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
NetBSD

- Fan of BSD in general
- NetBSD developer
- Powerful package system
- Clean code base
- Right size developer base
- Developers anal about correctness
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
Account types

- Package definition
- Term and billing period
- Exceptions to default pricing
- Basic components included
### Edit account type 101

<table>
<thead>
<tr>
<th>Account Attribute</th>
<th>Base</th>
<th>Incl</th>
<th>Extra</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Mbit upload:</td>
<td>0.00</td>
<td>0</td>
<td>$7.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Commercial 6Mb:</td>
<td>48.00</td>
<td>1</td>
<td>$48.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Commercial Lightspeed 10Mb:</td>
<td>75.00</td>
<td>1</td>
<td>$75.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Commercial Lightspeed 16Mb:</td>
<td>92.00</td>
<td>1</td>
<td>$92.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Commercial Lightspeed 25Mb:</td>
<td>106.00</td>
<td>1</td>
<td>$106.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Residential 6Mb:</td>
<td>36.00</td>
<td>1</td>
<td>$36.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Residential Lightspeed 10Mb:</td>
<td>43.00</td>
<td>1</td>
<td>$43.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Residential Lightspeed 15Mb:</td>
<td>49.00</td>
<td>1</td>
<td>$49.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Residential Lightspeed 25Mb:</td>
<td>61.00</td>
<td>1</td>
<td>$61.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL Residential Lightspeed 50Mb:</td>
<td>89.00</td>
<td>1</td>
<td>$89.000/ea</td>
<td>Add Custom</td>
</tr>
<tr>
<td>ADSL modem setup:</td>
<td>6.00</td>
<td></td>
<td></td>
<td>Add Custom</td>
</tr>
<tr>
<td>ISP 000/ADSLL modem:</td>
<td></td>
<td></td>
<td></td>
<td>Add Custom</td>
</tr>
</tbody>
</table>

*Make copy: Check*  
*Account active: Check*  
*User Selectable: Check*  
*Name of account: virtual domain SOHO (monthly)*  
*Commission Code: ISP services*  
*Base price: 9.00*  
*Setup fee: 0.00*  
*Period: Monthly*  
*Included: Check*  
*Default shell: bash - Enhanced Korn shell*  

*GL Account: 41400 ISP Services Revenue*  
*Setup GL Account: 41000 Programming Revenue*
Service groups

- Describe what client is purchasing
- Track billing dates
- Include additional services
- Additional information
### Edit Service Group 1968 (caingang)

**Aliases**
- Select a form letter
- Send letter

**Client:** 1316  
**ISP:** VEX

**Account Type:** Complimentary Virtual
**Web Directory:** /u/WEB/Music/Web_CainGang
**Mail Domains:**
**Serve DNS:**

**Due:** 24 Jun 2017
**Disconnect Date:**

**Event (optional):**

**Description:** The Cain Gang
**IP Number:** 98.158.134.12
**FTP Directory:**
**Outside Members:**

**Activation Date:** 2005-02-24
**Period Start:** Apr 2017
**Last Updated:** 2016-10-08 14:21:40
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

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