Project *C*

Bazaarmodel

Bijlagen

versie 2.53

http://joshua.zutnet.org

Inhoud

Bijlage 1 Gnu Free Documentation License (GFDL)

Version 1.2, November 2002

```
Copyright (C) 2000,2001,2002  Free Software Foundation, Inc.
59 Temple Place, Suite 330, Boston, MA  02111-1307  USA
Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.
```

0. PREAMBLE

The purpose of this License is to make a manual, textbook, or other functional and useful document "free" in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or noncommercially. Secondarily, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of "copyleft", which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

1. APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The "Document", below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as "you". You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A "Modified Version" of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A "Secondary Section" is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document's overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The "Invariant Sections" are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The "Cover Texts" are certain short passages of text that are listed, as Front-Cover Texts or Back-

Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A "Transparent" copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not "Transparent" is called "Opaque".

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The "Title Page" means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, "Title Page" means the text near the most prominent appearance of the work's title, preceding the beginning of the body of the text.

A section "Entitled XYZ" means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as "Acknowledgements", "Dedications", "Endorsements", or "History".) To "Preserve the Title" of such a section when you modify the Document means that it remains a section "Entitled XYZ" according to this definition.

The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

2. VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

3. COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

4. MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

- **A.** Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.
- **B.** List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.
- **C.** State on the Title page the name of the publisher of the Modified Version, as the publisher.
- **D.** Preserve all the copyright notices of the Document.
- **E.** Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.
- **F.** Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.
- **G.** Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.
- **H.** Include an unaltered copy of this License.

- **I.** Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.
- **J.** Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.
- **K.** For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.
- **L.** Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.
- **M.** Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.
- **N.** Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title with any Invariant Section.
- **O.** Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version's license notice. These titles must be distinct from any other section titles.

You may add a section Entitled "Endorsements", provided it contains nothing but endorsements of your Modified Version by various parties--for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

5. COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique

number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled "History" in the various original documents, forming one section Entitled "History"; likewise combine any sections Entitled "Acknowledgements", and any sections Entitled "Dedications". You must delete all sections Entitled "Endorsements."

6. COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

7. AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an "aggregate" if the copyright resulting from the compilation is not used to limit the legal rights of the compilation's users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document's Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

8. TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled "Acknowledgements", "Dedications", or "History", the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided for under this License. Any other attempt to copy, modify, sublicense or distribute the Document is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See http://www.gnu.org/copyleft/.

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License "or any later version" applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation.

How to use this License for your documents

To use this License in a document you have written, include a copy of the License in the document and put the following copyright and license notices just after the title page:

```
Copyright (c)  YEAR  YOUR NAME.
Permission is granted to copy, distribute and/or modify this document
under the terms of the GNU Free Documentation License, Version 1.2
or any later version published by the Free Software Foundation;
with no Invariant Sections, no Front-Cover Texts, and no Back-Cover
Texts.  A copy of the license is included in the section entitled "GNU
Free Documentation License".
```

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the "with...Texts." line with this:

```
with the Invariant Sections being LIST THEIR TITLES, with the
Front-Cover Texts being LIST, and with the Back-Cover Texts being LIST.
```

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.

Bijlage 2 GRID (ENS onderdeel)

Het *EU-DataGrid gedeelte* omvat verschillende termen die relevant zijn voor grid-netwerken, dus ook andere grid-netwerken naast die van de EU, en verschillende gebieden waarin het kan worden toegepast. Volgens mij is het een nadeel dat de huidige Grid niet met Intelligente agenten (Cycs) wordt uitgerust.

Het ENS (distributed Hal met Cyc) systeem binnen een onderneming, overheid of onderzoeksinstituut kan worden gekoppeld op het intelligente Global Grid netwerk. Het Global Grid netwerk kan een Global ENS systeem vormen. Resources van de systemen worden zo efficiënt mogelijk benut. Als voorbeeld: na 17:00 vertrekken veel werknemers waardoor er minder computers worden gebruikt. De vrijgekomen rekenkracht kan worden toegepast voor het berekenen van een simulatie voor een astronoom. Een uurtarief kan in rekening worden gebracht voor het gebruiken van het bedrijfsnetwerk.

DataGrid EU

The IST Work programme 2000 contains the following vision statement (about DataGrid):

*"Start creating the ambient intelligence landscape for seamless delivery of services and applications in Europe relying also upon test-beds and **open source** software, develop user-friendliness, and develop and converge the networking infrastructure in Europe to world-class".*

Bio-informatica

Bio-informatica is een gebied wat onder andere proteïnen bestudeert, ontwikkeling van virtueel leven (bacteriën, virussen) et cetera. Op dit moment is het voornaamste gebied de bestudering van gnoomdata afkomstig uit verschillende gnoomprojecten. Een voorbeeld gnoom project is Human Genome Research (http://www.ornl.gov/hgmis). DNA is interessant om data mee te verwerken en voor een korte periode op te slaan. Een pond DNA heeft meer rekencapaciteit dan alle computers op de wereld bij elkaar.

Collaborative Applications

Een data pakket die kan bestaan uit HTML, JAVA, PERL of andere web- of scripttalen die met behulp van een webbrowser bereikbaar is. Met de webbrowser kan de applicatie bedient worden zoals een zoekmachine (http://www.google.com). Vele gebruikers kunnen de applicatie gelijktijdig gebruiken.

DataGrid

DataGrid is een netwerk waarbij het verwerken van enorme hoeveelheden data, oplopend in de honderden petabytes, decentraal mogelijk is. De data-opslag en rekenkracht van DataGrid dienen gemakkelijk ter beschikking te staan voor wetenschappers, en in de nabije toekomst de commercie en de consument, net zo simpel als elektriciteit uit het stopcontact.

Data Intensive Applications

Programma's die terabytes of meer aan data verwerken. Voorbeelden zijn het filteren van data, waarbij overbodige data weg wordt gegooid, het doorsturen van terabytes aan data naar verschillende servers op de wereld, en het opslaan van data in een database.

Distributed Computing

De hardware en software staan op verschillende locaties maar de eindgebruiker ziet dat niet. Voor hem lijkt het als of een berekening of opdracht die hij heeft gegeven op één plaats wordt afgehandeld, terwijl in werkelijkheid het geheel wordt afgehandeld door verschillende servers en of programma's zoals met behulp van Beowulf, zie Fabricware.

eBusiness

Binnen eBusiness staat IT-technologie centraal voor het verwerken en presenteren van gegevens tussen ondernemingen en andere instituten (zoals onderzoeksinstituten). Daarnaast is eBusiness afhankelijk van wetenschappelijke ontwikkelingen waardoor zij nieuwe producten of diensten kan ontwikkelen. Met name spin off's van verschillende onderzoeken vormen een basis om nieuwe markten te ontwikkelen voor een nieuw product. Meest succesvolle van eBusiness is Business to Business (B2B) en in beperkte mate Business to Consumer (B2C).

eScience

Bij eScience wordt elk mogelijke IT-gereedschap gebruikt voor onderzoek. Voorbeelden zijn het visualiseren van bacteriën binnen een 3D omgeving of de werking van het hart of hoe files in het verkeer ontstaan binnen een virtueel model van een stad.

Fabricware

Fabricware is de basis van DataGrid. Fabricware bestaat uit hardwarecomponenten waarop een besturingsysteem is geïnstalleerd, in DataGrid is dit Linux. Alle Linux-servers worden aan elkaar gekoppeld. Samen vormt dit een cluster van computers die de bodem zijn voor DataGrid. Zo kan DataGrid worden toegepast voor zware rekenkundige opdrachten. Fabricware is het fundament van DataGrid. Op dit fundament kunnen applicaties worden gebouwd en gedraaid. Voorbeelden van superclusters zijn Beowulf at NASA/GSFC for Earth and Space Science Project (http://beowulf.gsfc.nasa.gov/). Meer info over Beowulf http://www.beowulf.org.

Globus

Het doel van Globus is het toegankelijk maken van supercomputers, live satelliet beelden (van bijvoorbeeld de zon (http://sohowww.nascom.nasa.gov) en het (toegankelijk) maken van petaschaal-informatiepoelen door middel van Open Source-applicaties. Globus heeft verschillende toolkits die elk een gebied bestrijkt zoals beveiliging, communicatie, foutdetectie (van soft- en hardware), informatie-infrastructuur, Resource Management, Data Management en Portability. Al deze gebieden vormen weer een onderdeel van Fabricware.

Hoge-energie-natuurkunde (High Energy Physics)

Bij deze tak van wetenschap bestaat uit het bestuderen van de (mogelijk) kleinste deeltjes waarvan materie binnen deze realiteit is opgebouwd. Bij een botsing (lancering) van protonen of elektronen, doormiddel van enorme versnellers die gigantische hoeveelheden aan energie verbruiken (vanwege de enorme energie verbruik wordt deze vorm van wetenschap hoge-energie-natuurkunde genoemd) komen nog kleinere deeltje vrij, zoals muonen en hadrons (zij bestaan uit verschillende quarks). Het resultaat wordt met behulp van sensoren razendsnel opgevangen en opslagen.

Afhankelijk van de frequentie, een hoge frequentie levert veel meer data op dan een lagere, kunnen er terabytes aan data worden verwerkt. Als de data aan een bepaalde criteria voldoet, wordt het opgeslagen voor toekomstige analyse. Meer informatie over alle High Energy Physics projecten: http://www.hep.net. Men wil graag alle data bewaren maar dit is nu nog niet mogelijk door een gebrek aan opslag- en verwerkingscapaciteit

Kosmologie

Kosmologie is de studie waarbij het bestuderen van het universum en haar geschiedenis centraal staan. Met name het onderzoek naar het ontstaan van het universum neemt een belangrijke plaats in voor de volgende drie gebieden: astronomie, filosofie en religie. DataGrid ondersteunt astronomie voor het verwerken van gegevens onder andere over sterren, sterrenstelsels nebula's, sterrenstelselclusters, grote muren (verzameling van superclusters), nova's en planeten rond zonnestelsels (http://exoplanets.org) en andere objecten in het heelal.

Astronomy Picture of the Day Archive: http://antwrp.gsfc.nasa.gov/apod/archivepix.html

Kunstmatige intelligentie (AI: Artificial Intelligence)

Kunstmatige intelligentie werd door Marvin Minsky in 1968 gedefinieerd als volgt: de wetenschap die machines iets laat doen waarbij, als dit door mensen zou worden gedaan, menselijke intelligentie voor nodig is. Kunstmatige intelligentie softwarepakketten worden onder meer gebruikt door banken, op beurzen (waarbij zogenaamde 'bots' aandelen kopen of verkopen), informatiemanagement en het ruimteschip Deep Space One (http://nmp.jpl.nasa.gov/ds1). Cyc is 'formalized common sense' (http://www.cyc.com) is een AI bestaande uit meer dan 1.000.000 beweringen (of 'regels') over de realiteit. De Cyc software is Open Source en is te downloaden op http://www.opencyc.org of http://www.sf.net.

- Toepassingen van Cyc zijn in databases. Databases bevatten veel informatie maar weinig kennis. Cyc voegt er kennis (en beginnend inzicht) aan toe.
- Betere spraakherkenning (van IBM Palms) tot (Voice) V-commerce.
- Distributed AI, wat perfect is voor DataGrid. Naast informatie krijgt DataGrid een kennis laag, samen vormen zij DataGrid Intelligence.

De ontwikkeling van Cyc is een topdown tak van AI.

Kwantumcomputer

Een kwantumcomputer is een apparaat wat gebruik maakt van superposities in kwantumstatus. Kwantumstatus is een situatie waarbij een deeltje op een oneindig aantal plaatsen tegelijkertijd (wat mogelijk is binnen kwantummechanica) is. Binnen ons huidige data verwerking met computers (ook wel met klassieke computers aangeduid) gebruiken wij het binair-systeem, de 0 en de 1, zowel voor dataopslag als berekeningen binnen een processor. In dit geval zeggen we dat 0 het teken 'uit' is en 1 voor 'aan'. Bij kwantumcomputers is een deeltje tegelijkertijd 0 en 1, aan het uit, of in het voorbeeld van Schrödingers kat, levend en dood tegelijkertijd. Dit is een superpositie. Tijdens het meten vervalt de superstaat van een superpositie deeltje in een binair systeem in een 0 of een 1.

Het is uitermate ingewikkeld om te bepalen wanneer de berekening is gestopt en wanneer je mag meten om achter het resultaat van de berekening(en) te komen aangezien je, wanneer tijdens de berekening meet, de superpositie (zie het maar als een ballon) kapot kunt prikken.

Op dit moment zijn kleine kwantumcomputers operationeel zoals binnen Los Almalos (US, New Mexico) waarbij een kwantum database supersnel wordt doorzocht. Daarnaast kunnen kwantumcomputers worden gebruikt om klassieke-encryptie binnen een paar tellen te breken, waar alle klassieke-computer op deze planeet gebundeld niet genoeg tijd heeft binnen dit universum om de versleuteling te kraken. Voor beveiliging wordt daarom nu al kwantum-encryptie gebruikt. Deze versleuteling is tot op heden onmogelijk te kraken al worden op dit gebied voorderingen gemaakt.

Kwantumcomputers herbergen een enorme rekencapaciteit en in theorie kunnen zij zonder energie functioneren zoedoende is het een welkome aanvulling op DataGrid. Meer informatie: http://www.qubit.org.

Middleware

Middleware zit tussen de Fabricware en de applicaties in. Middleware zijn programma's die zich bezig houden met het managen van resources, veiligheid van data, back-ups maken, maar ook de authenticiteit (beveiliging) van een agent. Middleware kan fouten in zowel hardware als software isoleren zodat deze fouten geen invloed hebben op draaiende processen. Dit is een kleine greep van mogelijkheden. Middleware is vooral belangrijk voor de beheerders van Datagrid voor relevante data over DataGrid processen. Normale gebruikers zullen Middleware nooit gebruiken.

Problem Solving Applications (PSA)

Met behulp van deze applicaties kan met data herstellen, nalopen welke hardware mogelijk moet worden vervangen om problemen te voorkomen of wat de toestand van DataGrid is. De PSA is meer gericht op de beheerders van DataGrid.

Remote Instrumentation Applications

Remote instrumentation applications zijn programma's die het mogelijk maken om je proces(sen), berekening(en), je data in databases, directories of iets dergelijks gerelateerd met DataGrid, bereikbaar te maken, ongeacht de plaats waar iemand zich bevindt. Van af het International Space Station of in het Amazone gebied, kan men bij de data komen. Deze applicaties moeten dus toegankelijk zijn voor zowel standaard computers als Handhelds pc (http://www.simputer.org), Personal Digital Assistent (PDA)'s et cetera.

World-DataGrid

Alle datagrids op deze planeet aan elkaar gekoppeld vorm een World-DataGrid. Dit is het begin van een kunstmatige hersenen voor deze planeet. World-DataGrid omvat alle gegevens wat bij het menselijk ras bekend is en zal continu worden uitgebreid aan de hand van waarnemingen en metingen van deze realiteit. Toepassingen en mogelijkheden: real-time informatie over de toestand van Terra (of te wel Aarde), real-time informatie over ons zonnestelsel en de toestand van zon, gegevens over de gezondheid van flora en fauna op deze planeet, kennis bron voor elk mogelijk denkend wezen op deze planeet, simulator voor modellen zowel economische modellen als modellen over het heelal, een 3D kaart van deze planeet en andere objecten zoals het sterrenstelsels en het heelal et cetera.

Nu al wordt El Niño (en La Niña) gevolgd en bestudeert door middel van duizenden sondes die in de Grote Oceaan ronddolen vooral tussen Australië en Latijns-Amerikaan in. Zij verzenden continu data over de temperatuur van het water, de stroming, of ze aan het oppervlak drijven of hoeveel meter zij onderwater zijn, naar satellieten in een baan om de aarde die deze data weer doorstralen naar NASA en weeronderzoekinstituten in Zuid-Amerika en Australië.

Bijlage 3 Vertrouwde Agenten binnen het 2.5.x Kernel project

Deze lijst is sterk ingekort. De volledige lijst is te downloaden op: http://www.kernel.org

List of maintainers and how to submit Kernel changes

Please try to follow the guidelines below. This will make things easier on the maintainers. Not all of these guidelines matter for every trivial patch so apply some common sense.

1.	Always _test_ your changes, however small, on at least 4 or 5 people, preferably many more.

2.	Try to release a few ALPHA test versions to the net. Announce them onto the Kernel channel and await results. This is especially important for device drivers, because often that's the only way
you will find things like the fact version 3 firmware needs a magic fix you didn't know about, or some clown changed the chips on a board and not its name. (Don't laugh! Look at the SMC etherpower for that.)

3.	Make sure your changes compile correctly in multiple configurations. In particular check that changes work both as a module and built into the Kernel.

4.	When you are happy with a change make it generally available for testing and await feedback.

5.	Make a patch available to the relevant maintainer in the list. Use 'diff -u' to make the patch easy to merge. Be prepared to get your changes sent back with seemingly silly requests about formatting and variable names. These aren't as silly as they seem. One job the maintainers (and especially Linus) do is to keep things looking the same. Sometimes this means that the clever hack in your driver to get around a problem actually needs to become a generalized Kernel feature ready for next time. See Documentation/CodingStyle for guidance here.

	PLEASE try to include any credit lines you want added with the patch. It avoids people being missed off by mistake and makes it easier to know who wants adding and who doesn't.

	PLEASE document known bugs. If it doesn't work for everything or does something very odd once a month document it.

6.	Make sure you have the right to send any changes you make. If you do changes at work you may find your employer owns the patch not you.

7.	Happy hacking.

Maintainers List (try to look for most precise areas first)

Note: For the hard of thinking, this list is meant to

remain in alphabetical order. If you could add yourselves to it in alphabetical order that would be so much easier [Ed]

P: Person
M: Mail patches to
L: Mailing list that is relevant to this area
W: Web-page with status/info
S: Status, one of the following:

Supported:	Someone is actually paid to look after this.
Maintained:	Someone actually looks after it.
Odd Fixes:	It has a maintainer but they don't have time to do much other than throw the odd patch in. See below..
Orphan:	No current maintainer [but maybe you could take the role as you write your new code].
Obsolete:	Old code. Something tagged obsolete generally means it has been replaced by a better system and you should be using that.

3C359 NETWORK DRIVER
P: Mike Phillips
M: mikep@linuxtr.net
L: linux-net@vger.rutgers.edu
L: linux-tr@linuxtr.net
W: http://www.linuxtr.net
S: Maintained

3C501 NETWORK DRIVER
P: Alan Cox
M: alan@the.3c501.cabal.tm
L: linux-net@vger.Kernel.org
S: Maintained for 2.2 only

3C505 NETWORK DRIVER
P: Philip Blundell
M: Philip.Blundell@pobox.com
L: linux-net@vger.Kernel.org
S: Maintained

53C700 AND 53C700-66 SCSI DRIVER
P: James E.J. Bottomley
M: James.Bottomley@HansenPartnership.com
L: linux-scsi@vger.Kernel.org
S: Maintained

6PACK NETWORK DRIVER FOR AX.25
P: Andreas Koensgen
M: ajk@iehk.rwth-aachen.de
L: linux-hams@vger.Kernel.org
S: Maintained

8139CP 10/100 FAST ETHERNET DRIVER
P: Jeff Garzik
M: jgarzik@mandrakesoft.com
S: Maintained

8139TOO 10/100 FAST ETHERNET DRIVER
P: Jeff Garzik
M: jgarzik@mandrakesoft.com
W: http://sourceforge.net/projects/gKernel/
S: Maintained

8250/16?50 (AND CLONE UARTS) SERIAL DRIVER
P: Theodore Ts'o
M: tytso@mit.edu
L: linux-serial@vger.Kernel.org
W: http://serial.sourceforge.net
S: Maintained

8390 NETWORK DRIVERS [WD80x3/SMC-ELITE,
SMC-ULTRA, NE2000, 3C503, et cetera.]
P: Paul Gortmaker
M: p_gortmaker@yahoo.com
L: linux-net@vger.Kernel.org
S: Maintained

A2232 SERIAL BOARD DRIVER
P: Enver Haase
M: ehaase@inf.fu-berlin.de
M: A2232@gmx.net
L: linux-m68k@lists.linux-m68k.org
S: Maintained

ACENIC DRIVER
P: Jes Sorensen
M: jes@trained-monkey.org
L: linux-acenic@sunsite.dk
S: Maintained

ACI MIXER DRIVER
P: Robert Siemer
M: Robert.Siemer@gmx.de
L: linux-sound@vger.Kernel.org
W: http://www.uni-karlsruhe.de/~Robert.Siemer/Private/
S: Maintained

ACP/MWAVE MODEM
P: Paul B Schroeder
M: paulsch@us.ibm.com
P: Mike Sullivan
M: sullivam@us.ibm.com
W: http://www.ibm.com/linux/ltc/
S: Supported

AACRAID SCSI RAID DRIVER
P: Adaptec OEM Raid Solutions
M: linux-aacraid-devel@dell.com
L: linux-aacraid-devel@dell.com
L: linux-aacraid-announce@dell.com
W: http://domsch.com/linux
S: Supported

ACPI
P: Andy Grover
M: andrew.grover@intel.com
L: acpi-devel@lists.sourceforge.net
W: http://sf.net/projects/acpi/
S: Maintained

AD1816 SOUND DRIVER
P: Thorsten Knabe
W: http://www.student.informatik.tu-darmstadt.de/~tek/projects/linux.html
W: http://www.tu-darmstadt.de/~tek01/projects/linux.html
S: Maintained

ADVANSYS SCSI DRIVER
P: Bob Frey
M: linux@advansys.com
W: http://www.advansys.com/linux.html
L: linux-scsi@vger.Kernel.org
S: Maintained

Bijlage 4 Voorbeeld van een electronische Linux notulen

Kernel Traffic #165 For 6 May

By Zack Brown
Table Of Contents
Default Format
Text Format
XML Source
Mailing List Stats For This Week
Threads Covered

Mailing List Stats For This Week
We looked at 1331 posts in 6447K.
There were 396 different contributors. 196 (49%) posted more than once.
128 (32%) posted last week too.
The top posters of the week were:
78 posts in 287K by Daniel Phillips <phillips *at* bonn-fries.net>
61 posts in 211K by Jeff Garzik <garzik *at* havoc.gtf.org>
44 posts in 157K by Larry McVoy <lm *at* bitmover.com>
29 posts in 163K by Martin Dalecki <dalecki *at* evision-ventures.com>
28 posts in 87K by Linus Torvalds <torvalds *at* transmeta.com>
28 posts in 67K by Alan Cox <alan *at* lxorguk.ukuu.org.uk>
Full Stats

1. Development Philosophy Of Unstable Tree; Linus Comments On The FSF
19 Apr - 28 Apr (348 posts) Archive Link: [PATCH] Remove Bitkeeper documentation from Linux tree
In the course of debating the presence of BitKeeper in the Kernel documentation, some interesting things were said about something else. Alexander Viro said, **"I doubt that dropping -pre completely in favour of dayly snapshots is a good idea - "2.5.N-preM oopses when ..." is preferable to "snapshot YY/MM/DD oopses when..." simply because it's easier to match bug reports that way. Having all deltas downloadable as diff+comment is wonderful, but it doesn't replace well-defined (and less frequent) resync points."** Rob Landley said, **"The well-defined resync points are the 2.5.N releases. If -pre goes away, then the dot-releases might need to come a little closer together, that's all."** And Linus Torvalds replied:
I agree.
I've told myself that I shouldn't have done "-preX" releases at all in 2.5.x - the "real" numbers have become diluted by them, and I suspect the -pre's are really just because I got used to making them during the over-long 2.4.x time.

For development stuff, I think I personally would rather have dailies together with a higher frequency of "real" releases. But as it is now (because it isn't automated), the dailies would be a lot of work..

Pavel Machek replied:

I believe -pre's are still important. Daily snapshots are too likely to be broken, and "real" releases are different from -pre ones (with *usefull* difference): you can ignore -pre release, but you can't ignore real release (because real releases are relative to each other).

Having slightly more frequent real releases would be nice, but I believe it is not feasible to make them as common as pre- patches.

Linus said he'd try to increase the frequency of real releases. He added:

Considering how even real releases in the development tree are likely to be broken (never mind the _trivial_ brokenness of applying the same patch to init/main.c twice, I'm talking about the more fundamental brokenness of just broken drivers and filesystems due to development), I'm not sure how big a deal that is.

And I do make full tar-files of real releases, so that people can skip a few (although unless you have a fast connection it usually only makes sense after 10 full releases or so).

Elsewhere a different subject came up. While discussing the Linux Kernel FAQ, Richard Gooch (FAQ maintainer) promised to add a link to a Free Software Foundation page describing free software. But Linus said:

Please don't.

I don't want a Kernel howto quoting the FSF.

Richard replied, **"It already has, for years. Like it or not, certain questions/issues *do* get raised. If the FAQ can capture at least some of these, it saves bandwidth on the list."** Someone else speculated that Linus "didn't want to endorse the FSF stance that software must be ethically correct." To which Linus replied, **"Right. Besides, as the whole notion of "free software" has very little to do with the Kernel, please just link to some open source site. One of the more neutral ones is "http://www.debian.org/social_contract.html", for example."**

2. Status Of XFS Merge Into 2.5

22 Apr - 24 Apr (21 posts) Archive Link: XFS in the main Kernel

Dan Yocum requested of Linus Torvalds:

I know it's been discussed to death, but I am making a formal request to you to include XFS in the main Kernel. We (The Sloan Digital Sky Survey) and many, many other groups here at Fermilab would be very happy to have this in the main tree. Currently the SDSS has ~20TB of XFS filesystems, most of which is in our 14 fileservers and database machines. The D-Zero experiment has ~140 desktops running XFS and several XFS fileservers. We've been using it since it was released, and have found it to be very reliable.

Daniel Phillips remarked, **"The issue is how XFS's private versions of what would normally be generic vfs facilities fit with the rest of the Kernel."** And Wichert Akkerman also asked, **"Has XFS been proven to be completely stable and POSIX complient in its behaviour? The reason I am asking is that XFS seems to be a fairly common factor for segfault bugreports in dpkg. The problems are rare enough (and never reproducable) so I can't prove this but it does leave me wondering."** Various folks discussed the reliability of XFS, with the general consensus being that it was about as good as any other filesystem out there. At one point Luigi Genoni said:

the inclusion on XFS in the 2.5 tree would probably move more peole to use it, and so also to eventually trigger bugs, to report them, sometimes to fix them. This way XFS would improve faster, and of course that would be a good thing. That said, it is important to consider the technical reasons to include XFS in 2.5 or not; if this inclusion could cause some troubles, if XFS fits the requirements Linus asks for the inclusion and what impact the inclusion would

have on the Kernel (Think to JFS as a good example of an easy inclusion, with low impact).
Various folks discussed the prospect of putting XFS into 2.5, with most folks agreeing that it would be fine, though it shouldn't go into 2.4, because that would be too large a change for a stable series. At one point Daniel said, **"It's simply a matter of nobody having done the required analysis to find a really good way to reconcile XFS's way of doing things with mainline vfs. This is time-consuming work that requires a good deal of skill, and right now there are many projects in the same category."**
No real decision came out of the discussion.

3. Status Of NTFS Support In 2.4 And 2.5
24 Apr Archive Link: <u>ANN: NTFS 2.0.2 for Kernel 2.5.9 released</u>
Anton Altaparmakov announced:

NTFS 2.0.2 for Kernel 2.5.9 is now available. This is a small update mainly to incorporate Kernel 2.5.9. Also the default fmask is changed to 0177 which means files do not get the executable bit by default. The majority of users prefer it this way. Minor misc bug fixes. Updating is recommended and is necessary if you want to use Kernel 2.5.9. Note the patch will work with 2.5.7, too but it may not apply cleanly so you may have to do some minimal & obvious patch work yourself.
You can download patches for Kernel 2.5.9 from Sourceforge:
<u>http://linux-ntfs.sf.net/downloads.html</u>
And of course you can use BitKeeper to get our BitKeeper repository at:
<u>http://linux-ntfs.bkbits.net/ntfs-tng-2.5</u>
And a on-line view of the repository is available here: <u>http://linux-ntfs.bkbits.net:8080/ntfs-tng-2.5</u>
Erik Andersen asked if Anton planned to port the patches to 2.4, and Anton replied:

Not immediate plans. Eventually yes but right now there are too many other things to do.
But just today someone contacted me and he may be interested in doing the backport...

4. Bad Kernel Interaction With GCC
24 Apr - 25 Apr (5 posts) Archive Link: <u>[PATCH] gcc 3.1 breaks wchan</u>
Anton Blanchard posted a patch to change a variable from static inline to extern inline, saying, **"I noticed on a ppc64 Kernel compiled with gcc 3.1 that context_switch was left out of line. It ended up outside of the scheduling_functions_start_here/end_here placeholders which breaks wchan. This is one place where we require the code to be inline, so we should use extern."**
Linus Torvalds replied forcefully:

ABSOLUTELY NOT!
"extern inline" does not guarantee inlining. It only guarantees that _if_ the code isn't inlined, it also won't be compiled as a static function.
Complain to the gcc guys, they've made up some not-backwards-compatible thing called "always_inline" or something, apparently without any way to know whether it is supported or not.
Albert D. Cahalan replied:

This is why anything but INLINE or _INLINE (chosen in a Makefile or header) is broken. Every compiler wants something different these days. So, as needed, we get one of:
#define INLINE inline /* sanity! */ #define INLINE extern inline /* an oxymoron */ #define INLINE static inline /* another oxymoron */ #define INLINE __forceinline #define INLINE __attribute__((always_inline)) #define INLINE inline_me_harder #define INLINE inline_this_or_I_shove_it_up_your_gnu
BTW, I said this during the "extern inline" to "static inline" conversion.
IMHO "extern inline" and "static inline" are oxymorons and, were it not for the silly C99 standard, ought to produce error messsages. They make as much sense as "extern static" does. The compiler's inability to inline something ought to be

an error as well. Oh well.

5. Status Of Support For Windows Dynamic Disks
25 Apr - 30 Apr (2 posts) Archive Link: [ANNOUNCE] LDM 0.0.6 (Windows Dynamic Disks)
Richard Russon announced:

I've just released v0.0.6 of Linux-LDM which supports Windows Dynamic Disks. Windows 2000 and XP have new partition scheme to support their dynamic volumes. The source can be downloaded from the project page: http://linux-ntfs.sourceforge.net/downloads.html
This version should be pretty solid, but if you experience any problems, please let me know. If there are no reports, I'll consider replacing the old driver (2.4.10+) with this one.
Someone asked privately if it it would be possible to use this patch to convert dynamic disks to basic disks, and Richard replied to the list, **"The LDM patch just allows the Kernel to understand Windows new partitioning. Without it you'll just see one BIG partition of type 0x42. If you only have simple disks on a dynamic disk, then it shouldn't be too hard to convert a dynamic disk back to a basic disk. We don't have a tool to do this yet."**

6. Status Of AMD AM29F040B Flash Chip Support
25 Apr Archive Link: [PATCH] Add AM29F040B Support
John Tyner posted a patch to support the AMD AM29F040B flash chip in 2.4 Kernels, but David Woodhouse replied, **"That chip is already supported in the CVS code. The current plan is to wait for 2.4.19 to be released, send the current code to Marcelo for 2.4.20-pre1, and then look at what broke in 2.5, fix it and send the results to Linus."**

7. Status Of Patch To Allow Mounting Many Volumes
25 Apr - 28 Apr (4 posts) Archive Link: 1279 mounts
Pete Zaitcev announced:

I updated my patch that allows to mount unholy numbers of volumes. The old version was for 2.4.9 and did not apply anymore. I split the unnamed majors patch and the NFS patch. Also, CONFIG_ option is gone, because it made the code ugly.
Majors part: http://people.redhat.com/zaitcev/linux/linux-2.4.19-pre7-unmaj.diff
NFS part: http://people.redhat.com/zaitcev/linux/linux-2.4.19-pre7-nores.diff
Userland for NFS: http://people.redhat.com/zaitcev/linux/util-linux-2.11q-nores1.diff
Is anyone actually interested? Random people periodically ask me for patches, get them and disappear into the void. I hear nothing good or bad (well, nothing since Trond reviewed it several months ago, and also someone found a conflict with NFS server code, since fixed). I am thinking about submitting, but if users do not ask, why add extra bloat and negotiate with LANANA...
Panu Matilainen remarked, **"I've got quite a few users here who "need" this functionality and it's included in our RH-based custom Kernels. Having it as a separate patch for 2.4 is no problem, for 2.5 I'm hoping we finally move to 32bit device numbers..."** Pete replied, **"Mind, we only ship the unnamed majors part, but not the NFS part. There is no word from util-linux maintainer about required changes to mount(8), so I was cautious about doint that."** and Panu said, **"Sure, I know. In these cases getting the limit from 255 to around 800 is enough so the mount patch isn't even needed."**

8. The Nature Of Development Kernels
27 Apr Archive Link: 2.5.10-dj1 compilation failure
Christoph Lameter complained that 2.5.10-dj1 wouldn't even compile. Dave Jones gave a link to his explanation (http://lwn.net/daily/2.5.10-dj1-scsi.php3) of why various features had been disabled (SCSI error handling, in this case), but Christoph replied, **"That stuff might be useful in a CVS or BK() source code archive. What is the purpose of releasing a Kernel tarball that does not compile? Kernel tarball are there to be compiled and tried out ...."** Jerry McBride agreed with this wholeheartedly, but Anton Altaparmakov explained:

First, this is a development Kernel, i.e. using it means it may not compile, it may not work, or worse, it may destroy all your data.
Second, the Kernel compiles fine as long as you don't make use of any of the currently broken features. A blank statement "the Kernel doesn't compile" is more often then not incorrect and should say "the Kernel doesn't compile with my .config" instead.
The developmental Kernel series is for that... Just as the block layer was "flaky" while Jens was working on it in early 2.5.x and just as IDE is "flaky" at the moment, now scsi is joining the club. (-;
If you want Kernels that will compile and work you should be using 2.4.x or 2.2.x Kernels...

Dave also explained:

we've gone ~7 full point releases with no updates to the error handling of some drivers. Whilst it seems some maintainers are waiting until the block layer and scsi midlayer frobbing settle down, running these drivers without /any/ error handling is a disaster waiting to happen.
Experiments with new filesystem features is going to be tricky to debug if the scsi drivers are untrustable.
If the maintainers want to continue to wait for 2.5 to settle down, this at least points those interested in getting their hands dirty and fix the problem themselves to the parts that need work.
I debated adding this as a CONFIG_DEBUG_BROKEN_SCSI_DRIVERS or similar when Christoph first sent me the patch. Given how many reports of "xxx being broken" I've had, I'm tempted to do that for -dj2.

9. Some Discussion Of Patch Submission Policy
28 Apr - 29 Apr (5 posts) Archive Link: First working version of suspend-to-RAM
Pavel Machek sent a mime-encoded patch to the list, and Stelian Pop pointed to 'Documentation/SubmittingPatches' in the source tree, which indicated that all patches should be sent as plain text. But Alan Cox replied, **"Thats just Linus preference. A lot of us prefer to get stuff in attachments because that way there is a reasonable chance their mailer won't have eaten it."** David S. Miller added that he also preferred plain text patches.

10. Speeding Up i2c Drivers
29 Apr Archive Link: speeding up i2c drivers
Murtada Shah asked, **"I want to speed up the linux Kernel i2c drivers. They are running @ 10Khz now, although i2c is capable of 100. Would anyone be able to point me to the right direction?"** And Yves Rutschle replied:

Look in drivers/i2c/*
The details depend on what algorithm your interface uses. For "bitbanging" algorithm for example, timing information is coded in the last parameters of the struct i2c_algo_bit_data.
That said, i2c normally automatically slows down at the speed of the slowest device on the bus, so it may well be that the 10Khz you see has nothing to do with your Kernel driver.

11. Which Compiler To Use For Kernel Compilation
30 Apr Archive Link: What compiler to use
Frank Schaefer asked which compiler he should use to build Kernels for testing. Gabor Kerenyi replied, **"I use 2.95.2 for the test machine and gcc-3.1 from cvs on the other. There's no problem. gcc-3.1 gives a bit more warning. (I use 3.1 at home also) but don't try to use gcc 3.2 because the Kernel won't compile in some cases."** Roy Sigurd Karlsbakk asked, **"Is this common knowledge? Is 3.1 as stable as 2.95.[23]?for compiling the Kernel? Does it make any difference in performace?"** and Christian Borntræger said:
Not quite.

http://www.tux.org/lkml/#s8-2
Gcc 2.95.3 is the recommended compiler for Kernel 2.4.10 and later.

Bijlage 5 Auteursrecht klinkt door

De verandering in de wetgeving van de Verenigde Staten heeft een directe en indirecte invloed op de wereld. Napster werd aangeklaagd in de VS. Het resultaat was dat het Napster netwerk wereldwijd plat moest. Patent en copyright zijn twee punten die belangrijk zijn binnen de buitenlandse politiek. De DMCA dient als voorbeeld voor de Europese Commisie om een nog strengere Octrooi en Auteursrecht wet in te voeren. Dit is de European Union Copyright Directive (EUCD). De uitgevers van muziek, videospellen en boeken profiteren hier het meest van terwijl de rechten van de consument en de auteur verder worden ingeperkt. De auteur krijgt maar een klein percentage van de opbrengsten. De uitgever incasseert een groot gedeelte van de omzet.

Siva Vaidhyanathan On Copyrights and Wrongs

Jason Haas writes: *"While bad copyright laws such as the DMCA are having strong negative consequences, an even worse bill, the Consumer Broadband and Digital Television Promotion Act (CBDTPA), is now before Congress. The CBDTPA would have radical effects upon many of the devices that we take for granted -- including the computer you are now reading this on. Bad copyright law is among the many things that we talked about. Siva Vaidhyanathan has a thing or two to say about this. An avid defender of peer-to-peer, Siva recently debated one of the MPAA's top lawyers on copyright law. A recorded version of this will be available on the web in late May.*

Furthermore, he has written Copyrights and Copywrongs: The Rise of Intellectual Property and How It Threatens Creativity, the first fully fleshed history of American copyright law ever to be put in book form. The cool thing about this book is that although it's about copyright law, you don't have to be a lawyer to understand it. Copyrights and Copywrongs covers American copyright law's origins in seventeenth century English law, tracks Mark Twain's efforts to extend copyright in the nineteenth century, and ends at the dawn of the twenty-first century with the rise of Napster and the DMCA."

Jason Haas: How are you?

Siva Vaidhyanathan: Stressed. I'm trying to finish my second book, which will likely be called "The Anarchist in the Library." Basic Books will publish it next year.

JH: That sounds like it may be of interest to Slashdotters.

SV: Probably. I lifted many of the insights from Slashdot posts. The book will be an examination of the battles between efforts to centralize information and efforts to decentralize information. It starts with peer to peer, and moves on to battles over encryption, the commercialization and regulation of science, the regulation of algorithms, and the efforts to fight terrorism using information policy. One of the most interesting stories I'm following is the role that encryption plays on both sides of these battles. Some efforts to centralize and control information rely on encryption. For example, DVDs, and some efforts to distribute and liberate information (Freenet) depend on encryption.

JH: Your book, Copyrights and Copywrongs, covers the evolution of copyright law from its origins to the late twentieth century. Where did you get the idea for this?

SV: From rap music. I grew up with rap music. But in the early 1990s I noticed the music was changing. Everyone else was paying attention to the lyrics -- the sexism and the violence and the anger. I was observing how the underlying body of samples were getting thinner, more predictable, more obvious, less playful. I had heard that there had been some copyright conflicts in 1990 and 1991. So I suspected that lawsuits had chilled playful and transgressive sampling. I was right. The courts had stolen the soul. And rap music is poorer for it. We used to get fresh, exciting, walls of sound that were a language unto themselves. By the mid-1990s, all we got were jeep beats and heavy bass.

JH: Are you dissing Ice Cube?

SV: [laughs] No! He's an O.G.! He and other artists are handcuffed by the law. From my research on rap, I got curious about the evolution of American copyright law and how it altered and got altered by the rise of different media technologies and forms of expression. So I traced the changes from the 19th century publishing industries through the rise of film and television, through blues, jazz, rock, and rap, and finally to the digital moment.

JH: The book ends just after the DMCA has gone into effect and Napster has begun its rise. What's happened since then?

SV: I knew that Napster would radically change the ways we interact with the copyright system. And I knew the DMCA would radically undermined the democratic safeguards that were built into our copyright system. But I knew that there was much more to this story. So I wrote an article for The Nation which defended Napster and peer-to-peer. I used this as the starting point for what would become the second book.

JH: In your first book, you refer to the DMCA as an example of what you call a "thick" copyright law. Can you explain the difference between "thick" copyright law and a "thin" law?

SV: I think the DMCA (Digital Millennium Copyright Act) is misnamed. I don't consider it a copyright act. I consider it an anti-copyright act. Copyright is a fluid, open, democratic set of protocols. Conflicts are anticipated by Congress and mediated by courts. The DMCA wipes out the sense of balance, anticipation, and mediation, and installs a technocratic regime. In other words, code tells you whether you can use a piece of material. Under copyright, you could use a piece of material and face the consequences. The DMCA replaces the copyright system with cold, hard technology.

It takes human judgment out of the system and drains the fluidity out of what was a humanely designed and evolved system.

But getting back to thick and thin copyright.

One way to measure the thickness of a copyright law is to look at the duration of protection. If works enter the public domain before an author's life expectancy expires, then it's a thin and democratic system. If the duration of copyright protection is absurdly long and potentially indefinite, then it's way too thick.

JH: Senator Fritz Hollings' has introduced a new copyright bill to Congress, the Consumer Broadband and Digital Television Promotion Act. What what would it do? Is it another "thick" law?

SV: Yeah, it would be as thick as the Berlin Wall. But again, it's the extension of a technocratic control regime and a further abandonment of real copyright. All the attention this bill has received has generated an impressive movement for users' rights. People are finally waking up to the fact that their rights to make private, non-commercial use of material they buy is in danger. I think we should all thank Senator Hollings and the MPAA for sparking a revolt against copyright tyranny.

The title of the bill implies that by giving movie companies what they want, they will give us this wonderful library of streamed films, and we will finally have a reason to sign up for and pay for broadband. Paradoxically, nothing sells broadband like peer-to-peer, which is exactly what it would try to stop.

JH: CBDTPA would make a new computer ship with copy protection. What would it do to things like the iPod?

SV: The iPod would be hard to justify under the new law. But the real issue is the personal computer. The computer does three basic things: it does math, it stores data, and it copies data. A computer can't operate without those three basic functions. The law would limit these three basic functions, thereby cutting the Achilles heel of the PC. It would be just another appliance.

JH: It's that bad?

SV: Yes. If the law passes, I could send you a file that I made, but the machine would prevent you from making copies of just about anything else, including sound from web sites, video from web sites, et cetera. The law works completely for the benefit of big media companies that can afford to conform to the licensed encryption standards of the industry. Only the big boys could benefit from this law.

The law would only affect new stuff, so it'd be your next DVD players, your next TiVo, your next PC. The stuff you have now is going to do more and work better than any hardware that anyone could roll out after the law passes. But there's another, bigger issue. According to an early version, the bill covers not just hardware but software. Under it, you can't distribute a software package that has copy features. Furthermore, how in the world can anything released under the GPL have closed copy-protection standards embedded in it? It can't. It would make the GPL illegal, and future versions of Linux illegal. Even if Congress focused on hardware and excluded software, we all know that distinction is a matter of modular convenience and industry practice rather than a natural distinction. But nobody ever accused the U.S. Senate of understanding technology or thinking through long-term effects of tech policy.

JH: What can people do to stop this bill from passing?

SV: The first thing people should do is check out and support such organizations as the Electronic Frontier Foundation, digitalconsumer.org, and publicknowledge.org. The latter two are fairly new. And they are a sign that people are getting angry and active about these issues. I am particularly excited about publicknowledge.org, a public interest advocacy group that is coordinating and publicizing the concerns of a wide array of concerned citizens and groups.

But just as importantly, discuss this measure with your local librarians. Librarians are very active in opposing it. In 1998, very few groups actively opposed the DMCA, but librarians were at the front lines of its opposition. And once again, librarians are our best friends in this battle. And of course, the simple answer is, write members of the Senate Judiciary Community. [The American Library Association is a national organization of librarians that is active in defending freedom of information and access. The Senate Judiciary Committee can be found over here.]

If public anger doesn't stop this bill now, then we know that the corrupting power of the entertainment industries is at crisis level. The changes in copyright have not been great for our culture and our democracy. But I am optimistic that this new level of awareness and activism will make a difference.

Jason Haas retired from the computer industry in April 2001, and now juggles being a student, fatherhood, and progressive political activism.

This past year, Siva Vaidhyanathan has been an assistant professor in the School of Library and Information Studies at the University of Wisconsin, but is moving to New York University in the fall. The web page for his book, Copyrights and Copywrongs: The Rise of Intellectual Property and How It Threatens Creativity, is at NYU Press.

Bijlage 6 Copyrights copywrongs

Duane Hoffmann / MSNBC

Copyrights and copywrongs
Why Thomas Jefferson would love Napster

NEW YORK, July 3 - The dawn of the 21st century has illuminated an array of conflicts over the regulation of information in America: Napster, DVD-hacking, the right to create a parody, the rewards for freelance writers in a digital world, and the future of the Microsoft monopoly.

Each of these cases rests on several distinct pedestals of ideals. As a nation, we would like to reward enterprise and creativity, allow free and open access to ideas, and benefit from a rich trove of music, literature, journalism, and art. Often these goals conflict, and courts must choose among them.

BECAUSE SO MANY recent cases involve digital technology, we might assume that these are new issues, that copyright in an analog world was relatively stable and non-controversial. But in fact, copyright was not only one of the most lively subjects of debate among our Founding Fathers. The values that copyright reflects echo with the very principles of the American Revolution and Constitutional Convention.

At its birth in England, copyright was an instrument of censorship. In 1557, the Catholic Queen Mary Tudor capped off a 120-year monarchal struggle to censor printing presses in England by issuing a charter to the Stationers' Company, a guild of printers. Only members of the company could legally produce books. The only books they would print were approved by the Crown.

COPYRIGHTS AND THE CONSTITUTION

In contrast, the American copyright system since 1791 has reflected American republican values. While it granted a limited, temporary monopoly to a specific publisher, American copyright grew to embody four democratic safeguards:
- A guarantee that all works would enter the public domain once the copyright term expired.
- A collection of purposes that consumers could consider "fair use," such as limited copying for education or research.
- The principle that after the "first sale" of a copyrighted item, the buyer could do whatever he or she wants with the item, save distribute unauthorized copies for profit.
- The concept that copyright protects specific expression of ideas, but not the ideas themselves.

OUT OF BALANCE

Copyright, when well balanced, encourages the production and distribution of the raw material of democracy. But after more than 200 years of legal evolution and technological revolution, American copyright no longer offers strong democratic safeguards. It is out of balance. And our founders - especially Thomas Jefferson - would not be pleased.

Copyright was created as a policy that balanced the interests of authors, publishers, and readers. It was not intended to be a restrictive property right. But it has evolved over recent decades into one part of a matrix of commercial legal protections now unfortunately called "intellectual property."

GOOD DEAL FOR DEMOCRACY

Copyright is a "deal" that the American people made with the writers and publishers of books. Authors and publishers get a limited monopoly for a short period of time, and the public gets access to those protected works and free use of the facts, data, and ideas within them.

Without a legal guarantee that they would profit from their labors and creations, the framers feared too few would embark on creative endeavors. If there were no copyright laws, unscrupulous publishers would simply copy popular works and sell them at a low price, paying no royalties to the author.

FAR FROM IDEAL

George Washington believed copyright would enrich political culture by encouraging creativity and promoting enlightened public discourse. But recent changes to copyright law have debased his idealistic vision.

Library of Congress
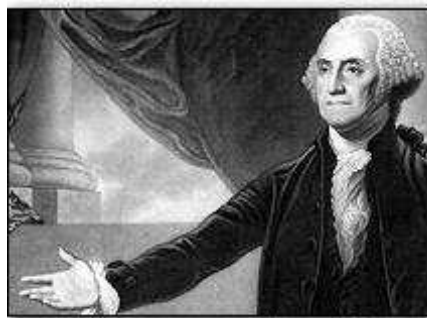
But just as importantly, the framers and later jurists concluded that creativity depends on the use, criticism, supplementation, and consideration of previous works.Therefore, they argued, authors should enjoy this monopoly just long enough to provide an incentive to create more, but the work should live afterward in the "public domain," as common property of the reading public.

AN INCENTIVE TO CREATE

This principle of copyright as an incentive to create has been challenged in recent decades by the idea of copyright as a "property right." Therefore, many recent statutes, treaties, and copyright cases have seemed to favor the interests of established authors and producers over those of readers, researchers, and future creators. These trends run counter to the original purpose of American copyright.

James Madison, who introduced the copyright and patent clause to the Constitution, argued in The Federalist papers that copyright was one of those few acts of government in which the "public good fully coincides with the claims of individuals." Madison did not engage in "property talk" about copyright. Instead, Madison argued for copyright in terms of "progress," "learning" and other such classic republican virtues as literacy and an informed citizenry.

NOT PROPERTY

James Madison introduced the copyright and patent clause to the Constitution. He didn't view copyright as a property issue, but as a way to ensure an informed citizenry.
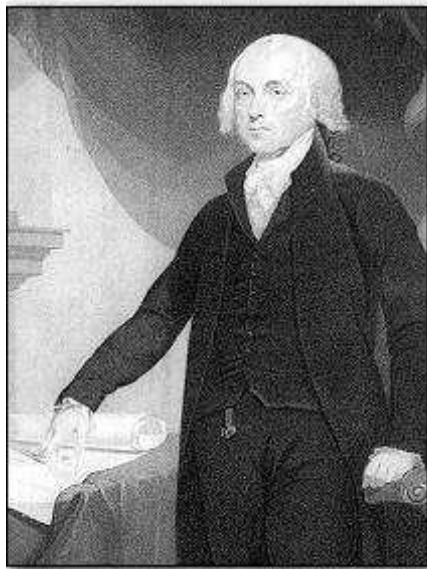
Library of Congress

Copyright fulfilled its role for Madison because it looked forward as an encouragement, not backward as a reward. This fit with the overall Madisonian project for the Constitution. If the federal government were to operate as the nexus of competing interests, each interest would need to approach the public sphere with reliable information. Copyright would be an engine for democratic culture.

When President George Washington declared his support for the Copyright Act of 1790, he proclaimed that copyright would enrich political culture by "convincing those who are entrusted with public administration that every valuable end of government is best answered by the enlightened confidence of the public; and by teaching the people themselves to know and value their own rights; to discern and provide against invasions of them; to distinguish between oppression and the necessary exercise of lawful authority."

JEFFERSON'S DOUBTS

Thomas Jefferson - author, architect, slave owner, land owner - had no misgivings about protecting private property. Yet he expressed some serious doubts about the wisdom of copyright. These concerns were based on Jefferson's suspicion of concentrations of power and artificial monopolies.

While in Paris in 1788, Jefferson wrote to Madison that he rejoiced at the news that nine states had ratified the new Constitution. "It is a good canvass," Jefferson wrote of Madison's work, "on which some strokes only want retouching." Primarily, Jefferson wanted a Bill of Rights attached to the document. But he also desired an explicit prohibition against monopolies, including those limited and granted by the Constitution: patents and copyright.

While Jefferson acknowledged that a limited copyright could potentially encourage creativity, it had not been demonstrated. Therefore, Jefferson wrote, "the benefit of even limited monopolies is too doubtful, to be opposed to that of their general suppression."

The following summer, as Congress was debating the Bill of Rights, Jefferson again wrote to Madison from Paris. This time Jefferson proposed specific language for an amendment that would have allowed copyrights and patents, despite his doubts, but forbidden any other type of commercial monopoly. "For instance," Jefferson wrote, "the following alterations and additions would have pleased me: Article 9. Monopolies may be allowed to persons for their own productions in literature, and their own inventions in the arts, for a term not exceeding _____ years, but for no longer term, and no other purpose."

IDEAS, NOT PROPERTY

INFORMATION MONOPOLY

Thomas Jefferson, himself an author and inventor, was suspicious of the information monopolies copyright laws could create. He feared monopolists could use their state-granted power to strengthen their control over the flow of ideas.

Library of Congress

Significantly, the founders did not argue for copyrights or patents as "property." Jefferson even explicitly dismissed a property model for copyright, and maintained his skepticism about the costs and benefits of copyright for many years. Fearing, justifiably, that copyright might eventually expand to encompass idea protection, not just expression protection, Jefferson wrote in 1813, "If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of everyone, and the receiver cannot dispose himself of it."

Jefferson then declared the flaw in the notion of copyright as property. Unlike tangible property, ideas and expressions are not susceptible to natural scarcity. As Jefferson wrote of copyright, "Its peculiar character, too, is that no one possesses the less, because every other possesses the whole of it. He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me."

Therefore, Jefferson feared, the monopolists could use their state-granted power to strengthen their control over the flow of ideas and the use of expressions.

Monopolies have the power to enrich themselves by evading the limitations of the competitive marketplace. Prices need not fall when demand slackens, and demand need not slacken if the monopoly makes itself essential to the economy (like electrical power or computer operating systems).

To accomplish the task of bolstering the value of these monopolies, those who control copyrights would have to create artificial scarcity by limiting access, fixing prices, restricting licensing, litigating, and intimidating potential competitors, misrepresenting the principles of the law and claiming a measure of authenticity or romantic originality. But when Jefferson warned of these potential abuses, they were more than a century away. Even in the early 20th century, jurists considered Jefferson's warnings, and skepticism about idea protection kept monopolists at bay.

As Justice Louis Brandeis wrote in a dissenting opinion in 1918, "The general rule of law is, that noblest of human productions-knowledge, truths ascertained, conceptions and ideas - become, after voluntary communication to others, free as the air to common use." Both Jefferson and Brandeis dissented from the conventional wisdom of their times, but nevertheless influenced the philosophy of copyright. So in the early republic and the first century of American legal history, copyright was a Madisonian compromise, a necessary evil, a limited, artificial monopoly, not to be granted or expanded lightly.

DIGITAL DAMAGE

In the 1990s the Clinton administration championed efforts to undermine the democratic safeguards that used to be built into the copyright system. In addition to signing a 20-year term extension and pushing for *sui generis* database protection law, the administration and Congress acted on behalf of global media companies by enacting the most egregious example of recent copyright recklessness: the Digital Millennium Copyright Act of 1998.

A PRINCIPLE DEBASED

The 1998 Digital Millennium Copyright Act, signed into law by President Clinton upends more than 200 years of democratic copyright law. By forbidding the "cracking" of electronic gates that protect works, it puts the power to regulate copying in the hands of engineers and the companies that employ them.

Jean-Paul Pelissier / Reuters file

This law has one major provision that upends more than 200 years of democratic copyright law. It forbids the "cracking" of electronic gates that protect works - even those portions of works that might be in the public domain or subject to fair use. It puts the power to regulate copying in the hands of engineers and the companies that employ them.

Because the DMCA allows content providers to regulate access and use they can set all the terms of use. And much like the database protection proposal, the *de facto* duration of protection under the DMCA is potentially infinite. While copyright law in 2001 protects any work created today for life of the author plus 70 years or 95 years in the case of corporate "works for hire," electronic gates do not expire.

This allows producers to "recapture" works already or about to fall in the public domain. This also violates the Constitutional mandate that Congress copyright laws that protect "for limited times." The DMCA works over and above copyright law.

DANGEROUS FOR DEMOCRACY

Most dangerously, producers could exercise editorial control over the uses of their materials. They could extract contractual promises that the use would not parody or criticize the work in exchange for access. Many web sites already do this. Just as dangerously, the DMCA allows producers to contractually bind users from reusing facts or ideas contained in the work.

For most of American history, copyright has not only reflected democratic principles. It fueled the engines of democracy by rewarding the efforts of both producers and consumers of information and cultural products.

Now, as we prepare to celebrate American independence for the 215th time, copyright is tilted to favor the powerful at the expense of the people. But with the popularity of Napster and such unregulatable networks as Gnutella, public is once again engaged in discussions of copyright and its role in culture and democracy. Jefferson might not have been happy with the recent trajectory of the law. But he would have gotten a kick out of Napster.

Siva Vaidhyanathan, a cultural historian and media scholar, is the author of Copyrights and Copywrongs: The Rise of Intellectual Property and How it Threatens Creativity (New York: New York University Press, 2001). He teaches information studies at the University of Wisconsin at Madison.

Bijlage 7 HAL (ENS onderdeel)

Star Bridge Systems

Star Bridge Systems (http://www.starbridgesystems.com) is opgericht door Kent Gilson. Kent Gilson ontwikkelde over een periode van vijftien jaar de Hypercomputer-technologie. Hypercomputer-technologie heeft als principe dat hardware geconfigureerd kan worden door on-the-fly te programmeren. Zo kan de hardware worden aangepast voor verschillende situaties zonder dat een systeem uit hoeft. Nu fabriceert men nog verschillende soorten seriële processors, zoals de Motorola of x86 processors. Seriële processen zijn t.o.v. een FPGA processor beperkt in hun mogelijkheden. FPGAs zijn met de juiste software, in dit geval Viva, zeer flexibel met enorme scala aan mogelijkheden en met veel meer rekenkracht dan een seriële processor.

Hypercomputer (HAL)

Hyper-Algorithmic-Logic (HAL) computers hebben zelfconfigureerbare hardware onderdelen. De processor is een Field Programmable Gate Array (FPGA). In HAL 15 zijn 10 Pensa (10 stuks van het Xilinx 4062 FPGA type) processors ingebouwd. Deze processors zijn on-the-fly te programmeren en parallel geschakeld met de andere processors en het FAI moederbord. De algoritmen, die in een x86 soort 'vast' staan, kunnen zo voor iedere simulatie eenvoudig worden veranderd. Niet alleen de processors zijn FPGA. Ook het moederbord opereert als een FPGA. De videokaart, geluidskaart, controllers en andere standaard moederbord onderdelen bestaan allemaal uit FPGA's. De software kan bijvoorbeeld de FPGA van de geluidskaart herprogrammeren om de beschadigde videokaart te vervangen. Dit concept noemt men Fault-recoverability, de Hardware herstelt zichzelf. De processor zelf kan ook bepaalde moederbord onderdelen simuleren. Zo kan het systeem veel langer meegaan in vergelijking met een standaard mainframe of PC.

Viva (2.3)

Viva bestaat uit de verschillende onderdelen:
- Programmeertaal en gereedschap.
- Compiler.
- Grafische gebruikers interface (GUI).

Met Viva kan men de FPGA programmeren. De Viva versie 2.3 is in staat om processen, zoals een simulatie, te beheren. Viva houdt dan het systeem in de gaten en grijpt bij beschadigingen van de hardware in. Functies die in het beschadigde gedeelte werden uitgevoerd worden over andere niet beschadigde onderdelen verdeeld. Desnoods voert de FPGA van de geluidskaart bepaalde berekeningen voor de simulatie uit.

De manier van ontwikkelen van programma's, namelijk met plaatjes in een 3D omgeving, maakt het programmeren velen malen sneller i.p.v. met tekst (C, Java, Fortran) en overzichtelijker.

De verschillende HAL's: HAL 15 en HAL 300

HAL 15 bestaat uit één FAI-moederbord met 10 Pensa processors. De HAL 300 bestaat uit 20 FAI moederborden met 10 Pensa's per FAI-moederbord net als in de HAL15. De HAL 300 is geheel fault-recoverble. Fault-tolerant is een passé begrip. Bij HAL kan ieder beschadigd onderdeel vervangen worden zonder dat het systeem uit hoeft. Bij een reperatie 'ziet' Viva wanneer een beschadigt onderdeel is vervangen en neemt het nieuwe onderdeel op waarna verplaatste functies weer terug kan worden gezet.

HAL 15.

Het opvangen van beschadigingen door Viva en de hardware is heel belangrijk voor onder meer de ruimtevaart waar geen ANWB is om beschadigde ruimteschepen (Deep Space One; http://nmp.jpl.nasa.gov/ds1) te repareren. Deep Space One had een beschadigde sterrencompas. Na een paar maanden van programmeren kon de camera als kompas fungeren om zo de sterrencompas te vervangen. Viva zou deze beschadiging binnen enkele minuten verholpen hebben door functies van de sterrencompas naar andere eenheden (FPGA) over te brengen. Wat resulteert in een besparing van geld, tijd en energie.

De HAL 300 is niet alleen voor de ruimtevaart maar ook voor het bedrijfsleven, onderzoekinstituten of scholen. Kortom, iedereen die over voldoende rekenkracht wil beschikken kan een HAL 300 aanschaffen. En niet alleen om de rekenkracht maar ook om de stabiliteit. De HAL 300 behoort daarnaast tot één van de snelste supercomputers en is 17,5 cm., 42,5 cm. bij 68,75 cm. groot.

HAL 300

De HAL 600

De HAL 600 gebruikt de Pensa II chip. De Pensa II is 120 maal sneller dan de Pensa en duizend maal sneller dan de Pentium chip van Intel. Daarnaast bevat de HAL 600 80 FAI moederborden met meer dan 800 Pensa's waarbij het de snelste supercomputer ter wereld is en niet veel groter dan een kartonnen doos voor een 19" monitor. Ter vergelijking. De gemiddelde supercomputer die nu in gebruik zijn omvatten vier voetbalvelden.

Conclusie

Vanwege de rekenkracht, flexibiliteit en stabiliteit is de HAL een basiscomponent voor de ENS infrastructuur. De GA's zijn met FPGA te gebruiken waardoor de HAL ook zonder intelligentie (Cyc) kan evolueren.

Note (2004): De HAL 15 is nu al weer een sterk verouderd model. Het meest geavanceerde model is de HC-124. De HC-124 heeft 'evenveel' rekenkracht als 10.000 gebundelde Intel Pentium 4 CPUs met een verbruik van maximaal 1.100 wat en kost 700.000 dollar. De toename aan rekenkracht van FPGA neemt sneller toe dan Moore's Law.

Bijlage 8 Cyc (ENS onderdeel)

Cycorp's Cyc

Cycorp (http://www.cyc.com) begon in 1984 met de ontwikkeling van Cyc. In 1995 werd Cyc voor het eerst toegepast binnen het bedrijfsleven terwijl de ontwikkeling in stroomversnelling kwam door de toenemende processor rekenkracht. Cycorp nam toentertijd een grote gok door al zijn geld in dit project te stoppen. Ze namen aan dat een tienjarige ontwikkelperiode misschien tekort was. Dit komt overeen met Star Bridge Systems die er ook tien jaar over deden voordat het eerste prototype voor het bedrijfsleven kon worden gepresenteerd.

Cyc

Cyc is een multi-contextual kennisbron. Multi-contextual houdt in dat termen en woorden onderling met elkaar in verband worden gebracht. Een standaard database weet niet wat goud is. Cyc weet wat goud is, namelijk een grondstof die aangeduid wordt met de scheikundige formule Au, wordt gebruikt in onder meer in sieraden, het roest niet, mensen vinden het mooi et cetera. Cyc weet ook wat het woord 'mooi' inhoudt, wat mensen zijn, wat een scheikundige formule is. Het begrijpt de contextuele overlapping van woorden. Zoals goud met mooi en/of duur en/of scheikunde. Allemaal relevant op het woord goud. Cyc is een kunstmatige gezondverstand intelligentie.

Vijf jaar geleden moest Cyc nog alles voorgekauwd krijgen. Nu is het zover dat het bij elke nieuwe term er vragen over stelt. Bij een nieuwe vorm van bacterie begint Cyc al te vragen of het schadelijk is of niet. Is het een menselijke bacterie of een dierlijke bacterie. Cyc puzzelt de omschrijving van de nieuwe bacterie bij elkaar door 'na te denken'. De operator vult de stukken aan waar Cyc niet op kan komen en 'leert' hier van.

Op dit moment (2002) bevat Cyc meer dan 325 miljoen regels en 1.100.000 concepten en is daarmee op het niveau van een specialist op vele gebieden zoals natuurkunde, chemie, neurologie, biologie, nanotechnologie, geschiedenis, archeologie en meer. Cyc kan zo vaak worden gekopieerd als men maar wil, zodat een 'stomme computer' binnen een uur als een kennisbron kan fungeren binnen een organisatie. Er kunnen verschillende agenten van Cyc worden gecreëerd en in dienst worden genomen.

Een Cyc agent kan zich geheel specialiseren in rechten terwijl een ander de in- en verkopen afhandelt. Bij in- en verkopen horen contracten. De in- en verkoop-Cyc-agent zal met de rechten-Cyc-agent communiceren bijvoorbeeld over de garantie voorwaarden van de producten. Het kan ook zo zijn dat de klant producten niet betaalt. De in- en verkoop-Cyc-agent geeft dit door aan rechten-Cyc-agent om mogelijk juridische stappen te ondernemen.

Het voordeel is dat Cyc, zoals de rechten-Cyc-agent, direct op het netwerk van de rechtelijke macht de nieuwe wettelijke regels kan 'opnemen' of hij scant een website na op nieuwe regelgeving. Zo is de juridische module binnen de onderneming altijd up-to-date.

Er zijn al verschillende Cyc-agenten bezig het gehele internet in te delen om ze hapklaar te maken voor de hoofd-Cyc bij Cycorp. Zo kan het systeem veel sneller parallel leren dan nu met behulp van de menselijke operators. Van de kennisbasis van de Hoofd-Cyc worden kopieën gemaakt en de kennis wordt gedeeld met andere Cycs. Dit gebeurt binnen Cycorp met een Distributed-Cyc-netwerk.

De Cyc's: CycSecure, CycAnswers, Cyc Knowledge Server

CycSecure

CycSecure is een netwerk beveiligingspakket. CycSecure houdt de gedragingen van agenten (bv. werknemers) bij en kan anti-sociaalgedrag, zoals het kraken van beveiliging of stelen van data, anticiperen. CycSecure kan indien nodig de agent misleiden en een virtuele kopie maken van de netwerkomgeving waar de agent in werkt om de agent in te vangen. Zo wordt het echte netwerk niet beschadigd en de agent heeft geen flauw idee dat elk handeling wordt gelogd om als mogelijk bewijslast te dienen.

CycSecure houdt ook bedreigingen van buitenaf in de gaten. Crackers, die het netwerk proberen te kraken worden automatisch door CycSecure opgevangen. Ook deze agent (de cracker) wordt geanalyseerd om te kijken wat zijn volgende zet zal zijn. CycSecure simuleert voor deze cracker een omgeving zodat het echte netwerk niet beschadigt raakt.

De systeembeheerder kan meerdere situatie met CycSecure simuleren om achter zwakheden van het netwerk te komen. Deze zwakheden kunnen worden verholpen of als honey pot (honingpot) dienen om zo een lokaas te vormen voor potentiële crackers.

CycAnswers

CycAnswers is nu in ontwikkeling. CycAnswers, zoals de naam al zegt, geeft antwoorden aan agenten, zowel menselijk als in androïde (andere Cyc-agent) vorm. CycAnswers kan miljoenen vragen tegelijkertijd (parallel) afhandelen. Een vraag wordt door CycAnswers doorgeredeneerd op niet goed geformuleerde vragen waarna om extra gegevens wordt gevraagd. CycAnswers kan, indien gewenst, achter het redenerend vermogen van een agent komen en zich hieraan aanpassen.

Cyc Knowledge Server

De Cyc knowledge server is continu in ontwikkeling. De Cyc Knowledge Server is de bodem waarop een intelligente agent wordt ontwikkeld. Vervang het woord Knowledge door jurist, kunsthistoricus, leraar, systeembeheerder et cetera. De Cyc Knowledge server is de hoofdboom voor toekomstige Cycs zoals CycAnswer die gespecialiseerd is in een bepaalde taak; vragen kunnen beantwoorden door het raadplegen van een kennisdatabase.

OpenCyc

OpenCyc (http://www.opencyc.org) is de Open Source versie van Cyc. OpenCyc gebruikt dezelfde Cyc Inference Engine, Knowledge Base Index en de Knowledge Base Browser component. De broncode is vanaf SourForge te downloaden. OpenCyc wordt onder de LGPL licentie aangeboden.

OpenCyc is een kopie van Cyc, behalve de nieuwste geleerde kennis van de Cycs die binnen Cycorps functioneren en bepaalde software toepassingen, die over een paar jaar in de OpenCyc worden verwerkt. De commerciële Cyc loopt op bepaalde aspecten een paar jaar voor op de OpenCyc.

Voor het bedrijfsleven, onderzoeksinstituten en scholen is OpenCyc een manier om Cyc beter te leren kennen en een kans om een bijdrage te leveren aan de ontwikkeling van Cyc.

Mogelijke ontwikkelingen

Cyc is nodig om de HAL systemen gezond verstand te geven. Meerdere combinaties van Cyc met HAL systemen en deze onderling met elkaar verbonden vormen een intelligent distributed netwerk. Om Cyc een grotere leercapaciteit te geven kunnen we het systeem (HAL + Cyc) uitbreiden met een Language Acquisition Device (LAD). De LAD is nu in ontwikkeling op de King's College in Londen. De LAD dient taal, zowel gesproken als tekst te begrijpen.

Conclusie

De mogelijkheden van Cyc zijn nu met OpenCyc voor een groot publiek bereikbaar. Cyc op zichzelf is alleen gelimiteerd in zijn beeld van de wereld. Het weet wat een tafel is maar nog niet hoe het eruit ziet of voelt. Cyc zal voor de komende tijd alleen begrensd zijn tot de digitale wereld en daarin zijn taken kunnen uitvoeren, van leraar tot intelligente expertsysteem die vragen probeert te doorgronden en, wanneer hij er zelf niet uitkomt, andere Cycs of menselijke agenten, kan raadplegen.

Bijlage 9 Kostenstructuur en Cost-Plus methode

Het totale kosten plaatje voor het Red Hat platform bedroeg over het fiscaal jaar van 2001 108,9 miljoen dollar over het fiscaal jaar van 2002 bedroeg het 93,4 miljoen dollar, een daling van 14% (2001 als basis). Voor een volledig overzicht zie Red Hats Financiën (blz. 174).

Ik ga aan de hand van de Cost-Plus methode bepalen of de huidige prijs voor de Red Hat Advanced Server te laag of te hoog is.

De volgende variabelen zijn van belang:
- Gewenste groei omzet abonnement;
- Draagkracht van kosten door Red Hat Advanced Server;
- Draagkracht product mix van Red Hat Advanced Server;
- Kostenstijging.

De Red Hat Advanced Server product mix bestaat uit de volgende producten:
- Red Hat Advanced Server product mix (RH AS);
- Red Hat Advanced Server Standard Edition Versie 2.1 (RH AS SE);
- Red Hat Advanced Server Premium Edition Versie 2.1 (RH AS PE).

Advanced Server	Advanced Server Standard Support Edition	Advanced Server Premium Support Edition
Annual Subscription: $799.00 [Buy Now]	Annual Subscription: $1499.00 [Buy Now]	Annual Subscription: $2499.00 [Buy Now]
Advanced Server Basic Support **Hours:** 9-5 M-F (North America) **Response Time/SLA:** None **Scope of Coverage:** Base (Installation & Configuration)	*Advanced Server Standard Support* **Hours:** 9-9 M-F (North America) 9-5 M-F (APAC/EMEA) **Response Time/SLA:** 4 Business Hours **Scope of Coverage:** Medium	*Advanced Server Premium Support* **Hours:** 24x7 **Response Time:** 1 Hour (Sev 1 Issues) **Scope of Coverage:** High

Ik ga er vanuit dat de abonnementinkomsten met 40% zullen stijgen. Deze stijging komt in zijn geheel van de Red Hat Advanced server productmix verkoop. Overige inkomsten stijgen of dalen niet. De kosten stijgen met 8,8 %. Zie Red Hats Financiën verwachting (blz. 176) voor een compleet overzicht. De draagkracht van Red Hat Advanced server over de kosten is 20%. De overige 80% wordt door onder andere rente-, service- en productinkomsten gedragen.

De variabelen samengevat:
- Gewenste groei omzet abonnement = 40%
- Draagkracht van kosten door Red Hat Advanced Server = 20%
- Draagkracht product mix van Red Hat Advanced Server:
  - RH AS   = 30%.
  - RH AS SE   = 45%.
  - RH AS PE   = 25%.
- Kostenstijging;
  - Abonnement   = 30%.
  - Service   = 20%.
  - R&D (O&O)   = 10%.
  - J&A   = 10%.

De verwachting is dat RH AS SE (voor beginners) de grootste inkomsten bron is gevolgd door RH AS (voor gevorderden met Linux kennis in huis) en als laatste de RH AS PE (voor grote ondernemingen met 24 uur dienstverlening zoals banken). Zie Advies verkoopprijs voor fiscaaljaar 2002-2003 (blz. 177) voor de details.

	Huidige prijs	Adviesprijs
Red Hat Advanced Server	799	998
Red Hat Advanced Server SE	1499	1873
Red Hat Advanced Server PE	2499	3122

Het advies prijs bevat de kosten per service en module plus een winstmarge (markup) van 15%. Uit de Adviesprijs valt af te lijden dat Red Hat zijn prijzen dient te verhogen tenzij Red Hat het volgende doet:
- Verlaging van inkomsten verwachting naar bijvoorbeeld 30% en/of;
- Kostendraagkracht verlagen naar bijvoorbeeld 18% en/of;
- Winstmarge verlagen naar bijvoorbeeld 8% en/of;
- Kostenprognose verlagen.

Stel: Kostendraagkracht wordt verlaagd van 20% naar 18% wat zijn dan de nieuwe adviesprijzen?

	Huidige prijs	Adviesprijs
Red Hat Advanced Server	799	898
Red Hat Advanced Server SE	1499	1685
Red Hat Advanced Server PE	2499	2810

Waarschijnlijk zal Red Hat de kostendraagkracht niet verlagen. De RH AS dient namelijk kosten op te vangen van andere onderdelen met name de embedded markt. De embedded markt, denk aan handcomputers of simputers, is vergeleken met de server markt nog jong. De ontwikkelingen gaan zeer snel wat een hoge kostenpost met zich meebrengt en de winst marge is vrij laag. Linux is een kloon van UNIX en de techniek is al meer dan 20 jaar in gebruik dus de Red Hat Advanced Server product is een zeer laag risico voor de klant. Dit in tegenstelling tot embedded producten.

Ik vermoed dat Red Hat hoge verwachtingen heeft van haar nieuwe product en dat Red Hat een verhoging van 50% verwacht over haar abonnementinkomsten. Bij 50% stijging van de abonnementsinkomsten zijn de adviesprijzen als volgt:

	Kosten	Adviesprijs
Red Hat Advanced Server	694	799
Red Hat Advanced Server SE	1303	1498
Red Hat Advanced Server PE	2172	2498

Het adviesprijs komt zeer sterk overeen met de huidige prijs die Red Hat voor haar Advanced Server vraagt.

De kosten zullen volgens mij met name in abonnement en service snel stijgen. Beiden hebben direct betrekking op de Red Hat Advanced Server. Marketing zal verder dalen aangezien de voorgaande jaren grote bedragen zijn besteed aan promotie van Red Hat. Deze investering begint nu zijn vruchten af te werpen, steeds meer klanten vragen om Linux. Vroeger moest de leverancier Linux pushen maar nu is het een pull product geworden. De kosten van de verkoop en marketing zullen stijgen. Doch de afname van marketingkosten zullen de totale kosten van verkoop en marketing in balans houden en niet verder laten stijgen. Onderzoek en ontwikkeling (O&O) en juridisch & administratie (J&A) zal een stijgende lijn in kosten kennen maar niet zo sterk als de productiekosten. O&O en J&A hebben indirect betrekking op de Red Hat Advanced Server en zagen de voorafgaande jaren ieder jaar gemiddeld een 10% kostenstijging ook toen de Red Hat Advanced Server nog niet bestond.

Red Hats Financiën

Bedragen maal duizend

Fiscaaljaar *	28 feb. 2001		28 feb. 2002	
Inkomsten				
abonnement	45.498		42.300	
service	35.334		36.610	
hardware	777		0	
rente	20.766		15.535	
overige inkomsten **			2.240	
Totaal	**102.375**		**96.685**	
Totale inkomsten		**$102.375**		**$96.685**
Productiekosten				
abonnement	14.660		9.887	
service	20.549		18.655	
hardware	646		0	
overige kosten ***	0		1.501	
totaal	**35.855**		**30.043**	
Modulenkosten				
verkoop en marketing	38.355		33.442	
onderzoek en ontwikkeling	15.713		16.429	
juridisch en administratie	18.910		13.491	
Totaal	**72.978**		**63.362**	
Totale kosten		**$108.833**		**$93.405**
Winst / verlies in dollars		**-$6.458**		**$3.280**
Koers Dollar in Euro's =	€ 1,0550			
Winst / verlies in euro's		**-€ 6.813**		**€ 3.460**

*   Fiscaaljaar eindigt op 28 februari
**   Bestaat uit Lease buyout proceeds
***   Bestaat uit Lease buyout costs

Koers dollar in euro's op 15 juni 2002

Advies verkoopprijs voor fiscaaljaar 2002-2003

Abonnement omzet 40% groei

RH AS	=	Red Hat Advanced Server
RH AS SE V2.1	=	Red Hat Advanced Server Standard Edition versie 2.1
RH AS PE V2.1	=	Red Hat Advanced Server Premium Edition versie 2.1

Abonnement omzet *(in dollars maal duizend)*

Jaar	**2002**		**2003**
Abonnement omzet	42300	40% groei	59220
RH advanced omzet	16920		
Eind 28 feb 2003	59220		

De verkoopmix *(omzet in dollars maal duizend)*

	huidig verkoopprijs	aandeel	omzet	eenheden
RH AS	799	30%	5076	6353
RH AS SE V2.1	1499	45%	7614	5079
RH AS PE V2.1	2499	25%	4230	1693
		100%	**16920**	**13125**

Draagkracht Red Hat Advanced Server *(in dollars maal duizend)*

Draagkracht RH AS = 20%	fiscaaljaar	draagkosten
Productiekosten	**2002**	
abonnement	9.887	1977
service	18.655	3731
hardware	0	
overige kosten ***	1.501	
Totaal	**30.043**	**5708**
Modulenkosten		
verkoop en marketing	33.442	6688
onderzoek en ontwikkeling	16.429	3286
juridisch en administratie	13.491	2698
Totaal	**63.362**	**12672**
Totale kosten	**$93.405**	**$18.381**

Kosten per product *(kosten in dollars maal duizend)*

product	prijs	draagkracht	kosten	kosten per eenheid	
RH AS	998	30%	5514	0,868 x 1000 =	868
RH AS SE V2.1	1873	45%	8271	1,628 x 1000 =	1628
RH AS PE V2.1	3122	25%	4595	2,715 x 1000 =	2715
		100%	**18381**	5,211	5211

Cost-Plus methode *(in dollars)*

		RH AS		RH AS SE		RH AS PE
Ondernemingsfunctie						
Abonnement		93		175		292
Service		176		331		551
Verkoop en marketing		316		593		988
Onderzoek en ontwikkeling		155		291		485
Jurifisch en administratie		127		239		399
Totale kosten per product		**868**		**1628**		**2715**
Markup	15%	130	15%	244	15%	407
Advies verkoopprijs		998		1873		3122

Red Hats Financiën verwachting

Bedragen maal duizend
Abonnement omzet 50% groei

Fiscaaljaar *	28 feb. 2002		28 feb. 2003	
Inkomsten				**Stijging******
abonnement	42.300		59.220	40%
service	36.610		36.610	0%
hardware	0			
rente	15.535		15.535	0%
overige inkomsten **	2.240			
Totaal	**96.685**		**111.365**	
Totale inkomsten		**$96.685**		**$111.365**
Productiekosten				**Stijging******
abonnement	9.887		12.853	30%
service	18.655		22.386	20%
hardware	0			
overige kosten ***	1.501			
Totaal	**30.043**		**35.239**	
Modulenkosten				
verkoop en marketing	33.442		33.442	0%
onderzoek en ontwikkeling	16.429		18.072	10%
juridisch en administratie	13.491		14.840	10%
totaal	**63.362**		**66.354**	
Totale kosten		**$93.405**		**$101.593**
Winst / verlies in dollars		**$3.280**		**$9.772**
Koers Dollar in Euro's =	€ 1,0550			
Winst / verlies in euro's		**€ 3.460**		**€ 10.309**

*	Fiscaaljaar eindigt op 28 februari
**	Bestaat uit Lease buyout proceeds
***	Bestaat uit Lease buyout costs
****	Stijging ten opzichte van fiscaaljaar 2002

Koers dollar in euro's op 15 juni 2002

Advies verkoopprijs voor fiscaaljaar 2002-2003

Abonnement omzet 50% groei

RH AS	=	Red Hat Advanced Server
RH AS SE V2.1	=	Red Hat Advanced Server Standard Edition versie 2.1
RH AS PE V2.1	=	Red Hat Advanced Server Premium Edition versie 2.1

Abonnement omzet *(in dollars maal duizend)*

Jaar	**2002**		**2003**
Abonnement omzet	42300	50% groei	63450
RH advanced omzet	21150		
Eind 28 feb 2003	63450		

De verkoopmix   *(omzet in dollars maal duizend)*

	huidig verkoopprijs	**aandeel**	**omzet**	**eenheden**
RH AS	799	30%	6345	7941
RH AS SE V2.1	1499	45%	9517,5	6349
RH AS PE V2.1	2499	25%	5287,5	2116
		100%	**21150**	**16406**

Draagkracht Red Hat Advanced Server   *(in dollars maal duizend)*

Draagkracht RH AS = **20%**	**fiscaaljaar**	**draagkosten**
Productiekosten	**2002**	
abonnement	9.887	1977
service	18.655	3731
hardware	0	
overige kosten ***	1.501	
Totaal	**30.043**	**5708**
Modulenkosten		
verkoop en marketing	33.442	6688
onderzoek en ontwikkeling	16.429	3286
juridisch en administratie	13.491	2698
Totaal	**63.362**	**12672**
Totale kosten	**$93.405**	**$18.381**

Kosten per product *(kosten in dollars maal duizend)*

product	prijs	draagkracht	kosten		kosten per eenheid
RH AS	799	30%	5514	0,694 x 1000 =	694
RH AS SE V2.1	1498	45%	8271	1,303 x 1000 =	1303
RH AS PE V2.1	2498	25%	4595	2,172 x 1000 =	2172
		100%	**18381**	4,169	4169

Cost-Plus methode *(in dollars)*

	RH AS	**RH AS SE**	**RH AS PE**
Ondernemingsfunctie			
Abonnement	75	140	234
Service	141	264	441
Verkoop en marketing	253	474	790
Onderzoek en ontwikkeling	124	233	388
Jurifisch en administratie	102	191	319
Totale kosten per product	**694**	**1303**	**2172**
Markup 15%	104 15%	195 15%	326
Advies verkoopprijs	799	1498	2498

Red Hats Financiën verwachting

Bedragen maal duizend
Abonnement omzet 50% groei

Fiscaaljaar *	28 feb. 2002		28 feb. 2003	
Inkomsten				**Stijging******
abonnement	42.300		63.450	50%
service	36.610		36.610	0%
hardware	0			
rente	15.535		15.535	0%
overige inkomsten **	2.240			
Totaal	**96.685**		**115.595**	
Totale inkomsten		**$96.685**		**$115.595**
Productiekosten				**Stijging******
abonnement	9.887		12.853	30%
service	18.655		22.386	20%
hardware	0			
overige kosten ***	1.501			
Totaal	**30.043**		**35.239**	
Modulenkosten				
verkoop en marketing	33.442		33.442	0%
onderzoek en ontwikkeling	16.429		18.072	10%
juridisch en administratie	13.491		14.840	10%
totaal	**63.362**		**66.354**	
Totale kosten		**$93.405**		**$101.593**
Winst / verlies in dollars		**$3.280**		**$14.002**

Koers Dollar in Euro's =   € 1,0550

Winst / verlies in euro's		**€ 3.460**		**€ 14.772**

*	Fiscaaljaar eindigt op 28 februari
**	Bestaat uit Lease buyout proceeds
***	Bestaat uit Lease buyout costs
****	Stijging ten opzichte van fiscaaljaar 2002

Koers dollar in euro's op 15 juni 2002