**Mo Vid Cloud Proposal**

**Summary**

This solution was created to meet Mo Vid’s needs in a reliable, convenient, cost-effective, and secure manner.

We recommend using Microsoft Azure’s cloud services due to its industry standard (roughly 95% of fortune 500 companies use Azure over AWS), and the cost comparison between the two services (AWS is nearly 4x more expensive than Azure for Windows/SQL). Azure SQL also has the added benefit of BYOL (bring your own license); allowing for added flexibility. Azure also offers more security than competitors, and better flexibility for migration.

Azure guarantees to encrypt sensitive data. Mo Vid customer account information, customer behavior and their preference related recommendation data of videos will be encrypted and well protected.

With the highest level of server security, Azure guarantees to protect Mo Vid from bootkits, rootkits, and kernel-level malware with trusted launch. Azure will monitor Mo Vid workloads and find and fix system vulnerabilities with Azure Security Center. Azure also offers add-on protection for events like DDoS attacks.

Azure secures network traffic and meets regulatory and compliance requirements with enterprise-grade security and governance, including General Data Protection Regulation (GDPR), ISO 27001, HIPAA, FedRAMP, and SOC 2.

Azure Virtual Machines are easily scaled to customize for any size client. With the development of the scale of Mo Vid, expanding Mo Vid will not be difficult.

**Proposed Solution**

For each Mo Vid client, we recommend the following system architecture.

*Application & Streaming Servers*

Containerize the Application and Streaming servers and run both containers on a single Azure VM.

Mo Vid will benefit from streamlined server maintenance and responsive, easily scaled services as their customer’s needs change.   
Azure guarantees uptime of at least 99.5% for Single Instance VMs using Standard SSD Managed Disks.

*Transcodiing*

Transcoding will be done by Azure Media Services.

The Media Service billing structure allows clients to be appropriately charged for their transcoding usage. Clients are only billed for transcoding jobs that are completed – if a job is started then cancelled before it is finished, the client will not be charged.   
Azure Media Services guarantees 99.9% uptime.

*SQL Server*

Mo Vid will use an Azure SQL Database instance and create a database in the Elastic Pool for each client.

Azure’s SQL service is simple to manage compared to maintaining an SQL server, and it is scalable for adding databases and processing resources for new companies. Mo-Vid can use their existing SQL Server licenses on the Azure SQL Database, which makes it extremely cost-effective.   
Azure SQL Database guarantees 99.995% uptime.

**System Specifications**

Each client will require one virtual machine running Docker. Two containers for the Application and Streaming servers will be created.   
Client’s transcoding jobs will be completed by Azure’s Media Service.   
Web application SQL data will be stored in Azure SQL Elastic Pool, 8vCore instance.   
All Azure services are easily scaled as the customer’s needs grow.

***Small Customer***

*Virtual Machine:*  
VM Instance: B16ms – 16 cores, 64 GB RAM  
3-year reserved pricing  
Outbound Data – Inter Region – 1 TB  
  
*Storage:*  
6TB   
Type: File Storage  
Tier: Hot

*Transcoding*  
HD Video w/ Audio: 250 hours

*SQL Data*  
3 GB

***Medium Customer***

*Virtual Machine*  
VM Instance: B16ms – 16 cores, 64 GB RAM  
3-year reserved pricing  
Outbound Data – Inter Region – 10 TB

*Storage*   
41 TB   
Type: File Storage  
Tier: Hot

*Transcoding*  
HD Video w/ Audio: 1,536 hours

*SQL Data*8 GB

***Large Customer***

*Virtual Machine*  
VM Instance: B16ms – 16 cores, 64 GB RAM  
3-year reserved pricing  
Outbound Data – Inter Region – 25 TB

*Storage*   
130 TB   
Type: File Storage  
Tier: Hot

*Transcoding*HD Video w/ Audio: 3,072 hours

*SQL Data*16 GB

**Backup & Disaster Recovery**

Mo Vid will use the long-term retention feature of Azure backup to store the data, which has a retention period of up to 120 days.   
  
*Virtual Machines*

VM backups will be done nightly with a 7-day retention period.

*Data Storage*

Storage pool backups will be done nightly, with a 7 day/ 4 week retention period.

**Costs**

***Azure***

The costs listed below are Azure’s monthly cost estimates for providing service to 3 large, 10 medium and 25 small Mo Vid clients using the system/ data specifications listed above, unless otherwise noted.

*VM Instances:* $20,500

*Storage:* $29,300

*Transcoding:* $62,500

*Azure SQL Database:* $900

*Azure Professional Direct Support:* $1000

*Backup:* $6000

***Mo Vid***

The costs listed below are cost estimates to move the Mo Vid platform to Azure, and create and maintain client services for 3 large, 10 medium and 25 small clients.  
Cost of staff hours is estimated at $50 per hour (salary + 25% fringe benefits).

*Architectural Changes:* $12,000   
This is a one-time cost.

*Move Clients:* $19,000  
This is a one-time cost to move clients to new platform.

*Client Maintenance & Support:* $11,000  
This is a recurring monthly cost.

***Total Cost of Ownership - 1 year***

One-time costs: $31,000  
Monthly costs: $131,200

Over one year, the cost to host 3 large, 10 medium and 25 small clients will be $1,605,400.

**Advanced Cloud Technology**

We recommend Mo Vid consider using Azure AI or Azure SCUTIO to enhance their cloud offerings.

***Azure AI***

AI is the capability of a machine to imitate intelligent human behavior. Through AI, machines can analyze images, comprehend speech, interact in natural ways, and make predictions using data.

There are several ways that Mo Vid can use AI to enhance their platform.

*Smart Advertisement*

Mo Vid’s advertising revenue is significant. By analyzing the video content, the recognition module can recognize those actors, brands, item images showing in the videos. Every video or film can be marked with different tags and stored. Thus, when a user clicks a certain video, a more customized commercial can pop up, rather than those less attractive ones no one wants to click.

For example, if a user clicks the film *Space Jam*, which could be tagged with #MichaelJordan #Basketball #Sports #NBA #AirJordanSneaker, embedded commercials could be for sneakers, sports video games, or sporting goods stores.

Furthermore, this mechanism could be more accurate depending on the length user has watched, or the kinds of videos that user clicks more frequently.

*Advanced Video Recommendation*

With AI, video recommendation would be more accurate and efficient. Recommendations can be achieved without Azure AI by analyzing user’s behavior and comparing different users. Videos could be tagged depending on their contents.

Combining these two features of user-behavior and video-content recognition, the recommendation mechanism could be great. Videos with similar content or actors could be shown on the side bar. The user clicking and the length of staying at Mo Vid would improve, which are key for the growth of Mo Vid.

*Intelligent Video Reviewer*

AI can detect the image, audio, and subtitle in the video, and recognize specific contents in the video such as terrorism, violence, nudity, or copyright infringement. Intelligent video review would save Mo Vid considerable time and money.

Mo Vid would be able to choose to block those contents or filter them depending on the user’s age. This is not only for the satisfaction of the Mo Vid users, but also the responsibility to society of being a content broadcast platform.

*Video Preview and Video Poster*

Many video websites have a GIF preview if users hover their mouse on the video. With AI, Mo Vid can also achieve that. Of course, users will be given options to cut the clips they want to a GIF.

For individual video uploaders, they always have this problem: they do not have a proper/decent video poster, compared to those professional video providers. These short videos often use the first frame as the video cover poster by default, but in many cases, the display first frame of the video is not that satisfying.

A well-trained AI model can choose the main topic or highlight of the video as the video poster. This gives individual video uploaders passion to create more high quality and attractive videos, benefiting the improvement of Mo Vid.

***Micron ScutiO***

Micron ScutiO is the world’s fastest SSD with exclusive Azure features that Mo Vid can use to enhance its user experience.

*Greater Storage Capabilities:*

ScutiO can be used to secure greater and faster storage capabilities for Mo Vid which are essential as video streaming platforms are continuously being scaled up, thanks to users uploading content regularly and new customers starting to stream from the platform.

*Lower Latency:*

User experience is always better when the latency is minimal. Mo Vid can secure low latency with ScutiO as it a bandwidth of 9GB/s with 128 I/O queue pairs. The read and write IOPs are at 2.35M and 1.95M respectively.

It has up to 1000 times lower latency and exponentially greater endurance than NAN SSD storages, playback will be practically seamless.

*3D XPoint:*

The 3D XPoint technology can deliver game changing performance for transactional workloads and big data applications. It will be a powerful tool for the transcoder servers that Mo Vid will deploy.

*Multiple VM scaling:*

The ScutiO inherently supports scaling on multiple VMs at once, which makes it a good fit for Mo Vids cloud architecture. Mo Vid is going to scale up themselves regularly so it pays off to invest in storage that supports scaling up our architecture.