First Experience with Antelope Cloud Processing

Sizing, Licensing, etc.

Stefan Radman, Kinematics | Antelope User Group, Taormina, Sicily, May 29, 2019
Advancement Through Innovation
Antelope Virtualization

History

- Most new Antelope instances installed by Kinemetrics are virtual nowadays.
- Trend to virtualize existing installations.
- Primarily on shared private hardware.
- VMware vSphere most popular but others emerging (Proxmox, Nutanix, Xen, etc).
- Next logical step: Antelope in the Cloud
Antelope Cloud Processing
Motivations

- Reliable infrastructure
- Low TCO
- Availability
- Growing market
Antelope Cloud Demo

Objective

• Live demo
• Fully operational
• Real-time data processing
• Accessible from the Internet
• Low bandwidth requirement
• Secure
Antelope Cloud Demo
Virtual Hardware Specifications

- Amazon EC2
- Region: Oregon
- EC2 instance type: m4.xlarge
  - M4 = Intel Xeon E5
  - 4 vCPU, 16GB RAM
  - Balanced
- No traditional text or GUI console
Antelope Cloud Demo
Software Specifications

- Operating system: CentOS 7 x86_64
- Installation method: AMI HVM
  - Amazon Machine Image
- Hardware Virtual Machine
- Remote access methods:
  - SSH
  - Remote Desktop (RDP)
  - HTTP
Amazon Cloud Overview & Glossary

- AWS = Amazon Web Services
- EC2 = Elastic Cloud 2
- Instance = Virtual Machine
- AMI = Amazon Machine Image
- HVM = Hardware Virtual Machine (Xen)
- Region = Geographical region
- Availability Zones = Datacenters

Amazon Virtualization is based on the Xen Hypervisor but recently moving to KVM

https://www.infrastructure.aws
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AWS Management Console
Installation and Management

- Not a system console (terminal) in the common sense
- Web based
- Solution driven
- Wizards
Installation
Operating System selection

• Virtual Machine Image
• Ready to start
• RHEL7 or CentOS7
• No traditional installation
• No console GUI or terminal
Installation
Instance Type selection

- Hundreds of instances types
- For different workloads in
- 5 Groups
  - General Purpose
  - Memory Optimized
  - Accelerated Computing
  - Storage Optimized
- Differ by
  - Processor type
  - # vCPUs
  - Memory
  - I/O bandwidth
Installation
Instance Type selection

- M4 = Balanced performance
- Up to 64 vCPU & 256G Mem
- Similar to proven hardware used by Kinemetrics
- Reasonable pricing

General Purpose

<table>
<thead>
<tr>
<th>Model</th>
<th>vCPU*</th>
<th>Mem (GiB)</th>
<th>Storage</th>
<th>Dedicated EBS Bandwidth (Mbps)</th>
<th>Network Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>m4.large</td>
<td>2</td>
<td>8</td>
<td>EBS-only</td>
<td>450</td>
<td>Moderate</td>
</tr>
<tr>
<td>m4.xlarge</td>
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<td>16</td>
<td>EBS-only</td>
<td>750</td>
<td>High</td>
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<td>32</td>
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<td>1,000</td>
<td>High</td>
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<td>64</td>
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<td>High</td>
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<td>m4.10xlarge</td>
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<td>160</td>
<td>EBS-only</td>
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<td>10 Gigabit</td>
</tr>
<tr>
<td>m4.16xlarge</td>
<td>64</td>
<td>256</td>
<td>EBS-only</td>
<td>10,000</td>
<td>25 Gigabit</td>
</tr>
</tbody>
</table>

M4 instances provide a balance of compute, memory, and network resources, and it is a good choice for many applications.

Features:
- 2.3 GHz Intel Xeon® E5-2686 v4 (Broadwell) processors or 2.4 GHz Intel Xeon® E5-2676 v3 (Haswell) processors
- EBS-optimized by default at no additional cost
- Support for Enhanced Networking
- Balance of compute, memory, and network resources
Installation
Instance Type selection

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AWS Management Console
Elastic IP
AWS Management Console
Elastic IP

- Private IP = configured on VM
- Elastic IP = Assigned Public IP
- Needed for Antelope IP license
- One Elastic IP / Instance = included
- No need for ald_proxy
Antelope Cloud Demo
Antelope Real-time Systems

- Started June 21, 2018
- Installed Antelope 5.8
  - GSN Demo
  - ANZA Demo
- Running automatically
- Daily reports
  - rtsys
  - rtreport
- Upgraded to 5.9 last week
Antelope Cloud Demo
Remote Access

- Remote desktop (RDP protocol)
- Based on xrdp from EPEL7
- Clients for Windows, Mac & Linux
- HTTP frontend Guacamole
- Official Kinemetrics DNS name
- Only using HTTPS
- Official certificate from DigiCert
Antelope Cloud Demo
Guacamole

- Apache Guacamole
- Clientless remote desktop gateway
- HTML5 web application
- Support for VNC, RDP and SSH
• GNOME Desktop
• Custom Icons
Antelope Cloud Demo
Automatic processing
Cost control
Planning

• Simple Monthly Calculator
• Estimate for operational cost
• On-demand pricing
• Reserved instances
Cost control
Operational costs

- AWS Cost Explorer
- Current cost
- Monthly/Daily cost
- History
- Trend/Forecast
Antelope Cloud Processing

Security

- AWS security measures
- EC2 Security Groups
- Linux firewalld
- SELinux (Security Enhanced Linux)
- Secure SSL configuration
- Software updates!
- Open Source Tripwire®
- Monitoring (Zabbix)
- SSH Public Key Authentication
Antelope Cloud Processing
Challenges

• Credit Card required
• Cost control
• Network bandwidth
• Resource hungry GUI
• Traditional storage model
• Remote access integration
• Security
Antelope Cloud Processing
Questions

Thank you!
Questions?
Antelope Cloud Demo
Links and References

- Antelope Cloud Demo  https://antelope.kinemetrics.com
- Amazon Web Services (AWS)  https://aws.amazon.com
- xrdp  http://www.xrdp.org
- Apache Guacamole  http://guacamole.apache.org
- Zabbix  https://www.zabbix.com
- Open Source Tripwire  https://github.com/Tripwire/tripwire-open-source