Hellenic Linux Information Sheet

Georgios E. Keramidas, keramida@ceid.upatras.gr v1.0, 22 October 1997

Ayto to keimeno parexei basikes plhrofories gia to leitoyrgiko susthma Linux, symperilambanomenhs kai mias perigrafhs toy Linux, mia lista me xarakthristika, merikes apaithseis kai arketes phges. Basizetai sto aggliko Linux Information Sheet (ekdosh 4.11, 13 Ianoyarioy 1997), to opoio diathrei o Michael K. Johnson, johnsonm@redhat.com

Contents

1 Eisagwgh sto Linux

To Linux einai mia teleiws dwrean epanaulopoihsh toy POSIX protupoy, me SYSV kai BSD epektaseis (poy shmainei oti moiazei me UNIX, alla den proerxetai apo thn idia bash phgaioy kwdika), to opoio einai dia8esimo se morfh phgaioy kwdika alla kai se ektelesimh morfh. Ta pneymatika dikaiwmata anhkoyn ston Linus B. Torvalds `Linus.Torvalds@Helsinki.FI` kai alloys poy kata kairous exoyn prosferei sthn anaptyjh toy. Dianemetai "eleu8era", sumfwna me toys oroys ths GNU General Public License.

To Linux den einai public domain, kai den einai shareware. Einai "dwrean" logismiko, kai mporeite na dwsete antigrafa toy, alla prepei na dwsete kai ton phgaio kwdika mazi h na kanete dynath thn dianomh toy me ton idio tropo. An dianeimete opoiesdhpote allages, eiste nomika ypeu8ynoi na dianeimete ton phgaio kwdika gia aytes tis allages. Deite thn GNU General Public License gia leptomereies. Ena antigrafo dianemetai me ton phgaio kwdika toy Linux, h mporeite na parete ena antigrafo mesw ftp apo to prep.ai.mit.edu, katalogos `/pub/GNU/COPYING`.

To Linux akomh dianemetai eleu8era, twra poy exei ftasei sthn ekdosh 2.0, kai 8a synexisei na dianemetai eleu8era. Akribws logw ths fushs ths GNU adeias xrhshs, ypo toys oroys ths opoias dianemetai to Linux, 8a htan paranomo na mhn dianemetai eleu8era to Linux. Prosoxh omws: einai apolutws nomimo na apaitountai xrhmata gia thn dianomh toy Linux, arkei na dianemetai kai o phgaios kwdikas mazi. Ayth einai mia polu genikh diapistwsh. An 8elete tis akribeis nomikes leptomereies, diabaste thn GNU adeia xrhshs toy Linux.

To Linux trexei se 386/486/Pentium mhxanes me ISA, EISA, PCI kai VLB diauloys. O diaylos MCA (ths IBM) den yposthrizetai teleia akoma, parolo poy exei arxisei na yposthrizetai apo ta kernels 2.1.x. An endiafereste, deite thn selida `$<$http://glycerine.itsmm.uni.edu/mca$>$`.

Yparxei mia metafora se anaptyjh gia polles Motorola 680x0 platformes (twra trexei se kapoies Amiga, Atari, kai VME mhxanes), poy twra pleon doyleuei arketa kala. Apaitei enan 68020 me MMU, enan 68030, 68040, h enan 68060. Epishs apaitei mia FPU. Oi trexoyses ekdoseis exoyn yposthrijh kai gia diktyakes kai gia X efarmoges.

To Linux trexei polu kala stoys Alpha epejergastes ths DEC, me yposthrijh gia tis mhxanes "Jensen", "NoName", "Cabriolet", "Universal Desktop Box" (eyrutera gnwsto ws Multia), kai polles alles platformes. Gia perissoteres plhrofories, deite thn selida `$<$http://www.azstarnet.com/\~{}axplinux/FAQ.html$>$`.

To Linux trexei kala kai se Sun SPARCs; oi pio polles sun4c kai sun4m mhxanes twra mporoun na trejoyn to Linux, me yposthrijh gia tis sun4u na exei hdh jekinhsei na anaptussetai. To Red Hat Linux einai (thn stigmh poy grafontai aytes oi grammes) h monh dianomh toy Linux poy yparxei gia SPARCs! Gia perissoteres plhrofories deite thn selida `$<$http://www.redhat.com/support/docs/rhl-sparc/$>$`.

To Linux metaferetai twra kai sthn arxitektonikh PowerPC, symperilambanomenwn twn PowerMac (Nubus kai PCI), Motorola, IBM, kai Be mhxanwn.

Metafores toy Linux kai se alles arxitektonikes, opws MIPS kai ARM, exoyn jekinhsei kai deixnoyn diafora pososta proodoy. Mhn kratate thn anasa sas, alla an endiafereste kai mporeite na prosferete, mporeite na breite ki alloys poy 8a endiaferontoysan na doylecoyn mazi sas.

To Linux den 8ewreite pia se peiramatiko stadio, afou ekdosh 1.0 exei teleiwsei apo tis 14 Martioy toy 1994. Yparxoyn akomh bugs sto susthma, kai nea bugs 8a emfanizontai kai 8a dior8wnontai ka8ws perna o kairos. Epeidh to Linux akoloy8ei to "anoixto protypo anaptyjhs", oles oi nees ekdoseis 8a dinontai sto koino, akomh ki an den 8ewrountai "emporikhs poiothtas". Parol' ayta, kai gia na boh8h8ei o kosmos sthn epilogh enos sta8erou pyrhna, to akoloy8o sxhma exei ylopoih8ei: Oi ekdoseis 2.x.y, opoy to x einai zygos ari8mos, einai sta8eres ekdoseis kai mono dior8wseis la8wn prosti8entai ka8ws to y ayjanetai. Etsi apo thn ekdosh 2.0.2 sthn 2.0.3, yparxoyn mono dior8wseis la8wn oxi nea xarakthristika. Oi ekdoseis 2.x.y, opoy to x einai enas perittos ari8mos, einai beta-poiothtas ekdoseis mono gia developers. Mporei na einai asta8eis, na paroysiazoyn genikotera problhmata kai allazoyn polu grhgora ka8ws nea features prosti8entai se aytes synexeia. Molis pernaei arketos kairos, ka8ws h trexoysa ekdosh toy kernel sta8eropoieitai, h anaptyjh "pagwnei" gia ligo, mia kainouria sta8erh ekdosh toy kernel moirazetai, kai h anaptyjh synexizetai me mia kainouria peiramatikh ekdosh.

H trexoysa sta8erh ekdosh einai h 2.0.31 (ayto 8a synexisei na allazei ka8ws kainourioi odhgoi prosti8entai kai bugs dior8wnontai). H peiramatikh ekdosh poy anaptussetai einai h seira 2.1.x. An h 2.0.x einai polu kainouria gia esas, mporeite na parameinete me thn 1.2.13 pros to paron. Parol' ayta oi teleytaies 2.0.x ekdoseis exoyn apodeixtei arketa sta8eres. Shmeiwste oti h allagh apo thn ekdosh 1.2 sthn 2.0 apaitei na allajete kai polla apo ta programmata sas! Isws protimhsete na allajete sthn pio kainouria ekdosh ths dianomhs sas gia na allajoyn mazi kai ayta ta programmata. O phgaios kwdikas toy Linux kernel periexei ena arxeio, Documentation/Changes, poy ejhgei aytes tis allages kai polla alla.

Oi pio polles ekdoseis toy Linux, peiramatikes kai mh, einai arketa sta8eres, kai mporeite na synexiste na tis xrhsimopoieite an kanoyn ayto poy 8elete kai den sas endiaferei na eiste sthn "aixmh ths texnologias". Ena site eixe enan ypologisth poy etrexe thn ekdosh 0.97p1 (apo to kalokairi toy 1992) gia panw apo 136 hmeres xwris kanena la8os h crash. (8a leitoyrgouse gia polu perissotero an enas ergaths den ekleine kata la8os ton metasxhmatisth kurias isxuos...) Alloi exoyn steilei uptimes parapanw apo ena xrono. Ena site akomh eixe enan ypologisth poy etrexe to Linux 0.99p15s gia panw apo 600 days thn teleytaia fora poy to anefere.

Ena pragma poy ajizei na jerei kaneis einai oti to Linux akoloy8ei ena anoixto kai katanemhmeno montelo anaptyjhs, anti gia ena kleisto kai kentrikopoihmeno montelo, opws h pleiochfia twn ypoloipwn megalwn systhmatwn logismikou. Ayto shmainei oti h trexoysa ekdosh einai panta dia8esimh (me to polu mia h dyo ebdomades ka8ysterhsh) etsi poy opoiosdhpote na mporei na thn xrhsimopoihsei. To apotelesma einai oti opote mia kainouria ekdosh me nea xarakthristika bgainei, sxedon panta periexei kai bugs, alla suntoma arxizei mia taxisth dokimh kai anaptyjh, etsi poy ta bugs briskontai kai dior8wnontai grhgora, syxna mesa se liges wres, afou polloi ergazontai gia na "xtisoyn" thn nea ekdosh.

Se anti8esh, to kleisto kai kentrikopoihmeno montelo shmainei oti yparxei ena atomo h mia omada poy doyleuei sto project, kai dianemoyn logismiko otan aytoi nomizoyn oti doyleuei arketa kala. Syxna ayto odhgei se megala diasthmata metaju twn dianomwn kai megales anamones gia dior8wseis la8wn. Safws h teleytaia ekdosh tetoioy systhmatos logismikou einai syxna ychlhs poiothtas, alla h taxuthta anaptyjhs einai genika polu mikroterh.

Stis 26 Oktwbrioy, 1997, oi trexoyses ekdoseis einai 2.0.31 gia thn sta8erh ekdosh toy Linux, kai 2.1.57 gia thn peiramatikh.

2 Xarakthristika toy Linux

- Multitasking: polla programmata trexoyn taytoxrona.
- Polyxrhstiko (multiuser): polloi xrhstes sto idio mhxanhma taytoxrona (kai kamia anagkh gia polles adeies xrhsth!).
- Metafersimo (multiplatform): trexei se polles diaforetikes CPUs, oxi mono stoys epejergastes ths Intel.
- Multiprocessor: Yparxei hdh yposthrijh SMP stis Intel kai SPARC platformes (me thn doyleia na exei jekinhsei kai se alles platformes), kai to Linux xrhsimopoieitai se polles MP efarmoges, symperilambanomenwn kai twn systhmatwn Beowulf (deite to `$<$http://cesdis.gsfc.nasa.gov/linux-web/beowulf/beowulf.html$>$`) kai ston Fujitsu AP1000+ yperypologisth poy basizetai sthn SPARC arxitektonikh.
- Trexei se prostateymenh katastash (protected mode) ston 386 kai toys newteroys Intel epejergastes.
- Exei prostasia mnhmhs metaju twn diergasiwn, etsi wste ena programma na mhn mporei na "katebasei" olo to susthma.
- Fortwnei otan yparxei anagkh ta ektelesima: to Linux diabazei apo to disko mono ekeina ta merh enos programmatos poy pragmatika xrhsimopoiountai.
- Koines copy-on-write selides metaju twn ektelesimwn. Ayto shmainei oti polles diergasies mporoun na xrhsimopoioun tis idies perioxes mnhmhs gia na trexoyn. Otan kapoia prospa8hsei na gracei sthn

mnhmh, ekeinh h selida (ena kommati 4KB ths mnhmhs) antigrafetai kapoy allou. To copy-on-write exei duo pleonekthmata: ayjanei thn taxuthta kai meiwnei thn mnhmh poy apaiteitai.

- Ideath mnhmh xrhsimopoiwntas selidopoihsh (den kanei swapping oloklhres diergasies) kai meros toy diskoy: se ena jexwristo partition h ena arxeio sto susthma arxeiwn, h kai ta duo, me thn dynatothta gia pros8hkh perissoterwn swapping perioxwn se runtime xrono (nai, akoma legontai swapping perioxes). Synolika to polu 16 swapping perioxes twn 128 MB mporoun na xrhsimopoiountai taytoxrona, dinontas ena 8ewrhtiko orio twn 2 GB sthn synolikh swapping perioxh. Einai aplo, omws, na allajei to orio ayto, tropopoiwntas liges grammes kwdika.
- Mia enopoihmenh phgh mnhmhs gia programmata xrhsth kai cache diskwn, etsi wste olh h eleu8erh mnhmh na mporei na xrhsimopoih8ei gia caching, kai h cache na mporei na meiw8ei otan trexoyn megala programmata.
- Dynamika fortwsimes diamoirasmenes biblio8hkes (dynamically linked shared libraries) (alliws gnwstes kai ws DLL's). Bebaia, yposthrizei kai statikes biblio8hkes.
- Dhmioyrgei core dumps gia ek twn ysterwn analysh, dinontas thn dynatothta gia xrhsh enos debugger se ena programma oxi mono otan trexei, alla ki afou exei crash-arei.
- Symbato se ena megalo pososto me to POSIX, to System V, kai to BSD se epipedo phgaioy kwdika.
- Mesw enos iBCS2-symbatou tmhmatos ejomoiwshs, symbato me SCO, SVR3, kai SVR4 se dyadiko (ektelesimo) epipedo.
- Olos o phgaios kwdikas einai dia8esimos, symperilambanomenoy oloklhroy toy kernel kai olwn twn odhgwn, twn ergaleiwn anaptyjhs kai olwn twn programmatwn xrhsth! Epishs, oloklhro to Linux mporei na dianemetai eleu8era oloklhro. Polla emporika programmata yparxoyn dia8esima gia Linux xwris ton phgaio kwdika, alla oti htan eleu8era dia8esimo, symperilambanomenoy oloklhroy toy basikou leitoyrgikou systhmatos, einai akomh eleu8era dia8esimo.
- Elegxos ergasiwn symbatos me POSIX.
- pseudoterminals (pty's).
- Ejomoiwsh ths 387 FPU mesa sto idio to kernel etsi wste ta programmata den xreiazetai na kanoyn thn dikh toys ejomoiwsh. Ka8e ypologisths poy trexei to Linux moiazei na exei ena ma8hmatiko synepejergasth. Bebaia, an o ypologisths sas exei hdh mia FPU, 8a xrhsimopoih8ei ayth anti gia thn ejomoiwsh, kai mporeite na xtisete ton pyrhna sas xwris ayth thn ejomoiwsh, gia na kerdisete ligh mnhmh.
- Yposthrijh gia polla e8nika kai prosarmosima plhktrologia – einai arketa eukolo na proste8oun kainouria dynamika otan yparjei anagkh.
- Pollaples ideates konsoles: arketa anejarthta login sessions apo thn konsola toy systhmatos, allazete patwntas ena syndyasmo apo hot-keys (anejarthta apo to video hardware). These are dynamically allocated; you can use up to 64.
- Yposthrizei polla koina systhmata arxeiwn, symperilambanomenwn twn minix, Xenix, ola ta koina system V filesystems (p.x. UFS), kai exei ena diko toy ejeligmeno susthma arxeiwn, to opoio prosferei systhmata arxeiwn mexri 4 TB, kai onomata poy periexoyn mexri 255 xarakthres. Epipleon, sto susthma arxeiwn toy Linux, o monos periorismos poy yparxei sto poioys xarakthres mporei na periexei ena onoma einai oti den mporei na periexei ton xarakthra ASCII NUL (0) (anti8eta me to VFAT, p.x. poy apagoreuei toys xarakthres “*?<>|”:/\\+=,; []”).

- Diafanh prospelash twn arxeiwn enos MS-DOS partition (h OS/2 FAT partition) mesw enos eidikou systhmatos arxeiwn: den xreiazeste eidikes entoles gia na xrhsimopoihsete to MS-DOS partition, moiazei san ena kanoniko Unix susthma arxeiwn (ektos apo merikous asteioys periorismous sta onomata twn arxeiwn, thn prostasia twn arxeiwn, ktl.). Ta sympiesmena partitions toy MS-DOS 6 den doyleuoyn ayto ton kairo xwris ena patch (dmsdosfs). To Linux 2.0 yposthrizei to VFAT (WNT, Windows 95).
- Eidiko susthma arxeiwn, poy legetai UMSDOS, to opoio yposthrizei thn egkatastash toy Linux se ena DOS partition.
- Yposthrijh (gia anagnwsh-mono) toy HPFS-2 (OS/2 2.1).
- Yposthrijh gia to HFS (Macintosh) file system yparxei jexwrista san module.
- CD-ROM filesystem which reads all standard formats of CD-ROMs.
- TCP/IP networking, including ftp, telnet, NFS, etc.
- Appletalk ejyphrethths
- Netware pelaths kai ejyphrethths
- Lan Manager (SMB) pelaths kai ejyphrethths
- Polla diktyaka prwtokolla: ta basika prwtokolla poy einai dia8esima sta teleytaia peiramatika kernels perilambanoyn ta TCP, IPv4, IPv6, AX.25, X.25, IPX, DDP (Appletalk), NetBEUI, Netrom, kai alla. Sta8era diktyaka prwtokolla poy periexontai sta sta8era kernels perilambanoyn ta TCP, IPv4, IPX, DDP, and AX.25.

3 8emata Ylikou (Hardware)

To yliko poy apaiteitai gia na trejei to Linux einai elaxisto an elaxistes einai ki oi dikes sas apaithseis apo ena Linux susthma. Parol' ayta to yliko toy systhmatos sas mporei na prosarmozetai stis trexoyses anagkes sas. Kai to Linux mporei na prosarmozetai stis allages aytes!

3.1 Elaxistes Apaithseis

To akoloy8o einai pi8anon to minimalistiko setup sto opoio mporei kapoios na xrhsimopoihsei to Linux: 386SX/16, 1 MB RAM, 1.44 MB h 1.2 MB floppy, opoiadhpote yposthrizomenh karta o8onhs (+ plhktrologia, o8ones, kok. bebaia). Ayto 8a sas dwsei thn dynatothta na jekinhsete kai na dokimasete an doyleuei to susthma, alla den 8a mporeite na kanete otidhpote xrhsimo. Deite to `$<$http://rsphy1.anu.edu.au/ \~{}gpg109/mem.html$>$` gia alla “mikra” Linux configurations.

Gia na kanete otidhpote, 8a xreiasteite kai kapoio xwro sto sklhro disko, 5 ws 10 MB 8a prepe na einai arketa gia ena polu syrriknwmeno setup (mono me ta apolutws aparaithta programmata ki isws mia h dyo mikres efarmoges egkatesthmenes, opws, gia paradeigma ena programma termatikou [minicom,term,ktl.]). Ayto einai akomh pragmatika polu periorismeno kai ka8oloy aneto san egkatastash, kai den exei arketo xwro gia na kanete sxedon tipota, ektos ki an h xrhsh poy 8a kanete exei polu periorismenes anagkes. Den synistatai genika gia otidhpote allo, ektos apo dokimes gia to an ta pragmata doyleuoyn, kai bebaia gia na mporoume na yperhfaneyomaste pws to Linux exei fobera mikres apaithseis.

3.2 Xrhsimopoihsima Systhmata

An prokeitai na trejete ypologistika baria programmata, opws ton gcc, ta X, h to TeX, mallon 8a xreiasteite ena pio grhgoro epejergasth apo enan 386SX/16, alla akomh ki aytos 8a htan arketos an exete thn apaitoumenh ypomonh.

Sthn pragmatikothta, 8a xreiasteite toylaxiston 4 MB kurias mnhmhs (RAM) an den xrhsimopoieite ta X, kai 8 MB an ta xrhsimopoieite. Epishs, an 8elete na yposthrizete pollous xrhstes taytoxrona, h na trexete polla megala programmata thn idia stigmh (metaglwttiseis gia paradeigma), mporei na xreiasteite parapanw apo 4 MB kurias mnhmhs. To Linux 8a doylecei akomh kai me mikrotera mege8h mnhmhs (8a prepe na doyleuei akomh kai me 2 MB), alla 8a xrhsimopoiei ideath mnhmh (xrhsimopoiwntas ton sklhro disko san argh mnhmh) ki ayto 8a einai polu argo, sxedon adunato na xrhsimopoih8ei. An xrhsimopoieite polla programmata taytoxrona, 16 MB 8a meiwsoyn to swapping kata polu. An 8elete na apofugete to swapping akomh kai katw apo arketa ypologisimo load, 32 MB einai mallon ayto poy xreiazeste. Bebaia, an trexete efarmoges poy pragmatika “peinane” gia mnhmh, 8a xreiasteite akomh pio polu mnhmh.

To poso toy sklhrou diskoy poy 8a xreiasteite ejartatai apo to logismiko poy 8elete na egkatasthsete. To kanoniko basiko set apo Unix ergaleia, shells, kai programmata diaxeirishs toy systhmatos xwraei sxetika aneta se ligotero apo 10MB me ligo xwro sthn akrh gia arxeia twn xrhstwn. Gia ena pio oloklhrwmeno susthma, parte thn Red Hat, thn Debian, thn Slackware, h opoiadhpote allh dianomh, kai ypologiste oti 8a xreiasteite apo 60 ws 300 MB, analoga me to ti 8a dialejete na egkatasthsete kai poia dianomh 8a parete. Pros8este se ayto to xwro poy 8elete na desmeusete gia arxeia twn xrhstwn. Me tis shmerines times stwn sklhrwn diskwn, an pairnete ena kainourio susthma, den exei nohma na parete ena disko poy einai polu mikros. Parte toylaxiston 500 MB, an kai 1 GB h pio polu einai protimotero, kai den 8a to metaniwsete.

Pros8este perissoterh mnhmh, megalutero sklhro disko, ena pio grhgoro epejergasth, ki oti allo 8elete analoga me tis anagkes, tis epi8ymies kai to portofoli sas gia na jefugete apo to orio toy aplws xrhsimopoihsimoy systhmatos. Genika, mia megalh diafora toy Linux apo to DOS einai oti sto Linux h pros8hkh mnhmhs deixnei polu megaluterh diafora, parolo poy sto DOS h ejtra mnhmh den moiazei na allazei kai polla pragmata. Ayto exei, en merei, sxesh kai me to asteio orio twn 640 KB toy DOS, to opoio sto Linux apla den yparxei.

3.3 Yliko poy Yposthrizetai

CPU:

Otidhpote trexei programmata se prostateymenh katastash leitoyrgias opws o 386 (ola ta montela twn 386, 486, 586, kai 686 8a prepe na doyleuoyn kanonika). Oi 286 kai oi katwteroi mporei kapoia mera na yposthrizontai apo ena mikrotero kernel, to opoio legetai ELKS (Embeddable Linux Kernel Subset), alla mhn perimenete tis idies dynatothtes. Mia ekdosh gia toys 680x0 epejergastes (gia x = 2 me ejwterikh MMU, 3, 4, kai 6) poy trexei se Amiga kai Atari mporei na bre8ei sto tsx-11.mit.edu ston katalogo 680x0. Polloi DEC Alpha yposthrizontai. Polloi SPARCs yposthrizontai twra pleon. Metafores exoyn hdh jekinhsei gia tis PowerPC, ARM, kai MIPS arxitektonikes. Polles leptomereies mporoun na bre8oun kai se alla keimena toy Linux Documentation Project.

Architecture:

ISA h EISA diaylos. O MCA diaylos (poy yparxei kyriws se ay8entikous PS/2) den yposthrizetai plhrws, alla h yposthrijh beltiwnetai synexeia (deite parapanw). Oi Local diayloi (VLB kai PCI) doyleuoyn. To Linux apaitei pio polla pragmata apo to yliko ap’ oti to DOS, ta Windows, kai ta pio polla alla leitoyrgika systhmata. Ayto shmainei oti merika kommatia ylikou, poy se alla leitoyrgika doyleuoyn se oriakh katastash, xwris wstoso na apotygxanoyn, mporei na paroysiasoyn problhma katw apo to Linux. To Linux einai, gia paradeigma, enas aristos elegkths mnhmhs...

RAM:

Mexri 1 GB se Intel platformes! Pio polu se 64-bit platformes. Merikoi (ki o idios o Linus) exoyn shmeiwsei oti h pros8hkh mnhmhs xwris thn pros8hkh analoghs cache ka8ysterei to susthma para polu, etsi an balete mnhmh kai parathrhsete oti to susthma sas einai pio argo, dokimaste na pros8esete pio polu cache. Merikes mhxanes mporoun na kratoun cache mono gia sygkekrimena mege8h mnhmhs anejarthta apo thn synolikh dia8esimh mnhmh poy einai egkatesthmenh sto susthma (64 MB einai to megisto mege8os mnhmhs poy mporei na krataei se cache ena dhmofiles chipset). Panw apo 64 MB kurias mnhmhs xreiazontai eidikh parametro kata thn ekkinhsh, afou to BIOS mporei na anaferei to polu mexri 64 MB, giati einai 'problhmatiko opws exei sxedias8ei'.

Data storage:

Yposthrizontai generic AT drives (EIDE, IDE, 16 bit HD controllers me MFM h RLL, h ESDI), opws kai SCSI sklhroi diskoi kai CD-ROMs, me enan SCSI adaptor, o opoios yposthrizetai. Epishs, yposthrizontai generic XT controllers (8 bit controllers me MFM h RLL). Yposthrizontai oi ejhs SCSI adaptors: Advansys, Adaptec 1542, 1522, 1740, 27xx, kai h seira 29xx (me merikes epektaseis), Buslogic MultiMaster controllers (h yposthrijh Flashpoint einai se beta-testing), controllers basismenoi sto NCR53c810, DPT controllers, Qlogic ISP kai FAS controllers, Seagate ST-01 kai ST-02, h seira Future Domain TMC-88x (h opoiodhpote board basismeno sto TMC950 chip) kai TMC1660/1680, Ultrastor 14F, 24F kai 34F, Western Digital wd7000, kai alloi. SCSI, QIC-02, kai merika QIC-80 tapes yposthrizontai epishs. Diaforoi CD-ROM odhgoi yposthrizontai, opws Matsushita/Panasonic, Mitsumi, Sony, Soundblaster, Toshiba, ATAPI (EIDE), SCSI, kai alloi. Gia akribh montela, deite to "Hardware Compatibility HOWTO".

Video:

H VGA, h EGA, h CGA, h Hercules (kai oi symbates) doyleuoyn se text mode. Gia grafika kai ta X, yparxei yposthrijh (toylaxiston) gia aples VGA, merikes super-VGA kartes (oi pio polles kartes poy basizontai sto ET3000, ET4000, Paradise, kai merika Trident chipsets), S3, S3-Virge, 8514/A, ATI, MACH8/32/64, Matrox Millenium & Mystique kai Hercules. (To Linux xrhsimopoiei ton Xfree86 X server, opote ayto kanonizei ti kartes yposthrizontai. Mia oloklhrwmenh lista apo yposthrizomena chipsets pianei apo monh ths panw apo mia selida.)

Networking:

H yposthrijh gia Ethernet kartes perilambanei tis 3COM 503/509/579/589 (oi 501/505/507 yposthrizontai alla den tis synistoume), AT&T GIS (NCR) WaveLAN, oi pio polles kartes poy basizontai sthn WD8390, oi pio polles kartes poy basizontai stis WD80x3 kartes, h NE1000/2000 ki oi pio polloi klwnoi toys, AC3200, Apricot 82596, AT1700, ATP, DE425/434/435/500, D-Link DE-600/620, DE-PCA, DE100/101, DE200/201/202 Turbo, DE210, DE422, Cabletron E2100 (den synistatai), Intel EtherExpress (den synistatai), DEC EtherWORKS 3, HP LAN, HP PCLAN/plus, oi pio polles kartes poy basizontai sthn AMD LANCE, NI5210, ni6510, SMC Ultra, DEC 21040 (tulip), Zenith Z-Note ethernet, oles oi Zircom kartes ki oles oi Cabletron kartes ektos apo thn E2100 den yposthrizontai, epeidh oi kataskeyastes toys den dexontai na dianemoyn eleu8era plhrofories gia ton programmatismo toys.

H trexoysa yposthrijh gia FDDI perilambanei tis DEFxx kartes apo thn DEC.

H yposthrijh gia Point-to-Point syndeseis perilambanei ta prwtokolla PPP, SLIP, CSLIP, kai PLIP.

Seiriakes 8ures:

Ta perissotera boards poy basizontai sto 16450 kai sto 16550 UART, symperilambanomenhs ths AST Fourport, ths Usenet Serial Card II, kai allwn. Ta intelligent boards poy yposthrizontai perilambanoyn thn seira Cyclades Cyclom (yposthrizontai apo ton kataskeyasth), thn seira Comtrol Rocketport (yposthrizontai apo ton kataskeyasth), Stallion (ta pio polla boards, yposthrizontai apo ton kataskeyasth), and Digi (merika boards, den yposthrizontai apo ton kataskeyasth). Merikes ISDN, frame relay, kai leased line kartes yposthrizontai.

Allo Yliko:

SoundBlaster, ProAudio Spectrum 16, Gravis Ultrasound, sxedon oles oi ypoloipes kartes hxoy, oi pio polles (oles;) oi morfes pontikiwn (Microsoft, Logitech, PS/2), ktl.

4 Mikros Katalogos Metaferomenwn Programmatwn & Alloy Logismikou

Ta pio polla apo ta koina ergaleia toy Unix exoyn metafer8ei sto Linux, symperilambanomenwn kai pollwn GNU programmatwn, kai polloi X pelates apo diafores phges. Bebaia, to "exoyn metafer8ei" einai sxetiko, giati polla programmata mporoun na xtistoun xwris kamia apolutws allagh, h me tetrimmenes, mikres tropopoihseis, afou to Linux akoloy8ei to POSIX protypo me arketa kalh akribeia. Dystyxws, den yparxoyn arketes efarmoges gia aplous xrhstes, alla ayto allazei synexws. Epikoinwnhste me ton promh8eyth ths agaphmenhs sas Unix efarmoghs kai rwthste an thn exoyn metaferei sto Linux.

Akoloy8ei enas mikros katalogos logismikou poy einai gnwsto pws trexei katw apo to Linux:

Basikes Unix Entoles:

ls, tr, sed, awk ki outw ka8ejhs (peite to, to Linux pi8anon na to exei).

Ergaleia Anaptyjhs Programmatwn:

gcc, gdb, make, bison, flex, perl, rcs, cvs, prof.

Glwsses & Periballonta:

C, C++, Objective C, Java, Modula-3, Modula-2, Oberon, Ada95, Pascal, Fortran, ML, scheme, Tcl/tk, Perl, Python, Common Lisp, kai polles alles.

Grafika Periballonta:

X11R5 (XFree86 2.x), X11R6 (XFree86 3.x), MGR.

Epejergastes Keimenoy:

GNU Emacs, XEmacs, MicroEmacs, jove, ez, epoch, elvis (GNU vi), vim, vile, joe, pico, jed, kai alloi.

Shells:

bash (POSIX sh-symbato), zsh (periexei katastash symbatothtas me to ksh), pdksh, tcsh, csh, rc, es, ash (kyriws sh-symbato shell poy to xrhsimopoiei to BSD sth 8esh toy /bin/sh), kai polla alla.

Epikoinwnies:

Taylor (BNU-symbath) UUCP, SLIP, CSLIP, PPP, kermit, szrz, minicom, pcomm, xcomm, term (trexei pollapla shells, anakatey8unei ton diktyako forto, kai epitrepei apomakrysmenh prosbash sta X, ola apo mia kai mono grammh modem), Seyon (dhmofiles programma epikoinwnias gia X-windows), diafora paketa gia fax kai voice-mail (xrhsimopoiwntas ta ZyXEL kai alla modems) yparxoyn. Profanws, apomakrysmenh prosbash me login panw apo seiriakes grammes yposthrizetai.

News kai mail:

C-news, innd, trn, nn, tin, smail, elm, mh, pine, ktl.

Epejergasia Keimenoy:

TeX, groff, doc, ez, LyX, Lout, Linuxdoc-SGML, kai alla.

Paixnidia:

Nethack, diafora Muds kai paixnidia gia X, kai polla alla. An caxnete gia kati sygkekrimeno, mporeite panta na cajete gia ta dia8esima paixnidia sto tsx-11 kai sto sunsite.

Oloklhrwmenes Luseis:

AUIS, to Andrew User Interface System. To programma ez einai meros aytou toy paketoy efarmogwn.

Ola ayta ta programmata (ki ayta den einai oute to ena ekatosto apo ola osa einai dia8esima) dianemontai dwrean. Emporika paketa exoyn arxisei kai diati8entai epishs! Rwthste ton promh8eyth toy agaphmenoy sas emporikou paketoy an yposthrizei to Linux.

5 Poios Xrhsimopoiei to Linux;

To Linux einai eleu8era dia8esimo, kai kaneis den xreiazetai na kanei kapoioy eidoys registration gia to antigrafo toys me kapoia kentrikh ejoysiodothmenh omada h atomo, etsi einai polu duskolo na ma8ei kaneis akribws posoi xrhsimopoioun to Linux. Yparxoyn arketes epixeirhseis twra poy epibiwnoyn apokleistika poylwntas kai yposthrizontas to Linux kai einai sxetika mikros o ari8mos twn xrhstwn poy xrhsimopoioun aytes tis epixeirhseis, kai ta newsgroups toy Linux einai apo ta pio baria fortwmena se oloklhro to Internet, ara o ari8mos twn xrhstwn toy Linux einai ths tajews twn ekatontadwn xiliadwn, alla einai mallon adunato na ma8oyme pragmatika akribh noumera. Parol' ayta, mia gennaia cyxh, o Harald T. Alvestrand, apofasise na dokimasei, kai zhtaei an xrhsimopoieite to Linux, na steilete ena mhnyma sthn dieu8ynsh linux-counter@uninett.no me ena apo ta parakatw subjects: “I use Linux at home”, “I use Linux at work”, or “I use Linux at home and at work”. Metraei, epishs, akoma kai tis chfoys tupoy “I don't use Linux”, gia kapoio logo. Stelnei tis metrhseis toy sto comp.os.linux.misc.

6 Pws na Parete to Linux

6.1 Anwnymo FTP

O Matt Welsh exei anakoinwsei ton kainourio toy ‘Installation and Getting Started’ odhgo, ekdosh 2.2.2. Epishs, to Linux Documentation Project (to LDP) exei jekinhsei diafora biblia poy briskontai se diaforetiko stadio oloklhrwshs, ta opoia (biblia) yparxoyn sto SunSite, ston katalogo `/pub/Linux/docs/LDP/`. Krathste epafh mesw toy comp.os.linux.announce. H selida toy Linux Documentation Project yparxei sto `$<$http://sunsite.unc.edu/LDP$>$`.

Toylaxiston ta parakatw sites kratoun antigrafa toy Linux.

```
Textual name                   Numeric address  Linux directory
=============================  ===============  ===============
tsx-11.mit.edu                 18.172.1.2       /pub/linux
sunsite.unc.edu                152.2.22.81      /pub/Linux
ftp.funet.fi                   128.214.248.6    /pub/OS/Linux
net.tamu.edu                   128.194.177.1    /pub/linux
ftp.mcc.ac.uk                  130.88.203.12    /pub/linux
src.doc.ic.ac.uk               146.169.2.1      /packages/linux
fgb1.fgb.mw.tu-muenchen.de     129.187.200.1    /pub/linux
ftp.informatik.tu-muenchen.de  131.159.0.110    /pub/comp/os/linux
ftp.dfv.rwth-aachen.de         137.226.4.111    /pub/linux
ftp.informatik.rwth-aachen.de  137.226.225.3    /pub/Linux
ftp.Germany.EU.net             192.76.144.75    /pub/os/Linux
```

ftp.ibp.fr	132.227.60.2	/pub/linux
ftp.uu.net	137.39.1.9	/systems/unix/linux
wuarchive.wustl.edu	128.252.135.4	mirrors/linux
ftp.win.tue.nl	131.155.70.100	/pub/linux
ftp.stack.urc.tue.nl	131.155.2.71	/pub/linux
srawgw.sra.co.jp	133.137.4.3	/pub/os/linux
cair.kaist.ac.kr		/pub/Linux
ftp.denet.dk	129.142.6.74	/pub/OS/linux
NCTUCCCA.edu.tw	140.111.1.10	/Operating-Systems/Linux
nic.switch.ch	130.59.1.40	/mirror/linux
cnuce_arch.cnr.it	131.114.1.10	/pub/Linux
ftp.monash.edu.au	130.194.11.8	/pub/linux
ftp.dstc.edu.au	130.102.181.31	/pub/linux
ftp.sydutech.usyd.edu.au	129.78.192.2	/pub/linux

To tsx-11.mit.edu kai to fgb1.fgb.mw.tu-muenchen.de einai ta epishma sites gia ton Linux-GCC (GNU C Compiler gia to Linux). Merika sites kratoun mirror apo alla sites. Parakaloume na xrhsimopoieite to site poy einai pio konta (se epipedo diktuoy) se esas opote ayto einai dynaton.

Toylaxiston to sunsite.unc.edu kai to ftp.informatik.tu-muenchen.de prosferoyn yphresies ftpmail. Steilte mhnyma sthn dieu8ynsh `ftpmail@sunsite.unc.edu` h sthn `ftp@informatik.tu-muenchen.de` gia boh8eia.

An niw8ete oti exete xa8ei, dokimaste na koitajete sto `sunsite.unc.edu:/pub/Linux/distributions/`, opoy diafores dianomes prosferontai dwrean. Oi dianomes poy protimountai polu teleytaia einai oi: Red Hat Linux, Debian, kai Slackware.

6.2 CDROM

Oi pio polloi twra egka8istoun to Linux apo CDROM's. Oi dianomes exoyn megalwsei se arketes ekatontades MBs apo Linux software, kai to "katebasma" olwn aytwn apo ena 28.8 modem pairnei polu wra.

Yparxoyn basika duo tropoi na parei kaneis to Linux se CDROM: san meros enos archive kapoioy FTP site, h apo ton kataskeyasth ths sygkekrimenhs dianomhs. An parete kapoio archive, sxedon panta 8a exete thn eykairia na dialejete anamesa se arketes dianomes, alla syxna den yparxei yposthrijh. An parete thn dianomh katey8eian apo ton kataskeyasth, pairnete synh8ws mono mia dianomh, alla tis pio polles fores exete kai yposthrijh kapoioy eidoys (tis pio polles fores yposthrijh gia thn diadikasia ths egkatastashs).

6.3 Alloi Tropoi na Parete to Linux

Yparxoyn polles BBS's poy exoyn arxeia gia Linux. Mia lista me aytes stelnetai syxna sto comp.os.linux.announce. Rwthste filoys kai omades xrhstwn (user groups), h paraggeilete kapoia apo tis emporikes dianomes. Mia lista me tis emporikes dianomes yparxei sto "Linux distribution HOWTO", dia8esimo apo to SunSite ston katalogo `sunsite.unc.edu:/pub/Linux/docs/HOWTO/distribution-HOWTO`. H lista ayth stelnetai kai sto newsgroup comp.os.linux.announce arketa syxna.

7 3ekinwntas

Opws anafer8hke kai sthn arxh, to Linux den exei kentrikh diaxeirish. Akribws gi' ayto, den yparxei "epishmh" ekdosh poy kapoios 8a mporouse na deijei kai na pei "Ayto einai to Linux." Anti8eta, yparxoyn diafores "dianomes," poy einai ligo polu oloklhrwmenes sylloges apo logismiko sthmeno kai paketarismeno etsi wste na mporei na ftiaxtei ena Linux susthma.

To prwto pragma poy prepei na kanete einai na parete kai na diabasete thn lista me tis pio syxnes erwthseis (FAQ) apo ena FTP site, h apo ta synh8ismena arxeia me ta USENET FAQ (e.g. rtfm.mit.edu). Ayto to keimeno exei polles odhgies poy sas boh8oun na jekinhsete, ti arxeia xreiazontai, kai pws na lusete ta pio polla apo ta koina problhmata (kata thn diarkeia ths egkatastashs h argotera).

8 Nomikh Katastash toy Linux

Parolo poy to Linux dinetai plhres se morfh phgaioy kwdika, einai copyrighted logismiko, ki oxi public domain. Einai, omws, eleu8era dia8esimo ypo toys oroys ths GNU General Public License, poy merikes fores apokaleitai kai “copyleft”. Diabaste thn GPL gia perissoteres plhrofories. Ta programmata poy trexoyn katw apo to Linux exoyn thn dikh toy adeia xrhshs, parolo poy polla apo ayta dianemontai ki ayta me thn GPL, opws kai to idio to Linux. Ta X xrhsimopoioun thn adeia toy MIT gia ta X, kai merika apo ta programmata dianemontai me toys oroys toy BSD copyright. Se opoiadhpote periptwsh, pantws, olo to logismiko sto FTP site einai eleu8era dia8esimo (alliws den 8a prepe an einai ekei).

9 Nea gia to Linux

Ena mhniaio periodiko, poy legetai “Linux Journal”, exei jekinhsei panw apo dyo xronia twra. Periexei ar8ra, ta opoia apey8unontai se ola ta epipeda gnwshs, kai exei skopo na einai boh8hma gia oloys toys xrhstes toy Linux. H syndromh gia ena etos einai $22 sths HPA, $27 ston Kanada kai to Mejiko, kai $32 opoydhpote allou, panta se nomismata twn HPA. Aithseis syndromhs mporoun na staloun mesw hlektronikou taxydromeioy sthn dieu8ynsh `subs@ssc.com`, h mesw fax sto thlefwno +1-206-782-7191, h mesw aplou thlefwnhmatos sto +1-206-782-7733, h mesw aplou taxydromeioy sthn dieu8ynsh: Linux Journal, PO Box 85867, Seattle, WA 98145-1867 USA. H etaireia SSC, poy ekdidei thn Linux Journal, dia8etei ena dhmosio PGP kleidi gia na kwdikopoihsete to hlektroniko gramma sas gia na prostateusete ton ari8mo ths pistwtikhs sas kartas; apla kante “finger info@ssc.com” gia na parete to kleidi.

Yparxoyn polla USENET newsgroups gia syzhthseis poy aforoun to Linux, kai polles listes hlektronikou taxydromeioy. Deite to ‘Linux FAQ’ h to ‘Hellenic Linux FAQ’ gia perissoteres plhrofories gia tis hlektronikes listes.

To newsgroup `comp.os.linux.announce` einai ena moderated newsgroup gia anakoinwseis sxetika me to Linux (nea programmata, bug fixes, etc).

To newsgroup `comp.os.linux.answers` einai ena moderated newsgroup sto opoio to Linux FAQ, ta HOWTO keimena, kai alla boh8htika keimena stelnontai.

To newsgroup `comp.os.linux.admin` einai ena aplo newsgroup gia syzhthseis poy aforoun thn diaxeirish enos Linux systhmatos.

To newsgroup `comp.os.linux.development.system` einai ena aplo newsgroup eidika gia syzhthseis poy aforoun thn anaptyjh toy Linux kernel. Oi mones erwthseis gia efarmoges poy mporoun an ginoyn edw einai gia efarmoges poy exoyn amesh sxesh me to idio to kernel. Oles oi alles erwthseis einai, pi8anon, sxetikes me anaptyjh Unix efarmogwn kai armozoyn pio polu se ena newsgroup ths comp.unix.* ierarxias, ektos ki an exoyn sxesh me anaptyjh efarmogwn poy trexoyn apokleistika katw apo Linux, opote einai pio swsto na katey8unontai sto `comp.os.linux.development.apps`.

To newsgroup `comp.os.linux.development.apps` einai ena aplo newsgroup eidika gia syzhthseis poy aforoun thn anaptyjh efarmogwn katw apo Linux. Den einai to katallhlo meros gia na rwthsete poy 8a parete efarmoges gia Linux, oute ena meros gia ekeinoys poy 8eloyn na doyn kapoies efarmoges na trexoyn katw apo to Linux.

To newsgroup `comp.os.linux.hardware` einai gia erwthseis poy exoyn sxesh me thn xrhsh toy ylikou (hardware) katw apo Linux.

To newsgroup `comp.os.linux.networking` einai gia erwthseis poy exoyn sxesh me thn anaptyjh programmatwn poy xrhsimopoioun tis diktyakes yphresies toy Linux, kai oti allo exei sxesh me thn diktyakh yposthrijh toy Linux.

To newsgroup `comp.os.linux.x` einai gia erwthseis sxetikes me to Linux kai ta X Windows.

To newsgroup `comp.os.linux.misc` einai ayto poy antikatesthse to comp.os.linux, kai exei ws skopo thn syzhthsh 8ematwn poy den empiptoyn se kapoio allo newsgroup.

Genika, mhn stelnete to idio mhnyma se polla newsgroups toy Linux (crossposting). H monh periptwsh poy ayto einai apodekto einai otan stelnete kati se kapoio aplo Linux newsgroup (oxi moderated) kai taytoxrona to stelnete kai sto `comp.os.linux.announce`. H genikh idea ths diaspashs toy comp.os.linux se polla newsgroups einai na moiras8ei o fortos se polla newsgroups. Osoi den akoloy8oun ton parapanw kanona 8a exoyn thn xara na paroyn arketa eygenikotata kai dwrean flames.

To Linux exei thn selida toy sto Web sthn dieu8ynsh `$<$http://sunsite.unc.edu/LDP$>$` .

10 To Mellon

Afotoy to Linux 1.0 anakoinw8hke, h doyleia exei proxwrhsei pros8etontas diafora xarakthristika. To Linux 1.2 perieixe beltiwseis sth taxuthta prospelashs twn diskwn, beltiwseis twn termatikwn, beltiwseis ths eikonikhs mnhmhs (virtual memory), yposthrijh gia polles platformes, quotas, kai alla polla. To Linux 2.0, h trexoysa sta8erh ekdosh, exei akoma pio polles beltiwseis, eidika sto 8ema ths apodoshs, arketa kainouria prwtokolla diktuwn, mia apo tis taxuteres ylopoihseis toy TCP/IP poy yparxoyn, kai polla, polla alla. Akomh pio kalh apodosh, pio polla diktyaka prwtokolla kai polloi odhgoi syskeywn 8a einai dia8esimoi me to Linux 2.2.

Akomh kai me perissoteres apo 3/4 toy ekatommyrioy grammes kwdika sto kernel, yparxei akomh polus kwdikas poy apomenei na graftei, kai polla boh8htika keimena. Parakaloume ginete melos ths hlektronikhs listas linux-doc@vger.rutgers.edu an 8elete na prosferete sto gracimo boh8htikwn keimenwn. Steilte ena hlektroniko gramma ston majordomo@vger.rutgers.edu me mia mono grammh, poy 8a periexei thn lejh “help” sto kyriws swma toy mhnumatos (oxi to Subject).

11 Ayto to Keimeno

Ayto to keimeno enhmerwnetai apo ton Gewrgio E. Keramida, `$<$keramida@ceid.upatras.gr$>$`. Einai amesh metafrash toy agglikou Linux Info Sheet, to opoio diathrei enhmerwmeno o Michael K. Johnson, `$<$johnsonm@redhat.com$>$`. Parakalw steilte moy hlektronika grammata me opoiadhpote sxolia sas, akomh kai ta pio mikra. Den mporw na kanw kalh doyleia enhmerwnontas ayto to keimeno, xwris thn dikh sas boh8eia. Ena ligo-polu prosfato antigrafo aytou toy keimenoy yparxei sto `$<$http://sunsite.unc.edu/LDP/translations/Hellenic$>$`.

12 Nomika & Alla

Ta trademarks, poy periexontai se ayto to keimeno, anhkoyn se aytous poy ta exoyn katoxyrwsei. Den parexetai kamia egguhsh gia tis plhrofories aytou toy keimenoy. Xrhsimopoihste kai dianeimete to me dikh sas ey8unh. To periexomeno toy keimenoy einai public domain, alla sas parakalw na eiste eygenikoi kai na kanete tis katallhles anafores otan to xrhsimopoieite.