Billing for Apache CloudStack
Apache CloudStack & Apalia

- Involved with CloudStack since 2010
- Dozens of CloudStack implementations mostly across Europe
- Accelerite CloudPlatform partner
- Company behind Amysta Billing software
Apache CloudStack and Billing System

- GUI
- API
- LOAD BALANCER
- MANAGEMENT SERVER
- USAGE SERVER
- MySQL DBs
- Aggregated Raw Usage data
- Availability Zones
- BILLING SYSTEM
- MEDIATION
- Processed Usage data
Apache CloudStack usage

<table>
<thead>
<tr>
<th>Type ID</th>
<th>Type Name</th>
<th>USAGE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RUNNING_VM</td>
<td>Provide aggregated usage records</td>
</tr>
<tr>
<td>2</td>
<td>ALLOCATED_VM</td>
<td>Run from 1 min to 1440 min – 1day (default)</td>
</tr>
<tr>
<td>3</td>
<td>IP_ADDRESS</td>
<td>Take data from the events log in cloud DB</td>
</tr>
<tr>
<td>4</td>
<td>NETWORK_BYTES_SENT</td>
<td>Create summary usage records in cloud usage DB</td>
</tr>
<tr>
<td>5</td>
<td>NETWORK_BYTES_RECEIVED</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>VOLUME</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>TEMPLATE</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>ISO</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>SNAPSHOT</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>SECURITY GROUP USAGE</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>LOAD_BALANCER_POLICY</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>PORT_FORWARDING_RULE</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>NETWORK_OFFERING</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>VPN_USERS</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>VM_DISK_USAGE (I/O READ)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>VM_DISK_USAGE (I/O Write)</td>
<td></td>
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<tr>
<td>23</td>
<td>VM_DISK_USAGE (Bytes Read)</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>VM_DISK_USAGE (Bytes Write)</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>VM_SNAPSHOT STORAGE_USAGE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>USAGE SERVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provide aggregated usage records</td>
</tr>
<tr>
<td>• Run from 1 min to 1440 min – 1day (default)</td>
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<tr>
<td>• Take data from the events log in cloud DB</td>
</tr>
<tr>
<td>• Create summary usage records in cloud usage DB</td>
</tr>
<tr>
<td>• Access usage records using listUsageRecords API</td>
</tr>
</tbody>
</table>
Cloud Service Providers Billing main components

- METERING – APACHE CLOUDSTACK USAGE API
- APACHE CLOUDSTACK PUBLIC CLOUD INFRASTRUCTURE
- SERVICE CATALOG / APP STORE / STORE FRONT
  - ON BOARDING
  - RATING
  - INVOICING
  - PAYMENT
  - ACCOUNT MANAGEMENT
  - USAGE REPORTING & EXPORTING
- MEDIATION
Metering

**COMPUTE**
- Stopped & Running VMs
- Bare-metal servers

**NETWORK**
- IP addresses,
- Bytes In & Out
- VPN, Firewall, Load Balancer…

**STORAGE**
- Root disks, Data disks
- Tiered storage, IOPS
- Snapshots usage
- Templates
- ISO
On-Boarding

TO CONSIDER:
- User screening or fully automated?
- Pre-payment and post-payment
- Reseller enrollment
- Fraud management
- Trial management
Usage-based rating

TO CONSIDER:

- Hourly and monthly
- Apache CloudStack domain hierarchy support
## Invoicing

### User 1

**Business Unit 1**

24 Piccadilly Circus, London, W1J 9HP, United Kingdom

### Invoice Period:
- From 02/01/2017 to 02/28/2017
- Account: bu1
- Domain: bu1.corporate.com
- Invoice number: 1575

### TO CONSIDER:
- Multi-currency support
- VAT management
- Discount
- Credit
- Invoice distribution
- Invoice history

<table>
<thead>
<tr>
<th>VM Type</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper - 1 CPU @ 2.4 GHz - 512 MB RAM</td>
<td>1344 h</td>
<td>GBP 2.000</td>
<td>GBP 2,695.91</td>
</tr>
<tr>
<td>Silver - 1 CPU @ 2.4 GHz - 4 GB RAM</td>
<td>2312 h</td>
<td>GBP 0.500</td>
<td>GBP 1,156.97</td>
</tr>
<tr>
<td>Bronze - 1 CPU @ 2.4 GHz - 2 GB RAM</td>
<td>1047 h</td>
<td>GBP 0.400</td>
<td>GBP 512.62</td>
</tr>
</tbody>
</table>

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<tr>
<th>VM Type</th>
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<th>Unit Price</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronze - 1 CPU @ 2.4 GHz - 2 GB RAM</td>
<td>672 h</td>
<td>GBP 0.250</td>
<td>GBP 167.93</td>
</tr>
<tr>
<td>Silver - 1 CPU @ 2.4 GHz - 4 GB RAM</td>
<td>375 h</td>
<td>GBP 0.200</td>
<td>GBP 74.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GBP 242.99</td>
</tr>
</tbody>
</table>

### Storage

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Disk SATA, 5 GB</td>
<td>3359 GB</td>
<td>GBP 2.100</td>
<td>GBP 7,053.88</td>
</tr>
<tr>
<td>Large Disk SATA, 100 GB</td>
<td>2396 GB</td>
<td>GBP 0.009</td>
<td>GBP 1,648.87</td>
</tr>
<tr>
<td>Root Volume</td>
<td>1416 GB</td>
<td>GBP 0.0036</td>
<td>GBP 53.99</td>
</tr>
<tr>
<td>Medium Disk SATA, 20 GB</td>
<td>7916 GB</td>
<td>GBP 0.0036</td>
<td>GBP 284.97</td>
</tr>
</tbody>
</table>

### Network

<table>
<thead>
<tr>
<th>Network Type</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bytes sent</td>
<td>0.01 GB</td>
<td>GBP 2.000</td>
<td>GBP 0.02</td>
</tr>
<tr>
<td>Bytes received</td>
<td>0.01 GB</td>
<td>GBP 0.500</td>
<td>GBP 0.01</td>
</tr>
<tr>
<td>IP Address</td>
<td>3736 h</td>
<td>GBP 0.0012</td>
<td>GBP 4.49</td>
</tr>
<tr>
<td>Delta Isolated Network Offering With Source Nat Service</td>
<td>5374 h</td>
<td>GBP 0.0010</td>
<td>GBP 5.38</td>
</tr>
<tr>
<td>Port Forwarding Rate</td>
<td>370 h</td>
<td>GBP 0.0000</td>
<td>GBP 0.00</td>
</tr>
</tbody>
</table>

### Subscriptions

<table>
<thead>
<tr>
<th>Subscription Type</th>
<th>One-time Fee</th>
<th>Monthly Fee</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>BU1: FireUser-DailyBackup</td>
<td>GBP 12.00</td>
<td>GBP 12.00</td>
<td>GBP 50.00</td>
</tr>
<tr>
<td>DDOS Service</td>
<td>GBP 500.00</td>
<td>GBP 500.00</td>
<td>GBP 500.00</td>
</tr>
</tbody>
</table>

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**Note:** The values in GBP are approximate and subject to actual conversion rates at the time of invoicing.
Payment

TO CONSIDER:

• PCI/DSS certification
• Payment gateway integration
• Transaction logging
• Chargebacks
Users & resellers Management

TO CONSIDER:

- Account management
- Reseller white labeling automation
- Credit card update
- Wire management for large amounts (reseller)
Usage Reporting, Exporting

TO CONSIDER:

- Usage analytics per account, project, domain…
- PDF, CSV export, monthly, daily
- Export automation via API
- ERP/CRM integration
TO CONSIDER:

- App Builder aligned with CloudStack service offering and domains
- Multi-tiers apps support
- App life cycle management
- Cost estimate
- One-click and SLA selection
- Combine usage based apps and subscription services
Example of Billing system for Apache CloudStack

End-customers

Resellers

CSP

amysta

On-boarding
End-customers
Resellers on-boarding

Store Front
App catalog
Dashboard
Subscriptions

Iaas integration
CloudStack integration

Invoicing
Credit
Discount
Multi-Currencies
Tax management

Payment
Pay as you go
Prepaid

Usage-based services

CSP’s Public IaaS

Subscriptions Services
Contacts

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