

Managing an ISP with NetBSD

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About me

- **First program 1968**
- **Involved in a number of technology companies**
- **Program primarily in C, Python**
- **Shell, Tcl, SQL, 4GL, BASIC, PostScript, and others**
- **Also worked with assembler for PIC, 8080, Z80, iAPX**
- **Published in Software Solutions in C**

Open source involvement

- NetBSD developer
- Contributed to PostgreSQL
- Chief maintainer for PyGreSQL
- Contributor to comp.lang.c faq
- Many small programs open sourced

Goals

- Lean and agile
- Centrally controlled
- Independent operations
- Simple day to day administration



History

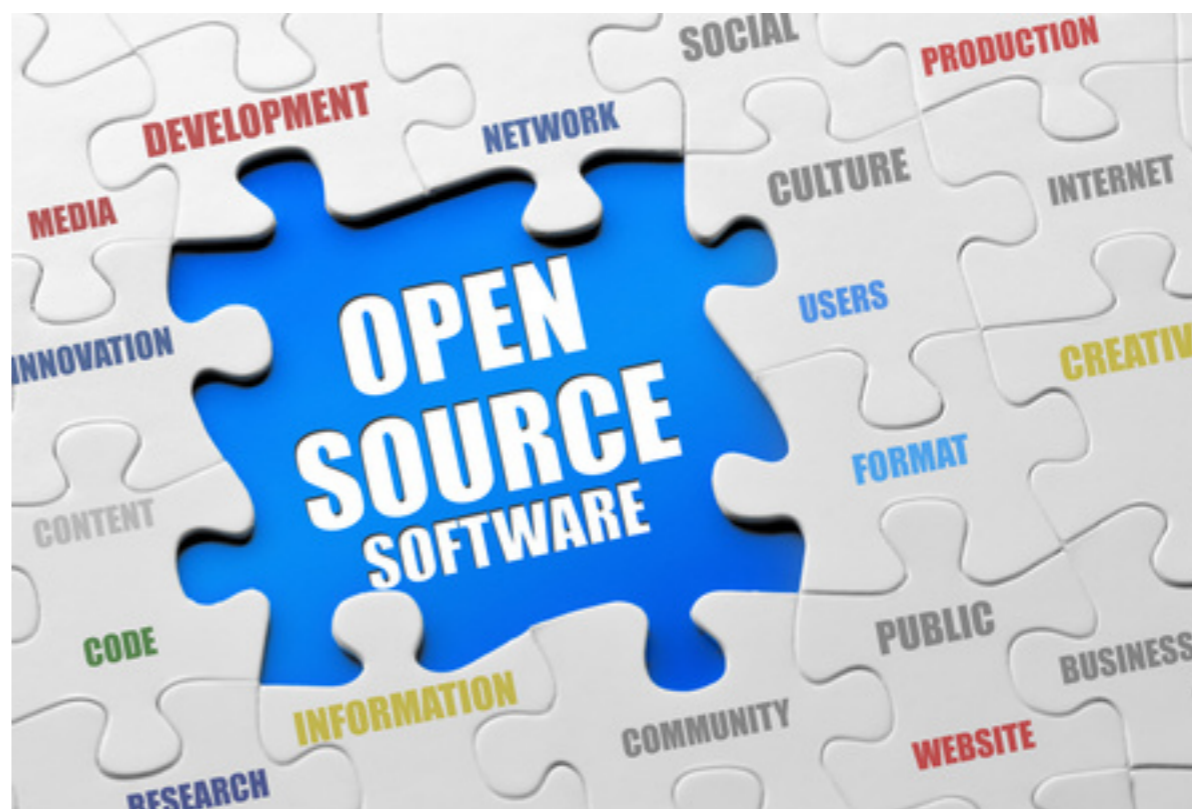
- Took over Internet Canada
- Billing disconnected from operations
- Worse as new features added
- Needed to react quickly to market changes
- Took over Internex Online
- Many disconnected Perl scripts

Requirements

- Control everything from one database
- Billing incorporated into operations
- Handle ad-hoc billing
- Modular
- Consistent
- Robust
- Open source components
- Commodity hardware
- User (administrator) friendly
- Configurable

Components

- NetBSD and pkgsrc
- Python
- PostgreSQL and PyGreSQL
- Apache
- Asterisk
- Postfix and Dovecot
- Subversion and rsync



PostgreSQL

- Open source
- Dr. Michael Stonebraker
- Andrew Yu and Jolly Chen
- BSD type license
- Enterprise level



Python

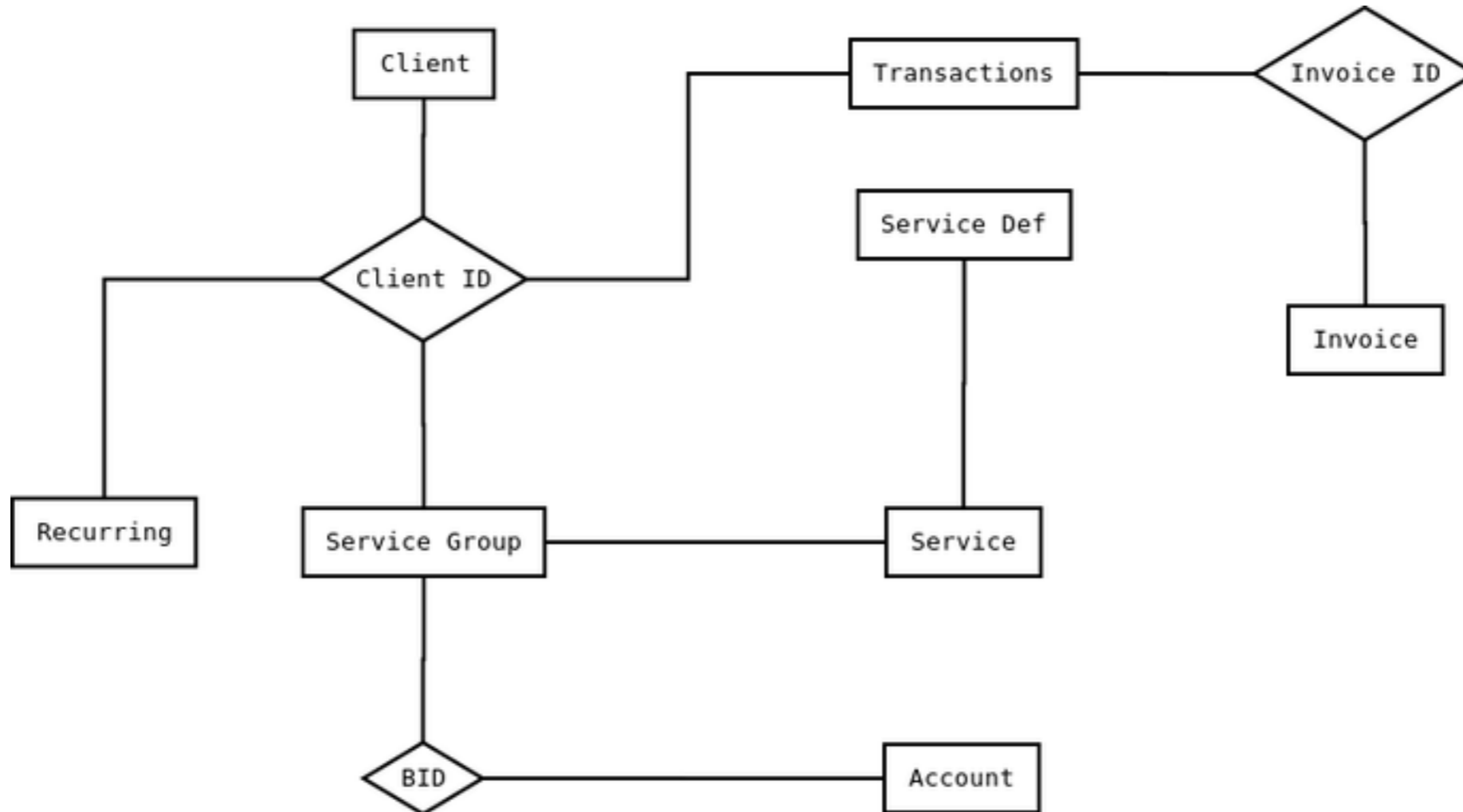
- Easy to learn
- Interpreted but fast
- Comprehensive
- Object oriented
- Clean style
- Executable pseudo-code
- BSD type license



System components

- General ledger
- Accounts receivable
- Accounts payable
- Billing
- ISP management





Billing

- **Service definitions and pricing**
- **Account types**
- **Service groups and accounts**
- **Service instances**
- **Transactions**
- **Invoices**

Service definitions and pricing

- **Product description**
- **Base price**
- **Extra charges**
- **Input format**
- **G/L chart ID**

Edit service 48 (ADSL_RL50)

Label:	<input type="text" value="ADSL_RL50"/>	Description:	<input type="text" value="ADSL Residential Lightspeed 50Mb"/>
Active:	<input checked="" type="checkbox"/>	Group service:	<input checked="" type="checkbox"/>
Group edit:	<input checked="" type="checkbox"/>	User edit:	<input type="checkbox"/>
Allow multiple:	<input checked="" type="checkbox"/>	Apply tax:	<input checked="" type="checkbox"/>
Base unit:	<input type="text" value="ea"/>	Extra unit:	<input type="text" value="ea"/>
G/L account:	<input type="text" value="41500 Connectivity Revenue"/>		
Commission code:	<input type="text" value="Connectivity"/>		
Service info:	<pre>login:Login:S:24:2 password>Password:S:16:2</pre>		

Account types

- Package definition
- Term and billing period
- Exceptions to default pricing
- Basic components included

Edit account type 101

Make copy:

Account active: User Selectable:

Name of account:

Commission Code:

Base price: G/L Account:

Setup fee: Setup G/L Account:

Period:

Included:

Default shell:

Account Attribute	Base	Incl	Extra	Action
10 Mbit upload:	0.00	0	\$7.000/ea	Add Custom
ADSL Commercial 6Mb:	48.00	1	\$48.000/ea	Add Custom
ADSL Commercial Lightspeed 10Mb:	75.00	1	\$75.000/ea	Add Custom
ADSL Commercial Lightspeed 16Mb:	92.00	1	\$92.000/ea	Add Custom
ADSL Commercial Lightspeed 25Mb:	106.00	1	\$106.000/ea	Add Custom
ADSL Residential 6Mb:	36.00	1	\$36.000/ea	Add Custom
ADSL Residential Lightspeed 10Mb:	43.00	1	\$43.000/ea	Add Custom
ADSL Residential Lightspeed 15Mb:	49.00	1	\$49.000/ea	Add Custom
ADSL Residential Lightspeed 25Mb:	61.00	1	\$61.000/ea	Add Custom
ADSL Residential Lightspeed 50Mb:	89.00	1	\$89.000/ea	Add Custom
ADSL modem rental:	5.00	1	\$5.000/ADSL modem	Add Custom

Service groups

- Describe what client is purchasing
- Track billing dates
- Include additional services
- Additional information

Edit Service Group 1968 (caingang)

[Aliases](#) [Discounts](#) [Service Events](#) [Services](#)

Select a form letter

Send letter

Active:

Client: 1316 - [Cain, D'Arcy J.M.](#)

ISP: VEX

Description: The Cain Gang

Account Type: Complimentary Virtual

IP Number: 98.158.134.12

Web Directory: /u/WEB/Music/Web_CainGang

FTP Directory:

Mail Domains: .

Outside Members:

Serve DNS:

Activation Date: 2005-02-24

Due: 24 Jun 2017 (Aniv/Mon/Year)

Period Start: Apr 2017 (Mon/Year)

Disconnect Date:

Last Updated: 2016-10-08 14:21:40

Event
(optional):

Send update

Accounts

- Individual mailboxes
- Web page
- User features
- Holds and controls resources



Service instances

- Can be attached to group
- Can be attached to account
- Hold details of service
- Tracks quantities
- Used in billing

Transactions and Invoices

- Created based on accounts and services
- Attached to clients
- Transactions grouped onto invoices
- Grouped by client
- Added to A/R import table

ISP management

- Based on definitions in the billing module
- "Pull" technology
- Configs stored locally
- Individual services do counting
- Some services checked manually

Case study - phone service

- Objects added to system for phone
- Objects describe details of service
- Asterisk server pulls phone details
- Configs built for Asterisk
- Phones are auto-provisioned
- CDR records track usage



Summary

- **Based on open source**
- **One control panel for admins**
- **One control panel for users**
- **Everything tracked in database**
- **Easy, remote management**

NetBSD project



<http://www.NetBSD.org/>



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