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Deploying Analytic Databases in the Cloud

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Agenda

Cloud Computing overview
Software as a Service (SaaS).
Platform as a Service (PaaS)
Infrastructure as a Service (IaaS)
Cloud Marketplaces
Actian Vector in the Cloud
Amazon Web Service (AWS)
Microsoft Azure
Live Demo
Summary
Cloud Computing Overview & Marketplaces
Cloud Computing Characteristics, Service & Deployment Models

- The National Institute of Standards and Technology (NIST) definition: “Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

- Five “essential characteristics” of cloud computing: on-demand self-service, broad network access, resource pooling, rapid elasticity or expansion, and measured service.

- Three "service models" (software, platform and infrastructure)
  - Software as a Service (SaaS)
  - Platform as a Service (PaaS)
  - Infrastructure as a Service (IaaS)

- Four "deployment models" (private, community, public and hybrid) that together categorize ways to deliver cloud services.
Software as a Service (SaaS)

- The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

- Usually licensed on a subscription basis.

- Accessed via an app or web browser.

- Examples: Salesforce.com, Microsoft Office 365, Box, Google Apps, Amazon Web Services, Concur, Zendesk, Docusign, Dropbox, Slack.
Platform as a Service (PaaS)

- The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

- Examples: Amazon Web Services, Salesforce, Microsoft Azure, Google App Engine, Heroku
Infrastructure as a Service (IaaS)

- The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls).

- Examples: Amazon Web Services (AWS), Microsoft Azure, Google Compute Engine (GCE), Rackspace, VMware Cloud Foundation
Cloud Providers & Marketplaces

AWS Marketplace

AWS Marketplace is an online store that helps customers find, buy, and immediately start using the software and services they need to build products and run their businesses. AWS Marketplace complements programs like the Amazon Partner Network and is another example of AWS’s commitment to growing a strong ecosystem of software and solution partners.

https://aws.amazon.com/marketplace

Microsoft Azure

Azure is a comprehensive set of cloud services that developers and IT professionals use to build, deploy, and manage applications through our global network of datacenters. Browse through Azure Marketplace’s rich catalog of thousands of products and end-to-end solutions from independent software vendors (ISVs). Get access to open source and enterprise applications that have been certified and optimized to run on Azure.

https://azuremarketplace.microsoft.com
Amazon Web Service Marketplace
AWS Marketplace

- Actian Vector Analytic Database - Community Edition
- 250 GB data limit
- Free to use (pay AWS for VM usage)
- “1-Click Launch” or “Manual Launch”
AWS Marketplace

- 1-Click Launch
- Select “Region”
  - Pick based on geographical
- Select “EC2 Instance Type”
  - Pick enough CPUs and memory
- Select “VPC Settings”
AWS Marketplace

- 1-Click Launch
- Select “Security Group”
  - A security group acts as a firewall that controls the traffic allowed to reach one or more instances.
  - Defines the ports open and source IPs
    - 22 SSH
    - 27832 Actian Vector VW0 GCC
    - 27839 Actian Vector VW7 GCD
    - 44223 Actian Vector VW15 IIMGMTSVR (Director)
- Key Pair
  - Defined in your Amazon EC2 Console
- Launch with 1-click
AWS Marketplace

- Manual Launch
- Step 1: Select “Region”
  – Pick based on geographical
Manual Launch

Step 2: Choose an Instance Type

- Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.

- Select “EC2 Instance Type”

- Pick enough CPUs and memory
AWS Marketplace

- Manual Launch
- Step 3: Configure Instance Details
  - Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.
Manual Launch

Step 4: Add Storage

– Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. Learn more about storage options in Amazon EC2.

– For Provisioned IOPS (SSD) volumes, you can provision up to 50 IOPS per GiB. For General Purpose (SSD) volumes, baseline performance is 3 IOPS per GiB, with a minimum of 100 IOPS and a maximum of 10000 IOPS. General Purpose (SSD) volumes under 1000 GiB can burst up to 3000 IOPS. Learn more abo
AWS Marketplace

- Manual Launch
- Step 5: Add Tags
  - A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. Learn more about tagging your Amazon EC2 resources.
AWS Marketplace

- Manual Launch
- Step 6: Configure Security Group
  - A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below.
  - 22 SSH
  - 16902 Actian Director management
  - 27832 Actian Vector VW0 GCC
  - 27839 Actian Vector VW7 GCD
  - 44223 Actian Vector VW15 IIMGMTSVR (Director)
AWS Marketplace

- Manual Launch
- Step 7: Review Instance Launch
  - Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.
AWS Marketplace

- Manual Launch

- Step 8: Select an existing key pair or create
  - A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

- “Launch instances”
AWS Marketplace

- After the launch
- Monitor via the EC2 Dashboard
- Access via the IPv4 Public IP or Public DNS
- Use PUTTY to for an ssh connection
  - Click Enable TCP keepalives
  - Click Auth
    - Private key file for authentication
    - Use the private key file that matches the public key you launched the instance with.
  - No Operating System passwords are set. Must use keys.
- Uses DBMS passwords for database access.
  - Default “actian” user password is set to the “Instance ID”
    - Found in the EC2 console
- Connect via Director, JDBC, ODBC
  - Use the “Instance ID” for the user “actian”.
Microsoft Azure Marketplace
Microsoft Azure

- Actian Vector Analytic Database - Community Edition
- 250 GB data limit
- Free to use (pay Azure for VM usage)
- Azure VM “GET IT NOW” wizard
- Click “GET IT NOW”
Microsoft Azure

- Click “GET IT NOW”
Select the deployment model
– Use the “Resource Manager”
– Click “Create”
Microsoft Azure

- Fill in a name for the VM
- Recommend SSD for VM disk type
- Enter “actian” for the User name. –Selecting a different username name prevent Vector from starting properly
- Choice of SSH public key or Password –Select based on personal preference
- Choose a Resource group
- Choose a Location
Select the VM size
- Browse the available sizes and their features
Microsoft Azure

- Configure Network security group
  - 22 SSH
  - 27832 Actian Vector VW0 GCC
  - 27839 Actian Vector VW7 GCD
  - 44223 Actian Vector VW15 IIMGMTSVR (Director)
Microsoft Azure

- Review and Create
Microsoft Azure

- After the launch
- Monitor via the Azure Dashboard
- Access via the IPv4 Public IP or configure a Public DNS
- Use PUTTY to for an ssh connection
  - Click Enable TCP keepalives
  - Click Auth
    - Private key file for authentication
    - Use the private key file that matches the public key you launched the instance with.
  - Use a password if the Operating System was set.
- Uses DBMS passwords for database access.
  - Default “actian” user password is set to the “Instance ID”
    - Found after logging into an SSH session of the VM.
- Connect via Director, JDBC, ODBC
  - Use the “Instance ID” for the user “actian”.

![Microsoft Azure Dashboard](https://example.com/azure-dashboard.png)
Live Demo AWS EC2
Demo for the Community AMI

- Demo provisioning
  - Show how easy is it to spin up a Vector instance
- Demo query performance (You can do this on a previously spun-up and warmed up instance so that you don’t have to show the slow query times due to the first time EBS boot issue)
  - Connect and run queries from Director
- Demo that Vector reconfigures itself on machine resize – Queries are generally faster
Actian Vector Cloud in Cloud Marketplace futures

- Provide an Actian Vector Enterprise AMI on the AWS Marketplace
- Providing an Actian Vector Community and Enterprise VM on the Azure Marketplace
PaaS with respect to Analytic Databases

- What are the expectations?
  - Separation of storage from compute
  - Scalability and Elasticity
  - Security
  - High-availability
  - Integrations with native data stores (S3, Azure Blob, Azure DataLake etc.) to facilitate high-speed data loading
  - 24x7 monitoring and self-healing
  - Management
  - Cloud API/SDK - To facilitate embedding into platforms and applications

- Some examples
  - Snowflake, Google BigQuery, Azure Data Warehouse, AWS Redshift etc.
Can Actian Vector provide these capabilities? YES!

- **Separation of storage from compute**
  - Vector team is researching what would it take to extend this to other cloud native storage systems such as Azure Data Lake without compromising performance

- **Integrations with native data stores**
  - Spark Vector connector can read data from S3 and load into Vector
  - Can be extended to other systems

- **High-availability, 24x7 monitoring**
  - Actian DataCloud Services have been around for more than 10 years and we have the knowledge and experience in building

- **Security**
  - We have an experience Operations team that has been trained in Security best practices and follows established and proven best practices
  - We regularly perform third party security audits to ensure that we are meeting industry standards

- **Management**
  - Our management API’s can be extended to be more secure and Cloud friendly
  - We recently added end-to-end encryption to our management server API and more improvements are planned
Actian Vector Cloud Roadmap

**Platform as a Service**

*Q1 '19*
- High availability, 24x7 monitoring
- Scale-out, Billing
- Web Console for Management

**Managed Service**

*Q3' 18 - Q4 '18*
- Improved provisioning/management
- Resources provisioned in delegated account
- API/SDK

**Cloud Marketplace**

*Q4 ’17 - Q2 ’18*
- Vector & VectorH
- Community & Enterprise
- AWS & Azure

**BYOL**

*Today*
- Bring your own license (BYOL)
- Can run on IaaS (AWS, Azure etc.)
- Works with Vector & VectorH
Summary

- Actian Vector is getting ready for the Cloud
- The Actian Vector Cloud offering will be multi-cloud to provide a freedom of choice
  - AWS Marketplace offering now
  - Microsoft Azure to follow
- The Actian Vector Cloud offering is the only analytics database to provide a very mature and proven SQL engine with the best breed in performance
- Will be easy to use and available to embed via an API
- Very quick and easy to spin up a VM
- Very quick and easy to connect to the Actian Vector databases in the Cloud.

Questions?
- Reach me at Christopher.Hane@Actian.com
Thank you!