WHO WE ARE
Anguilla
Antigua
Barbados
British Virgin Islands
Cayman Islands
Colombia
Costa Rica
Curacao
El Salvador
Grenada
Guatemala
Honduras
Jamaica
Montserrat
Nicaragua
Panama
Peru
Puerto Rico
República Dominicana
San Vicente y las Granadinas
St. Kitts & Nevis
St. Lucia
Trinidad
Turk and Caicos
> 7,500 employees
> 6,000,000 customers
> 125,000 Corporate clients
> 3.8m with mobile services
> 430000 TV, 650,000 broadband

**Our Network**

42 countries, 54 cities
42,000 km of sub-sea fiber
22,300 km of terrestrial fiber
15,100 km of terrestrial coaxial
7 Data Centers

Annual Sales
US $ 2.4 BILLION
Capital Investment
US $ 1.5 BILLION
2005-2012
Cloud Infrastructure Architecture

REFERENCES
NOC: C&W Network Operation Center
CSC: C&W Customer Service Center
SOC: C&W Security Operation Center

C&W Business
Cloud Portal Business Manager
C&W Provide corporate IT self-managed cloud services based on different business models and powered by ACS and CPBM (Cloud Portal Business Manager)
Model 1: C&W Virtual Datacenter (VDC)

- Fixed monthly fee calculated based on the number of allocated resources (account quota).

### Resource Usage

<table>
<thead>
<tr>
<th>Resource</th>
<th>C&amp;W Colombia Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instances</td>
<td>10 / 30</td>
</tr>
<tr>
<td>CPUs</td>
<td>10 / 15</td>
</tr>
<tr>
<td>Memory</td>
<td>17 / 20 GB</td>
</tr>
<tr>
<td>Volumes</td>
<td>10 / 30</td>
</tr>
<tr>
<td>Primary Storage</td>
<td>590 / 600 GB</td>
</tr>
<tr>
<td>Secondary Storage</td>
<td>1 / 600 GB</td>
</tr>
<tr>
<td>Snapshots</td>
<td>0 / 10</td>
</tr>
<tr>
<td>Networks</td>
<td>2 / 10</td>
</tr>
<tr>
<td>VPCs</td>
<td>1 / 5</td>
</tr>
<tr>
<td>Public IPs</td>
<td>1 / 5</td>
</tr>
<tr>
<td>Templates</td>
<td>1 / 10</td>
</tr>
</tbody>
</table>
Other models

- **VPC**
  - VPC is the Metered service. Same service offering as the other models but no commitment.
  - Product Catalog implemented at CPBM
  - Credit limit associated to each account
  - Usage is reported to 3rd party Billing system

- **Private Zone**
  - Private Zone is provided through dedication of resources to an account. We achieve it through ‘Explicit Dedication’ at the Host level
Our Implementation Strategy
- We used Cloudops as our consultant for Cloud adoption as well as the project integrator and now for ongoing technical support

Architecture
- 6 ACS regions among 5 different countries – Connected to CPBM
- Each ACS region have a single advanced zone with one or more PODs and clusters
- Hypervisors: Vmware (Enterprise) and XenServer (Standard)
- Physical Hosts for Client VMs: UCS
- Primary Storage: Hitachi HUS
- Secondary Storage: Nexenta virtual storage over JBOD
- Management Servers in HA schema and with LB
- ACS access via SSO (Single-Sign-On) from CPBM platform. Clients do not have access to ACS user interface.
## List All VMs

### CW-CLD-GCONTR
- **Name:** CW-CLD-GCONTR
- **IP Address:** 10.20.60.10 (Default)
- **Status:** Running

### CW-CLD-FILE02P
- **Name:** CW-CLD-FILE02P
- **IP Address:** 10.20.60.11

### ReplicaVMTest
- **Name:** ReplicaVMTest
- **IP Address:** 192.168.1.4, 10.20.60.122

### Server01
- **Name:** Server01
- **IP Address:** 10.20.60.221

### Server002
- **Name:** Server002
- **IP Address:** 10.20.60.51

### Server001
- **Name:** Server001
- **IP Address:** 10.20.60.31
Networking and Security
- Advanced networking mode with isolated VLAN for each account
- Shared internet, dedicated link or MPLS connectivity - Private GW
- Virtual Router for the network and security services (Firewall, Load Balancer, Port Forwarding, VPN).
- Optional integration of external FW and LB via Private GWs or virtual appliances deployed inside ACS.

User Model
- CPBM account mapped to ACS domain
- ACS Resource limits used for container definition (VDC model)
CWC CloudStack Implementation

- **Private / Public / Hybrid**
  - No self-subscription from Portal
  - Clients can run in shared or dedicated resources
  - Metered or flat rate

- **Integrations**
  - Billing via CPBM API
  - DR solution

- **Common Use Cases**
  - Enterprise cluster - VDC model for fixed workloads
  - DR environments
CWC CloudStack Implementation

- Monitoring
  - Tivoli – hypervisors and agent based – No multi-tenant
  - ZenOss – Cloudstack Zenpack – ACS API
    - Limited data for multi-tenant use

- Client VM Backup
  - Snapshot
    - Recurrent snapshot not space efficient for VMware
    - Doesn’t cover all use cases
  - Managed Backup – Commvault
    - Hypervisor level
    - Restore has to be done to an existing VM
Wrap-up

- Stable and scalable – It works!
- Monitoring challenge for Service Provider – Publish available info in the Portal?
- Template management is challenging
- Seamless integration to open source Backup tool
- What is next?
  - Hybrid Cloud vision – CloudMC
  - Leverage existing integrations to 3rd party elements
  - Upgrade on the infra – new offerings
THANK YOU

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