



Amazon AppStream 2.0

Deliver virtual labs and software using
application streaming and cloud desktops

David Ryder

Specialist Solution Architect – End User Computing
AWS Worldwide Specialist Organization

Tushar Dhanani

Specialist Solution Architect – End User Computing
AWS Worldwide Specialist Organization

MEET YOUR PRESENTERS

Sana Ahmed

Product Marketing
Technical Solutions,
AWS Worldwide Public Sector



David Ryder

Sr. Solutions Architect
End User Computing,
AWS Worldwide Specialization
Organization



Tushar Dhanani

Solutions Architect
End User Computing,
AWS Worldwide Specialization
Organization



Agenda

- AppStream 2.0 Introduction and key use cases
- Service overview
- Pricing overview
- Demo

Stages of transformation



React



Return



Reimagine

AppStream 2.0

End user experience

- Stream non-persistent desktop or apps
- Provide dedicated instance
- Adjusts streaming to network conditions



Admin curated

- Centrally manage applications
- Admin defined end user experience
- Resolve issues by starting a new session
- Deliver application updates seamlessly like a web app



Architecture

- Non-persistent by design
- Integrates existing IT, storage, and identity



Approach

- Fully managed service
- Deploy at scale globally
- Pay as you go pricing



amazon
AppStream 2.0

Fully managed service

On-prem VDI

Image management

Directory services & policies

VDI control plane install & admin

Host admin

Storage admin

Load balancers install & admin

Hypervisor install & admin

Physical security

Power, HVAC

Rack & stack

Customer managed

Other cloud VDI

Image management

Directory services & policies

VDI control plane install & admin

Host admin

Storage admin

Load balancers install & admin

Hypervisor install & admin

Physical security

Power, HVAC

Rack & stack

Service managed

amazon
AppStream 2.0

Image management

Directory services & policies

VDI control plane install & admin

Host admin

Storage admin

Load balancers install & admin

Hypervisor install & admin

Physical security

Power, HVAC

Rack & stack

AppStream use cases

Enterprise customers



- Deliver non-persistent desktops or apps to remote workers
- Migrate Windows application to AWS
- Deploy Bastion host for secure resource access
- Enable secure device access to unsecure resources

Education customers



- Virtualize labs & classrooms
- Enable remote learning
- Provide on-demand access to graphics applications
- Centrally manage licenses and application access

ISV customers



- Deliver online trials, demos, & training
- SaaSify your Windows app with no rewrite
- Enable your customer's cloud migrations

All customers – on premise VDI migration to cloud native solution



Education: Virtualize labs & classrooms

Business Challenges:

AppStream Solution Benefits:

- Challenges in scaling for remote users
- Costly to maintain
- Difficulty supporting the velocity of changing application and hardware requirements



Students can use their devices & have access anytime/anywhere



Supports faster response to market forces & allows for recruitment of both on/off campus students



Students get the opportunity to learn with real world applications



Ensures security, privacy, & compliance



Educations make more effective use of real estate and spend more time teaching



Keep up with changing application and hardware requirements



MACQUARIE
University

“AppStream 2.0 has enabled us to offer applications that students require for their coursework without the need for users to download, install, or configure any software. Using AppStream 2.0, our students can access their applications and files from anywhere, on campus or off campus, and from any device. AppStream 2.0 has allowed us to decommission aging server and storage hardware in favor of a fully-managed solution in the cloud.”

– Grant Sayer, Director of Infrastructure and Applications, Macquarie University



Education: Enable remote learning

Business Challenges:

AppStream Solution Benefits:

- Secure connectivity for students and educators
- Building supporting infrastructure to support extreme variabilities in usage
- Providing a positive end-user experience in terms of latency and performance



Pay as you go pricing based on concurrent (not peak) usage



Dedicated instance for each session (no noisy neighbor challenge to derogate education experience)



Autoscaling capabilities to ensure all resources are consistently available



Deliver secure access over the internet (non need for VPN)



Identity access management and single sign-on (SSO)



Classes aren't limited by students access to campus or classroom

“We looked at several virtual desktop solutions and found AWS’s scalability and unique pricing model most attractive with its pay-as-you-go model where we are only pay for AppStream based on student usage.”

– Eric Rzeszut, Associate Director of Client Services, University of Virginia



McINTIRE SCHOOL
of COMMERCE



Serving thousands of customers



Challenges for IT to meet the needs of end users



Costly on-prem infrastructure



Complicated app delivery



Improve user experience



Deliver GPU on commodity HW



Scale globally



Improve security

AppStream overview



Co-located compute, graphics, apps, data



Encrypted pixel stream



Users

AppStream benefits



Fully managed service



Secure by default



Scales on demand



Pay-as-you-go pricing



Integrate with your IT environment



Centrally manage applications



High-reliability



Fluid & responsive end user experience

Fully managed service



AppStream 2.0 is delivered as a fully managed service, eliminating the need for customers to worry with the administrative overhead and complexity of on-premises VDI. There is no upfront cost. You no longer have the need to acquire, provision, and operate Windows servers, databases, network appliances, or streaming gateways.

Allows you to ...

- focus on high value projects

- eliminate undifferentiated infrastructure deployment & management tasks

- lower operational costs/burden of patching and updating applications on every end-user device

- eliminate CapEx purchasing for future and unknown demand

Secure by default



Applications and data co-located on AWS. Your applications are streamed as encrypted pixels and access data secured within your network. AppStream 2.0 runs on AWS, so you benefit from a data center and network architecture built for the most security-sensitive organizations.

How ...

- no app data touches the endpoint

- data protection policy controls

- SAML federation which enables authentication and integration with popular identity providers

- precise admin tools to control user data movement

- encrypted end-to-end

Scales on demand



AppStream 2.0 is fully managed on AWS and globally available with pay-as-you-go pricing. You can easily scale your non-persistent environment to any number of users across the globe without acquiring, provisioning, and operating hardware or infrastructure.

Provides you ...

- faster response to business demands by rapidly provisioning non-persistent desktop & apps

- both schedule based and utilization based auto-scaling policies available

- the ability to scale the environment up and down to match your usage patterns

- the ability to optimize streaming costs overtime

Pay-as-you-go pricing



With AppStream you pay only for what you provision, when you provision it. Customers can pay for what they use, and once they stop using, there are no additional costs, termination fees, long-term contracts, or complex licensing.

- Enables you to ...**
- easily adapt to changing business needs without over-committing budgets, scale the environment up or down to optimize costs
 - only provision the amount of resources you actually need
 - avoid long-term contracts, complex licensing, or termination fees
 - only pay for what you provision when you provision it

Integrates with your systems



AppStream 2.0 connects to your Active Directory, network, cloud storage, and file shares. Users access their applications using their existing credentials and your existing security policies manage access. Extensive APIs let you integrate AppStream 2.0 with your custom IT solutions.

What ...

- enables users to sign in using their existing credentials, and start streaming applications

- use your existing user directory to control end-user access to applications available

- quickly add or remove access for users or groups, restrict access based on user locations, and enable multi-factor authentication

- enable federated access and controls via any SAML 2.0 compliant identity provider

- ability to connect to your Microsoft Active Directory (AD) domain

Centrally manage your applications



You centrally manage your applications on AppStream 2.0 and can stop managing installations and updates on each user's computer. Each user accesses the same version of your applications.

- Allows you to ...**
- quickly and easily install, test, and update your applications using the image builder
 - install any application that runs on Microsoft Windows Server 2012 R2, Windows Server 2016 or Windows Server 2019
 - copy application images across AWS regions and share images with other AWS accounts within the same region
 - resolve issues by updating the image, the next time the user logs in, they receive the updated image
 - leverage included APIs to easily integrate and extend the service

High-reliability



AWS has unmatched experience, maturity, reliability, security, and performance that you can depend upon for your most important applications. AWS has the most operational experience, at greater scale, of any cloud provider.

Delivers ...

99.9% service uptime SLA

multiple availability zones per region

auto scale load balancing

global footprint for disaster recovery and low-latency streaming

Fluid & responsive end user experience



Applications are highly responsive because they run on virtual machines and the NICE DCV protocol automatically adjusts each streaming session to network conditions for a fluid user experience.

Highlighted by...

the core design point that each user receives a dedicated instance thereby avoiding noisy neighbor challenges leading to resource contention

the ability to allow users to run multiple applications and easily switch and interact with them through an application centric view or a standard desktop experience

the enablement of copy and paste between applications and local machine, quickly upload or download files, and print to local or network printers functionality

the capability for users to to audio output from applications, and control the bandwidth and fidelity for the experience

Stream from nearest location

10 geographical regions

○ AppStream 2.0 Regions

GovCloud (US)

US-West

US West

Oregon

US East

N. Virginia

Europe

Frankfurt

Ireland

Asia Pacific

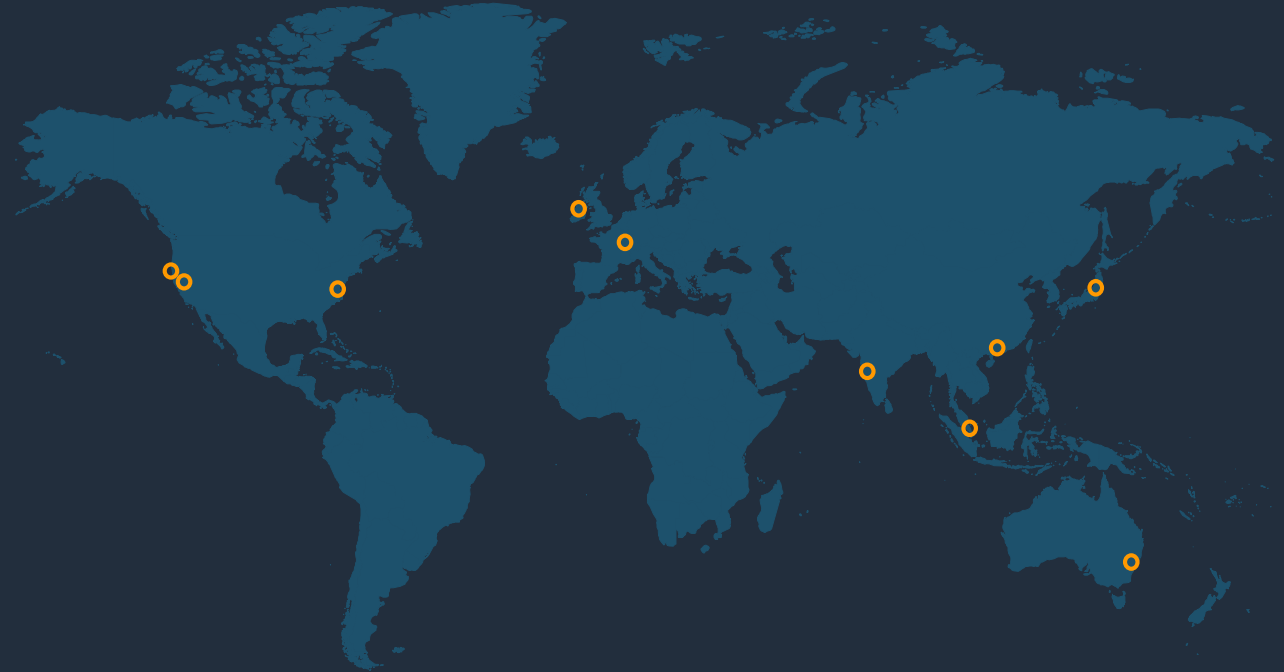
Singapore

Sydney

Tokyo

Seoul

Mumbai



Meet compliance mandates

AppStream key certifications

SOC
PCI
ISO
FedRAMP
DoD SRG
HIPAA BAA
IRAP
MTCS
C5
ENS High
OSPAR
HITRUST CSF



<https://aws.amazon.com/compliance/services-in-scope/>

What you eliminate with **AppStream 2.0**



Breaking your budget

Only pay for your concurrent usage



Wasted resources

Scales on demand, no longer have to design for and pay for peak utilization



Managing streaming infrastructure

Managed service with simplified application management capabilities



Worry about high availability

AWS offering by default



Poor performance for users

Each user gets dedicated instance 100% of the time

Pay-as-you-go pricing

Based on concurrent users per hour

Amazon AppStream pricing starting at*

\$0.10/hr

Running
instances

\$0.025/hr

Stopped
instances

Monthly user fee per user that streamed

(\$4.19/user license included, \$0.44/EDU user, No charge for BYOL)

*Prices here are in USD and apply to instances hosted in US-based regions. For other pricing go to: <https://aws.amazon.com/appstream2/pricing>



AppStream pricing options

Instance charges and user fees



Always on fleet

- Instant connection
- Standby instances are in running mode
- Pay streaming fees



On demand fleet

- 1-2 minute launch time
- Standby instances are in sleep mode
- Pay streaming fees when connected + small hourly fee for standby instances



Monthly user fee

- Charged per user that streamed in a given month
- License included - \$4.19
- EDU license included - \$0.44
- Bring Your Own SPLA or EA RDS CALs – No charge

Instance performance matching users / apps

Non-graphics instances

Standard

Compute

Memory

Memory Z1D

Instance details:

2 Instance types available
2 – 4 vCPU cores
4 – 8 GiB memory
*Starts at \$.10/hr

5 Instance types available
2 – 32 vCPU cores
4 – 60 GiB memory
*Starts at \$.25/hr

5 Instance types available
2 – 32 vCPU cores
15 – 244 GiB memory
*Starts at \$.25/hr

6 instance types available
2 – 48 vCPU cores
12 – 271 GiB memory
*Starts at \$.45/hr

Example use-cases/applications:



* Hourly pricing fee charged for running instances only. For Image Builder and Always-On fleets, instances may be considered running if they are available for use, even if no user is connected. For On-Demand fleets, instances are considered running only if users are connected with an active streaming session.

Instance performance matching users / apps

Graphics instances

Graphics G4DN

Instance details:

6 Instance types available
NVIDIA T4 GPU
4 – 64 vCPU cores
16 – 256 GiB memory
16 GiB GPU
*Starts at \$1/hr

Graphics design

4 Instance types available
AMD FirePro virtualized GPU
2 – 16 vCPU cores
7.5 – 61 GiB memory
1 – 8 GiB GPU
*Starts at \$.25/hr

Graphics pro

3 instance types available
NVIDIA Tesla M60 GPU
16 – 64 vCPU cores
122 – 488 GiB memory
8 – 32 GiB GPU
*Starts at \$2/hr

Example use-cases/applications:



* Hourly pricing fee charged for running instances only. For Image Builder and Always-On fleets, instances may be considered running if they are available for use, even if no user is connected. For On-Demand fleets, instances are considered running only if users are connected with an active streaming session.

AppStream 2.0 DEMO

Q&A Session

Thank you!

David Ryder
Specialist Solution Architect – End User Computing
daviryde@amazon.com

Tushar Dhanani
Specialist Solution Architect – End User Computing
tddhanan@amazon.com