UK UUG

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Contents

From the Secretariat

Jane Morrison

The minutes from the Annual General Meeting held on 24th September have (as last year) been made available electronically. All members were emailed on 5th October and advised that the minutes and associated documents could be found on the web site at:

`http://www.ukuug.org/events/agm2009/`

Of course anyone who wants a printed copy should contact me here at the office.

Current Council members are: Paul Waring, Howard Thomson, Phil Hands, John Pinner, John Collins, Niall Mansfield and Holger Kraus. There is one vacant place.

Paul Waring continues in the role of UKUUG Chairman and Howard Thomson continues as Treasurer.

At the time of writing this piece we are just one week from the *Perl Tutorials* being held on 24th, 25th and 26th November. These tutorials, organised in conjunction with O'Reilly, continue to be popular with a total of some 36 attendees over the three days.

Other tutorials and training days organised for early 2010 include an *Introduction to Zenoss* Workshop led by Jane Curry on 27th January: full details in are included in this Newsletter.

Also to be held in the new year will be a *Practical Erlang Programming* tutorial by Francesco Cesarini.

UKUUG is planning more tutorials for 2010 – if you have any particular topics that you think would be of interest please let us know.

You should find enclosed with this mailing the information booklet and booking form for the forthcoming Spring Conference. We are returning to the popular Manchester Conference Centre this year and the event will be held from 23rd – 25th March 2010.

The annual membership subscription invoices will be sent out in January. Please look out for your invoice: as always prompt payment will be gratefully received!

UKUUG would like to thank the continued support of our Gold Sponsor members, IBM, SUN and Novell. Their involvement does help us to keep event fees down.

I should like to take this opportunity to wish you all a very Happy Christmas and a Peaceful New Year.

The Secretariat will be closed between 21st December and 4th January.

Please note the copy date for the next issue of the Newsletter (March 2010) is 19th February.

We are always looking for interesting submissions from members, so if you have any news, articles etc. please send copy direct to

`newsletter@ukuug.org`

Chairman's report

Paul Waring

Future Conferences

Due to the amount of time and advance planning required, Council has decided to put all its efforts into organising one major conference a year from 2010 onwards, rather than trying to spread our efforts over two big events. This means that next year there will be no Summer/Linux conference. Our programme of regular tutorials will continue throughout the year, and we already have several of these events lined up for 2010.

Council have also discussed the possibility of running a one day "unconference" in the Autumn, where there is no pre-defined schedule and people break up into groups to talk about whatever they want to on

the day. Such an event would take place on a weekend and would only involve a very small delegate fee to help cover the costs of the venue. We would like to get members involved in the organising and running of the event – this is only a small commitment as there is no timetable to prepare, conference dinner to organise etc. If you would be interested in helping make this sort of event happen, or have other ideas for events which we could run, please let us know.

Get Involved

UKUUG exists to serve its members and we are always on the lookout for people who are keen to get involved in any capacity, whether that be through volunteering to help with organising events, writing newsletter articles, or entirely new activities which haven't been tried before.

We are particularly keen to recruit a new member to Council this year, so if you feel you have the time to spare or would like to know more about what this involves, please get in touch and I will be happy to answer any questions you may have.

LWN 3-month trial subscriptions for UKUUG members

LWN (Linux Weekly News) is a leading Linux news site, edited by Jonathan Corbet.

The site offers news and comment of a very high standard related to Linux and open source, and is funded partly by subscriptions which give early access to "subscribers only" sections of the site.

LWN has kindly offered a free three-month trial subscription to any member of UKUUG who signs up between 7th December 2009 and 15th January 2010 at
`http://lwn.net/Promo/UKUUG09`

Announcement: Zenoss Introduction Workshop by Jane Curry

UKUUG & O'Reilly – Zenoss Introduction Workshop by Jane Curry

Wednesday 27th January 2010, London

Zenoss provides comprehensive Open Source network and systems management.

The purpose of this workshop is to get delegates started with Zenoss. The product will be installed in a VMware environment and the main functions of Zenoss will be explored through a series of practical exercises, using a combination of real and virtual devices.

Discovery: Zenoss can discover specific devices, any devices on a given network, and ranges of devices. They can be classified into different types (such as Router, Linux Server); they can also be displayed on a network map.

Availability: Availability polling can use ping, SNMP, WMI and ssh commands. In addition, TCP/UDP ports can be checked, Windows and Unix/Linux processes can be monitored along with Windows services.

Events: The Zenoss Event Console provides several views into the events database, filtered by device, event type or configured for a particular user. Events can be Acknowledged or Cleared and automation can be setup to alert via email or pager. Event actions can also be created.

Performance and reporting: Zenoss provides out-of-the-box collection of basic performance data which can be further customised. Standard performance graphs can be enhanced and customised reports can be created to augment those provided by Zenoss.

The workshop aims for at least 80% hands-on time.

No previous knowledge of Zenoss is assumed. By the end of the workshop, participants should have a working Zenoss installation with basic customisation and an appreciation of how to further customise for their own environment.

Workshop Presenter: Jane Curry

Jane Curry has been a network and systems management technical consultant and trainer for 20 years. During her 11 years working for IBM she had both presales and consultancy roles spanning the Tivoli availability products.

Since 1997 Jane has been an independent consultant working with many companies, both large and small, commercial and public sector. Over the last 5 years her work has been more involved with Open Source offerings, with Zenoss featuring heavily in the last 18 months. She has written a number of indepth technical papers on Zenoss, available from:
`http://www.skills-1st.co.uk/papers/jcurry.html`

She was awarded the title of Zenoss Master by Zenoss in February 2009.

Bookings

- UKUUG members: (Individual & Academic) £310 + VAT

- UKUUG members: (Commercial) £385 + VAT

- Non-members: £430 + VAT

On-line booking is available:
`http://www.ukuug.org/events/zenoss/`

Telephone bookings can be taken – contact the Secretariat on 01763 273475.

Prices include refreshments, lunch and course notes.

Laptop Requirements: Delegates should bring a laptop PC to use for the exercises. It needs:
- 10GB of free disk space
- 2GB of RAM
- VMware: Workstation is most flexible, but Server or Player will work
- DVD drive or USB to read virtual machine image

Announcement: Practical Erlang Programming Turtorial by Francesco Cesarini

UKUUG & O'Reilly – Tutorial: Practical Erlang Programming by Francesco Cesarini

Wednesday 3rd February 2010, London

Practical Erlang Programming covers the basic, sequential and concurrent aspects of the Erlang programming language. You will learn the basics of how to read, write and structure Erlang programs. The target audience are software developers and engineers with an interest in server side applications and massively concurrent systems.

This goal of tutorial is a hands-on introduction to the theory and concepts behind sequential and concurrent Erlang programming, explaining the Erlang syntax, semantics and concurrency model. We conclude with an overview of the error handling mechanisms used to build fault tolerant systems with five nines availability.

In order to get the most out of this tutorial, you must have a good grasp of other programming languages. This will be a hands on tutorial. Make sure you come with your laptop having installed Erlang and your favourite editor.

Tutorial Contents:

Introduction: Introduction to the software requirements of distributed, fault tolerant soft real time systems followed by a history of Erlang, its features, and product and research examples within and outside Ericsson.

Basic Erlang: This section deals with Erlang data types and pattern matching. Functions, modules, and BIFs are discussed. Before the exercises, the Erlang shell and useful shell commands are introduced.

Sequential Programming: The Sequential Programming section comprehends conditional evaluations, guards and scope of variables. It then introduces recursion, with a special emphasis on different recursive patterns, tail recursion, and space saving optimizations. Before the exercises, libraries and their manual pages, possible run time errors and the debugger are demonstrated.

Concurrent Programming: This section describes the creation of processes and their life span. It looks at sending and receiving messages, selective reception, and passing data in the messages. It continues with the various uses of time outs and registering processes, and terminates by showing the generic process code structure. Before the exercises, a demonstration of the Process Manager tool is given.

Process Error Handling: This section introduces the simple but powerful error handling mechanisms in processes. It looks at process links, exit signals and their propagation semantics. How robust systems are built in Erlang are discussed, with plenty of examples.

About the Tutor

Francesco Cesarini is the founder and Chief Strategy Offer of Erlang Training and Consulting. He is also a co-author of Erlang Programming, a book published by O'Reilly Media. Having started his career as an intern at Ericsson's computer science lab, the birth place of Erlang, and has used the language on a daily basis for the last 15 years. He has worked with flagship Erlang projects both within and outside of Ericsson, including the R1 release of the OTP middleware and the AXD301 Switch. He has taught Erlang/OTP to hundreds of professionals and undergraduate students alike.

Soon after Erlang was released as Open Source, he founded Erlang Training and Consulting. With offices in the UK, Sweden, Poland (and soon the US), they have become the world leaders in Erlang based consulting, contracting, support, training and systems development. Their client base is spread on five continents and ranges from small start-ups to blue chip companies. In his role as Technical Director, he is currently leading the research, development and consulting teams.

He is active in the Erlang community not only through regularly talks, seminars and tutorials at conferences worldwide, but also through his involvement in international research projects. He organises local Erlang user groups and with the help of his colleagues and runs the Trapexit Erlang community website.

The tutorials take place in The Caesar Room, Imperial Hotel, Russell Square, London WC1B 5BB, starting at 09:30 and ending approx. 17:00 each day.

Bookings

Book now online:
http://www.ukuug.org/events/erlang/

Telephone bookings can be taken – contact the Secretariat on 01763 273475.

- UKUUG members: (Individual & Academic) £160 + VAT
- UKUUG members: (Commercial) £225 + VAT
- non-members: (Individual & Academic) £220 + VAT
- non-members: (Commercial) £295 + VAT

Announcement: BCS OSSG event: 7th January 2010 – London

Public Funds in the UK: Open Source for Document and Content Management?

Is Open Source a viable way for the public sector to contain its IT costs?

Government policy is gradually becoming more favourable to open source. Many commentators identify open source as a way to contain spiralling project costs. Yet much of this discussion is driven by underlying agendas: it contains as much disinformation as realistic appraisal of the capabilities of open source software.

The BCS Open Source Specialist Group is organising an event to look at the reality behind the rhetoric. Responding to the challenge in the above Guardian article, we aim to bring together a group of information management practitioners and vendors to discuss their experience of web and document management in the public sector.

The event will consist of a series of talks, panel sessions and open discussion of the challenges of web and document management in the public sector, and the ways in which open source software might be suitable for addressing these challenges.

The event will be held on Thursday 7th January, 2010, from 10.00 to 17.30 at the BCS Central London Offices, First Floor, The Davidson Building, 5 Southampton Street, London WC2E 7HA
`http://www.bcs.org/upload/pdf/london-office-guide.pdf`

Speakers include Mike Davis (Ovum), Matt Hamilton (Netsight), John Newton (Alfresco), Jon Marks (LBi), Danny Budzak, John Lindsay (Kingston University), Francois Mounier and Tjeerd Brenninkmeijer (Hippo).

There will be no fee to participate in this event and a free buffet and refreshments will be available during the day.

For further details please visit
`http://ossg.bcs.org/`

2010 USENIX Calls for Papers

We have received the following information about future USENIX events with calls for papers and submission dates.

TaPP '10: 2nd Workshop on the Theory and Practice of Provenance

The TaPP workshop series builds upon a set of Workshops on Principles of Provenance organized in 2007-2009, which helped raise the profile of this area within diverse research communities, such as databases, security, and programming languages. We hope to attract serious cross-disciplinary, foundational, and highly speculative research and to facilitate needed interaction with the broader systems community and with industry.

TaPP '10 is co-located with FAST '10 in San Jose, California, USA, and takes place on February 22nd, 2010. The deadline for submissions is December 14th, 2009.
`http://www.usenix.org/tapp10/cfp/`

OSDI '10: 9th USENIX Symposium on Operating Systems Design and Implementation

The ninth OSDI seeks to present innovative, exciting research in computer systems. OSDI brings together professionals from academic and industrial backgrounds in what has become a premier forum for discussing the design, implementation, and implications of systems software. OSDI '10 will take place October 4-6, 2010, in Vancouver, BC, Canada, and is sponsored by USENIX in cooperation with ACM

SIGOPS. The deadline for submissions is May 7th, 2010.
`http://www.usenix.org/osdi10/cfp/`

USENIX ATC '10: 2010 USENIX Annual Technical Conference

The Program Committee seeks high-quality submissions that further the knowledge and understanding of modern computing systems, with an emphasis on implementations and experimental results. We encourage papers that break new ground or present insightful results based on practical experience with computer systems. USENIX ATC '10 will take place June 23-25, 2010, in Boston, Massachusetts, USA. The deadline for submissions is January 11th, 2010.
`http://www.usenix.org/atc10/cfp/`

USENIX Security '10: 19th USENIX Security Symposium

The USENIX Security Symposium brings together researchers, practitioners, system administrators, system programmers, and others interested in the latest advances in the security of computer systems and networks. All researchers are encouraged to submit papers covering novel and scientifically significant practical works in security or applied cryptography. USENIX Security '10 will take place August 11-13, 2010, in Washington, DC, USA. The deadline for submissions is February 5th, 2010.
`http://www.usenix.org/sec10/cfp/`

Additional Open Calls

HotPar '10: 2nd USENIX Workshop on Hot Topics in Parallelism. To be held on June 14th and 15th, 2010, Berkeley, California, USA. The deadline for submissions is January 24th, 2010.
`http://www.usenix.org/hotpar10/cfp/`

LEET '10: 3rd USENIX Workshop on Large-Scale Exploits and Emergent Threats. To be held on April 27th, 2010, San Jose, California, USA, and co-located with NSDI '10. The deadline for submissions is February 25th, 2010.
`http://www.usenix.org/leet10/cfp/`

WebApps '10: USENIX Conference on Web Application Development To be held between June 23rd and 25th, 2010, Boston, Massachusetts, USA. Paper titles and abstracts are due January 4th, 2010.
`http://www.usenix.org/webapps10/cfpm`

Other events

NSDI '10: 7th USENIX Symposium on Networked Systems Design and Implementation. Sponsored by USENIX in cooperation with ACM SIGCOMM and ACM SIGOPS. April 28-30, 2010, San Jose, California, USA.
`http://www.usenix.org/nsdi10/cfp/`

SustainIT '10: First USENIX Workshop on Sustainable Information Technology. To be held on February 22, 2010 and co-located with FAST '10 in San Jose, California, USA.
`http://www.usenix.org/sustainit10/cfp/`

EuroBSDCon 2009 report

Gerard van Essen

This year the UKUUG kindly organised the EuroBSDCon 2009 conference, which was held in Cambridge from the 18th to the 20th September. It was the eighth European BSD Community's annual event to meet, share and interact across the projects and between friends. It proved once again to be a great opportunity for BSD developers and experts to present new ideas to the community, to socialise and to hack and meet together face-to-face, instead of by email and IRC.

Prior to the Conference the European FreeBSD Dev Summit started (17th and 18th). FreeBSD developers discussed there the desired new features for the next version of FreeBSD, FreeBSD 9, and some of those present gave an overview of the project they are working on and what they are planning for the future.

The conference started with a day of tutorials. Kirk McKusick's talk was titled *FreeBSD Overview, and a focus on FileSystems and VM*. Peter Hansteen did a tutorial called *Building the network you need with PF*, and Randall Steward gave an introduction to SCTP (*SCTP Introduction and Workshop*).

Unfortunately, I attended Friday and Saturday, and arrived on Thursday night late, missing the first day of the Dev Summit. Friday started with a walk over to the Computer Lab, where the day started with a warm welcome by Robert Watson, who is on the FreeBSD Core Team. He also gave an overview of his work porting Apple's Grand Central Dispatch to FreeBSD. Alexanter Moting spoke about his work on ATA-CAM. This was followed by a discussion and brainstorm session of the to-be-included features in FreeBSD 9. After lunch I joined a break-out session led by Hans Peter Selasky who gave an introduction on his USB 2.0 work, his plans to support USB 3.0, and he demonstrated a working web camera under FreeBSD. After some more sessions, it was time for a bit of exercise: punting. I've done it before, but it's always great fun. We punted along the famous University buildings to Teri-Aki Restaurant where we had dinner.

During the two days of the conference, there were two parallel tracks at most times. Highlights of Saturday were: *How FreeBSD finds oil*, *FreeBSD in a complex environment*, *ISC and BSD*, *Superpages in FreeBSD 8.0*, *pfSense* and *Long distance wifi*. Outlines and recordings of the talks are at:
`http://ukuug.org/events/eurobsdcon2009/schedule/`

These talks made it very clear that the BSD branch of the operating systems is certainly not dying, but going from strength to strength, thanks to the vision and dedication of developers and community.

I have thoroughly enjoyed my two days in Cambridge. It was the first BSD conference I've ever attended. The weather was nice, the workshops were interesting and the food was good. The UKUUG has done a great job organising the event. All went smoothly, from registration to rooms, to food, to wifi availability. Organised by UKUUG, sponsored by the FreeBSD Foundation and iXsystems (et al) and hosted by the University of Cambridge. All in all: a very successful conference.

The Birth of the Net

Peter H Salus

Let's pose a question: What is networking?

Is a single point-to-point connexion a simple network? I think so. In his brilliant Communication Nets (1964; reprinted 2007), Len Kleinrock says "The simplest structural system consists of a single channel" (p. 1).

So, let's start in the (relatively) distant past. In September 1940, George Stibitz connected a teletype at Dartmouth in Hanover, NH, to the Complex Calculator (Bell Labs Model 1) in Manhattan by means of a dedicated telegraph connexion. I would call this remote calculation, not networking. In 1963 Larry Roberts (at MIT's Lincoln Lab in Massachusetts) and Thomas Marill in Santa Monica, California managed to connect Lincoln's TX-2 to the Systems Development Corporation's AN/FSQ-32 via a dedicated 1200 bps telephone link, so that any command from one machine would be executed on the other.

At this time, Donald W. Davies, Roger Scantlebury and their colleagues at the NPL in Teddington were working on a "Digital Communication Network." Scantlebury delivered a paper on their work in Tennessee in October 1967. In 1986 at the ACM conference Roberts recalled meeting Davies in 1965 at which time he introduced the term "packet switching."

These are among the most salient footsteps leading us to 1969.

Just before Chrismas 1968, the Advanced Research Projects Administration of the US Department of Defense "let" a contract to BBN in Cambridge, Massachusetts, for a four-node packet-switching network to be completed by the end of 1969.

The four nodes of this network were to be UCLA SRI (Stanford Research Institute) UC-Santa Barbara and University of Utah.

Why these? Well, first of all they were prominent among the twenty-odd computer sites ARPA was funding. Secondly, no two were running the same mainframe, thus ensuring heterogeneity.

Steve Crocker, a graduate student at UCLA, wrote (in RFC 1000):

> *The contract called for four IMPs to be delivered to UCLA, SRI, UCSB and The University of Utah. These sites were running a Sigma 7 with the SEX operating system, an SDS 940 with the Genie operating system, an IBM 360/75 with OS/MVT (or perhaps OS/MFT), and a DEC PDP-10 with the Tenex operating system.*

"IMPs"? What were IMPs? In April 1967 at a meeting in Ann Arbor, Michigan, Larry Roberts and Bob Taylor spoke of their hopes for a network. The problems involved the very large number of conventions necessitated in exchanging messages between the number of possible pairs of different computers. During a rainy shared cab ride from Ann Arbor to the airport, Wesley Clark (then at Washington University in St. Louis) told Roberts of his notion to have a small computer on each site. These homogenous computers would communicate with each other and each of the sites would only need a single set of conventions to deal with. Roberts referred to them as "Interface Message Processors" in a memo on 27 April.

When the contract arrived at BBN, the first concern was which "mini-computer" was the most suitable to become the IMP. The hardware selected was the Honeywell DDP-516. The 516 wasn't really a Honeywell machine. It had been designed by a company called CCC which Honeywell bought out. The 516 had 16-bit words and a 0.96 microsecond cycle. It was configured with 12 Kilowords of memory, 16 multiplexed I/O channels, a 16-level priority interrupt system, a 100 microsecond clock, and a set of programmable status lights. A Teletype and a paper-tape reader were included. [see BBN Report 1763, January 6, 1969]

The IMP's operating system occupied 6K of the words, leaving 6K for message storage.

In 1969 BBN shipped four pieces of equipment to each host site: the IMP itself, an ASR-33 Teletype, a high-speed paper-tape reader, that contains modems connecting the IMP to the communication lines. BBN Report 1822 notes that "The telephone company will supply modems only for the communication lines actually installed." It's hard to know whether the telephone company has been an aid or a hinderance over the past 40 years.

The 516 IMP was $74" \times 24" \times 28"$ and weighed 990 lbs. It required 2100 watts. The modem cabinet was about the same size and weighed "up to 750 lbs." The paper-tape reader weighed 25 lbs.; the ASR-33 Teletype, 56 lbs.; the total was just under a ton. Mini computing 40 years ago!

On Thursday, August 28, 1969, IMP #1 was fully tested. It was crated and trucked to Boston's Logan Airport and sent as airfreight to Los Angeles, whence it was trucked to the UCLA loading dock. It was Saturday. Kleinrock's students (plus Truett Thach from BBN's Santa Monica office) unpacked and by Tuesday the IMP was connected to the Sigma 7 and running.

IMP #2 was delivered to the SRI in Menlo Park, California the first week in October; IMP #3 went to Santa Barbara the first week in November. Test messages between UCLA and the SRI seemed to be stable and Roberts flew to California. On November 21, 1969 there was a connexion established between Kleinrock's lab and Doug Engelbart's 500 miles away: the first Telnet session.

No one seems to recall what the first message was. It wasn't "What hath God wrought?" nor "Come here, Watson . . . " But it was amazing.

The first week in December the University of Utah received IMP #4. It worked as planned. There was a four-node heterogeneous network by the end of 1969.

Growth began slowly.

```
12/69    4
01/71   13
```

```
04/72   23
01/73   35
10/74   49
01/76   73
```

But then the rate increased:

```
08/81   213
05/82   235
08/83   562
```

The great switch to the domain naming system occurred on 1 January 1983. By October 1985 there were 1961 hosts on the Internet. By October 1989 there were 159,000. By the end of 2009 there will certainly be over 2,000,000,000 devices connected to the Internet.

On January 11, 1972 Alex McKenzie at BBN wrote to Nico Tinbergen inviting Carnegie-Mellon University in Pittsburgh to become a host on the ARPANET, which might grow to "a network user community of 2000 people, distributed over 14 sites." Yep.

In 1985, Vint Cerf, frequently called "the father of the Internet," who was a graduate student in Kleinrock's lab at UCLA in 1969, published:

```
Network Working Group                                          V. Cerf
Request for Comments: 968                                          MCI
                                                        December 1985


                    'Twas the Night Before Start-up'


  STATUS OF THIS MEMO

     This memo discusses problems that arise and debugging techniques used
     in bringing a new network into operation.  Distribution of this memo
     is unlimited.

  DISCUSSION

     Twas the night before start-up and all through the net,
       not a packet was moving; no bit nor octet.
     The engineers rattled their cards in despair,
       hoping a bad chip would blow with a flare.
     The salesmen were nestled all snug in their beds,
       while visions of data nets danced in their heads.
     And I with my datascope tracings and dumps
       prepared for some pretty bad bruises and lumps.
     When out in the hall there arose such a clatter,
       I sprang from my desk to see what was the matter.

     There stood at the threshold with PC in tow,
       An ARPANET hacker, all ready to go.
     I could see from the creases that covered his brow,
       he'd conquer the crisis confronting him now.
     More rapid than eagles, he checked each alarm
       and scrutinized each for its potential harm.

     On LAPB, on OSI, X.25!
       TCP, SNA, V.35!

     His eyes were afire with the strength of his gaze;
       no bug could hide long; not for hours or days.
     A wink of his eye and a twitch of his head,
       soon gave me to know I had little to dread.
     He spoke not a word, but went straight to his work,
       fixing a net that had gone plumb berserk;
     And laying a finger on one suspect line,
       he entered a patch and the net came up fine!
```

```
    The packets flowed neatly and protocols matched;
       the hosts interfaced and shift-registers latched.
    He tested the system from Gateway to PAD;
       not one bit was dropped; no checksum was bad.
    At last he was finished and wearily sighed
       and turned to explain why the system had died.
    I twisted my fingers and counted to ten;
       an off-by-one index had done it again...


    Vint Cerf
    December 1985
```

Happy Birthday, ARPANET/Internet!

> *[For a full narrative history, see my* **Casting the Net** *ISBN-13: 978-0201876741 (1995);*
> *for the actual documents, see* **The ARPANET Sourcebook: The Unpublished Founda-**
> **tions of the Internet** *ISBN-13: 978-1573980005 (2008)]*

The Advent of Linux

Peter H Salus

Linus Torvalds was born in Helsinki, Finland, 28 December 1969. The ARPANET had four hosts. UNICS was running on one machine at Bell Labs.

The first Berkeley tape (1977) was a Pascal system plus the vi editor for the PDP-11. 2BSD came the next year. 3BSD, the first Berkeley release for the DEC VAX, appeared in late 1979 (V7 had been announced six months earlier). In 1980 4BSD was released and became quite popular, largely because it was the only Unix that ran on the VAX 11/750. Listing all the Berkeley releases would be excessive. But it is important to note that 4.2BSD was what Bill Joy took to Sun Microsystems in 1982 to become SunOS. And in 1992, SunOS was succeeded by Solaris.

At the same time, Andrew S. Tanenbaum, a Unix user at the Free University in Amsterdam, frustrated by AT&T's licensing, decided to write a system incorporating no AT&T/Bell code and which could run on the 'new' PC with an Intel chip. By 1986 you could run Minix.

A few years later, Linus Torvalds, a college student in Helsinki who was playing with Minix, began writing another clone. "Just for fun," he said, unwittingly echoing Ken Thompson's 1969 remark. Begun as a terminal emulator, by 1991 Linux was available via ftp. By 1992, Both SuSE and Yggdrasil Linux were available; in 1994 Red Hat and Linux Pro were established.

<p align="center">*   *   *</p>

How did it grow?

Because, thanks to Richard Stallman, Andrew Tannenbaum and Linus Torvalds, Linux is "free as in freedom," there is no way of knowing how many users of the many Linux versions there are. So let's look at the growth of the system over the first year.

```
17 September 1991        Linux .01         63KB compressed
   5 January 1992        Linux .12        108KB compressed
      25 May 1992        Linux .96        174KB compressed (support for X)
```

Also in 1992, SuSE was formed and Bruce Perens produced MCC Linux. On 8 December, Adam Richter released Yggdrasil Alpha (Beta followed on 18 February 1993). 1993 also saw Slackware, Red Hat and Debian.

Let's look at Debian. First released by Ian Murdock, Debian has had several managers. After "Toy Story" appeared (November 1995), each release was named after one of the film's characters – the last column is the number of software packages included.:

```
1.1     buzz       17 June 1996              474
1.2     rex     12 December 1996             848
1.3     bo          5 June 1997              974
2.0     hamm       24 July 1998            1,500
2.1     slink       9 March 1999           ˜2,250
2.2     potato   15 August 2000            ˜3,900
3.0     woody      19 July 2002            ˜8,500
3.1     sarge       6 June 2005           ˜15,400
4.0     etch        8 April 2007          ˜18,000
5.0     lenny   14 February 2009          ˜23,000
```

In 18 years, Linux has grown enormously.

<center>*   *   *</center>

Macintosh OS X Server appeared in 1999. OS X was derived from Darwin, an open source POSIX-compliant operating system. It is composed of code developed by Apple, as well as code derived from NEXTSTEP, BSD, and other free software projects. It has undergone a great deal of development in the past decade, but its roots are quite clear. If you've got an Apple mini or a laptop, open a terminal window, and enter `man cat`. The text is nearly identical to that originated by Dennis Ritchie on November 3, 1971; and the page tells you it's the "3rd Berkeley Distribution" of "May 2, 1995."

Oh, yes. If you encounter a Microsoft system, it's running the Berkeley TCP/IP stack. Unix (and its children) is ubiquitous.

And what about C? Well, it's still going strong. Among its children and grandchildren are: awk, csh, C++, C#, Objective-C, BitC, D, Java, JavaScript, Limbo, Perl, PHP, Python, and many, many more.

In September 1983, Richard Stallman had announced the GNU Project. And his doing so inspired cooperation that went all over via the Net. At that time, Linus Torvalds was 14 years old and was "playing" with a Commodore VIC-20. Only a few years later, he spent his savings on a Sinclair QL, running at 7.5MHz with 128kB of RAM (the VIC-20 had 5k).

By early 1996, when the First Freely Redistributable Software Conference was held by the FSF, there was quite a large GNU and Linux community.

Today there are well over 300 distributions and the community is truly world-wide. Insofar as number of users is concerned, no one knows. If you use Google or order from Amazon, you are using Linux. There are an estimated 2,000,000,000 devices connected to the Net.

There are only a few things that have propelled technology to where we are today: smaller and cheaper hardware, better communications (the Internet and everything that rides on it, like the Web), and portable operating systems and applications. And both the communications network and Unix, Linux, and the languages and programs all originate in the late summer of 1969.

Computation and communication. But a third thing may be the most important: cooperation.

Milestones:

> *"Why would anyone want a telephone in their home?" Alexander Graham Bell, 1876*

> *"Where a calculator on the ENIAC is equipped with 18,000 vacuum tubes and weighs 30 tons, computers in the future may have only 1,000 vacuum tubes and weigh only 1.5 tons." Popular Mechanics, March 1949.*

> *"There is no reason anyone would want a computer in their home." Ken Olson, president, chairman and founder of Digital Equipment Corp. (DEC), 1977.*

> *In 1981, Bill Gates said: "640K ought to be enough for anybody."*

In 1993, he said: "The Internet? We are not interested in it"

*   *   *

Following is part of a press release. The same information was filed with the US SEC on 18 October.

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Lindon, Utah, October 16, 2009 -- The SCO Group, Inc., (Pink Sheets:
SCOXQ) a leading provider of UNIX® software technology, today
announced a restructuring plan following an analysis of the company's
operations and cost structure undertaken by Chapter 11 Trustee, Edward
Cahn and his advisors.

The company expects to finalize details of the restructuring and to reach
cash flow breakeven for core operations within the next month. The savings
are a combination of non-workforce related changes and a modest reduction
in SCO's workforce. As part of the restructuring, the company has
eliminated the Chief Executive Officer and President positions and
consequently terminated Darl McBride. The current management team
comprised of Chief Operating Officer, Jeff Hunsaker, Chief Financial
Officer, Ken Nielsen and General Counsel, Ryan Tibbitts, will continue to
work closely with the Chapter 11 Trustee and his advisors to implement the
restructuring plan, move the intellectual property litigation forward with
Boies, Schiller & Flexner, LLP and emerge from Chapter 11
bankruptcy. ...
```

By the time you read this, the plot may have unreveled further.

Happy 40th, Linus!

Happy New Year!

Version Control with Git
Jon Loegier
O'Reilly Media
ISBN: 978-0-596-52012-0
328pp.
£ 26.99
Published: June 2009

reviewed by John Collins

Git is the version control suite devised and mostly written by Linus Torvalds himself following a dispute concerning the commercial version control system he was previously using for Linux Kernel development up until 2005. Its direct competitors are Subversion and Mercurial. The previous version control system in widespread use was CVS. Before that was RCS and before that SCCS but those only really manage single files. A key feature of the newer version control systems is the ability to manage more than one repository in different locations and to efficiently manage and control multiple branches of development and merge branches.

This book introduces Git well, starting with use of a single repository and teaching the use of branches and merges, resolving conflicts in merges and so forth, with helpful diagrams for what is going on at each stage. Then the book moves on to work with multiple repositories and how do branches patches and merges with those.

The book concludes with how to use Git when everyone else is using Subversion.

The book is pretty good but I felt it was let down by not really going through and explaining all the options of various commands - I noticed a few which I find useful, like colour diffs, weren't mentioned at all.

Also this is most appropriate for old timers (like me) who never feel comfortable without a command line to type at. The various GUI interfaces only get a very brief mention which seems a pity.

With those quibbles I'm sure the book with be very useful to anyone planning to work with Git.

The book of Xen
Chris Takemura and Luke Crawford
No Starch Press
ISBN: 978-1-59327-186-2
312pp.
£ 39.49
Published: October 2009

reviewed by Roger Whittaker

This is an entire book about using Xen virtualisation in practice. As such it is the latest entrant to a small field – when searching for other books on Xen, I found two others that seem to be general and practical in their aim, one very theoretical book mainly for coders, and one book dedicated to a particular commercial implementation.

As the author of *The Book of Xen* writes, Xen is the leading open source virtualisation method. As the virtualisation method used by Amazon's EC2 and other cloud services, it is clearly of major importance, but at the same time it has not been as able to make serious inroads into VMWare's dominance in the "Enterprise" virtualisation market as was expected two or three years ago, despite the fact that the Xen hypervisor is bundled with most current Linux distributions, including the main commercial distributions (though that will change, at least in the case of Red Hat, with the next release).

Xen was first included in the major distributions in 2006, and a lot has happened since then. In particular that was the year in which both AMD and Intel released hardware with HVM (Hardware Virtual Machine) capabilities. It was also the time that the KVM project came to notice and some influential Linux people started raising doubts about Xen's approach.

In some ways this book still inhabits the atmosphere that existed at that time, when Xen was the new and exciting player in the open source virtualisation field (and when I was thrilled to be lucky enough to have a pre-release AMD "Pacifica" machine to play with the pre-release SLES 10's Xen implementation on). In the first chapter of the book, we learn that *"newer processors incorporate support for hardware virtualisation, allowing unmodified operating systems to run under Xen"*. And accordingly most of the book is about paravirtualisation. I suppose it depends what you mean by "newer": for three years (a very long time in the world of hardware) almost all new server hardware has had this capability.

The authors' backgrounds are in virtual private hosting (Luke Crawford founded the US virtual hosting provider `prgmr.com`), which possibly explains and corresponds with these biases quite well.

Whatever we think about how the virtualisation wars will play out in the future, however, this is a good book. It starts with a clear and full description of how the different methods of virtualisation work: this is a good omen for the rest of the book. The practical sections start in the second chapter, and most of the book uses Centos 5.x and the Xen 3 version that ships with it as the dom0 operating system and hypervisor. However, there is a whole chapter on using the Citrix XenServer product, and there are sections on using OpenSolaris and NetBSD both as dom0 and as domU.

The sections on provisioning virtual machines start begin a very much "from scratch" approach: creating a virtual disk, mounting it loopback and filling it up manually. Although they go on to explain more automated ways of working, including those that ship with the distribution, this is typical of the authors' method: to help the reader to understand the principles of how things work at a basic level, by doing them the hard way first. This is definitely not one of those books full of screenshots and "click this" instructions. At times I felt that things were going a bit too fast, and there were moments when I wasn't

quite sure whether the commands quoted were being entered in the dom0 or the domU. But maybe that was just me getting confused.

There are good sections on Xen storage and migration, and on HVM and Windows VMs, although as noted above, these latter are slightly detached from the rest of the book. Near the end of the book there are long chapters of "tips" and troubleshooting hints. The layout of the book is attractive, and the code and command examples are clearly laid out and easy to read. This is a book written by experts in its subject matter, and I can recommend it.

Contributors

John Collins is a UKUUG Council member and runs Xi Software Ltd which specialises in System Management tools for UNIX and Linux systems. Xi Software is based in Welwyn Garden City and has been in existence for nearly 21 years.

Gerard van Essen is a BSD enthusiast advocating use of open source software, especially FreeBSD related operating systems. He is a contributor to the PC-BSD project, and is the founder and maintainer of the website "FreeBSD, the unknown Giant"
`http://www.freebsdnews.net`

Jane Morrison is Company Secretary and Administrator for UKUUG, and manages the UKUUG office at the Manor House in Buntingford. She has been involved with UKUUG administration since 1987. In addition to UKUUG, Jane is Company Secretary for a trade association (Fibreoptic Industry Association) that she also runs from the Manor House office.

Peter H Salus is the author of *A Quarter Century of UNIX* (1994), *Casting the Net* (1995) and *The Daemon, the Gnu and the Penguin* (2008), and the editor of nearly a dozen other volumes.

Paul Waring is chairman of UKUUG and currently and the Technical Manager for an insurance intermediary. He is also responsible for organising the UKUUG Spring conference in 2010.

Roger Whittaker works for Novell Technical Services at Bracknell supporting major Linux accounts in the UK. He is also the UKUUG Newsletter Editor, and co-author of three successive versions of a SUSE book published by Wiley.

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