– NetBSD/Soc –

Google’s Summer of Code within NetBSD

Jan Schaumann

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136D 027F DC29 8402 7B42 47D6 7C5B 64AF AF22 6A4C

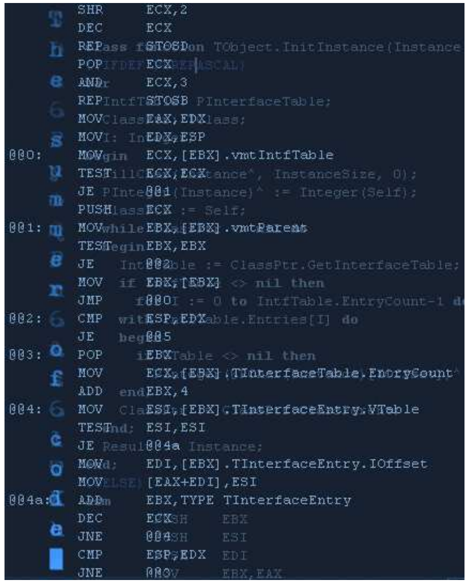
Summer of Code, eh?

Want to write open
source this summer?
Want to make money?
Want to do both?

[illegible]

Google

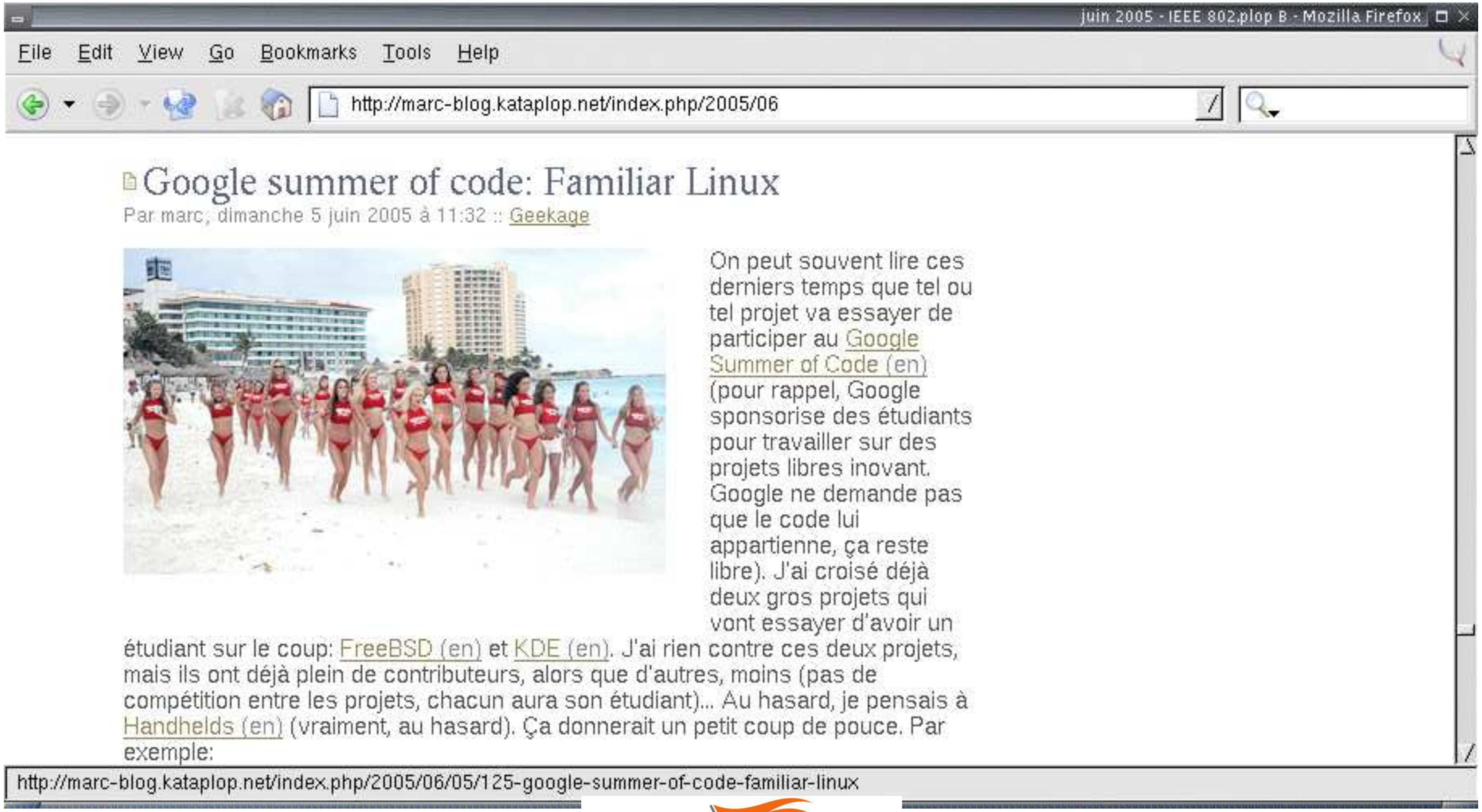
+



```
        SHR     ECX,2
        DEC     ECX
        REP     STOSD
        POP     ECX
        AND     ECX,3
        REP     STOSB
        MOV     EAX,EDX
        MOV     EDX,ESP
@@0:    MOV     ECX,[EBX].vmtIntfTable
        TEST    ECX,ECX
        JE      @@1
        PUSH    ECX
@@1:    MOV     EBX,[EBX].vmtParent
        TEST    EBX,EBX
        JE      @@2
        MOV     EBX,[EBX]
        JMP     @@0
@@2:    CMP     ESP,EDX
        JE      @@5
@@3:    POP     EBX
        MOV     ECX,[EBX].TInterfaceTable.EntryCount
        ADD     EBX,4
@@4:    MOV     ESI,[EBX].TInterfaceEntry.VTable
        TEST    ESI,ESI
        JE      @@4a
        MOV     EDI,[EBX].TInterfaceEntry.IOffset
        MOV     [EAX+EDI],ESI
@@4a:   ADD     EBX,TYPE TInterfaceEntry
        DEC     ECX
        JNE     @@4
        CMP     ESP,EDX
        JNE     @@3
```

Summer of Code, eh?

Summer of Code?



http://marc-blog.kataplop.net/index.php/2005/06

Google summer of code: Familiar Linux

Par marc, dimanche 5 juin 2005 à 11:32 :: Geekage

On peut souvent lire ces derniers temps que tel ou tel projet va essayer de participer au Google Summer of Code (en) (pour rappel, Google sponsorise des étudiants pour travailler sur des projets libres inovant. Google ne demande pas que le code lui appartienne, ça reste libre). J'ai croisé déjà deux gros projets qui vont essayer d'avoir un étudiant sur le coup: FreeBSD (en) et KDE (en). J'ai rien contre ces deux projets, mais ils ont déjà plein de contributeurs, alors que d'autres, moins (pas de compétition entre les projets, chacun aura son étudiant)... Au hasard, je pensais à Handhelds (en) (vraiment, au hasard). Ça donnerait un petit coup de pouce. Par exemple:

http://marc-blog.kataplop.net/index.php/2005/06/05/125-google-summer-of-code-familiar-linux

Summer of Code Dates

- **May 31st**: Start of application process on `http://code.google.com`
- **June 1st**: Last Day new Organizations will be listed on `http://code.google.com`
- **Interim Period**: Back and Forth with applicants on the Summer-Discuss Google Group
- **June 14th**: Final application submission deadline.
- **June 24th**: All applications approved or rejected. Cut $500 checks for initial funding.
- **Interim Period**: Give the students a helping hand and guidance.
- **August 3rd**: Google gives a preliminary progress report at OSCON
- **September 1st**: Deadline for all student work (pencils down).
- **September 30th**: All adviser feedback in.
- **October 1st**: Announce successful participants. Cut final checks send t-shirts.

Suggested Projects

- NetBSD Ports
- NetBSD Userland
- NetBSD Kernel
- Filesystems
- Networking
- pkgsrc
- Miscellaneous

Suggested Projects: Ports & Userland

- NetBSD Ports
    - Port NetBSD to SGI Octane and Origin machines
    - Support for MMU-less systems
    - Zaurus
    - IA64
- NetBSD Userland
    - WiFi browser
    - BSD licensed privacy guard
    - Wide Character Support in curses
    - BSD licensed rsync replacement
    - Dynamic NSS modules

Suggested Projects: Ports & Userland

- NetBSD Ports
  - Port NetBSD to SGI Octane and Origin machines
  - Support for MMU-less systems
  - Zaurus
  - IA64 *(WIP using the HP Ski simputer (see references))*
- NetBSD Userland
  - WiFi browser
  - BSD licensed privacy guard
  - Wide Character Support in curses
  - BSD licensed rsync replacement
  - Dynamic NSS modules

Suggested Projects: Kernel

- NetBSD Kernel
  - Improve FFS
  - Improve Caching
  - Improve writing to FS
  - NetBSD block device driver for NAND flash chips
  - Flash translation layer
  - Compressed Cache System
  - Debug softdep on slow machines
  - Real time support
  - Bluetooth support

Suggested Projects: Filesystems

- Filesystems
  - BSD tool to create ISO filesystems
  - BSD licensed XFS
  - BSD licensed JFS
  - BSD licensed HFS+
  - Journaling for UFS
  - ACLs
  - Efficient Memory Filesystem
  - resize_ffs

Suggested Projects: Networking & pkgsrc

- Networking
  - Teredo: Tunneling IPv6 over UDP through NATs
  - Kismet
  - NDIS network driver
  - Policy routing
  - Cleanup routing code
  - Implement IPv6 ipflow_fastforward
  - zeroconf
- pkgsrc
  - Unprivileged pkgsrc builds
  - Parallel bulk builds

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  - Implement IPv6 ipflow_fastforward
  - zeroconf
- pkgsrc
  - Unprivileged pkgsrc builds
  - Parallel bulk builds *(WIP called "bobac"; ask jlam@NetBSD.org)*

Suggested Projects: Miscellaneous

- Miscellaneous
  - syspkgs
  - valgrind
  - NetBSD LiveCD with installer
  - CD Bootloader
  - Automate regression framework

Suggested Projects: Miscellaneous

- Miscellaneous
  - syspkgs
  - valgrind
  - NetBSD LiveCD with installer
  - CD Bootloader *(WIP* `makefs -t cd9660` *in-tree)*
  - Automate regression framework

Summer of Code => Endless Summer?

... I wish.

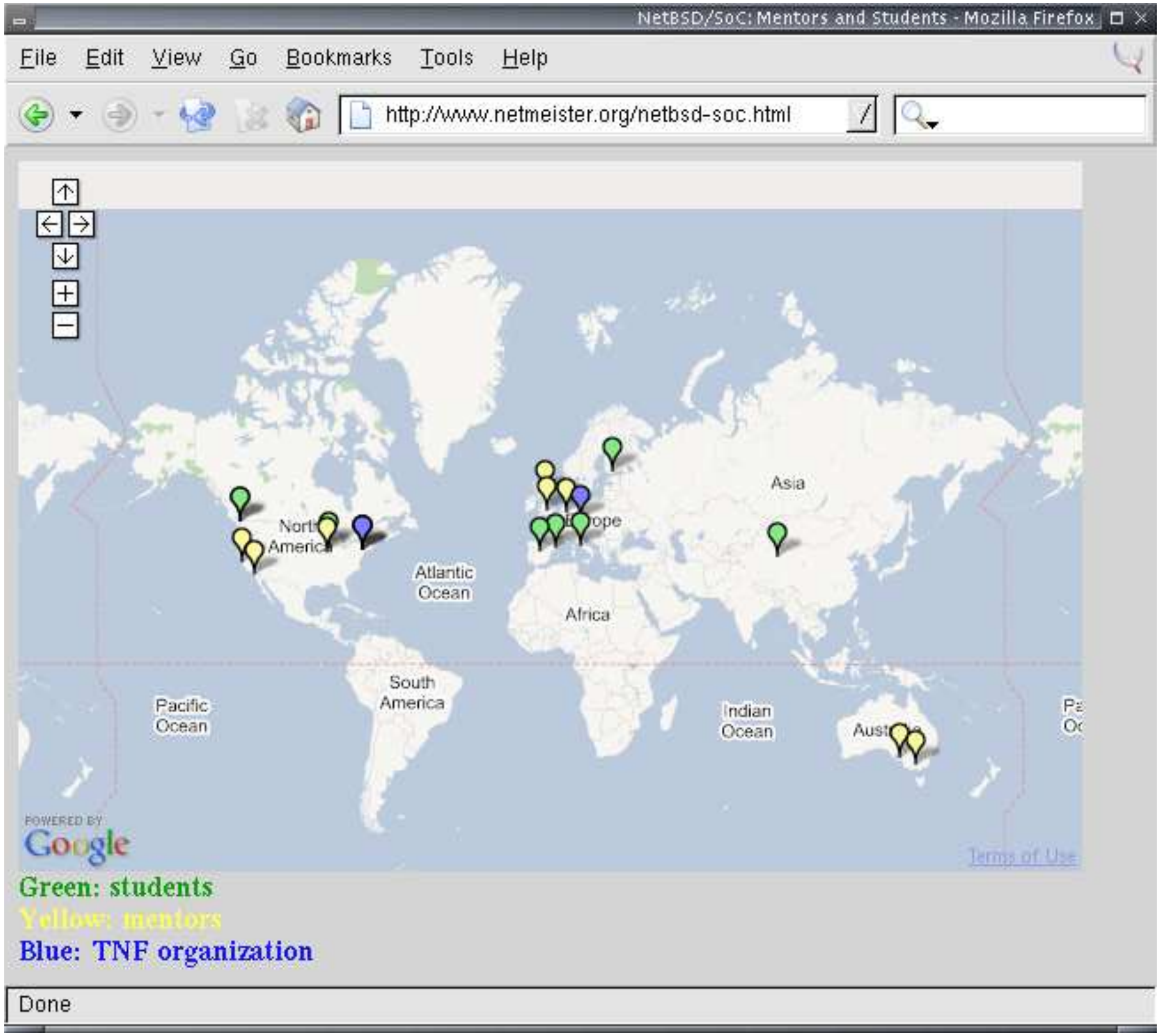
Selection Process

- small team weeds out obvious rejectees
- list of remaining applications presented to developer body
- list ranked based on developer feedback
- mentors solicited from developer body
- list sorted based on developer interest + mentor availability
- developers vote for their favorite projects
- ranked list returned to Google
- Google decides the total number of awarded projects, picks top ranked applications

Accepted Projects

Out of 96 applications in total, the following projects were chosen:

- bpg: BSD licensed privacy guard (pgp)
- hfs: HFS+
- ndis: NDIS network driver
- tmpfs: Efficient memory file-system
- userfs: Userspace file system hooks
- wcurses: Wide Character Support for Curses
- zeroconf: Zeroconfd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Done

Green: students

Yellow: mentors

Blue: TNF organization

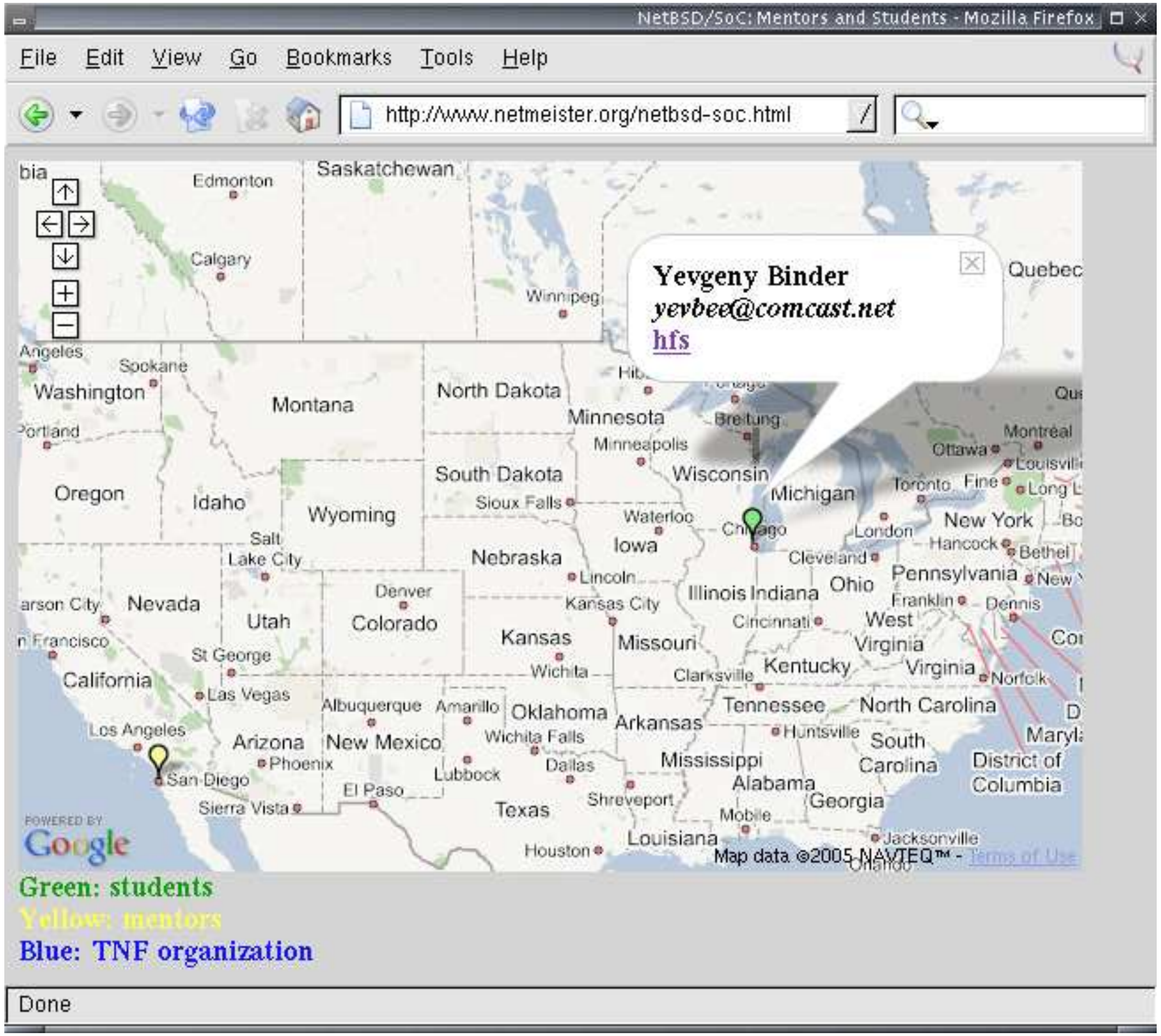
hfs: HFS+

Why?

- no HFS+ support currently available
- good amount of work for summer project

Who?

- Mentoring NetBSD developer: **Bill Studenmund** <`wrstuden@NetBSD.org`>
- Developing student: **Yevgeny Binder** <`yevbee@comcast.net`>



NetBSD/SoC: Mentors and Students - Mozilla Firefox

http://www.netmeister.org/netbsd-soc.html

Yevgeny Binder
yevbee@comcast.net
hfs

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Green: students
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Done

hfs: Results

- deliverables adjusted earlier on as the project was found slightly too ambitious
- student did not have much of a NetBSD background, so some time was spent on getting into NetBSD
- basic HFS+ filesystem completed in time
- import into NetBSD source tree: not ready yet

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Success.

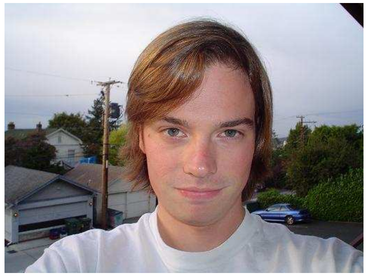
ndis: NDIS network driver

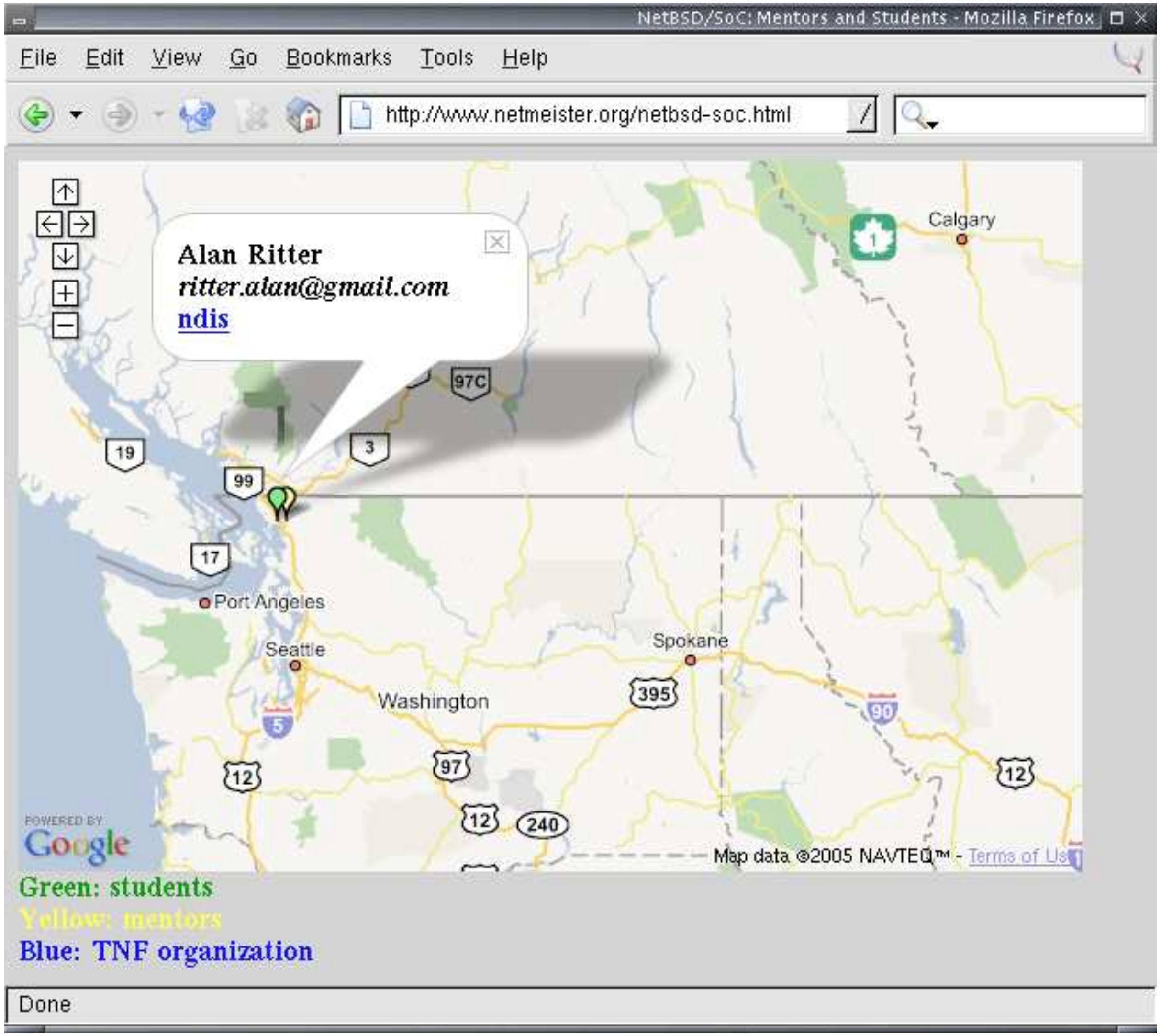
Why?

- driver available for FreeBSD
- allow Windows driver to run on NetBSD
- previous experience
- previous collaboration with mentor

Who?

- Mentoring NetBSD developer: **Phil Nelson** <`phil@NetBSD.org`>
- Developing student: **Alan Ritter** <`rittera@cc.wwu.edu`>

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ritter.alan@gmail.com
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Green: students
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Done

ndis: NDIS network driver

Deliverables:

- produce a driver working well enough to use at least a standard wired Ethernet card on PCI bus

Long Term Goals:

- get a working driver for one or more PCMCIA cards
- test and fix bugs on a multiprocessor system
- test and make sure it works on 64 bit systems
- merge with latest code from FreeBSD
- run as LKM

ndis: Results

- Intel EtherExpress Pro/100: works
- Broadcom wireless card: works
- mentor satisfied => we’re satisfied
- student continues work after official end of SoC
- mentor will review code before feature freeze for NetBSD 4.0

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Success.

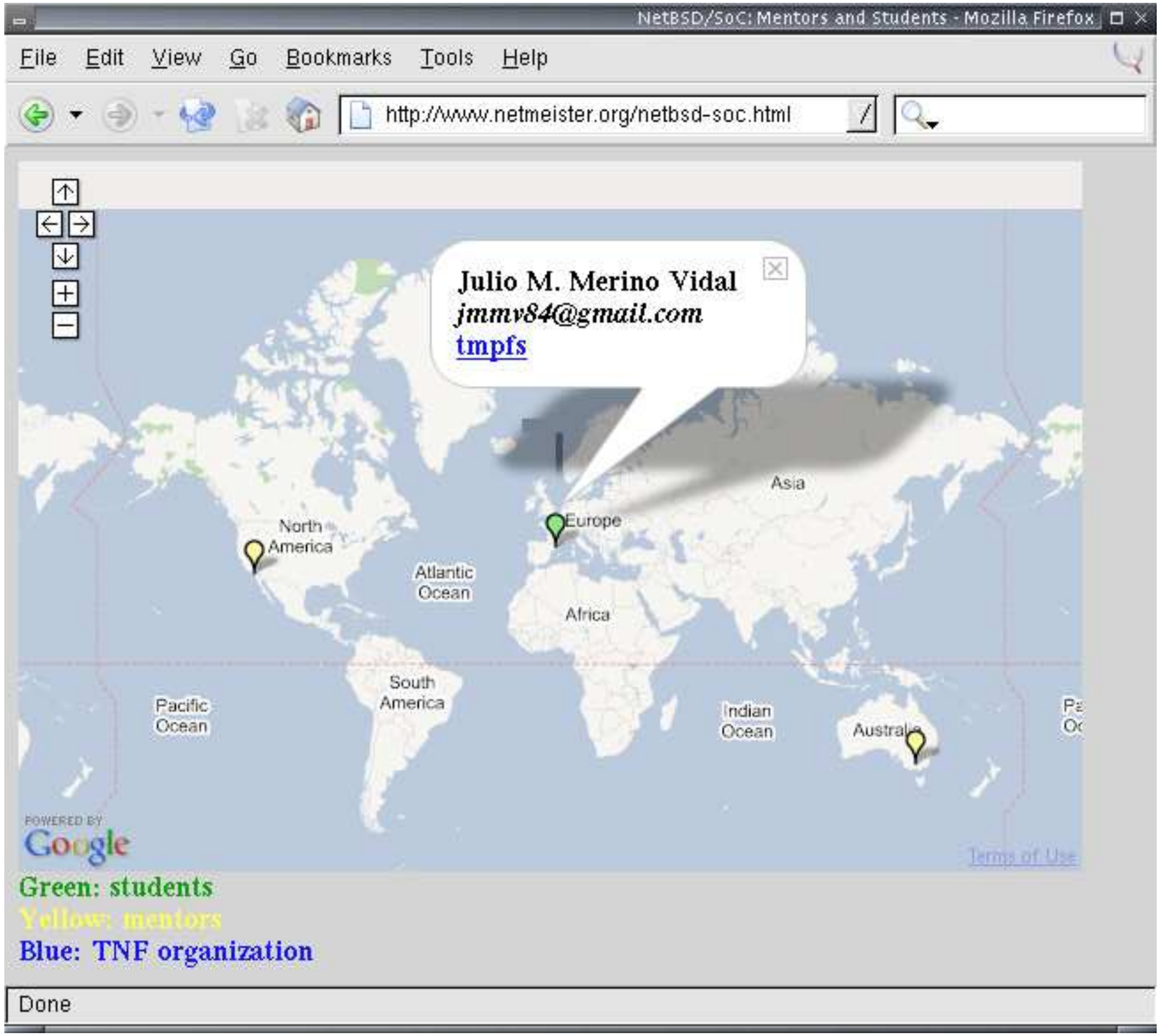
tmpfs: Efficient memory file-system

Why?

- `mfs(8)` is regular ffs on top of memory
- no specifically designed filesystem for temporary use available

Who?

- Mentoring NetBSD developer: **Luke Mewburn** <`lukem@NetBSD.org`>
- Mentoring NetBSD developer: **Bill Studenmund** <`wrstuden@NetBSD.org`>
- Developing student: **Julio M. Merino Vidal** <`jmmv84@gmail.com`>



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Julio M. Merino Vidal
jmmv84@gmail.com
tmpfs

Green: students
Yellow: mentors
Blue: TNF organization

tmpfs: Goals

- an implementation of an efficient memory file-system
- in-depth documentation about tmpfs in detail, describing its data structures, algorithms used and the rationales that lead to the decisions taken.
- a "file-system how-to" document explaining how to write a file-system driver for NetBSD from scratch.

tmpfs: Summary

- all goals met
- rated “top-notch”
- `tmpfs(8)` already imported into NetBSD-current
- comparisons with `mfs(8)` have shown `tmpfs(8)` to be
  - more memory-efficient
  - more accurate in reporting memory usage
  - faster
- student learned enough about filesystems to already have found and fixed some serious bugs in our NFS code
- expect an article on `tmpfs(8)` on OnLamp

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Success!

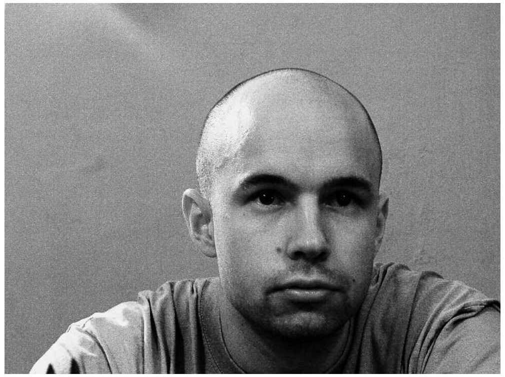
userfs: Userspace file system hooks

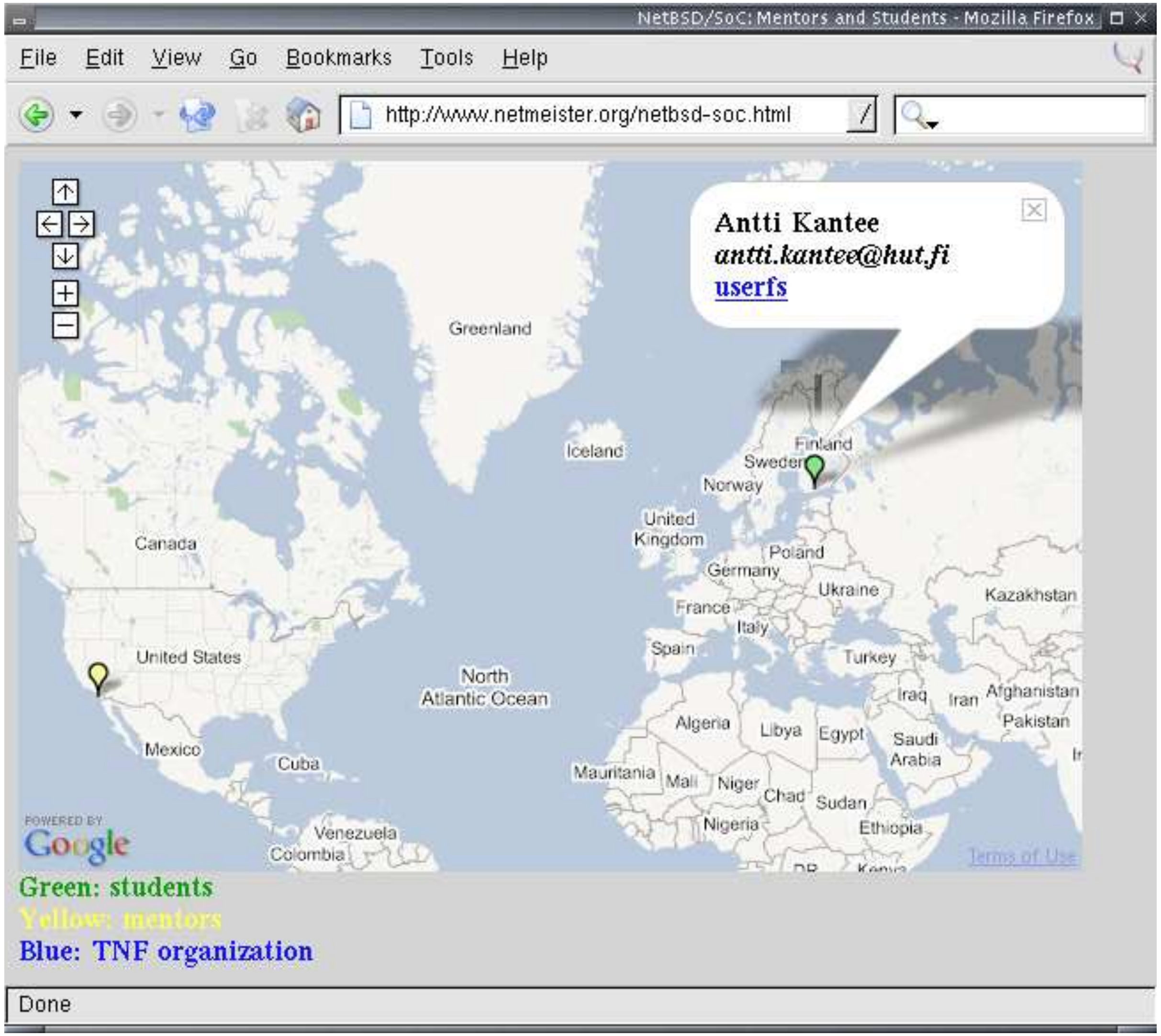
What?

- make it possible to write a file system in userspace so that an application will see no difference to the pure in-kernel file system.

Who?

- Mentoring NetBSD developer: **Bill Studenmund** <`wrstuden@NetBSD.org`>
- Developing student: **Antti Kantee** <`antti.kantee@hut.fi`>





Antti Kantee
antti.kantee@hut.fi
userfs

Green: students
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userfs: Userspace file system hooks

- most ambitious project
- consists of three parts
  - a kernel file system shim
  - a communications protocol
  - a userland API for the file system to use
- also provide a trivial userland file system to demonstrate functionality

userfs: Userspace file system hooks

Flow-control of the "Pass-to-Userspace F-F-f-f-fileSystem":

1. application
2. kernel (syscall, vfs ...)
3. kernel puffs
4. userspace puffs
5. fs implementation (userspace)
6. userspace puffs
7. kernel puffs
8. application

userfs: Results

- still bare-bones
- simple filesystem with some hardcoded files (which are modifyable) written
- "The framework coughs but manages to avoid complete and utter defeat."
- code not yet imported
- all SoC goals met

userfs: Results

- still bare-bones
- simple filesystem with some hardcoded files (which are modifyable) written
- “The framework coughs but manages to avoid complete and utter defeat.”
- code not yet imported
- all SoC goals met

Success.

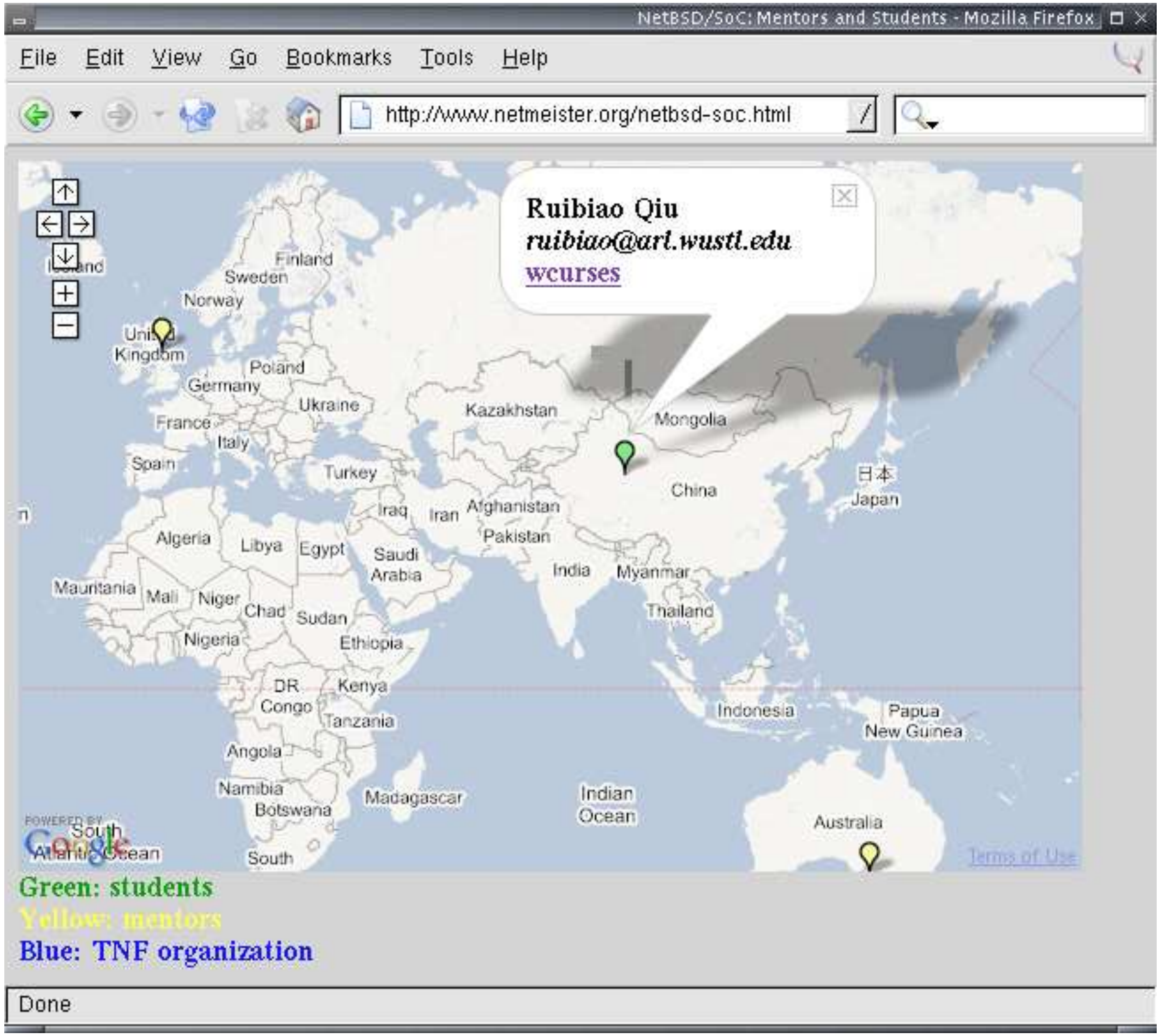
wcurses: Wide Character Support for Curses

Why?

- wide characters not supported in NetBSD's curses
- limited support for internationalized character sets

Who?

- Mentoring NetBSD developer: **Julian Coleman** <`jdc@NetBSD.org`>
- Mentoring NetBSD developer: **Brett Lymn** <`blymn@NetBSD.org`>
- Developing student: **Ruibiao Qiu** <`ruibiao@arl.wustl.edu`>



Ruibiao Qiu
ruibiao@arl.wustl.edu
wcurses

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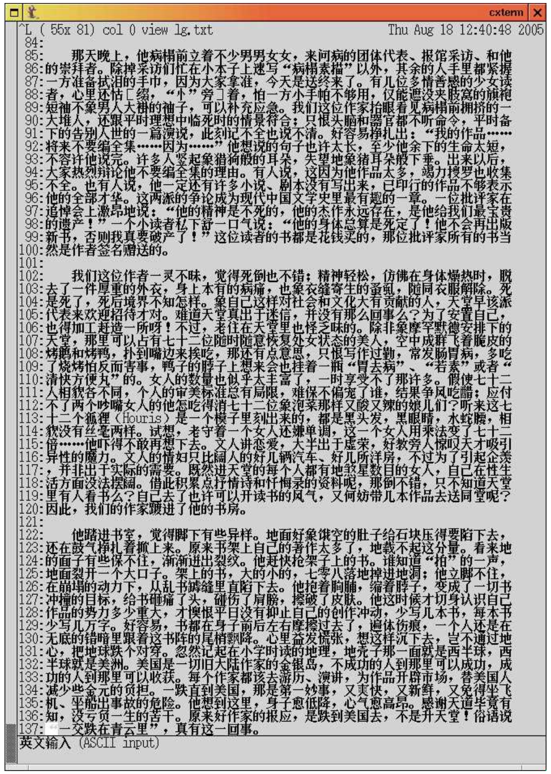
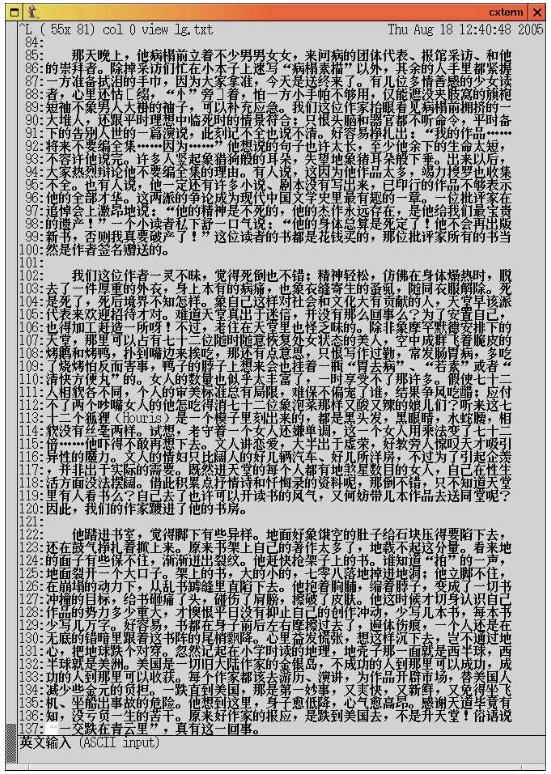
wcurses: Results



```
^L ( 55x 81) col 0 view lg.txt                    Thu Aug 18 12:40:48 2005
 84:
 85:    那天晚上，他病榻前立着不少男男女女，来问病的团体代表、报馆采访、和他
 86:的崇拜者。除掉采访们忙在小本子上速写“病榻素描”以外，其余的人手里都紧握
 87:一方准备拭泪的手巾，因为大家拿准，今天是送终来了。有几位多情善感的少女读
 88:者，心里还怙[缀，“忄”旁]着，怕一方小手帕不够用，仅能遮没夹肢窝的旗袍
 89:短袖不象男人大褂的袖子，可以补充应急。我们这位作家抬眼看见病榻前拥挤的一
 90:大堆人，还跟平时理想中临死时的情景符合；只恨头脑和器官都不听命令，平时备
 91:下的告别人世的一篇演说，此刻记不全也说不清。好容易挣扎出：“我的作品……
 92:将来不要编全集……因为……”他想说的句子也许太长，至少他余下的生命太短，
 93:不容许他说完。许多人竖起象猎狗般的耳朵，失望地象猪耳朵般下垂。出来以后，
 94:大家热烈辩论他不要编全集的理由。有人说，这因为他作品太多，竭力搜罗也收集
 95:不全。也有人说，他一定还有许多小说、剧本没有写出来，已印行的作品不够表示
 96:他的全部才华。这两派的争论成为现代中国文学史里最有趣的一章。一位批评家在
 97:追悼会上激昂地说：“他的精神是不死的，他的杰作永远存在，是他给我们最宝贵
 98:的遗产！”一个小读者私下舒一口气说：“他的身体总算是死定了！他不会再出版
 99:新书，否则我真要破产了！”这位读者的书都是花钱买的，那位批评家所有的书当
100:然是作者签名赠送的。
101:
102:    我们这位作者一灵不昧，觉得死倒也不错；精神轻松，仿佛在身体爆热时，脱
103:去了一件厚重的外衣，身上本有的病痛，也象衣缝寄生的蚤虱，随同衣服解除。死
104:是死了，死后境界不知怎样。象自己这样对社会和文化大有贡献的人，天堂早该派
105:代表来欢迎招待才对。难道天堂真出于迷信，并没有那么回事么？为了安置自己，
106:也得加工赶造一所呀！不过，老住在天堂里也怪乏味的。除非象摩罕默德安排下的
107:天堂，那里可以占有七十二位随时随意恢复处女状态的美人，空中成群飞着脆皮的
108:烤鹅和烤鸭，扑到嘴边来挨吃，那还有点意思，只恨写作过勤，常发肠胃病，多吃
109:了烧烤怕反而害事，鸭子的脖子上想来会也挂着一瓶“胃去病”、“若素”或者“
110:清快方便丸”的。女人的数量也似乎太丰富了，一时享受不了那许多。假使七十二
111:人相貌各不同，个人的审美标准总有局限，难保不偏宠了谁，结果争风吃醋；应付
112:不了两个吵嘴女人的他怎吃得消七十二位象泡菜那样又酸又辣的娘儿们？听来这七
113:十二个狐狸（Houris）是一个模子里刻出来的，都是黑头发，黑眼睛，水蛇腰，相
114:貌没有丝毫两样。试想，老守着一个女人还嫌单调，这一个女人用乘法变了七十二
115:倍……他吓得不敢再想下去。文人讲恋爱，大半出于虚荣，好教旁人惊叹天才吸引
116:异性的魔力。文人的情妇只比阔人的好几辆汽车、好几所洋房，不过为了引起企羡
117:，并非出于实际的需要。既然进天堂的每个人都有地煞星数目的女人，自己在性生
118:活方面没法摆阔。借此积累点抒情诗和忏悔录的资料呢，那倒不错，只不知道天堂
119:里有人看书么？自己去了也许可以开读书的风气，又何妨带几本作品去送同堂呢？
120:因此，我们的作家踱进了他的书房。
121:
122:    他踏进书室，觉得脚下有些异样。地面好象饿空的肚子给石块压得要陷下去，
123:还在鼓气挣扎着撅上来。原来书架上自己的著作太多了，地载不起这分量。看来地
124:的面子有些保不住，渐渐进出裂纹。他赶快抢架子上的书。谁知道“拍”的一声，
125:地面裂开一个大口子。架上的书，大的小的，七零八落地掉进地洞；他立脚不住，
126:在崩塌的动力下，从乱书罅缝里直陷下去。他抱着胸脯，缩着脖子，变成了一切书
127:冲撞的目标，给书砸痛了头，碰伤了肩膀，擦破了皮肤。他这时候才切身认识自己
128:作品的势力多少重大，才懊恨平日没有抑止自己的创作冲动，少写几本书，每本书
129:少写几万字。好容易，书都在身子前后左右摩擦过去了，遍体伤痕，一个人还是在
130:无底的错暗里跟着这书阵的尾梢飘降。心里益发慌张，想这样沉下去，岂不通过地
131:心，把地球跌个对穿。忽然记起在小学时读的地理，地壳子那一面就是西半球，西
132:半球就是美洲。美国是一切旧大陆作家的金银岛，不成功的人到那里可以成功，成
133:功的人到那里可以收获。每个作家都该去游历、演讲，为作品开辟市场，替美国人
134:减少些金元的负担。一跌直到美国，那是第一妙事，又爽快，又新鲜，又免得坐飞
135:机、坐船出事故的危险。他想到这里，身子愈低降，心气愈高昂。感谢天道毕竟有
136:知，没亏负一生的苦干。原来好作家的报应，是跌到美国去，不是升天堂！俗语说
137:“一交跌在青云里”，真有这一回事。
英文输入 (ASCII input)
```

- all goals met
- code will be imported into NetBSD source Real Soon Now

wcurses: Results



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 84:
 85:　　那天晚上，他病榻前立着不少男男女女，来问病的团体代表、报馆采访、和他
 86:的崇拜者。除掉采访们忙在小本子上速写“病榻素描”以外，其余的人手里都紧握
 87:一方准备拭泪的手巾，因为大家拿准，今天是送终来了。有几位多情善感的少女读
 88:者，心里还怙［缀，“忄”旁］着，怕一方小手帕不够用，仅能遮没夹肢窝的旗袍
 89:短袖不象男人大褂的袖子，可以补充应急。我们这位作家抬眼看见病榻前拥挤的一
 90:大堆人，还跟平时理想中临死时的情景符合；只恨头脑和器官都不听命令，平时备
 91:下的告别人世的一篇演说，此刻记不全也说不清。好容易挣扎出：“我的作品……
 92:将来不要编全集……因为……”他想说的句子也许太长，至少他余下的生命太短，
 93:不容许他说完。许多人竖起象猎狗般的耳朵，失望地象猪耳朵般下垂。出来以后，
 94:大家热烈辩论他不要编全集的理由。有人说，这因为他作品太多，竭力搜罗也收集
 95:不全。也有人说，他一定还有许多小说、剧本没有写出来，已印行的作品不够表示
 96:他的全部才华。这两派的争论成为现代中国文学史里最有趣的一章。一位批评家在
 97:追悼会上激昂地说：“他的精神是不死的，他的杰作永远存在，是他给我们最宝贵
 98:的遗产！”一个小读者私下舒一口气说：“他的身体总算是死定了！他不会再出版
 99:新书，否则我真要破产了！”这位读者的书都是花钱买的，那位批评家所有的书当
100:然是作者签名赠送的。
101:
102:　　我们这位作者一灵不昧，觉得死倒也不错：精神轻松，仿佛在身体爆热时，脱
103:去了一件厚重的外衣，身上本有的病痛，也象衣缝寄生的蚤虱，随同衣服解除。死
104:是死了，死后境界不知怎样。象自己这样对社会和文化大有贡献的人，天堂早该派
105:代表来欢迎招待才对。难道天堂真出于迷信，并没有那么回事么？为了安置自己，
106:也得加工赶造一所呀！不过，老住在天堂里也怪乏味的。除非象摩罕默德安排下的
107:天堂，那里可以占有七十二位随时随意恢复处女状态的美人，空中成群飞着脆皮的
108:烤鹅和烤鸭，扑到嘴边来挨吃，那还有点意思，只恨写作过勤，常发肠胃病，多吃
109:了烧烤怕反而害事，鸭子的脖子上想来会也挂着一瓶“胃去病”、“若素”或者“
110:清快方便丸”的。女人的数量也似乎太丰富了，一时享受不了那许多。假使七十二
111:人相貌各不同，个人的审美标准总有局限，难保不偏宠了谁，结果争风吃醋；应付
112:不了两个吵嘴女人的他怎吃得消七十二位象泡菜那样又酸又辣的娘儿们？听来这七
113:十二个狐狸（Houris）是一个模子里刻出来的，都是黑头发，黑眼睛，水蛇腰，相
114:貌没有丝毫两样。试想，老守着一个女人还嫌单调，这一个女人用乘法变了七十二
115:倍……他吓得不敢再想下去。文人讲恋爱，大半出于虚荣，好教旁人惊叹天才吸引
116:异性的魔力。文人的情妇只比阔人的好几辆汽车、好几所洋房，不过为了引起企羡
117:，并非出于实际的需要。既然进天堂的每个人都有地煞星数目的女人，自己在性生
118:活方面没法摆阔。借此积累点抒情诗和忏悔录的资料呢，那倒不错，只不知道天堂
119:里有人看书么？自己去了也许可以开读书的风气，又何妨带几本作品去送同堂呢？
120:因此，我们的作家踱进了他的书房。
121:
122:　　他踏进书室，觉得脚下有些异样。地面好象饿空的肚子给石块压得要陷下去，
123:还在鼓气挣扎着撅上来。原来书架上自己的著作太多了，地载不起这分量。看来地
124:的面子有些保不住，渐渐迸出裂纹。他赶快抢架子上的书。谁知道“拍”的一声，
125:地面裂开一个大口子。架上的书，大的小的，七零八落地掉进地洞；他立脚不住，
126:在崩塌的动力下，从乱书罅缝里直陷下去。他抱着胸脯，缩着脖子，变成了一切书
127:冲撞的目标，给书砸痛了头，碰伤了肩膀，擦破了皮肤。他这时候才切身认识自己
128:作品的势力多少重大，才懊恨平日没有抑止自己的创作冲动，少写几本书，每本书
129:少写几万字。好容易，书都在身子前后左右摩擦过去了，遍体伤痕，一个人还是在
130:无底的错暗里跟着这书阵的尾梢飘降。心里益发慌张，想这样沉下去，岂不通过地
131:心，把地球跌个对穿。忽然记起在小学时读的地理，地壳子那一面就是西半球，西
132:半球就是美洲。美国是一切旧大陆作家的金银岛，不成功的人到那里可以成功，成
133:功的人到那里可以收获。每个作家都该去游历、演讲，为作品开辟市场，替美国人
134:减少些金元的负担。一跌直到美国，那是第一妙事，又爽快，又新鲜，又免得坐飞
135:机、坐船出事故的危险。他想到这里，身子愈低降，心气愈高昂。感谢天道毕竟有
136:知，没亏负一生的苦干。原来好作家的报应，是跌到美国去，不是升天堂！俗语说
137:“一交跌在青云里”，真有这一回事。
英文输入 (ASCII input)
```

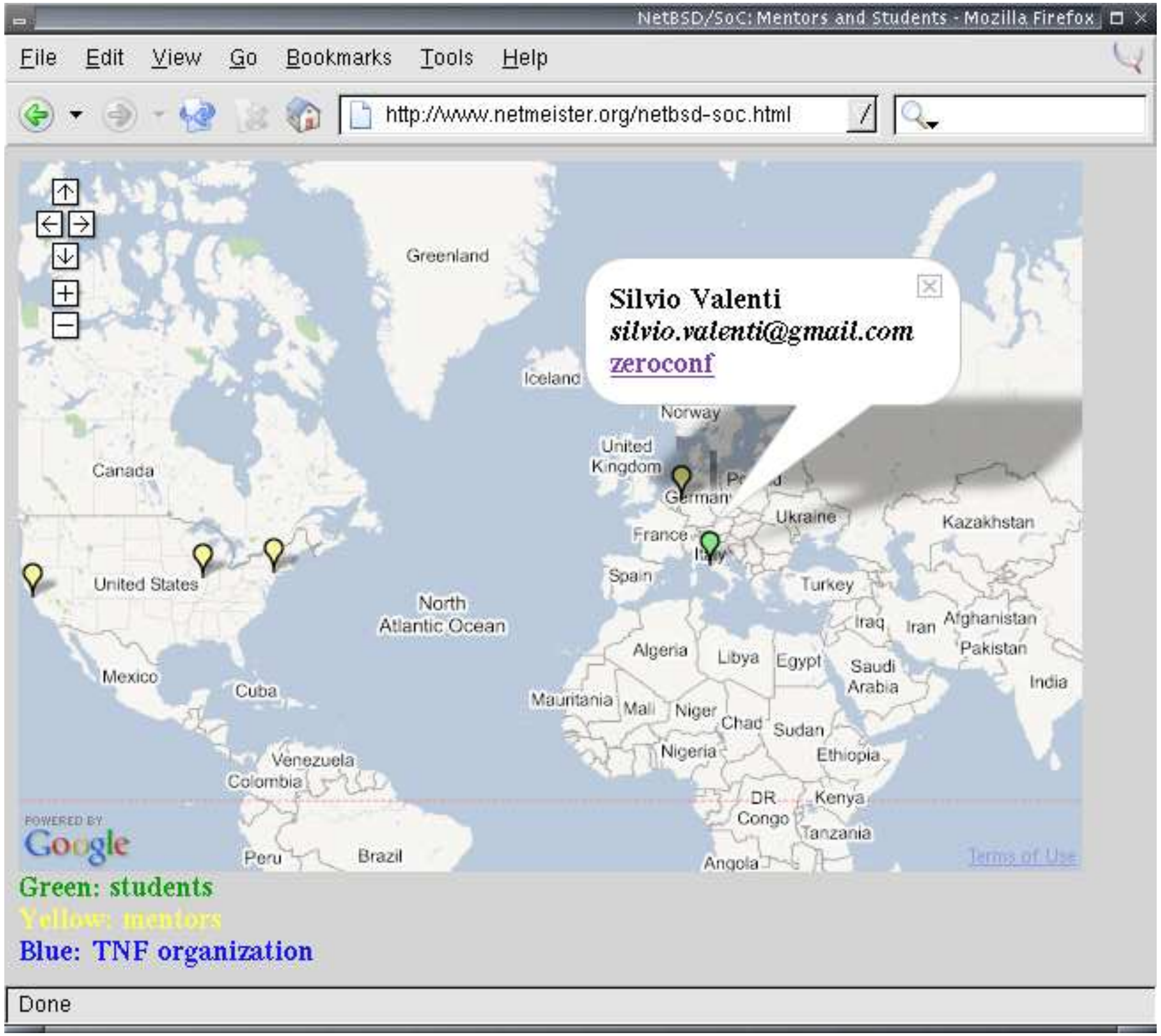
- all goals met
- code will be imported into NetBSD source Real Soon Now

Success.

zeroconf: Zeroconfd

Who?

- Mentoring NetBSD developer: **Christos Zoulas** <christos@NetBSD.org>
- Mentoring NetBSD developer: **David Young** <dyoung@NetBSD.org>
- Mentoring NetBSD developer: **Jason R. Thorpe** <thorpej@NetBSD.org>
- Mentoring NetBSD developer: **Ignatios Souvatzis** <is@NetBSD.org>
- Developing student: **Silvio Valenti** <silvio.valenti@gmail.com>



Silvio Valenti
silvio.valenti@gmail.com
zeroconf

Green: students
Yellow: mentors
Blue: TNF organization

zeroconf: Zeroconfd

Work split in two parts:

- daemon which autoconfigures an IPv4 link-local address for a network interface
- a library for multicast DNS, which is used to resolve local network host name and discover available services in network where there is no DNS server

zeroconf: Results

- `zeroconfd` implemented
- `responderd` implemented
- both working, but need more work
- import into NetBSD CVS: not yet
- too many mentors
- nevertheless: all goals met

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Success.

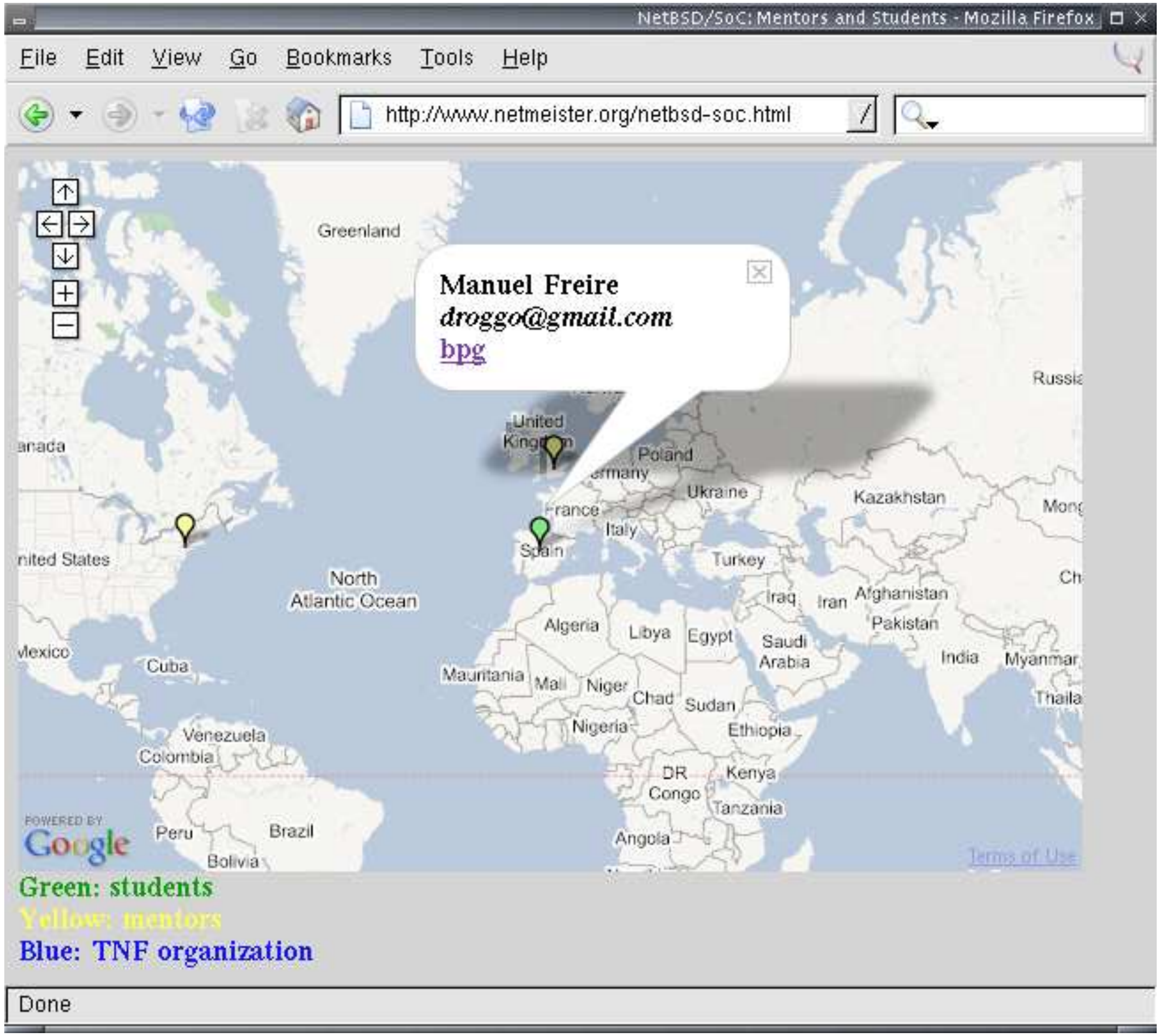
bpg: BSD licensed privacy guard (pgp)

Why?

- no BSD licensed OpenPGP tools available
- GPL licensed `gnupg` convoluted

Who?

- Mentoring NetBSD developer: **Alistair Crooks** <`agc@NetBSD.org`>
- Mentoring NetBSD developer: **Curt Sampson** <`cjs@NetBSD.org`>
- Developing student: **Manuel Freire** <`droggo@gmail.com`>
  - previous work on `myPGP`



Manuel Freire
droggo@gmail.com
bpg

Green: students
Yellow: mentors
Blue: TNF organization

bpg: BSD licensed privacy guard (pgp)

BPG, the BSD Privacy Guard, is a BSD-licensed program that performs authentication and encryption using the OpenPGP standard (RFC 2440).

It provides:

- A set of libraries for signing and encrypting data, allowing the integration of OpenPGP features in other applications.
- A modular “PGP cryptography toolkit” that allow users to chose their own encryption and signing algorithms, key management structure, and so on.
- A scriptable and well thought command-line interface built over the libraries. This standalone application will be a suitable replacement for GnuPG or PGP.

bpg: main uses

The main uses supported are:

- Data confidentiality: the library must support different algorithms for encryption of data. Concretely, it aims to be used for symmetric and asymmetric encryption.
- Data integrity and authentication: via digital signatures, BPG will support providing integrity and authentication to data, as defined in OpenPGP standard.
- Integrated key management: BPG aims to support centralized management of all of a user's public and private keys.

bpg: Goals

- Provide a complete implementation of the OpenPGP standard, with the only exception of possible old formats incompatibility if project needs demands it.
- Settle on the basis of a well-thought and well-designed data security framework.
- Develop command-line interface that is both:
  - powerful: it must support all the program functionality in an easily scriptable way;
  - usable: confusing user interfaces reduce security by making it harder for a user to make correct decisions.
- Design the libraries for extensibility. We'd like BPG to be a good field for developing researchs in the state-of-the-art of authentication and cryptography.
- Make BPG a good candidate to replace GnuPG usage in BSD Unixes.

bgp: Architecture

The main goal of BPG is to provide applications with a toolkit for using OpenPGP facilities. For that, functionality was packed into libraries.

There are four libraries, corresponding with the four problems BPG tries to solve:

- securing data
- key management
- trust management
- algorithms

bgp: Architecture: Securing data

Library name: `libbpg`

Relies on other libraries:

- Key management library: PKI keys are especified in the API with user-IDs and obtained from the BPG key management library. The key management library is the responsible of key decryption if necessary.
- Algorithms library: for performing low-level encryption, hashing and compression, it uses the BPG algorithms library.
- Compression library: BPG will use libzip for compression

bgp: Architecture: Key Management

Library name: `libbpgkey`

The key managament library is divided into a set of specialized submodules:

- Key fetcher: receives petitions for a key and performs the necessary operations to give it back to the user (or say why it wasn't possible).
- Key generator: receives petitions for creating asymmetric or symmetric keys.
- Key importer/exporter: this module receives petitions from the user to take a key from a location A and insert it into location B, where A and B can be files, keyrings or key servers.
- Key interpreter: translates OpenPGP packets containing keys into the internal data structure for keys and viceversa.
- Key deliverer: with no public functions, this module performs the internal checkouts and commits of keys from and to a file, keyring or key server.

bgp: Architecture: Trust Management

Library name: `libbpgtrust`

The trust library handles the trust database and the trust policy. The trust database contains a list of

$$UserID, trustlevel$$

pairs. The policy defines the rules for deriving the trust level of a given key from the trust database (i.e. OpenPGP web of trust, X.509 hierarchical trust model, ...).

bgp: Architecture: Algorithms

Library name: `libbpgalgo`

The initial algorithms supported will be:

- Hash functions: SHA-1.
- Symmetric algorithms: AES.
- Asymmetric algorithms: RSA, DSA.

`libbpgalgo` may offer with a plugins system would take the extensibility and reusability to a higher level.

bpg: Security Issues

- Memory purge
- Integrity of the keyring
- MITM attacks
- Emission captures
- Time-based attacks
- Password sniffing

bpg: Results

- very good work, mature code
- all goals set were achieved
- detailed documentation available (see references)
- student was pro-active, responsive
- result still under development on Sourceforge
- discussion on import into NetBSD source tree are ongoing
- expect a summary artice in “Dr. Dobb's Journal”

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Success!

References

General:

http://www.netbsd.org/

http://netbsd-soc.sourceforge.net/

http://www.netbsd.org/contrib/projects.html

http://www.netbsd.org/Foundation/press/soc.html

http://www.netmeister.org/netbsd/soc/

http://code.google.com/summerofcode.html

References

BPG:

http://www.sourceforge.net/projects/mypgp/
http://netbsd-soc.sourceforge.net/projects/bpg/
http://netbsd-soc.sourceforge.net/projects/bpg/doc/

HFS+:

http://developer.apple.com/technotes/tn/tn1150.html
http://netbsd-soc.sourceforge.net/projects/hfs/

NDIS:

http://netbsd-soc.sourceforge.net/projects/nids

tmpfs:

http://netbsd-soc.sourceforge.net/projects/tmpfs
http://www.solarisinternals.com/si/reading/tmpfs.pdf

References

userfs:

http://netbsd-soc.sourceforge.net/projects/userfs

wcurses:

http://netbsd-soc.sourceforge.net/projects/wcurses

zeroconf:

http://www.zeroconf.org/

http://netbsd-soc.sourceforge.net/projects/zeroconf

References

Other projects:

- NetBSD/ia64:
  - `http://www.netbsd.org/Ports/ia64/`
  - `http://mail-index.netbsd.org/port-ia64/`
  - `http://www.hpl.hp.com/research/linux/ski/`