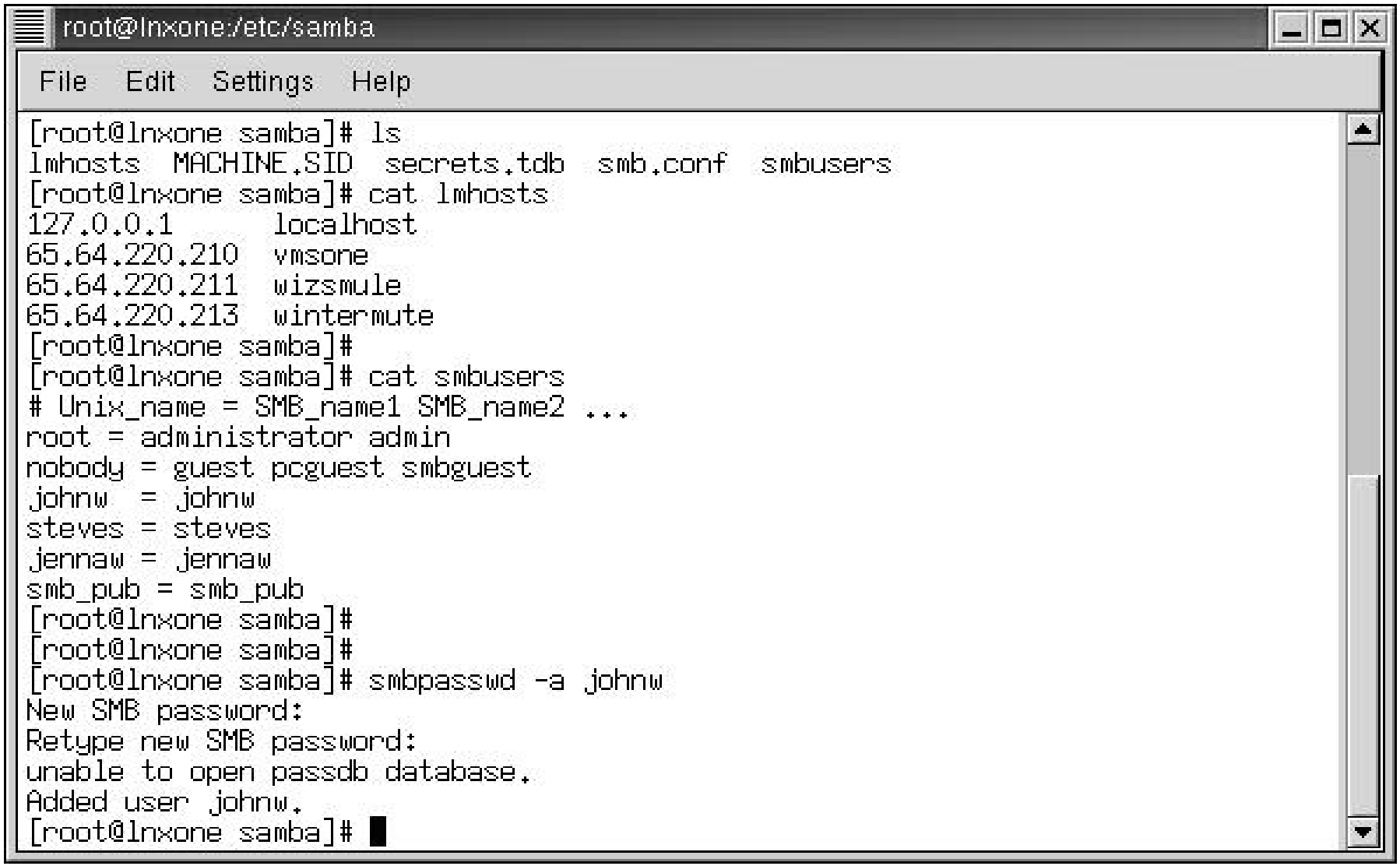
Smbpasswd (cont)



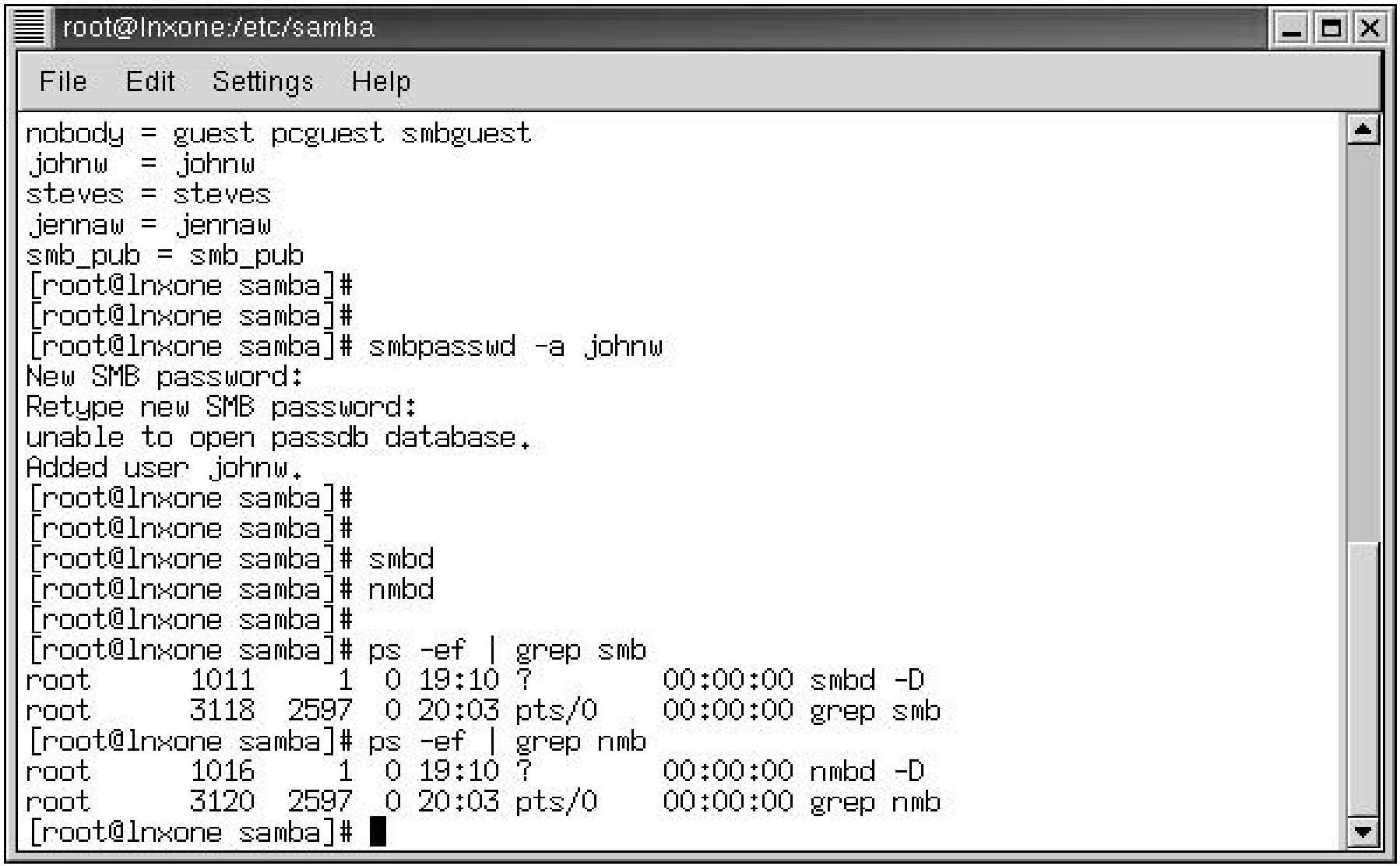
smbpasswd (cont)



Smbpasswd (cont)



Step 6 start your daemons and check



OpenVMS Samba and Advanced Server

- Samba does run on OpenVMS and it's Free
- Advanced Server runs on OpenVMS and it Costs.
- What do I look like I was born yesterday?

OpenVMS Advanced Server

- Advanced Server Source Code is sold/bartered/aquired by legal contract between Microsoft and HP/OpenVMS engineering.
- OpenVMS engineering builds, tests, and integrates Advanced Server with the goal of FULL compatibility with the Windows Servers.
- It's fully supported from Colorado and VMS engineering
- It does cost money for the license fee.
- Advanced Server is not part of the OpenVMS Hobbyist Program – Perhaps you should ask?

Top 7 Reasons (abridged) to chose OpenVMS Advanced Server over Samba

- AS is commercial software with full support from HP
- AS is updated regularly, SAMBA on VMS is updated… Less so
- AS can participate in an NT 4.0 or Windows 2000 security domain (Samba is looking for Win2k support soon)
- AS can be a Primary Domain Controller, Backup Domain Controller or a member server in the new security domain for Windows
- AS is licensed like the MS Windows Advanced Server products (oh wait that's another reason to use SAMBA)
- AS and Samba means never having to say you are sorry to Bill again.

Summary Advanced Server vs Samba

- Both have File and Print Service
- Both can sync passwords and home directories with multiple OS clients
- Both can be a Master Browser
- Both can provide WINS support
- Advanced Server fully integrates with the OpenVMS registry and integrates fully into all MS security domains
- SAMBA is free under licenses from GNU

- Go forth and share disks and printers…

But John, What about some Network Stuff?

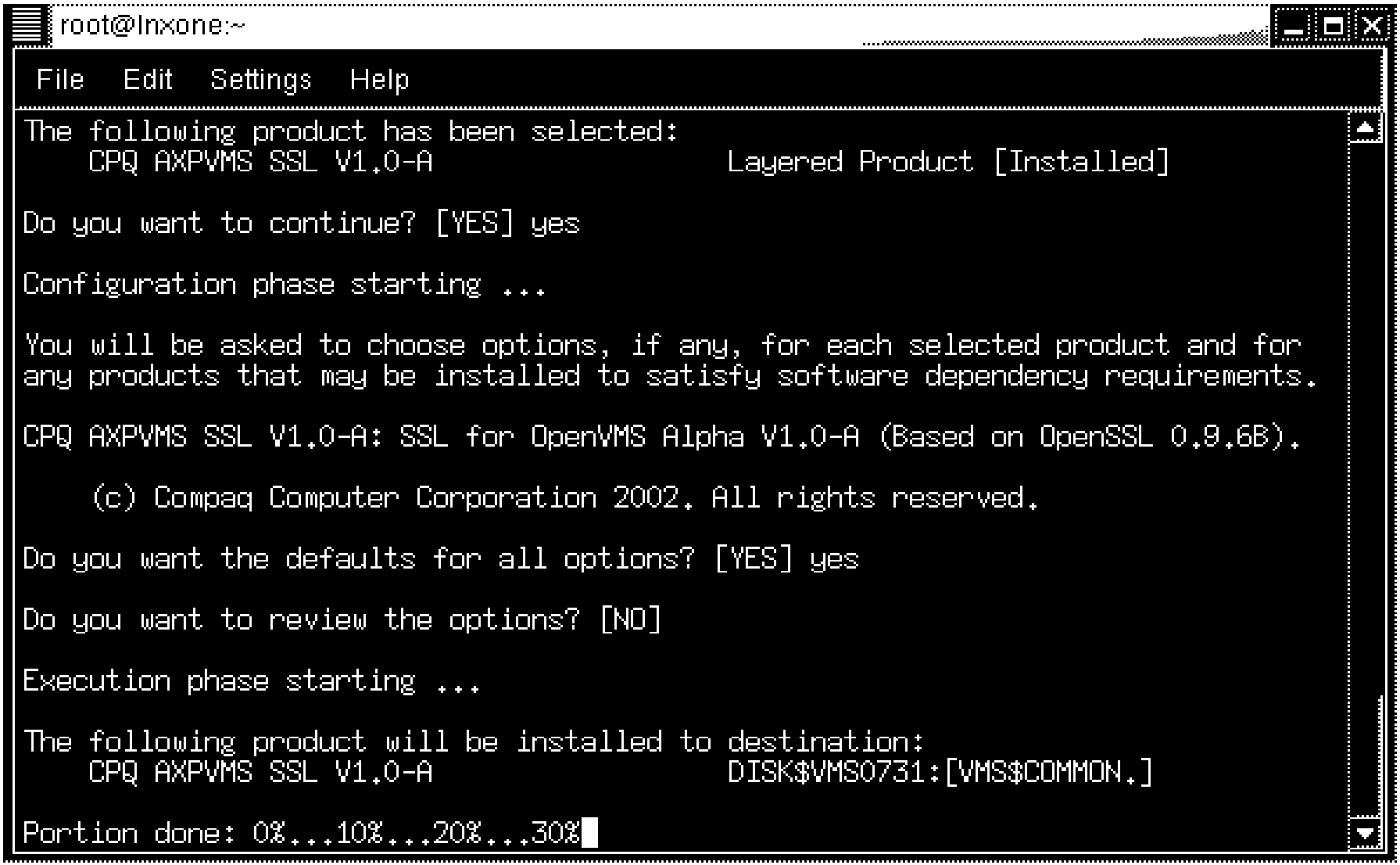
TCP/IP between Linux and OpenVMS

- Both VMS and Linux support the TCP/IP standard interfaces for process / application communications.
- Telnet, FTP, Xwindows, RSH, REXEC
- USE of Known Ports
- These give great flexibility.. There is also almost no privacy.
- Repeat the mantra: Crypto, Crypto, and then Encryption…

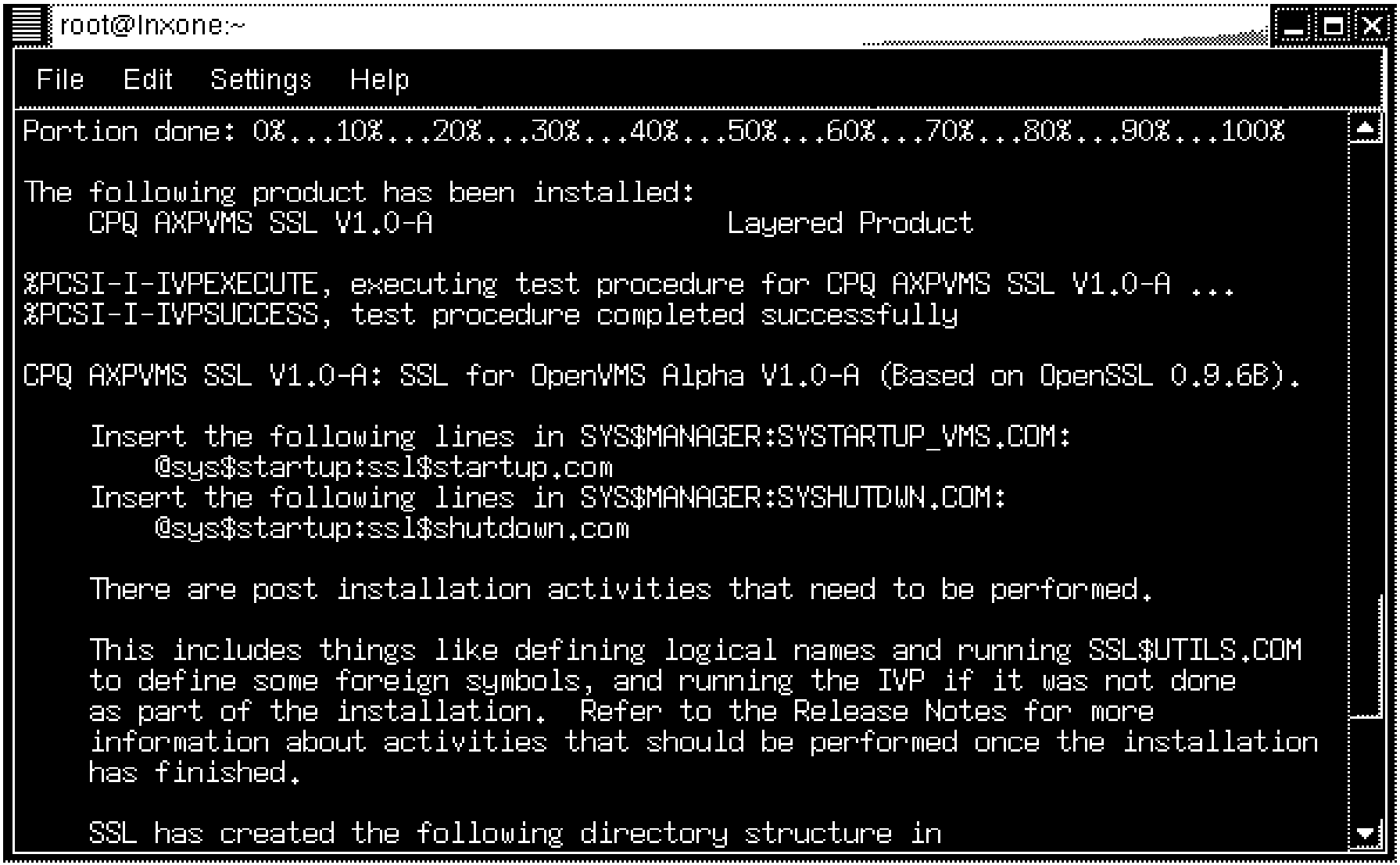
TCP/IP Security Tools

- OpenSSL for OpenVMS
http://www.openvms.compaq.com
- OpenSSL for Linux Standard with RedHat Distribution
or http://www.openssl.org/
- Stunnel for OpenVMS 7.3-1 Open Source CDrom
- Stunnel for Linux http://www.stunnel.org/
- OpenVMS SSH Process Software or OpenVMS Early Adopter Kit available this Fall.
- SSH for Linux is available with the RedHat Distribution.

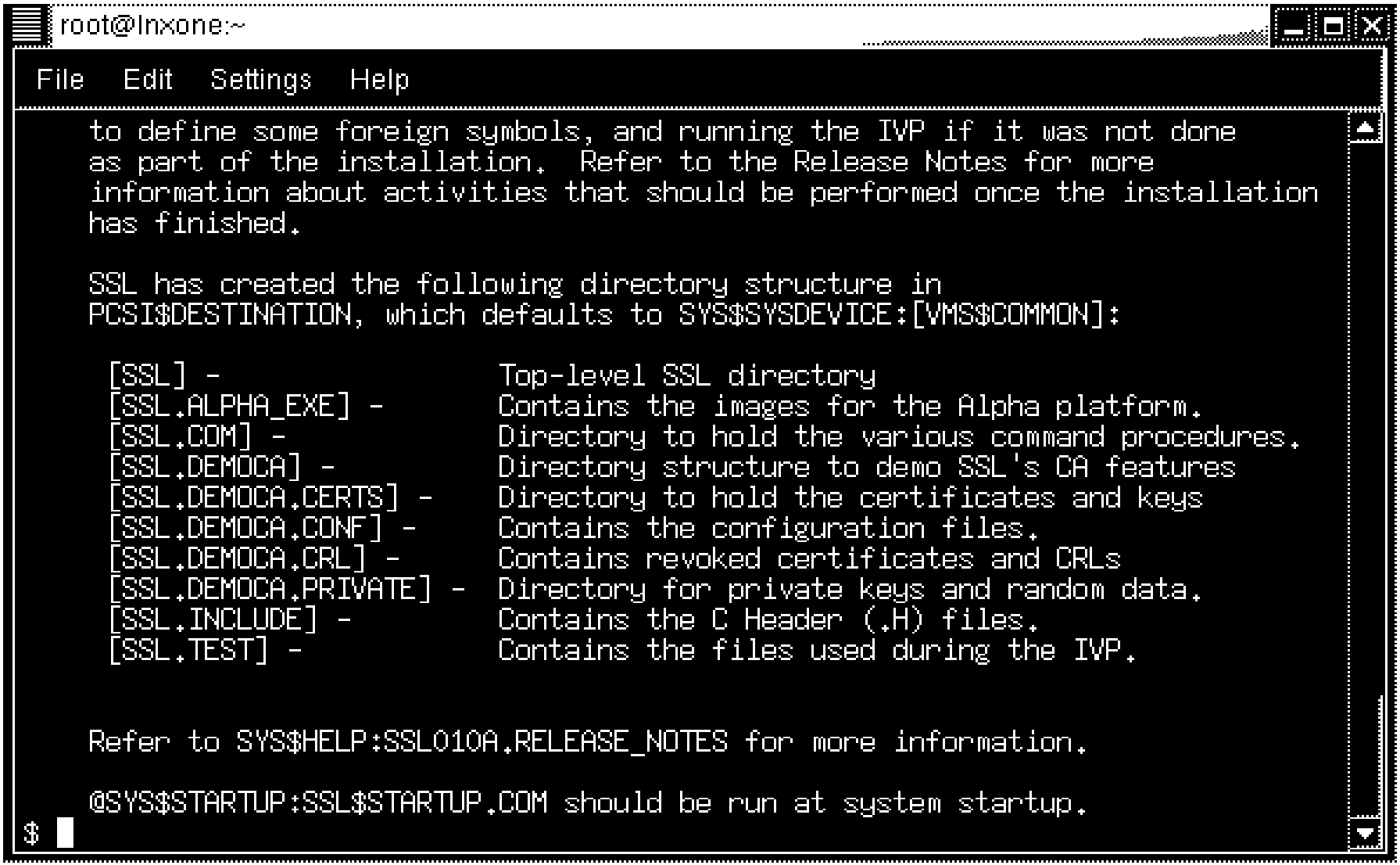
Installing SSL and Stunnel on OpenVMS



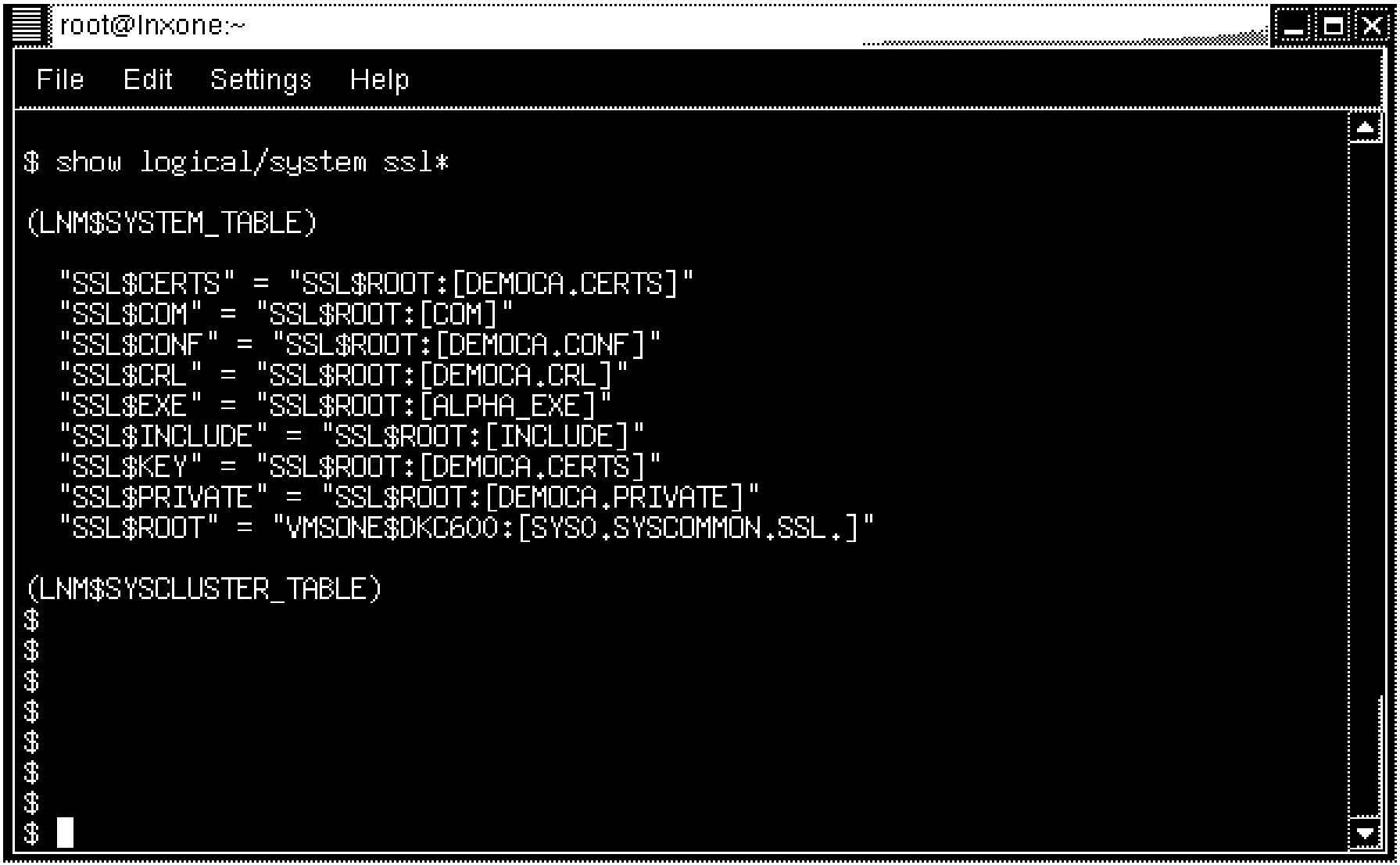
SSL Installation (cont)



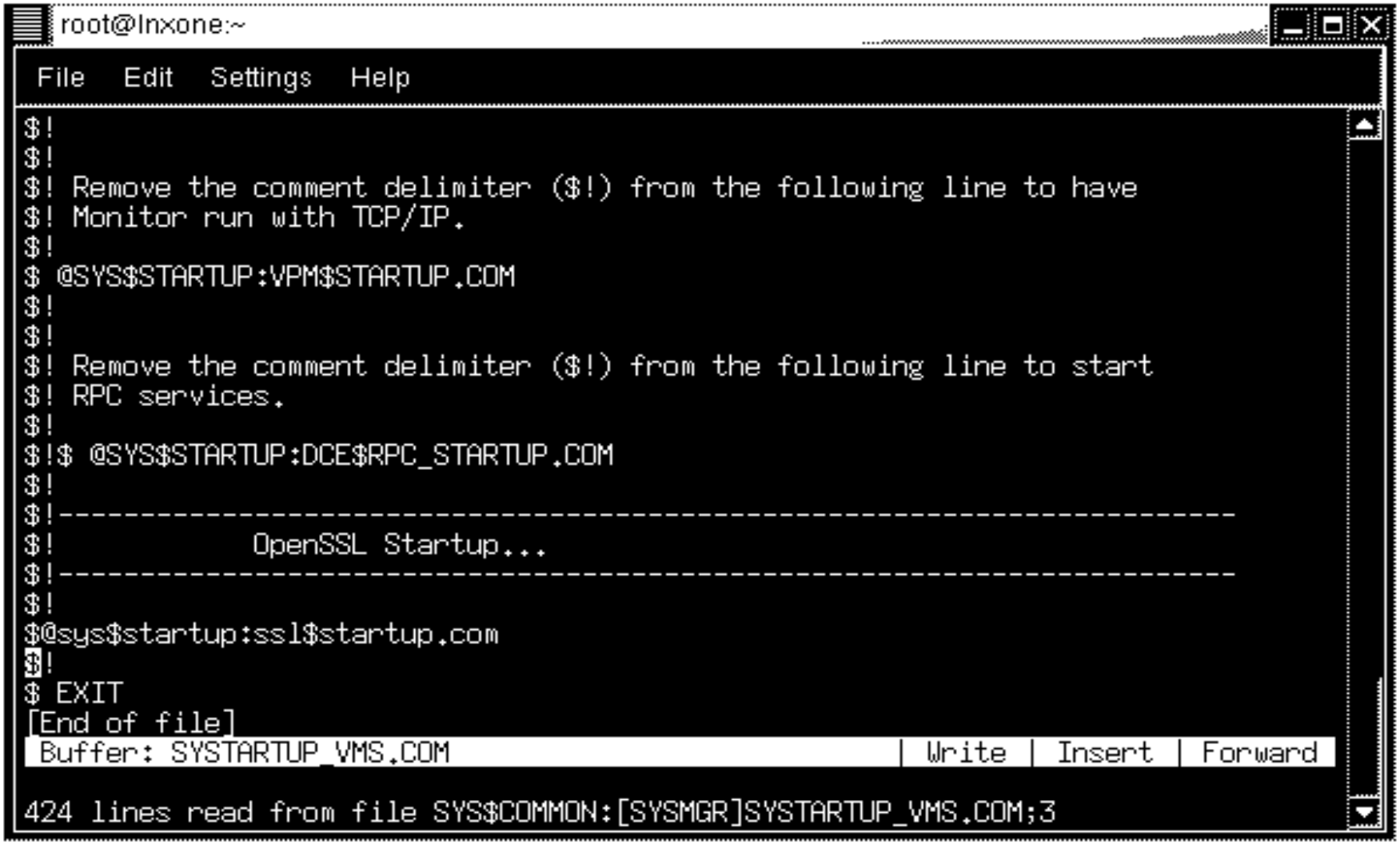
SSL Intallation (cont)



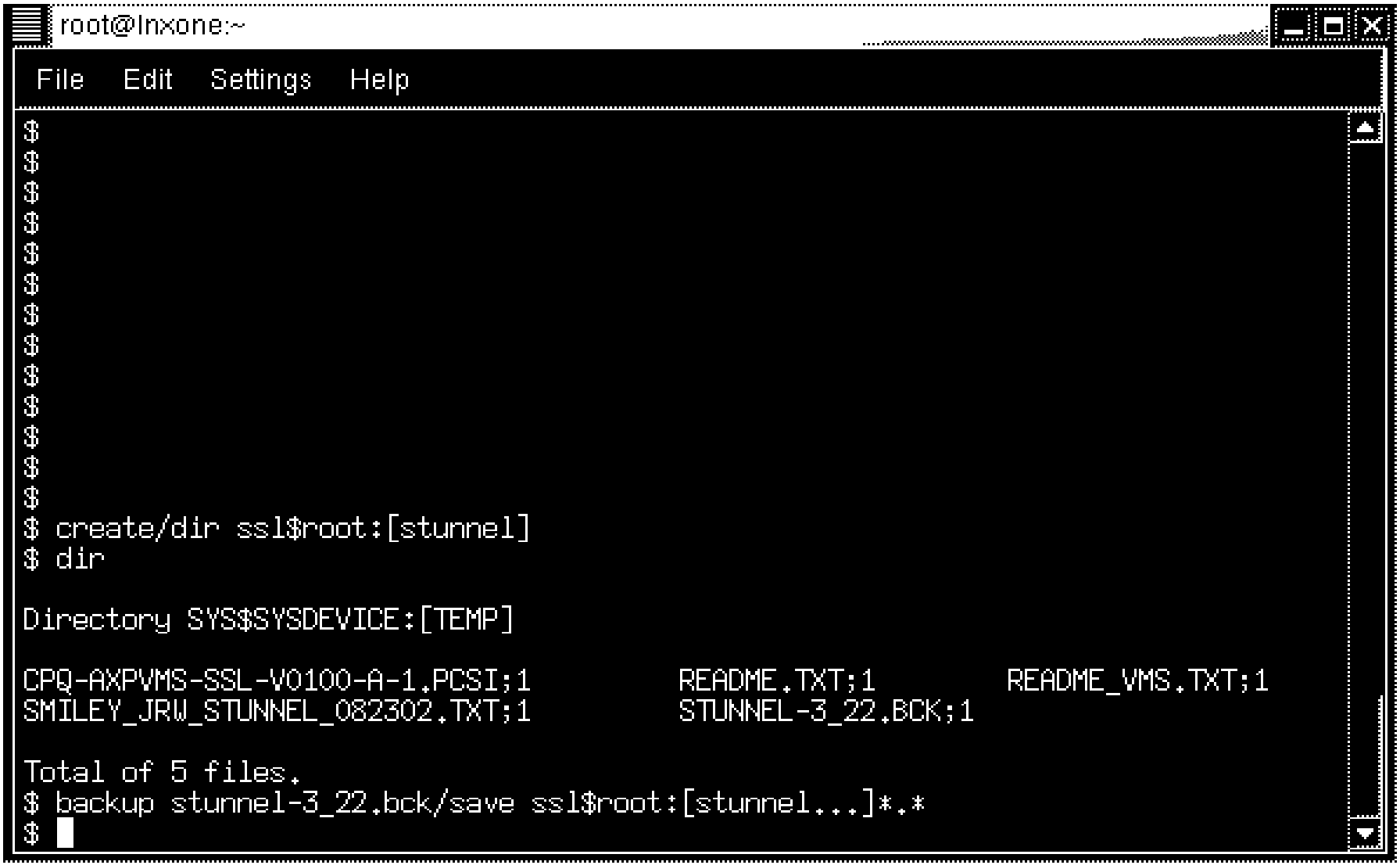
SSL Installation completed



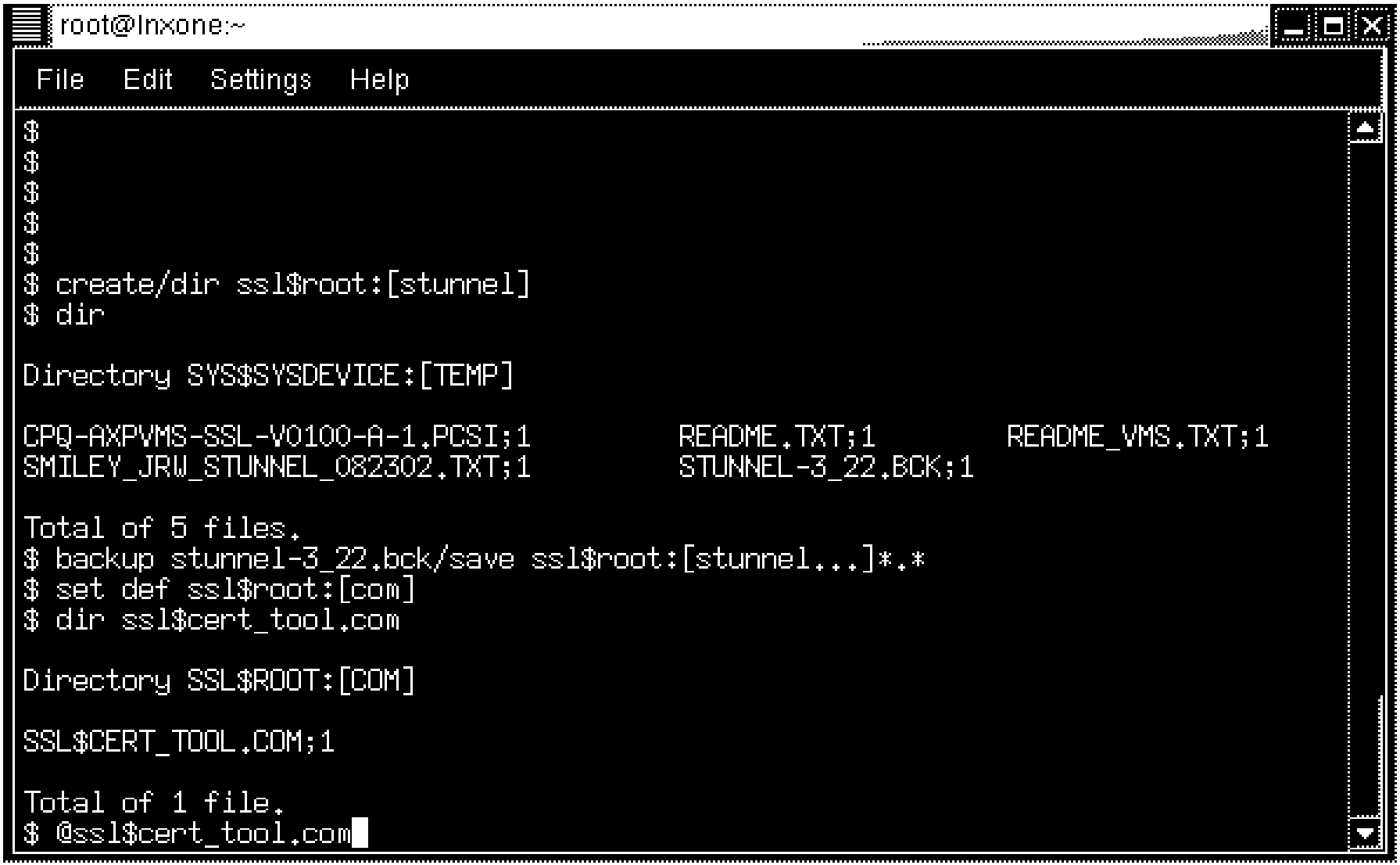
Edit systartup_vms.com file for SSL



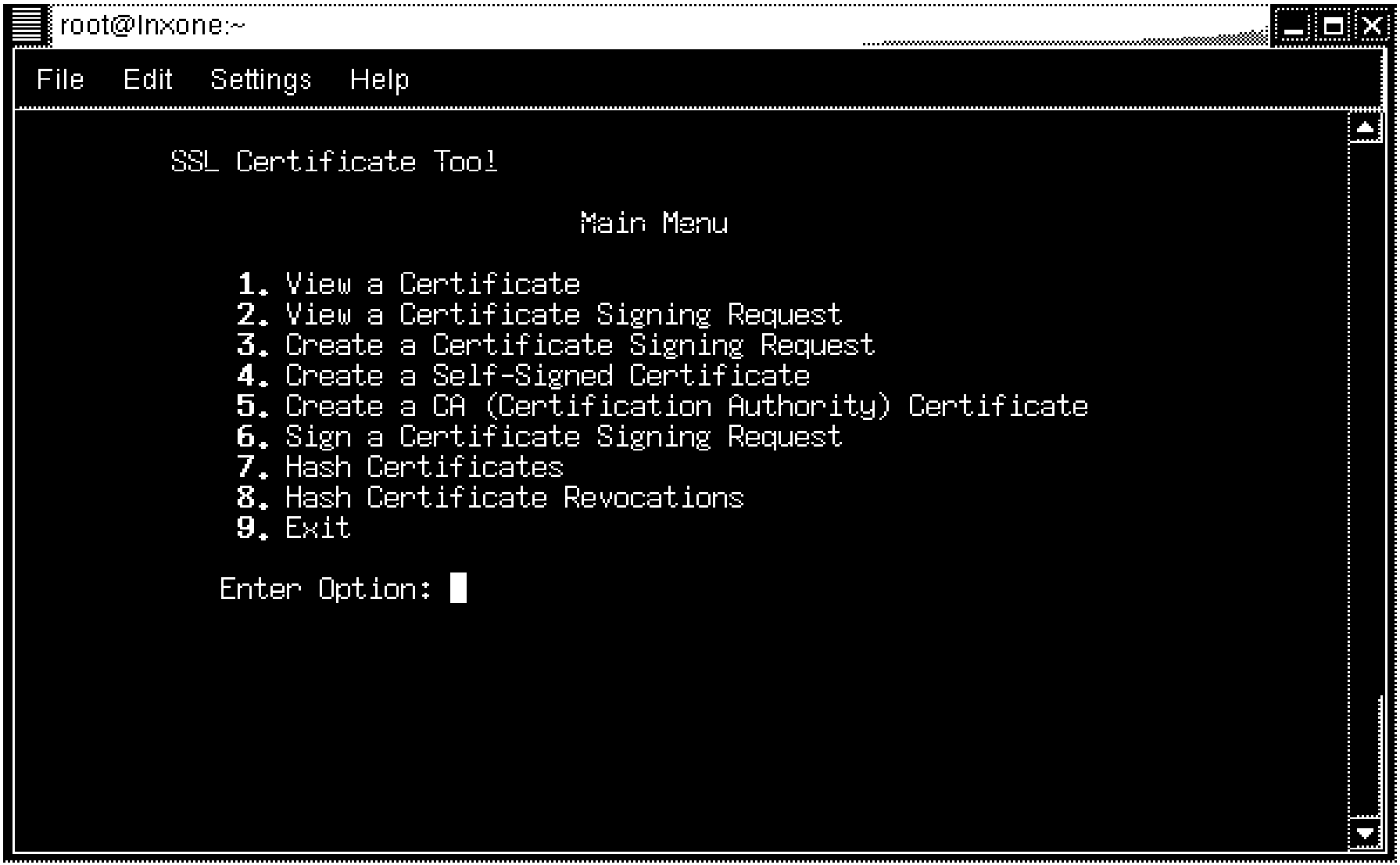
Restore VMS STUNNEL kit from CD



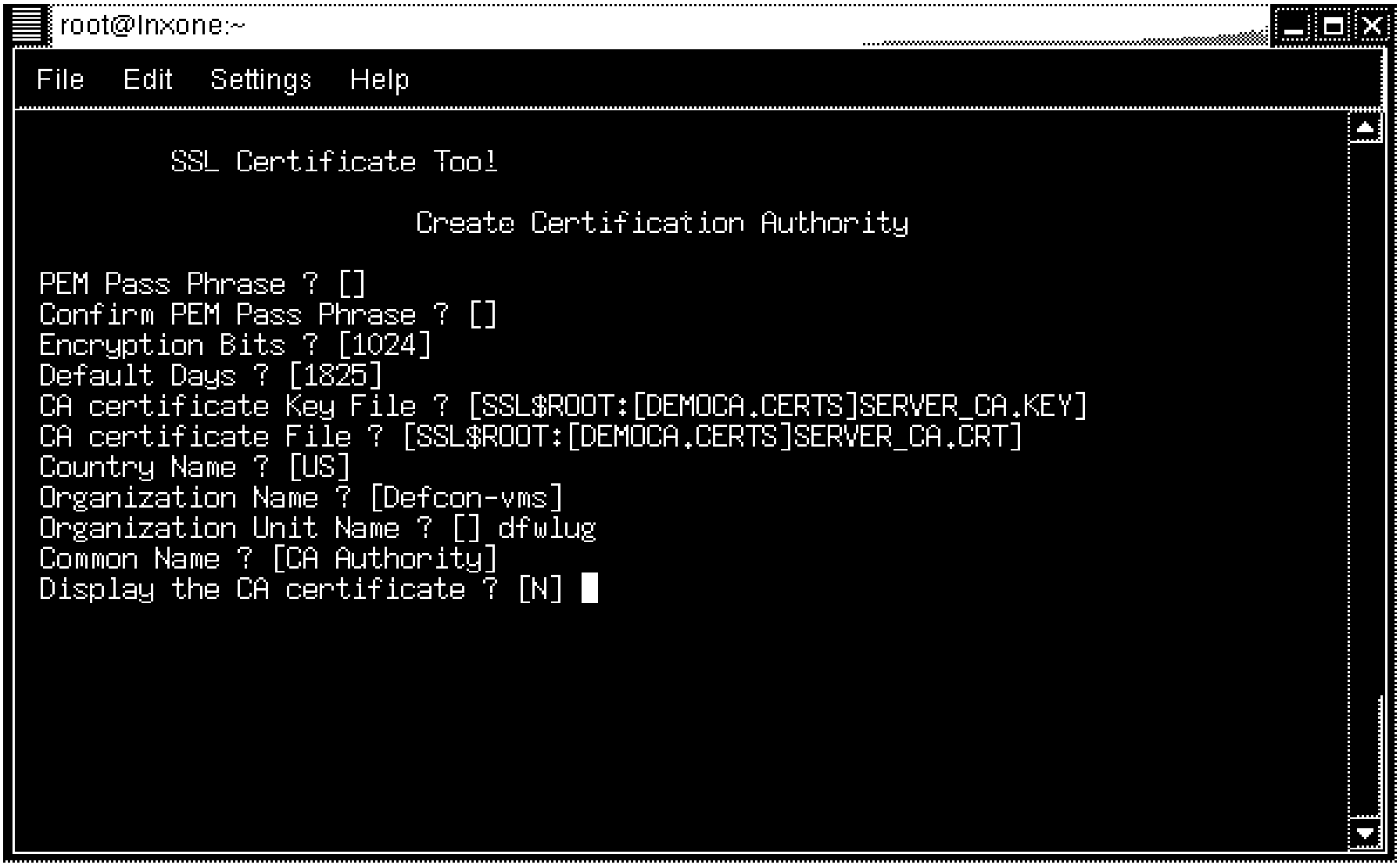
Start the SSL certificate tool



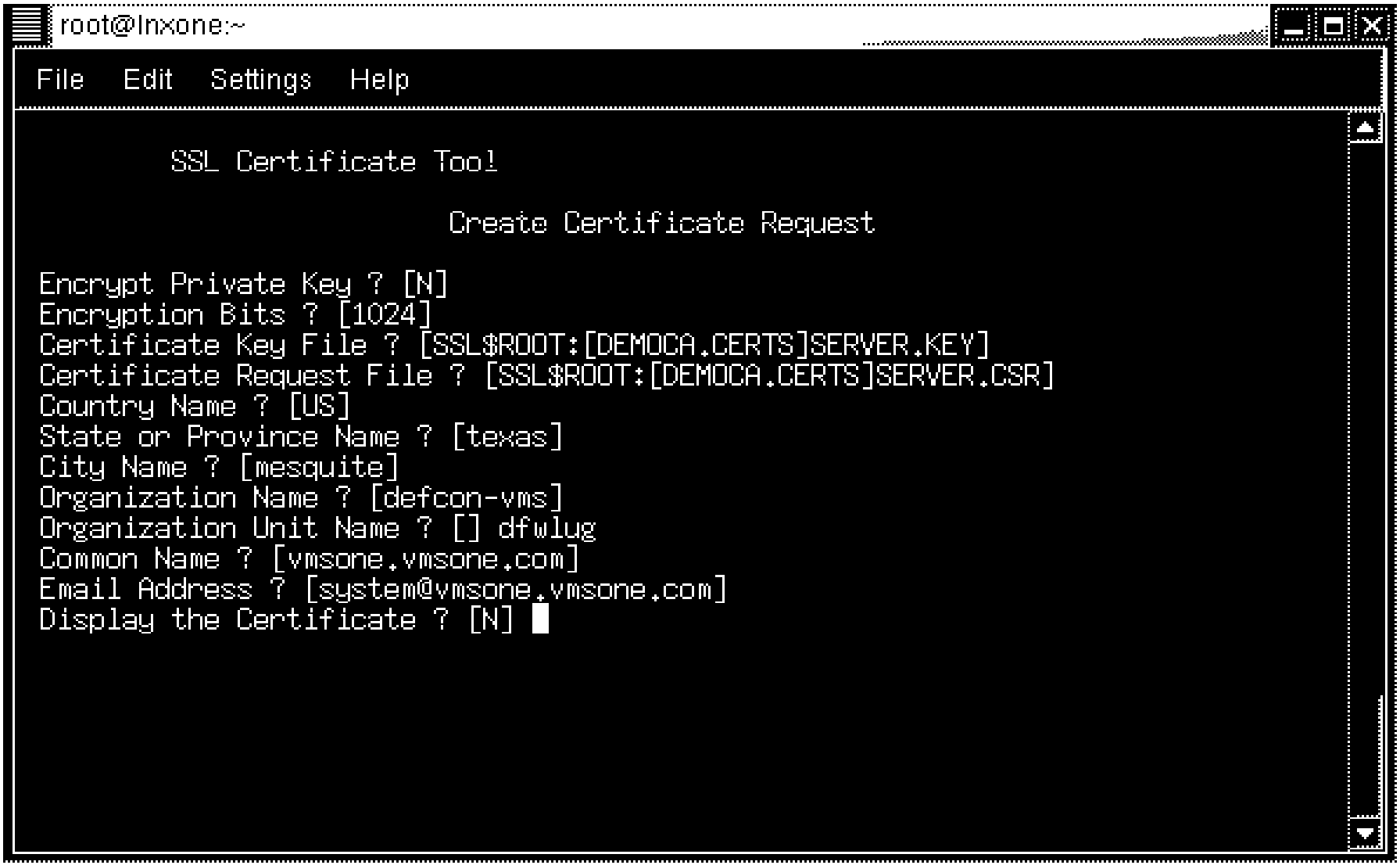
From the SSL menu chose 5



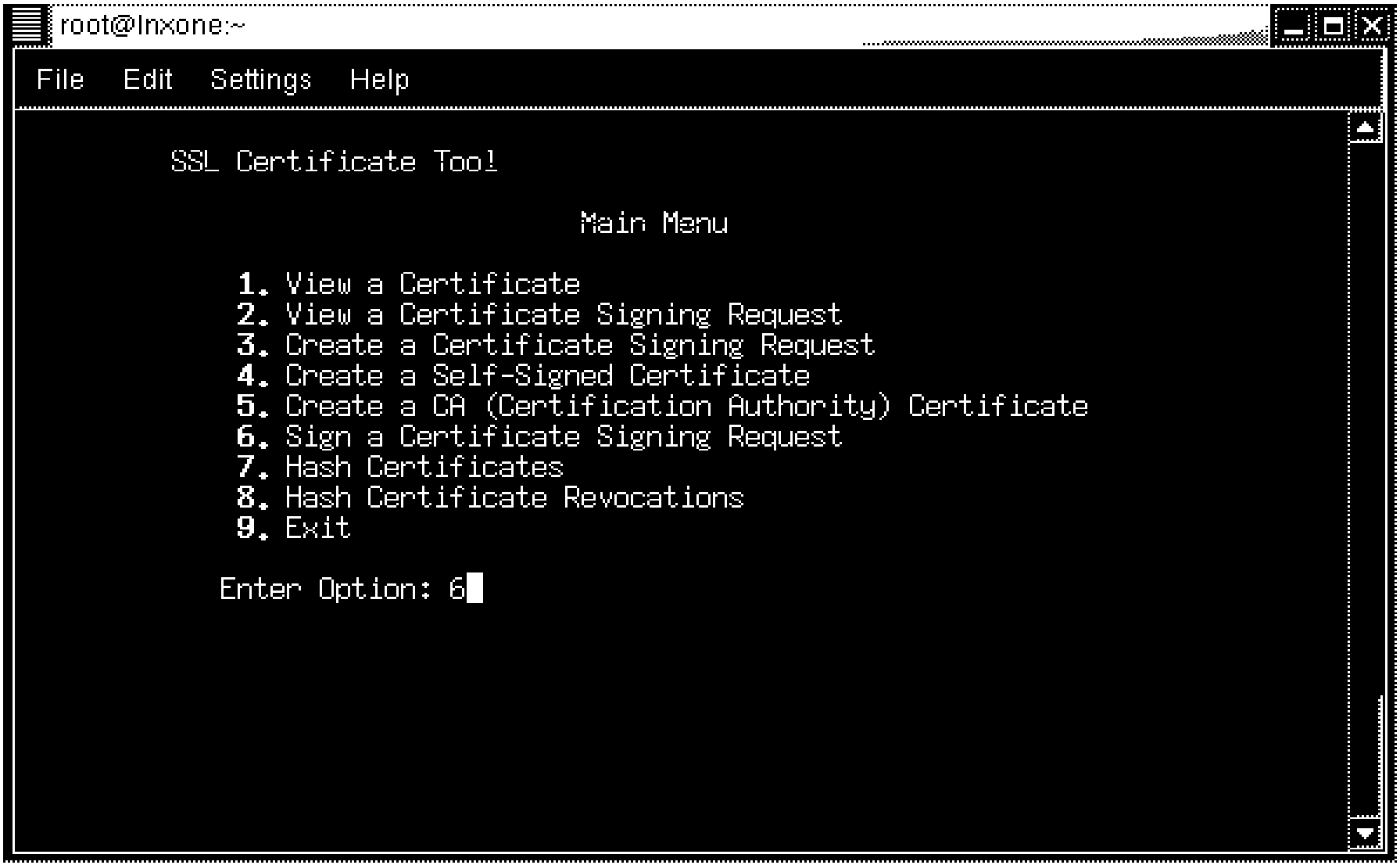
Enter Answers to Create CA

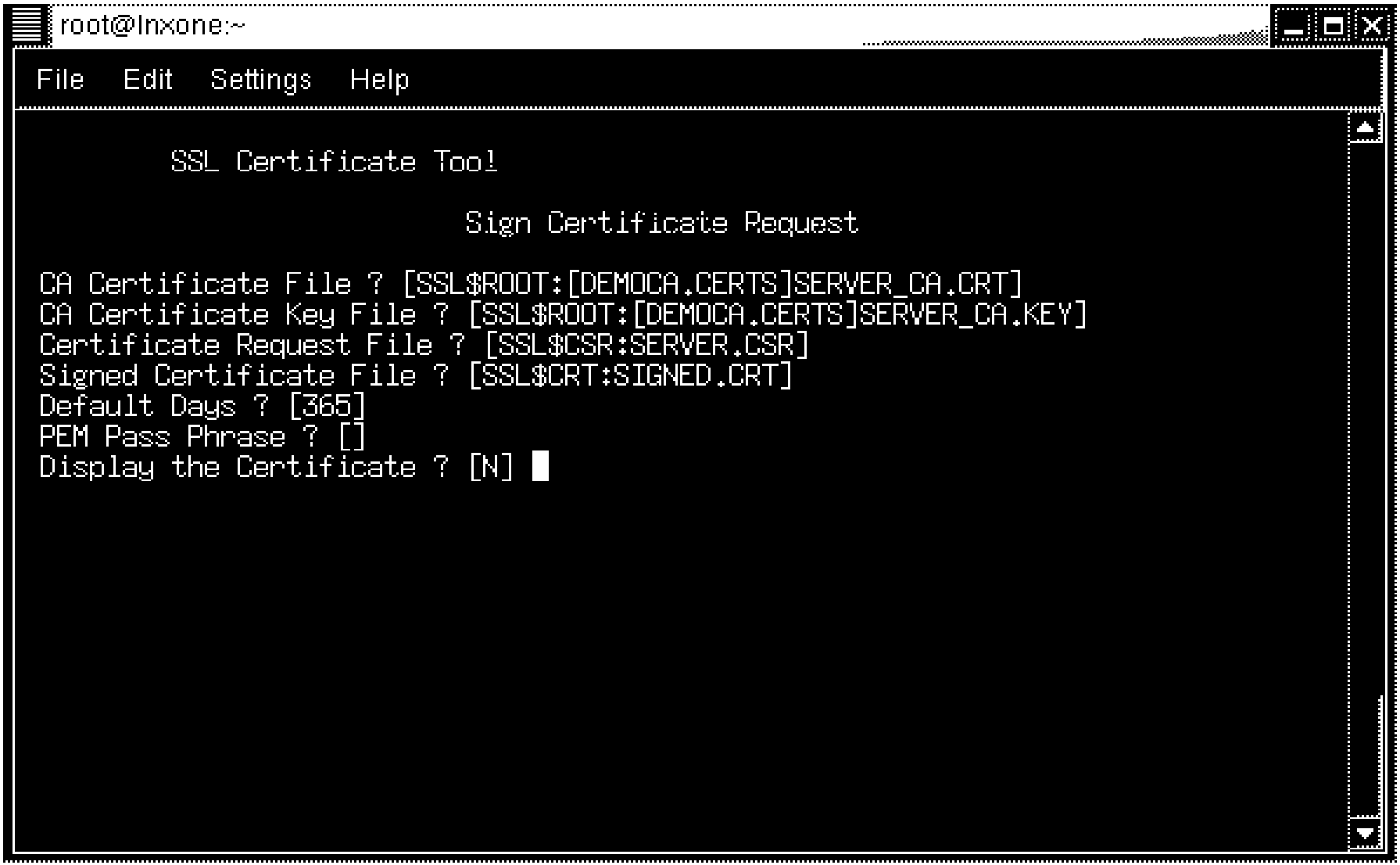


Next chose Create Cert Request

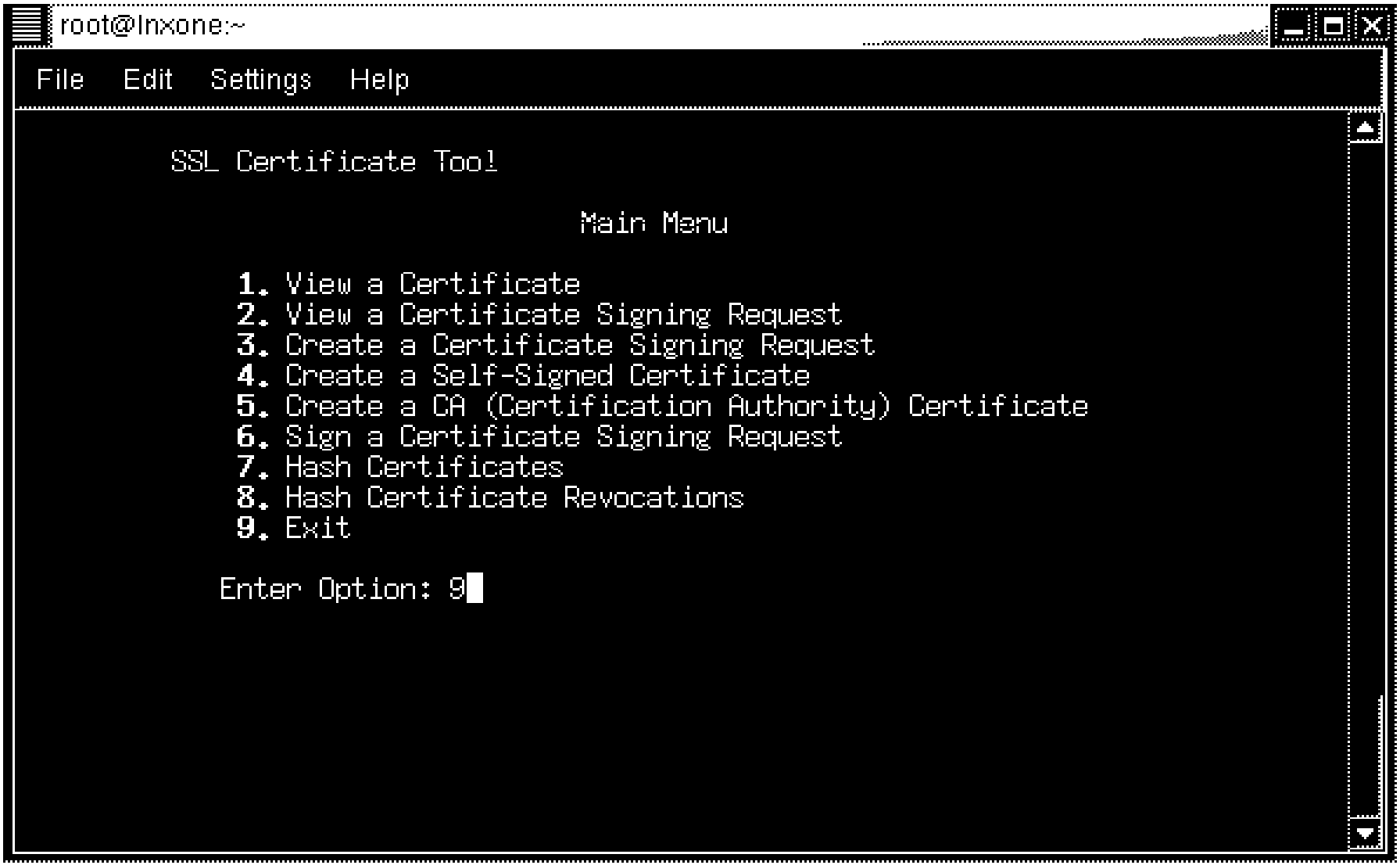


Last Sign the Certificate

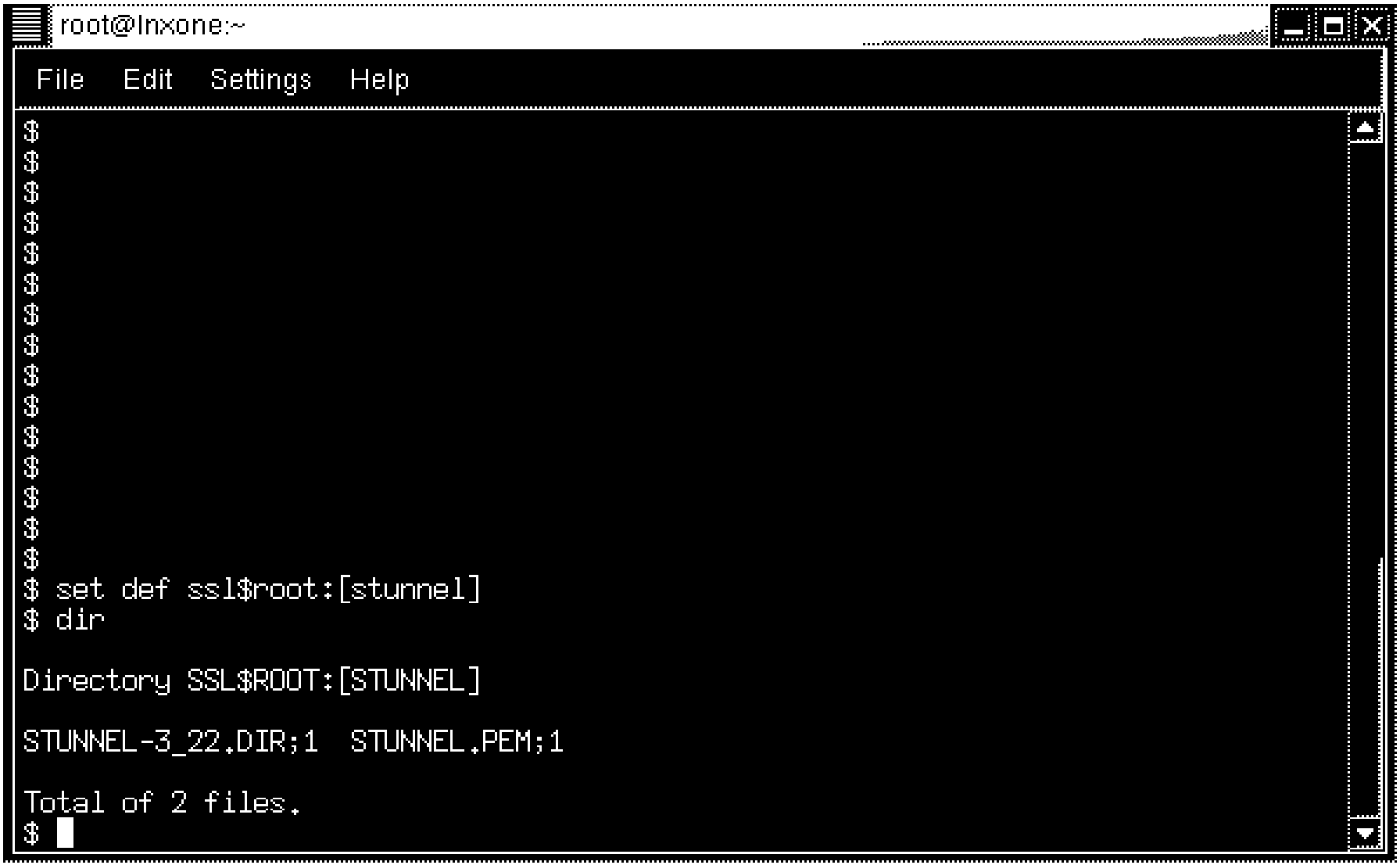



root@lnxone:~
File Edit Settings Help
SSL Certificate Too!
Sign Certificate Request
CA Certificate File ? [SSL$ROOT:[DEMOCA.CERTS]SERVER_CA.CRT]
CA Certificate Key File ? [SSL$ROOT:[DEMOCA.CERTS]SERVER_CA.KEY]
Certificate Request File ? [SSL$CSR:SERVER.CSR]
Signed Certificate File ? [SSL$CRT:SIGNED.CRT]
Default Days ? [365]
PEM Pass Phrase ? []
Display the Certificate ? [N]

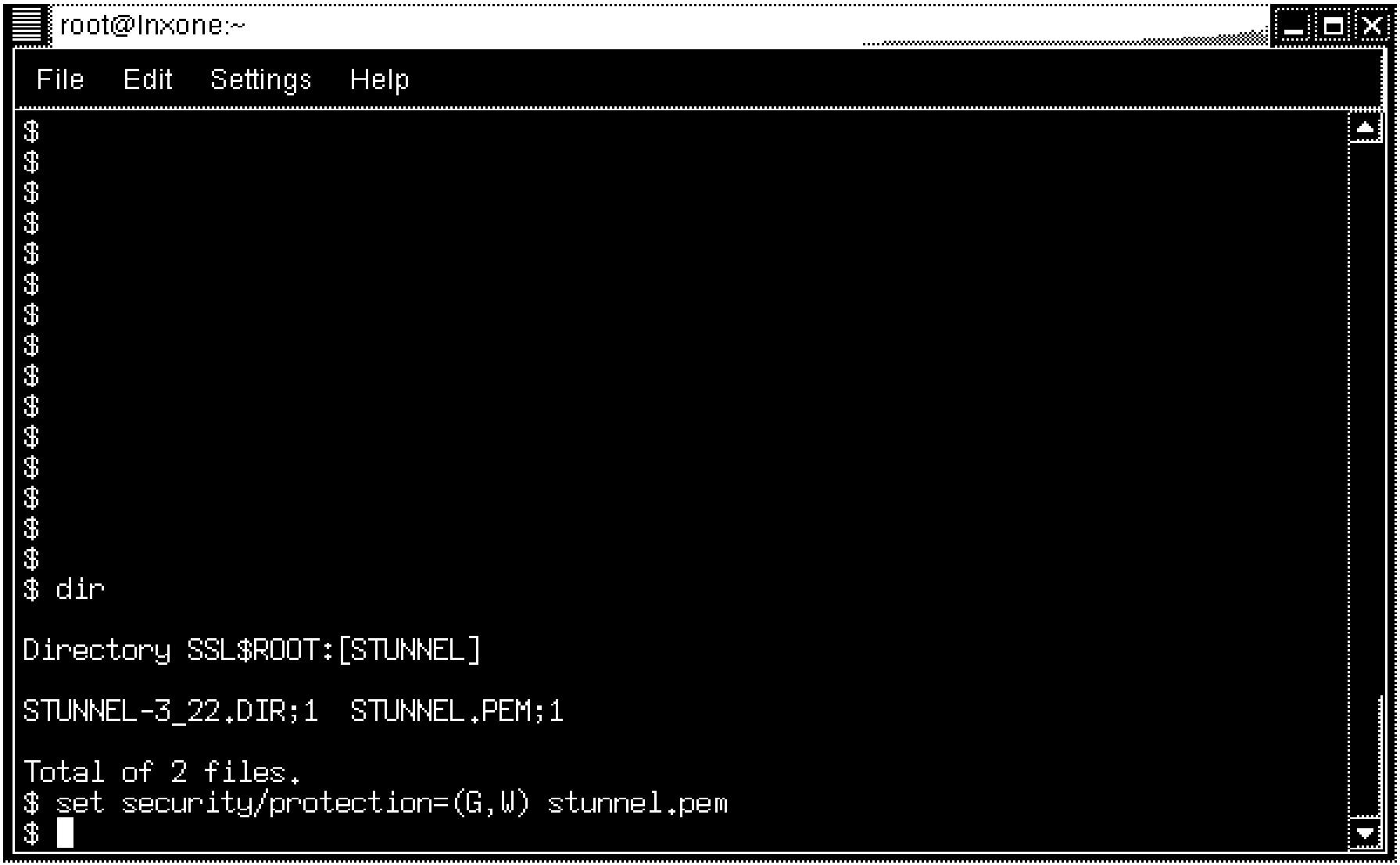
SSL Certificate Finished!



Now let's configure the Stunnel software



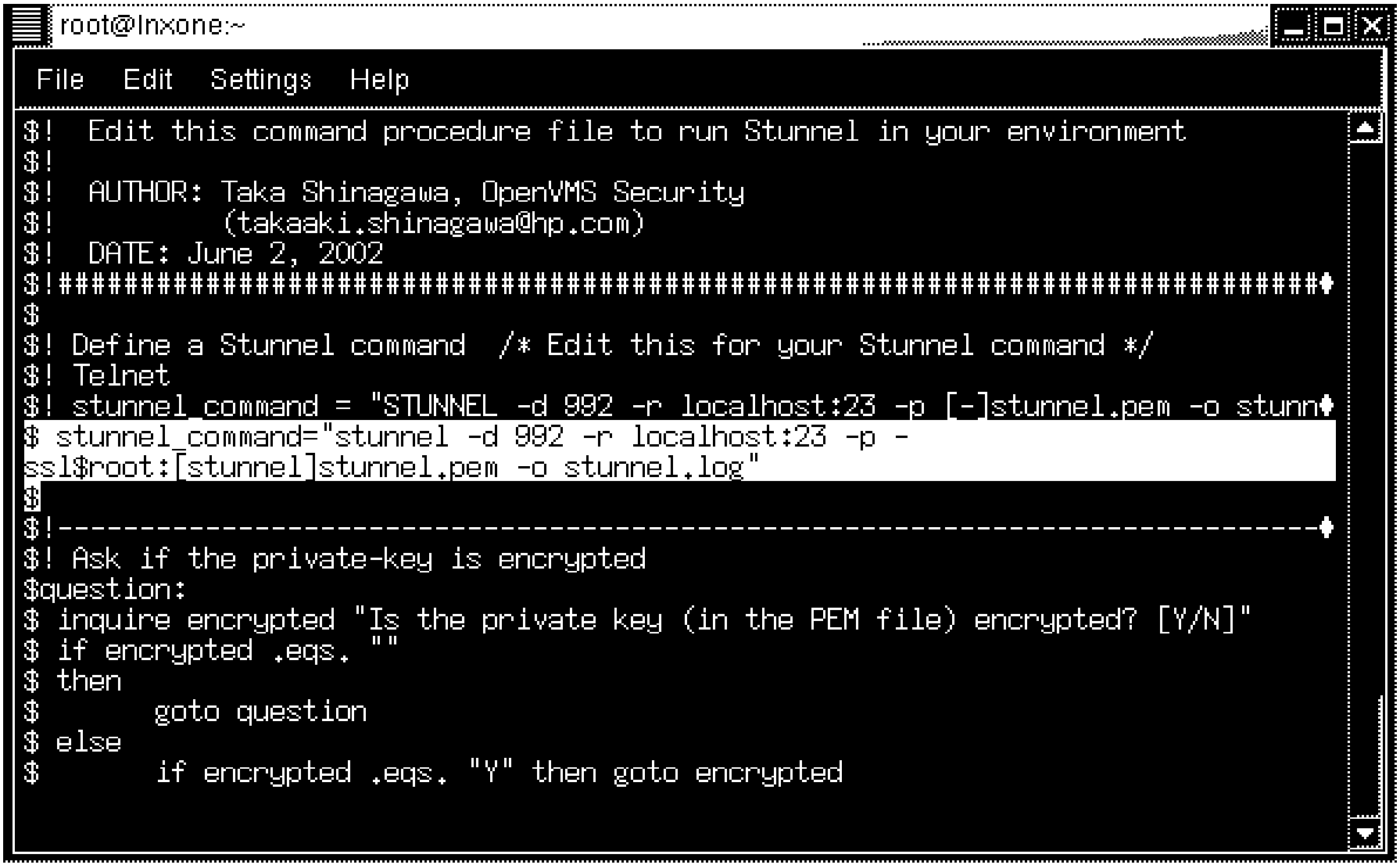
Set permission for Stunnel PEM file



View Stunnel PEM file

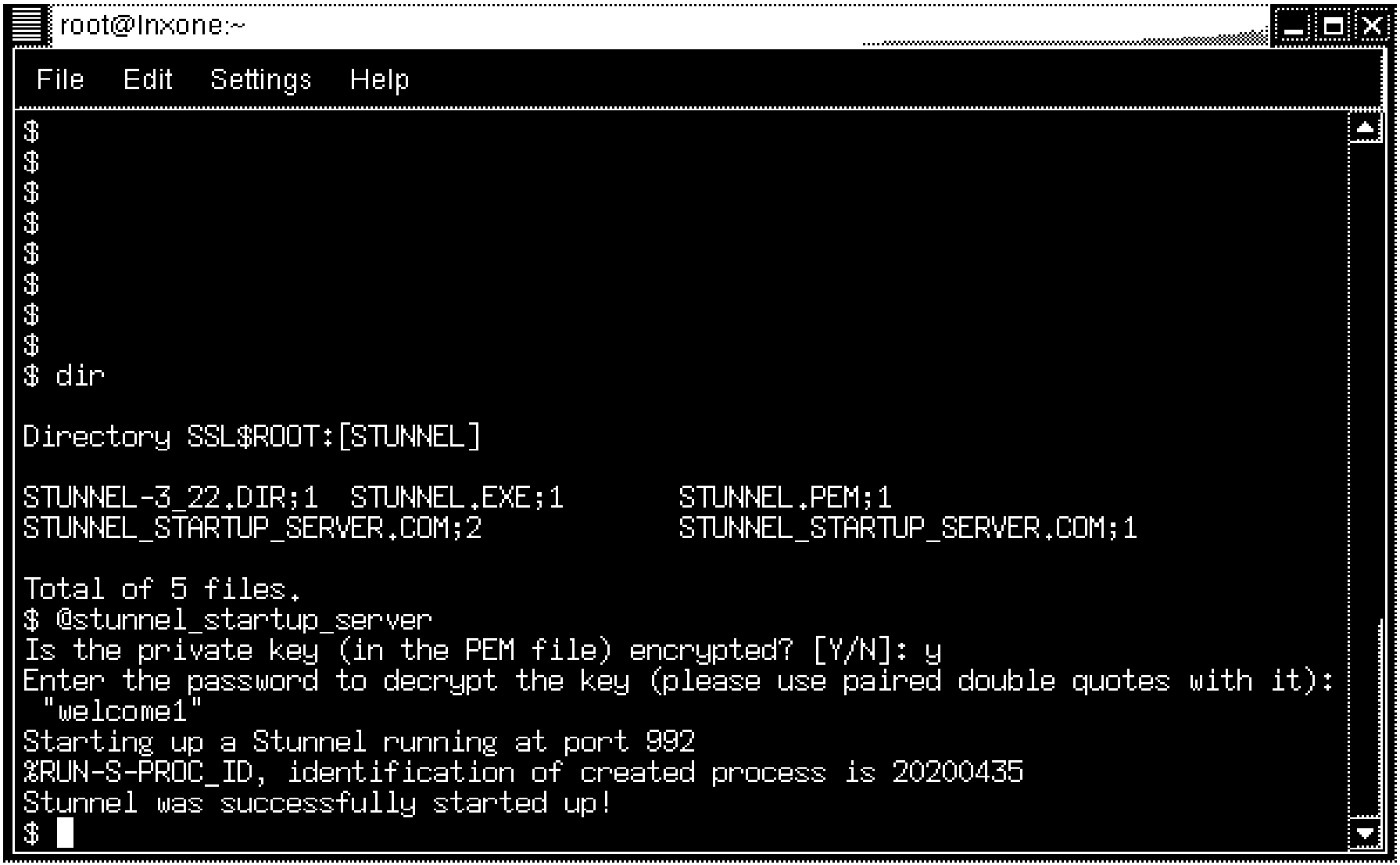
Copy Stunnel_startup_server.com

Edit the startup file for your system

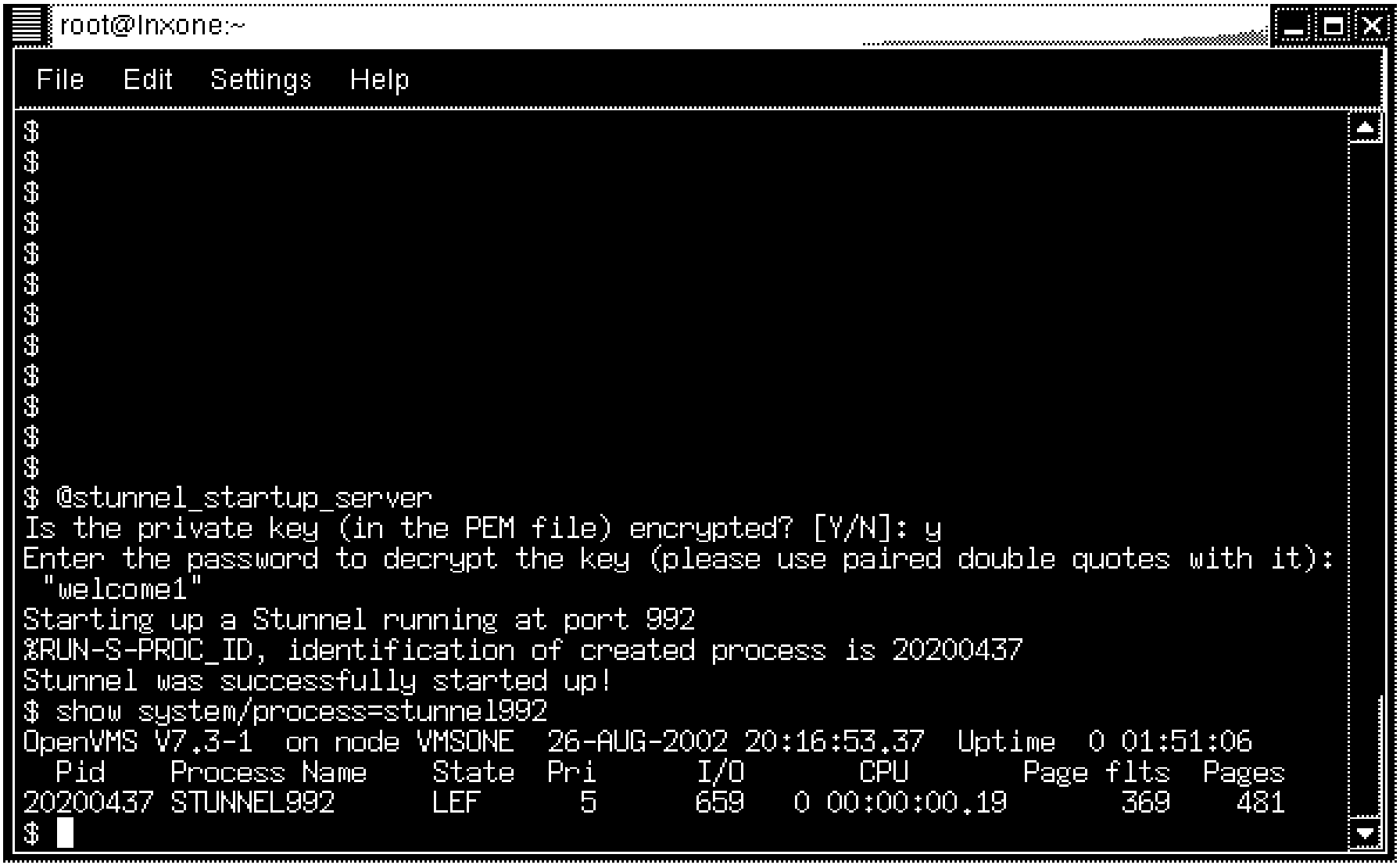


Note there are two versions (don't try this with your Linux box!)

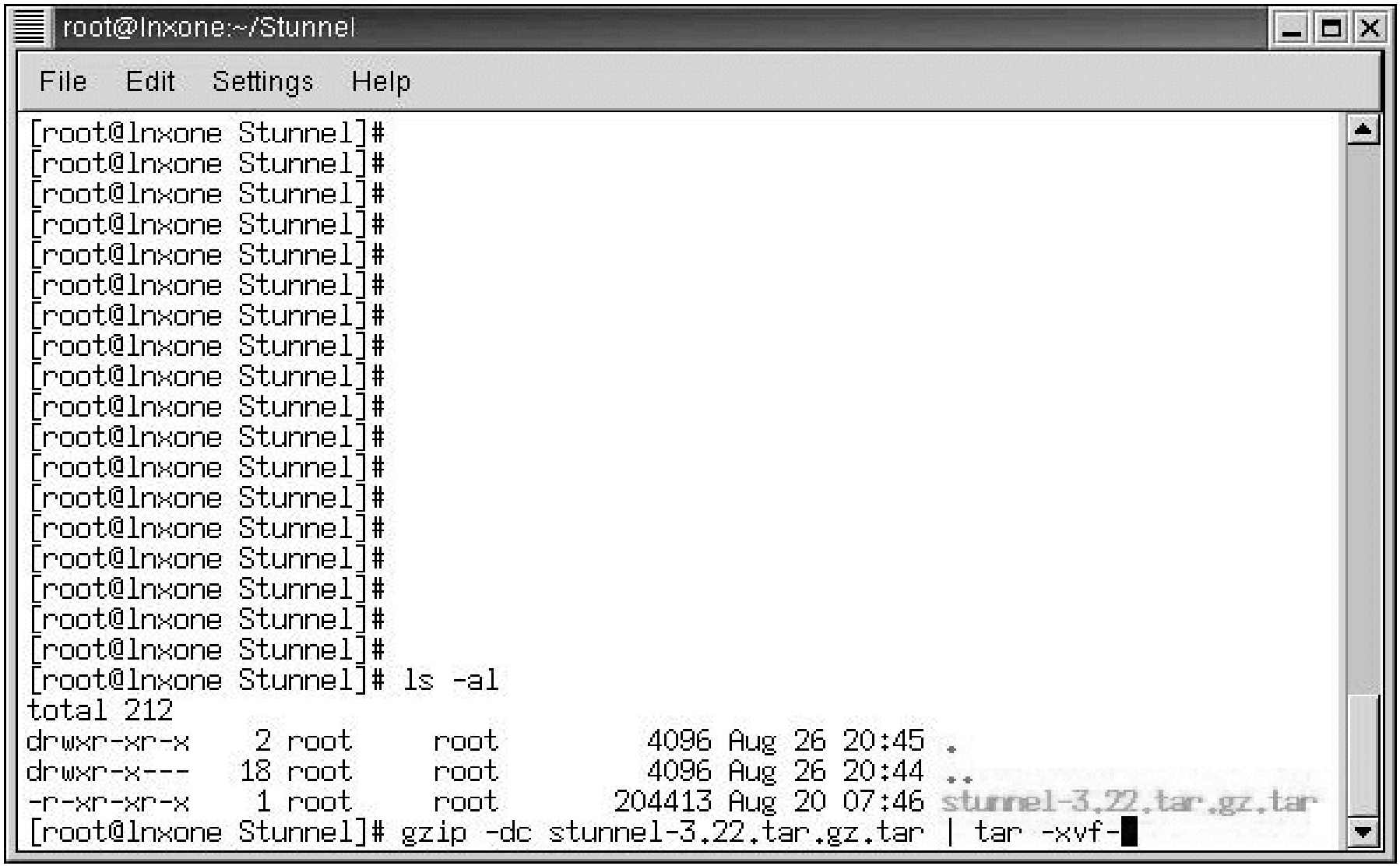
Startup the Stunnel Server



Check to see if the process is running

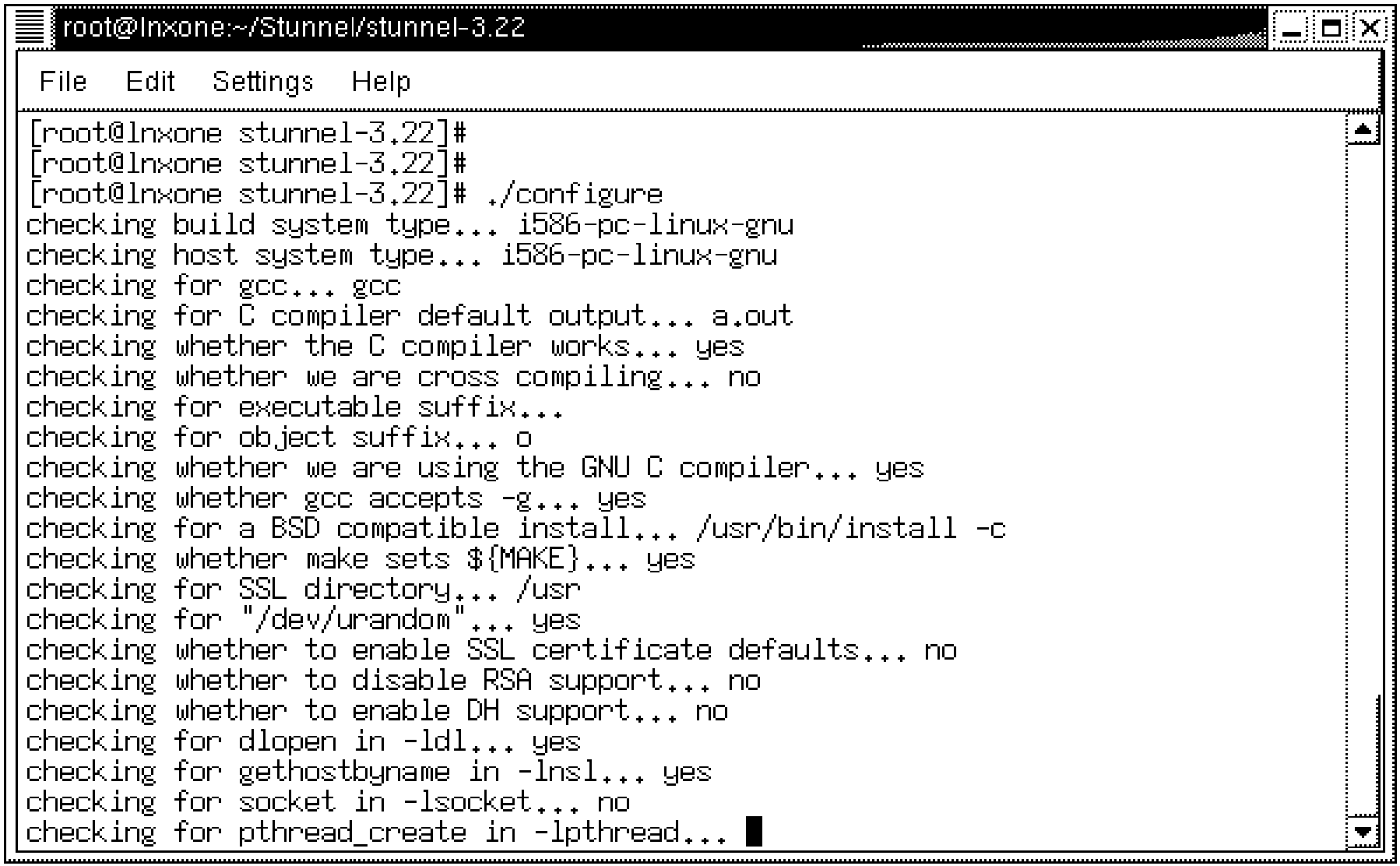


Installing Stunnel on Linux

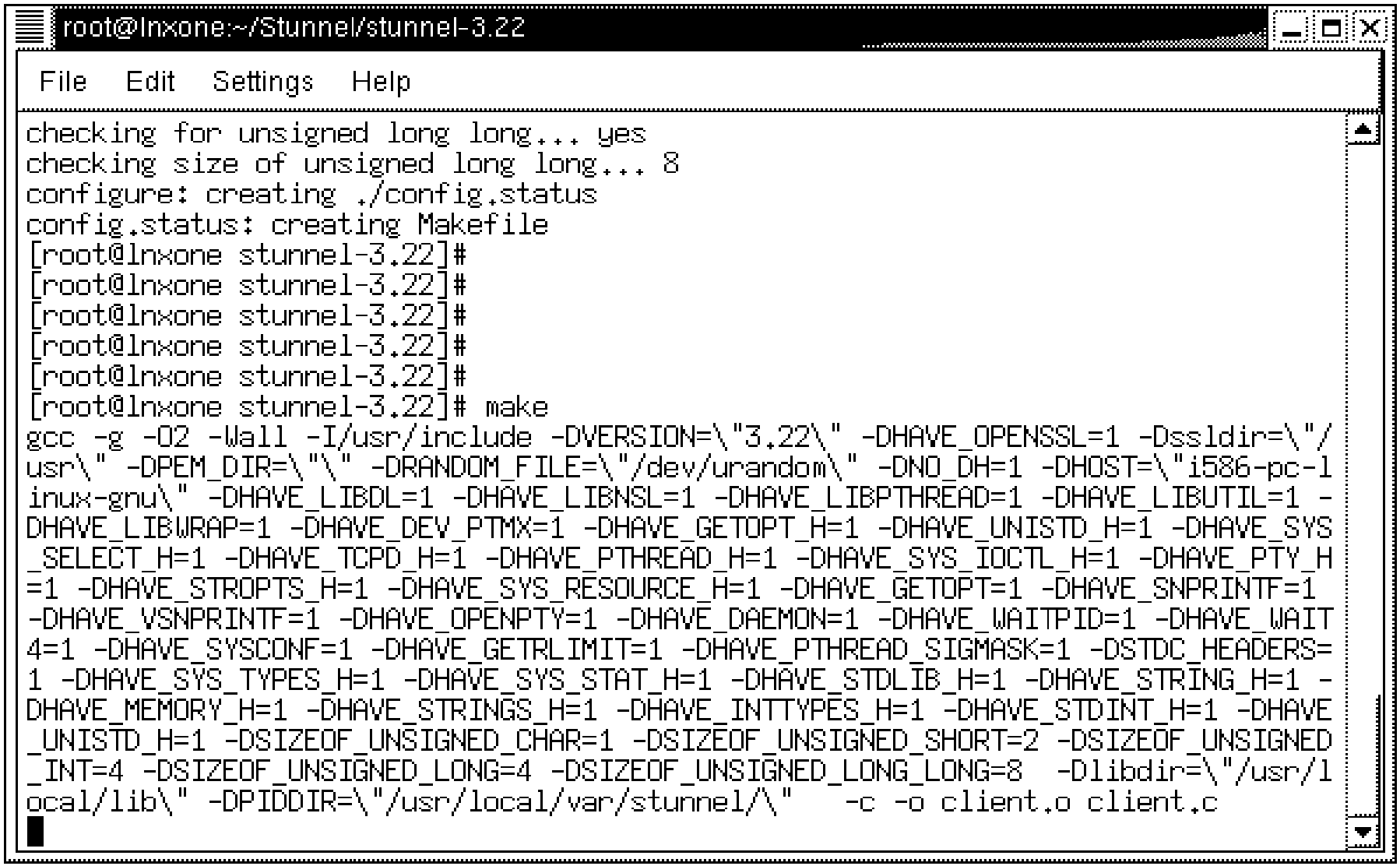


Linux Stunnel Install Directory

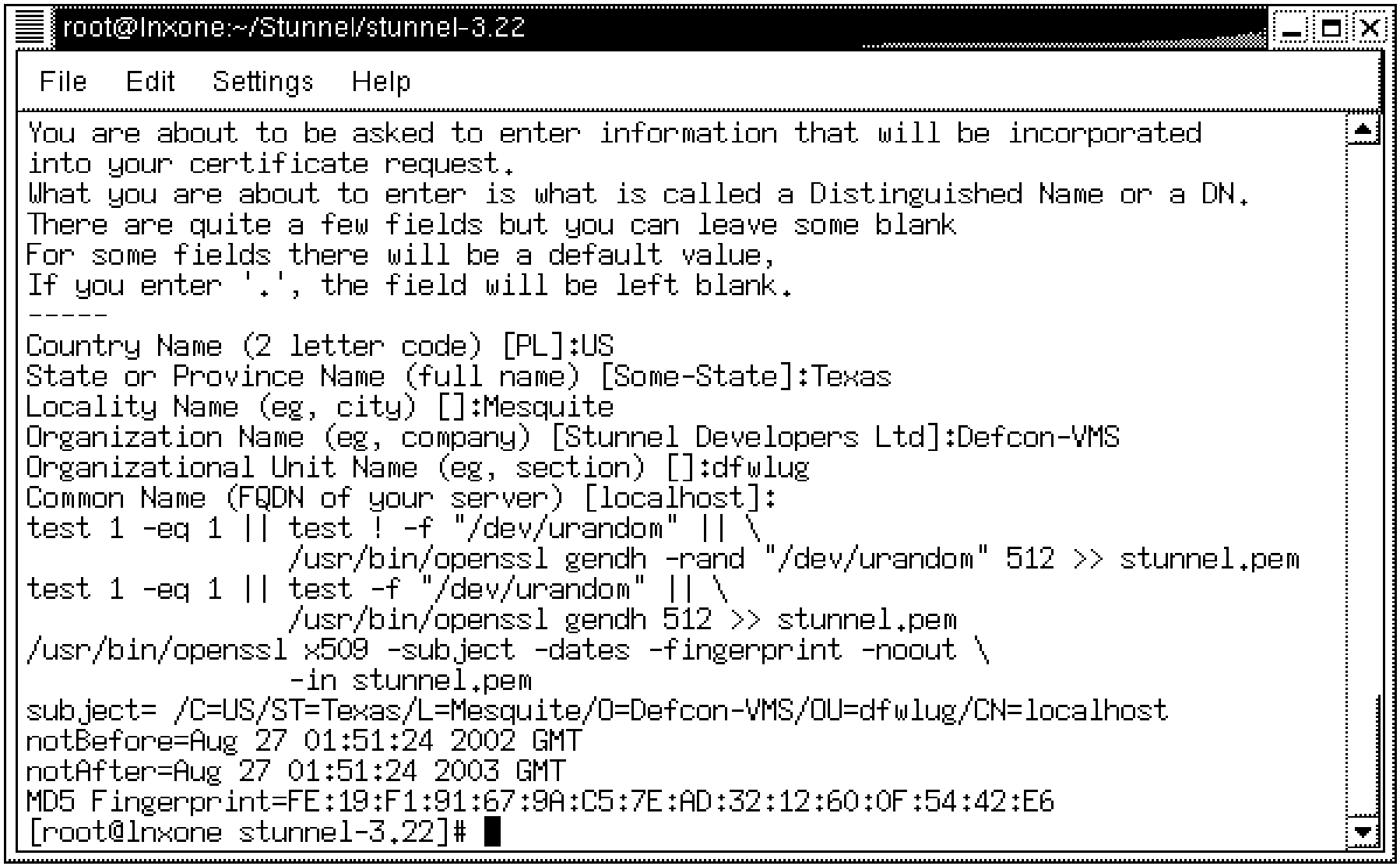
Linux Stunnel ./configure



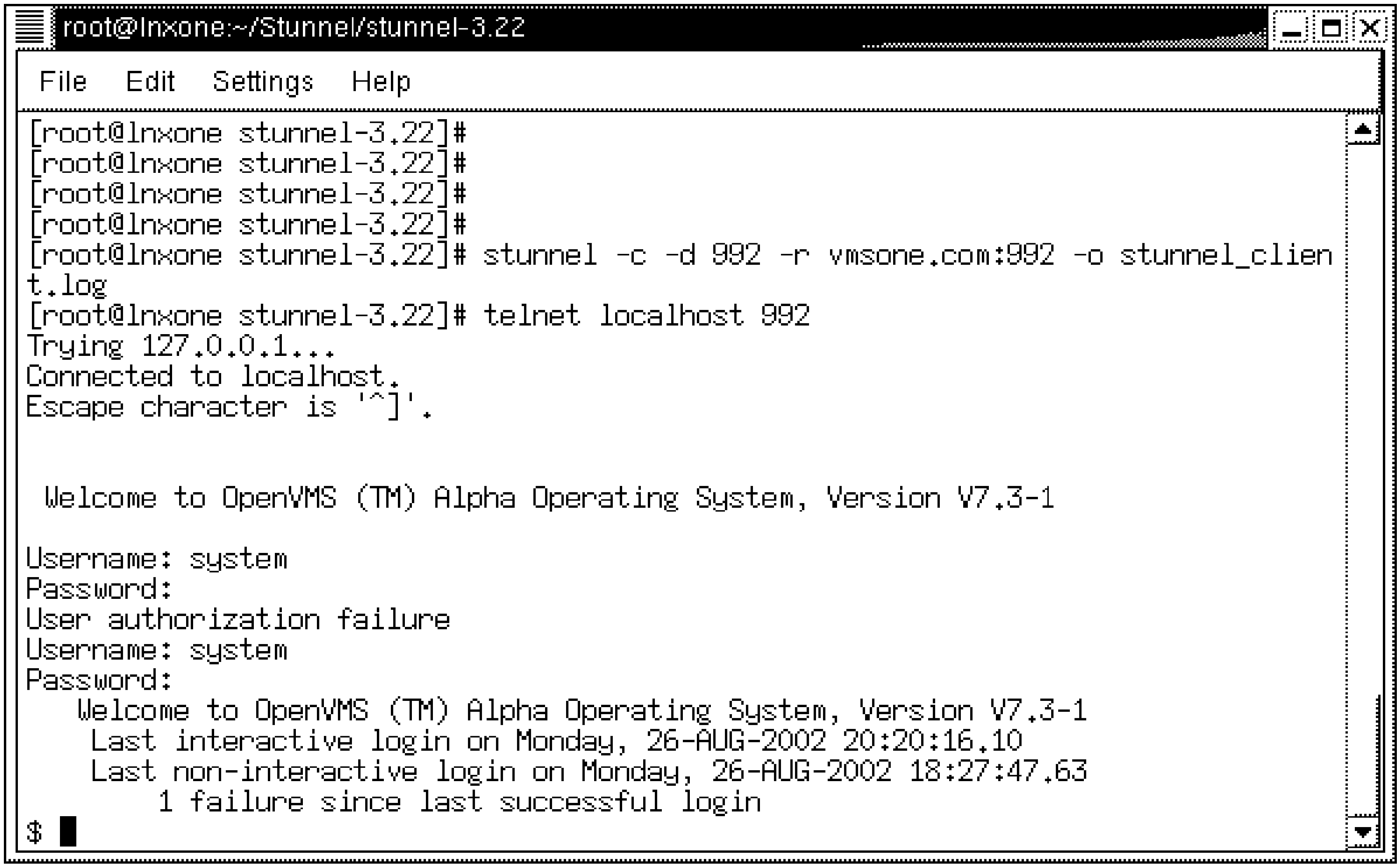
Linux Stunnel make



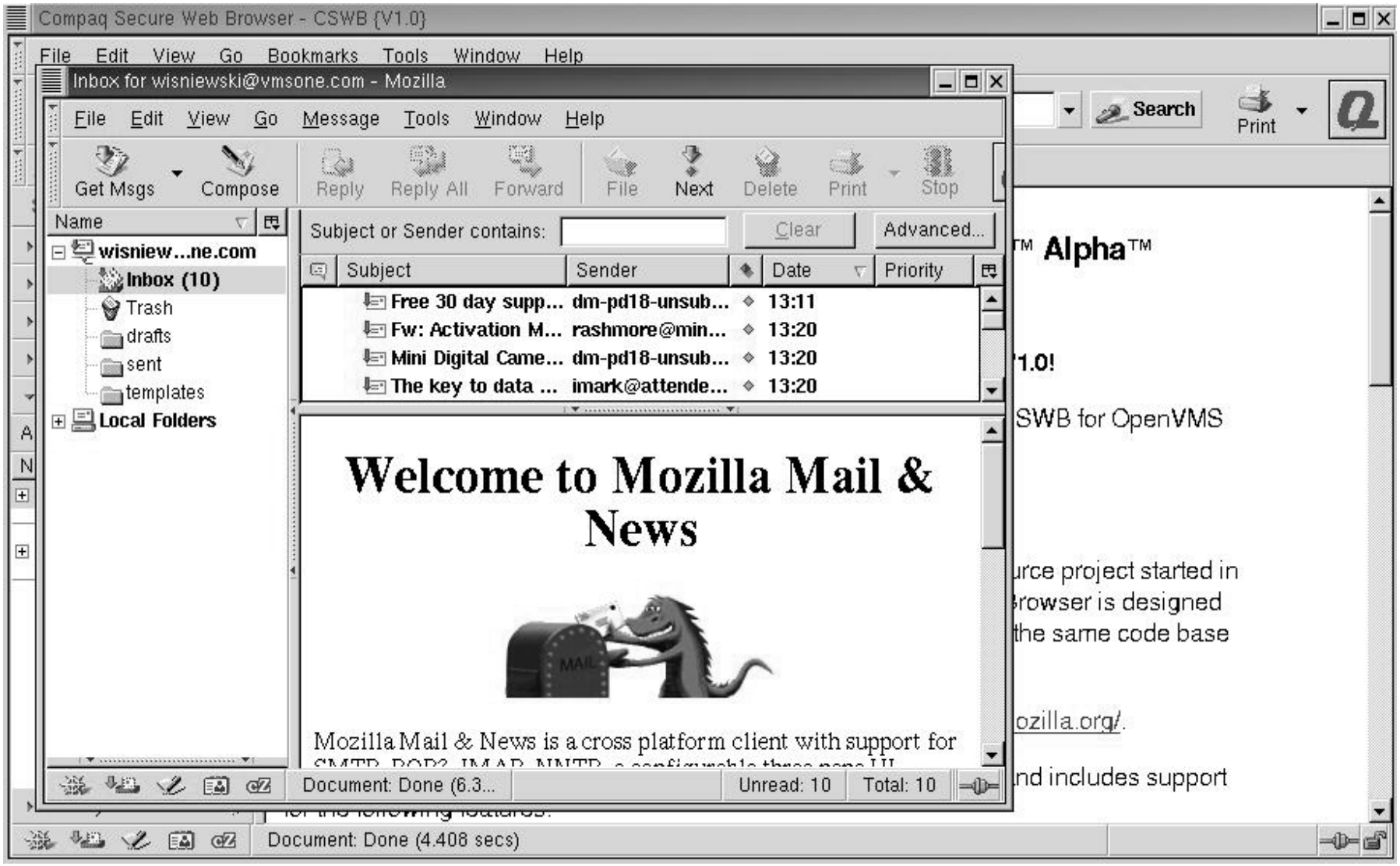
Stunnel Make Questions for CA



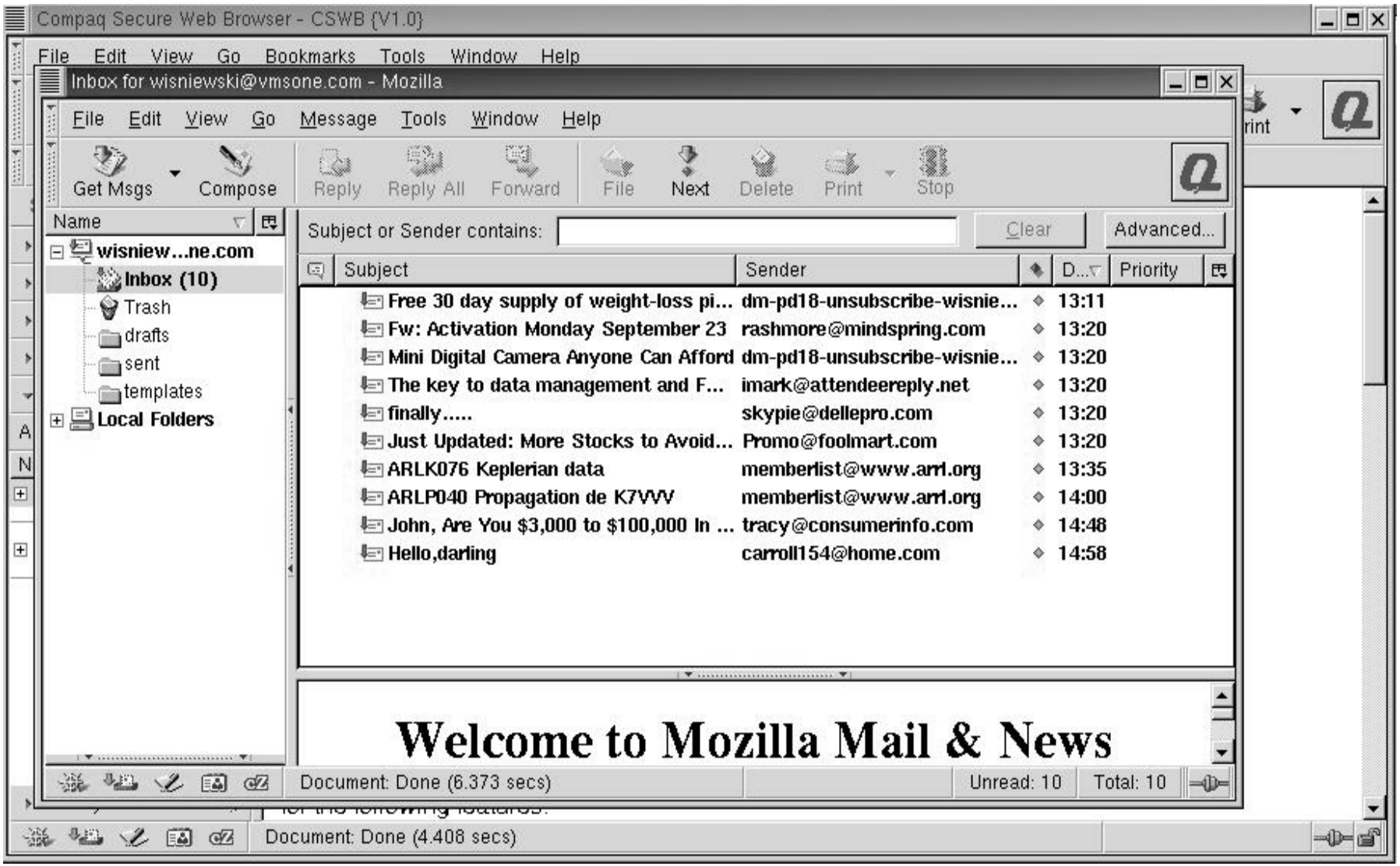
Using the Linux Stunnel Client



E-mail clients for OpenVMS and Linux



Mozilla is Mozilla for VMS or Linux



In Conclusion

- Linux is way cool!
- OpenVMS is way cool!

- They both share disks, graphics, do crypto together, share e-mail, and emulate the best parts of windows systems.

- At least at my house….

- And at many other houses too I'm sure.

- Use this information for good and not evil and if you must use force, clean up after yourself when finished…

The Flag Motherhood, and Apple Pie
And OpenVMS Hobbyist Programs

http://vmsone.com

http://openvmshobbyist.org

encompass
A COMPAQ USER GROUP

DECUS
DIGITAL EQUIPMENT COMPUTER USERS SOCIETY

John Robert Wisniewski

Is INSTALLATION Member number 183852 of DECUS.

(Please refer to your membership number when dealing with the DECUS office.)

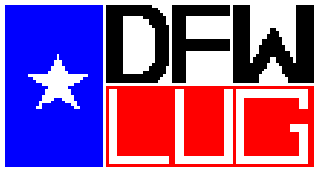
John Robert Wisniewsk

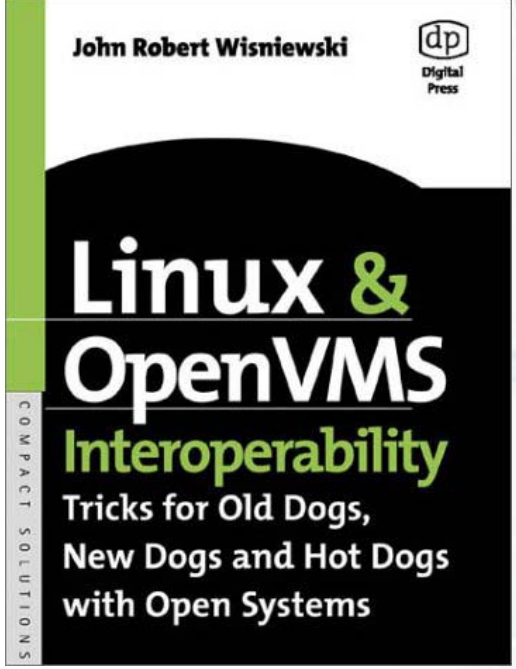
Signature

EN-1094B-07-R575—(369)

U

DFW LUG

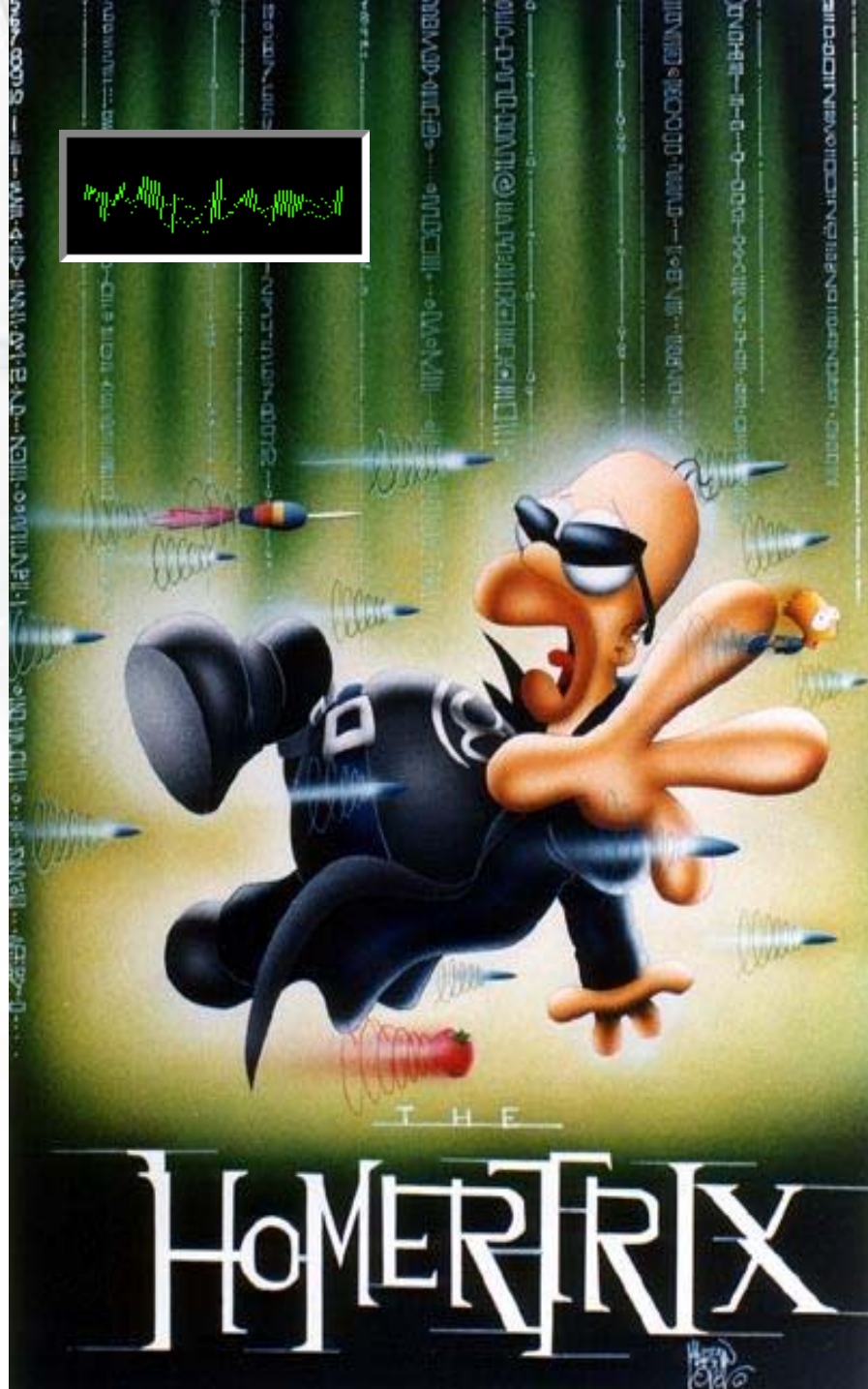




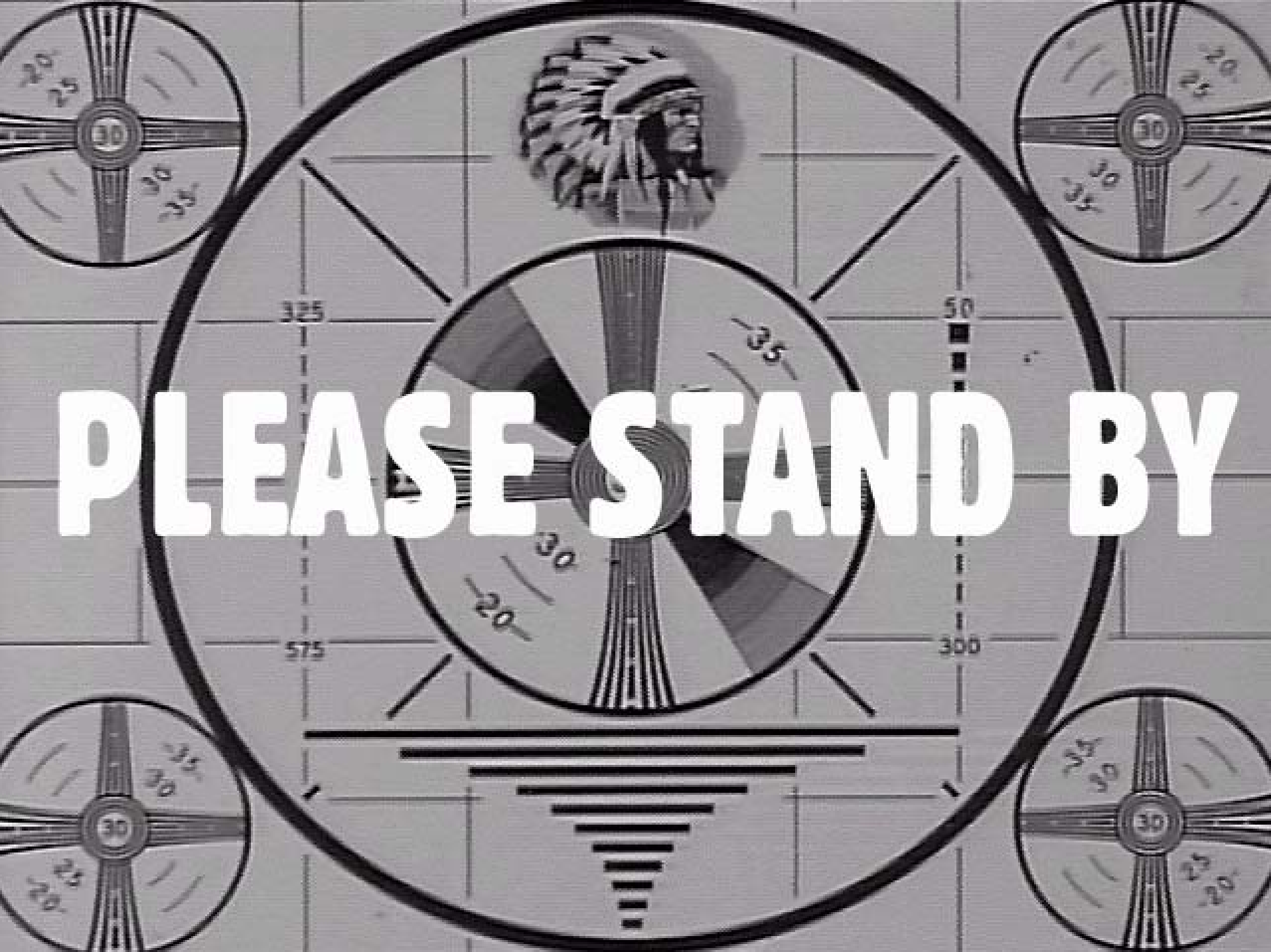
John Robert Wisniewski

http://vmsone.com

John.wisniewski@hp.com



QUESTIONS?


PLEASE STAND BY

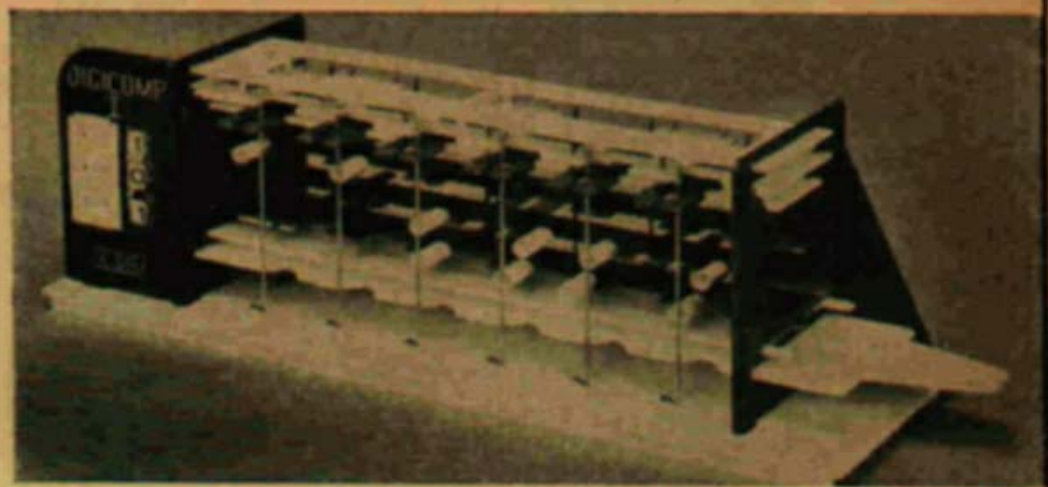
The next port after Itanium for OpenVMS and Linux

ELECTRONIC COMPUTER BRAIN

- EDUCATIONAL
- FUN AT PARTIES
- SOLVES RIDDLES
- EVEN TELLS FORTUNES

ONLY $4.99

ADDS—SUBTRACTS—
MULTIPLIES—MEMORIZES



Full 12" x 3½" x 4", it is open so complete operations can be viewed.

Digi Comp I is a miracle of the modern space age. It is an actual working digital computer that is designed simply and visually to demonstrate the apparatus hidden within the circuits of the giant brains of today. You will be able to add, subtract, multiply—solve problems—solve riddles—even check out Dad's bank balance and see that it is right. This magnificent little machine will shift, complement, carry, memorize, count, compare and sequence.

TRAIN IT TO DO YOUR BIDDING

Digi Comp I can even be trained for fun such as fortune telling, etc. And, think how amazed all your friends will be when you solve problems of missile countdown, satellite re-entry and missile checkout. Designed in plastic, this mechanical analog of a binary computer is 12" x 3½" x 4" and is open so its fascinating operation can be viewed. In kit form, it can be assembled in less than one hour and is complete with all parts, assembly chart and full 28-page operations manual which shows how to check the unit out, program problems, solve riddles and try experiments. A wonderful project for school also.

30 DAY FREE TRIAL

Try Digi Comp I in your home for 30 days free. Have fun putting it together, and have fun and excitement solving problems, riddles, telling fortunes and studying space age miracles. If you don't agree with us that this is the most exciting new development in modern research, then simply return for full refund. But don't delay—fill in coupon now. Only 4.98 + 63¢ shipping charges.

Money Back Guarantee

Royal Advertising Corp.
Lynbrook, New York
Dept. 86 RC22

Rush me my Electronic Computer Brain at once. I understand if I am not 100% delighted, I may return it for prompt refund of my purchase price.

I enclose $4.98 + 63¢ shipping charge. Same guarantee.

I enclose $1.00 deposit. Balance C.O.D. I will pay postman on delivery plus C.O.D. and shipping.

NAME_____

ADDRESS_____

The Fine Print

HP WORLD 2003
Solutions and Technology Conference & Expo

- Copyright 2003 Hewlett Packard Corporation All rights reserved.
- While Compaq believes the information included in this presentation is correct as of the date produced, it is subject to change without notice.
- All trademarks and registered trademarks are the property of their respective holders. Itanium™ and IA-64™ are trademarks of Intel.
- Presentation void where taxed or prohibited by law.
- Recommended for technical and engineering ranks ages 12 and up. Ask for special pointy-haired-boss toy.
- Do not taunt Happy Fun Ball.
- Wear Sunscreen.

OpenVMS and Linux Interoperability Session 2453

HP WORLD 2003
Solutions and Technology Conference & Expo