

Hysterical Raisins, or What did you do in the OSI Wars, Daddy?

...!mcvax!fulcrum!igb

igb@uk.co.fulcrum

/I=IG/S=Batten/OU=Fulcrum/O=BT

Axion/PRMD=UK.CO.BT/ADMD=GOLD 400/C=GB/

The Obligatory Pitch

- Fujitsu Telecommunications
 - Main provider of optical access to BT
 - Main provider of xDSL to BT
 - 21CN Access (one of two)
 - Long legacy, including TPON, M6000, LA30, SyncMux and those little red and white tents you see in the street.

My Point of View

- At the time, I was running Mail and WAN services for a telecomms and computer manufacturer.
- I was also providing some of the development effort in that field.
- I was always involved at one remove.
- I'm covering 89-92, when OSI lost and the Internet won.

History in Headers

```
Received: from axion.UUCP by cat.fulcrum.bt.co.uk (smail2.5/cat/1.4) with UUCP;  
21 Jun 89 10:17:25 BST (Wed)  
Received: from ukc.ac.uk by zaphod.axion.bt.co.uk via PSS with NIFTP  
id aa27918; 21 Jun 89 9:20 WET DST  
Received: from mcvax by kestrel.Ukc.AC.UK via EUnet with authorised UUCP  
id aa21115; 21 Jun 89 7:49 BST  
Received: by mcvax.cwi.nl via EUnet; Wed, 21 Jun 89 01:20:49 +0200 (MET)  
From: andrew@research.att.com  
Received: from arpa.att.com by uunet.uu.net (5.61/1.14) with SMTP  
id AA16454; Tue, 20 Jun 89 19:06:13 -0400
```

```
Received: from axion.bt.co.uk by balti.fulcrum.bt.co.uk (5.61/IDA/1.19)  
with SMTP id AA02845; Fri, 9 Aug 91 17:32:55 +0100  
Received: from ukc.ac.uk by zaphod.axion.bt.co.uk via PSS with niftp (pp)  
id <24452-0@zaphod.axion.bt.co.uk>; Fri, 9 Aug 1991 17:35:27 +0100  
Received: from earn-relay.ac.uk by kestrel.Ukc.AC.UK via Janet (UKC CAMEL FTP)  
id aa21340; 9 Aug 91 13:44 BST  
Received: from UKACRL by UK.AC.RL.IB (Mailer R2.07) with BSMTTP id 6103;  
Fri, 09 Aug 91 13:43:29 BST  
Received: from ESOC.BITNET by UKACRL.BITNET (Mailer R2.07) with BSMTTP id 3482;  
Fri, 09 Aug 91 13:43:29 B  
Received: from ESOC (ABATTEN) by ESOC.BITNET (Mailer R2.07) with BSMTTP id 9045;  
Fri, 09 Aug 91 14:41:58
```

History In Headers (2)

```
X400-Received: by mta kether.fulcrum.bt.co.uk in /PRMD=UK.CO.BT/ADMD=Gold 400/C=
GB/;
                Relayed; Sun, 23 Feb 1992 02:59:37 +0000
X400-Received: by mta zaphod.axion.bt.co.uk in /PRMD=UK.CO.BT/ADMD=GOLD 400/C=GB
/;
                Relayed; Sun, 23 Feb 1992 02:58:15 +0000
X400-Received: by mta eros.uknet.ac.uk in /PRMD=UK.AC/ADMD= /C=GB/; Relayed;
                Sat, 22 Feb 1992 21:17:07 +0000
X400-Received: by mta src.dec.com in /PRMD=UK.CO.BT/ADMD=GOLD 400/C=GB/;
                Relayed; Sat, 22 Feb 1992 21:16:10 +0000
Date: Sat, 22 Feb 1992 21:16:10 +0000
```

```
Received: from inet-gw-1.pa.dec.com by kether.fulcrum.co.uk with smtp (pp)
        id <00488-0@kether.fulcrum.co.uk>; Tue, 3 Mar 1992 17:05:19 +0000
Received: by inet-gw-1.pa.dec.com; id AA27121; Tue, 3 Mar 92 09:04:41 -0800
Received: by bambam.pa.dec.com; id AA01259; Tue, 3 Mar 92 09:04:31 -0800
```

History in Headers (3)

```
X400-Received: by mta kether.fulcrum.co.uk in /PRMD=uk.co.bt/ADMD=gold 400/C=gb/  
;  
                Relayed; Mon, 26 Oct 1992 17:33:38 +0000  
X400-Received: by /PRMD=OAMAIL/ADMD=GOLD 400/C=GB/; Relayed;  
                Mon, 26 Oct 1992 17:37:03 +0000  
Date: Mon, 26 Oct 1992 17:37:03 +0000  
X400-Originator: irene@buzzard.bt.co.uk  
X400-Recipients: I.G.Batten@fulcrum.co.uk  
X400-MTS-Identifier: [/PRMD=OAMAIL/ADMD=GOLD 400/C=GB/;bt_therese 0004425.000720  
121023]  
X400-Content-Type: P2-1984 (2)  
From: Irene Hassell <irene@buzzard.bt.co.uk>
```

Found while poking around in my logs, 1992

```

+-----+-----+
|          XXXXX  XXXXXX  XX    XX          |          Provided by:          |
|        XXXXXXXX   XX    XX   XX          |                               |
|       XX   XX   XX    XX  XX  +-----+   |          CIX                  |
|       XX          XX    XXX             | Europe's Most                 |
|      XX   XX   XX    XX  XX             | Advanced                      |
| XXXXXXXX   XX    XX   XX             | Conferencing                  |
| XXXXX   XXXXXX  XX    XX             | System                        |
|                               |                               |
+-----+-----+
| 081 390-1255 Courier HST DS+ V32bis, HST-14.4K, V42bis MNP 5 - 32 lines |
| 081 390-1244 Courier HST DS+ V32bis, HST-14.4k, V42bis MNP 5 - 26 lines |
| 081 390-9787 Hayes Ultras V32bis, Hayes 9600, V42bis MNP 5 - 4 lines  |
| 081 399-5252 Tricom Modems with V21 V22 V23 V22bis MNP 5 - 14 lines   |
| 081 399-3468 Dataflex V24 ISDN Terminal Adapter with V110 - 2 lines    |
| 2342 1330 0310 is our NUA for PSS, or X25 access - 10 chans           |
| cix.compulink.co.uk is our address for Telnetting into CIX - 10 users  |
+-----+-----+

```

If you type "qix" instead of "cix", this screen will not be displayed

What did stuff cost (excluding telco line costs!)

The new prices below come into force on February 1st, 1993.
We intend to continually review our prices.

per qtr

News Subs	50.00
Mail Subs	95.00 (outbound per Kb unchanged at 7.5p/Kb)
Pool Dialup IP	450.00
Dialup IP	600.00
PSS 9.6 IP	900.00
PSS 48k IP	1250.00
Leased 64k IP	1250.00

What was OSI?

- Complete, soup-to-nuts networking solution.
- Several lower layers, several transport layers, very complex upper layers.
- Main players were telcos, research bodies and national standards bodies.
- I'm going to use email (X.400) as the defining protocol, because FTAM, JTAM et al were never used in production outside niche environments.

Why did OSI Fail?

- An object lesson in the arrogance of standards bodies?
- A triumph for rough consensus and running code?
- Proof of the wonders of the IP stack?
- The power of the market at work?

What did UK networking look like?

- Academia: coloured books over Nx64 or possibly 2M, Internet post-Shoestring Project (1993?)
- Business: Coloured Books via PSS (very rare), UUCP over dialup (still pretty rare!), Internet post-91.
- General public: you must be joking.

Who was doing mail?

- Academia: peer-to-peer with NIFTP
- Big Business: peer-to-peer or peer-to-hub with NIFTP
- Smaller Business: UUCP by nightly dial-up
- Plus any amount of ad hoc stuff.

Who were the providers in the 80s?

- ARPAnet for SERC-funded bodies:
UCL-CS.ARPA (Steve K, Irene H)
- Kent for the rest: (Peter C, Peter H, Ian H)
- There was a link from RAL to WISCVM via Bitnet, but it wasn't reliable and it did EBCDIC conversion!

What was driving OSI in the UK?

- JNT insisted that JANET would transition from Coloured Books to OSI.
- Telcos saw it as an opportunity to hold their share.
- Government was talked into it by EU and telcos.
- Big Business was pushed by government.
- No one gave a toss about SME and consumers.
- TCP was **not** universal at the time.

Addressing

- Even email addresses weren't standard.
 - igb@uk.co.bt.fulcrum
 - igb@fulcrum.bt.co.uk
 - ...!mcvax!fulcrum!igb
 - /I=IG/S=Batten/OU=fulcrum/O=BT
Axion/PRMD=UK.CO.BT/ADMD=GOLD
400/C=GB/ (or something)

In passing...

- One amusing side-line of the period was that the `uk.ac.bham.cs` vs `cs.bham.ac.uk` dispute was still rumbling when Czechoslovakia came into email.
- Suddenly, ad hoc solutions stopped working.
- Imperial, Strathclyde and others adopted `dcs' instead of `cs'.
- But not merely did Greybook die, Czechoslovakia split up!

What else was out there?

- Coloured Books were known to be UK-only and dying.
- UUCP still had a huge following. HoneyDanBer had made it respectable, pathalias made it usable.
- TCP/IP wasn't bundled with most operating systems, even Unix ones.
- XNS, SNA, DECNet...every vendor...

What was the threat?

- The claim was that all datacomms on government funded or provided networks would be via OSI.
- No-one understood OSI well enough to implement, except for the hardcore.
- Everyone sensible wanted an Internet connection, but “it will never catch on” © My Wife (she said the same of SMS, mind you).

Was this stuff taken seriously?

- Yes.
 - People were seriously discussing how to, for example, run Usenet via X.400 mailing lists (presentation at UKUUG conference at UKC, 1988).
- It was assumed that all internal email systems would be X.400.
 - There were few open alternatives.
 - P7 Message Store looked a good alternative to POP, P7 Plus to IMAP, both of which were fairly rare.

What would Email have looked like?

- Telcos would run email, just like they ran the PSTN.
- There was no serious discussion of email for the masses: this was purely a business to business play.
- The main stakeholders were providers, not consumers.

What was the Software?

- ISODE: Marshall Rose, Steve Kille, Julian Onions, et al.
- PP: Steve, Julian, et al.
- Plus any amount of broken or semi-functional vendor stacks, which their heart wasn't in.
- The reputation for bloat was ill-deserved, by the way: we ran PP on a Sun IPC.
- And paradoxically, PP was and is probably the best SMTP mailer there's ever been!

What was happening IP-wise?

- Let's do this by UKUUG winter conference!
 - Cardiff '89: Andrew Findlay advocates X and NFS over WAN, while the JNT state that IP is proprietary and not to be used.
 - Cambridge '90: Peter Houlder announces 64K Internet for £25K plus the circuit to UKC. Peter Dawe talks about the UKIC. Sun 4/330s are given to Universities to run PP, ready for transition.
 - Herriot-Watt '91: Peter H has had about ten takers, but can't buy a Cisco AGS as the University sees no future in the Internet...

What about UUCP?

- GBNet had over 500 customers
- Anyone with a trailblazer modem could meet all the geeks they wanted, but most dialup email was best-efforts via willing volunteers (axion, stc, fulcrum)

Who was using OSI?

- X.400 worked-ish, and small numbers of companies were using it in low volume.
- X.500 for practical purposes had failed, so there was no directory. Manual download of PRMD information.
- DNS was now working well (no `hosts.txt` file!), so the failure of X.500 looked unforgivable.
- Fulcrum was taking all its email via X.400(88). I believe we were the only ones!

So what killed OSI?

- Lower layers:
 - multiple, non-interworking transport services.
 - caused by pandering to various telco interests with various legacy estate
 - incomprehensible addressing structures

The Killers, Named

- Upper Layers
 - “Profiles” which meant that multiple implementations of the same standard could be non-interworking
 - Standards written without regard to implementation
 - Standards codifying low-quality research, not high-quality experience.
 - Incomprehensible addressing structures
 - The failure of X.500
 - The ‘need’ to interwork Telex, fax, Videotex...

The role of the standards bodies

- A desire to cover all cases, in all scenarios.
- A refusal to say no to any stakeholder.
- No realisation of how the world was going (away from incumbent telcos, towards market liberalisation)
- Never again would anyone push an unproven standard. Until SNMP, HTML 3.0...

The role of government

- Perhaps in the Cold War, government could say “there’s no business like our business”
- But in the 90s and beyond, government followed the market, not vice versa
- So outside the MoD, the government had to follow business.

The rise of The Internet

- It's about content, dummy.
- Having an Internet connection let you speak to real users, OSI just meant talking about OSI.
 - Amateur Radio vs CB. So says G1FVC
- Anyone could implement TCP/IP for their OS, but OSI was close to impossible.
- Demon and KA9Q together probably provided several nails for the OSI coffin.
- Tim Berners-Lee hammered them in.

It's not dead yet, Jim

- TL/1 over OSI is still the default management technology for SDH transmission kit, in an exchange near you.
- X.400 has acquired a raft of security extras, and PP is still heavily used in that space.
- Exchange (I'm dimly aware of the concept, although I've never used it) is under the hood an X.400 MHS.