
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

EUC202

What's new with Amazon WorkSpaces, Amazon AppStream 2.0 & WorkSpaces Web

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Agenda

- Tenets for maximizing customer value
- Portfolio overview
- Innovation within Amazon WorkSpaces family services
- Ubuntu Desktop for WorkSpaces
- New features and capabilities
- Protocol deep dive
- Customer presentation featuring Maximus
- Wrap-up

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Tenets for maximizing customer value



Flexibility



Choice



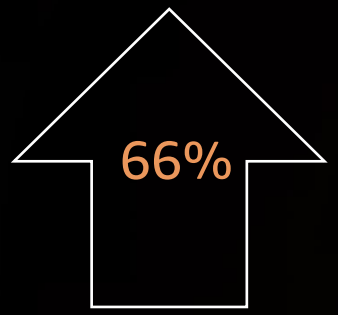
Customer experience

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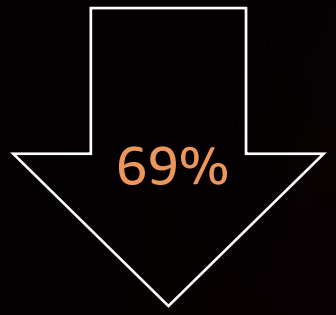
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Leverage the power of AWS

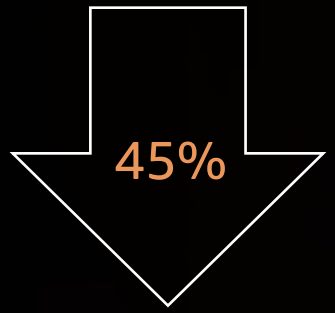
Migrating from on premises to AWS[1]



Admin productivity



Unplanned downtime



Security-related issues



Infrastructure costs

Driving productivity and agility[2]

"Key results include increased staff productivity after shifting from on premises to cloud VDI, as well as newfound business agility and EUC flexibility."

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[1] The Hackett Group January 2022 AWS has not independently verified the accuracy of the results
[2] "The total economic impact of AWS End User Computing"– Forrester, Dec 2021

Choice – Meeting customers where they are

ROI

Management simplicity



Individual workstation config, hardening, provisioning, tracking



On-premises VDI

- DCV protocol



Do-it-yourself cloud VDI

- DCV protocol on AWS



Fully managed cloud services

- Amazon WorkSpaces
- Amazon WorkSpaces Core
- Amazon WorkSpaces Web
- Amazon AppStream 2.0

Security/reliability

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AWS End User Computing (EUC) services

AWS virtual desktop services

WorkSpaces (fully persistent)
AppStream 2.0 (selective persistence)

All-inclusive virtual desktop services

WorkSpaces Core

Virtual desktop infrastructure APIs for third-party VDI software

WorkSpaces Web

Secure, low-cost browser service for access to internal websites and SaaS apps

Application SaaS conversion service

AppStream 2.0

Secure, reliable, and scalable access to applications from any location



WorkSpaces Streaming Protocol (WSP) and DCV protocol

High-performance remote display protocols for any application

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Innovating to create customer value

Agility



- Scale with changing business needs
- Choose service that meets your unique needs

Productivity



- Consistent toolset simplifies management
- AWS scale puts resources close to end users

Security



- Data resides in AWS Cloud, not on end-user devices
- Desktop streaming is encrypted

Reliability



- 99.9% financially backed uptime guarantee

Cost



- Fixed-rate, pay-as-you-go pricing, no hidden fees
- Auto scaling prevents over provisioning

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Amazon WorkSpaces

A WORKSPACE FOR EVERY WORKLOAD

Ubuntu Desktop (New)

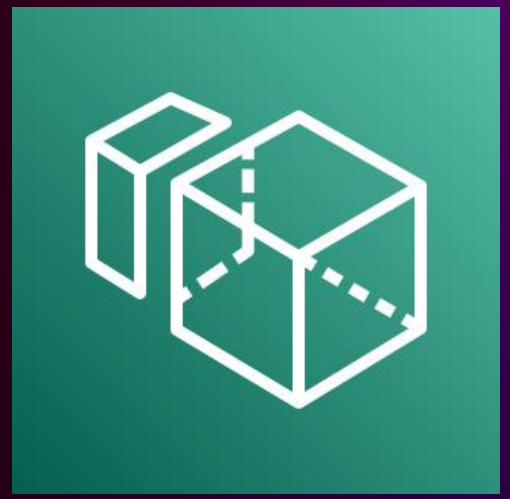
- Familiar Ubuntu environment
- Users with Ubuntu dev tool dependencies
- Move technology professionals such as developers for lower cost/enhanced productivity

Amazon Linux

- Lowest-cost Linux solution
- For users with no Linux OS preference
- No OS requirements by dev tool ISVs

Microsoft Windows

- Familiar Windows environment
- Users with Windows dev tool dependencies
- GPU-accelerated configurations



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Ubuntu Desktop for WorkSpaces



Ubuntu Desktop for WorkSpaces

- Scale rapidly, pay as you go
- 14 AWS Regions minimizes latency
- SAML 2.0, Active Directory via SSSD, GPOs via ADsys
- Self-service – optimize volume size, compute, running mode
- Custom image accelerates dev environment setup
- WSP v2: 4k, multiple monitor, webcam



Deliver cloud-native apps at scale

- Ubuntu Pro 22.04 LTS with GNOME desktop
- Runtimes (Python, node.js, Go)/server components (Apache Kafka, NGINX, MongoDB, Redis, PostgreSQL)
- AWS SDK and CLI ready
- Productivity and development apps a SNAP away
- Ubuntu Pro – Kernel LivePatch/patches for Universe repo

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Typical Ubuntu users



Developers

- Support for the latest tool chains/libraries
- Build/test/deploy in multiple environments



Data scientists

- The reference platform for cutting edge data science and AI/ML tooling
- Performance for data processing/modeling



Engineers

- Performance for visualization/rendering
- Low latency for collaborating



Task workers

- Access to applications
- Not dependent on Windows

IT Admins

- Active Directory enables mixed OS fleet management
- Rapid provisioning /deployment
- Lower hardware procurement costs

Security Teams

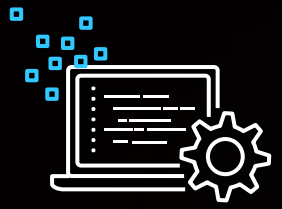
- 10 years of security patching with Ubuntu Pro
- Access to hardening and compliance tools (FIPS, CIS)
- Data remains in the AWS Cloud

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Why developers love Ubuntu

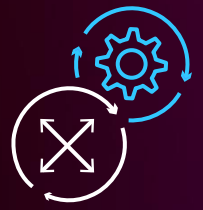
PROFESSIONAL DEVELOPERS PREFER UBUNTU*



Common platform for development, test, and production



Easy access to open source software



Reliable, predictable release (LTS)



Secure and supported by LTS model (now Pro w/ extended patching)



Global community access



Numerous open source/ Canonical tools (Juju, Microk8s, Multipass)

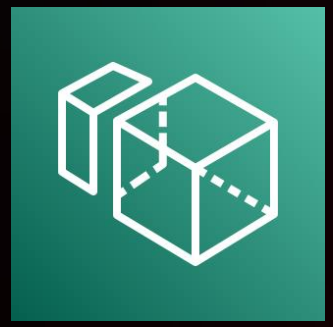
*HackerEarth 2020 developer survey

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Benefits of moving to Ubuntu

Ubuntu Desktop for WorkSpaces



Windows to Ubuntu

- No license fee
- More tools, ease of use
- Programming language/close to production
- Broad support for IDEs (VS Code, Eclipse, IntelliJ, Spacemacs, Atom)
- Memory and process control

WSL to Ubuntu

- Performance - file system/hardware
- Access - hardware, tools, libraries
- Run Docker containers
- Identifying errors/troubleshooting
- Support

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Ubuntu Desktop for WorkSpaces

- Extends Ubuntu Desktop into a fully managed cloud-desktop service
- Designed for builders, data scientists, and general users
- More choice for WorkSpaces deployment – all managed from one place
- Single point of support through AWS
- Pay only for what is used, no over provisioning

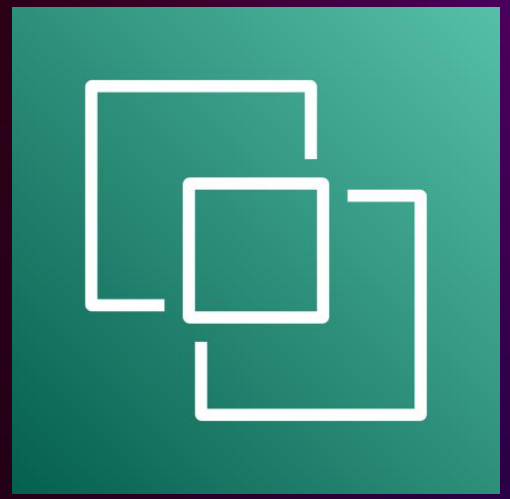
Ubuntu Desktop for WorkSpaces announcement blog

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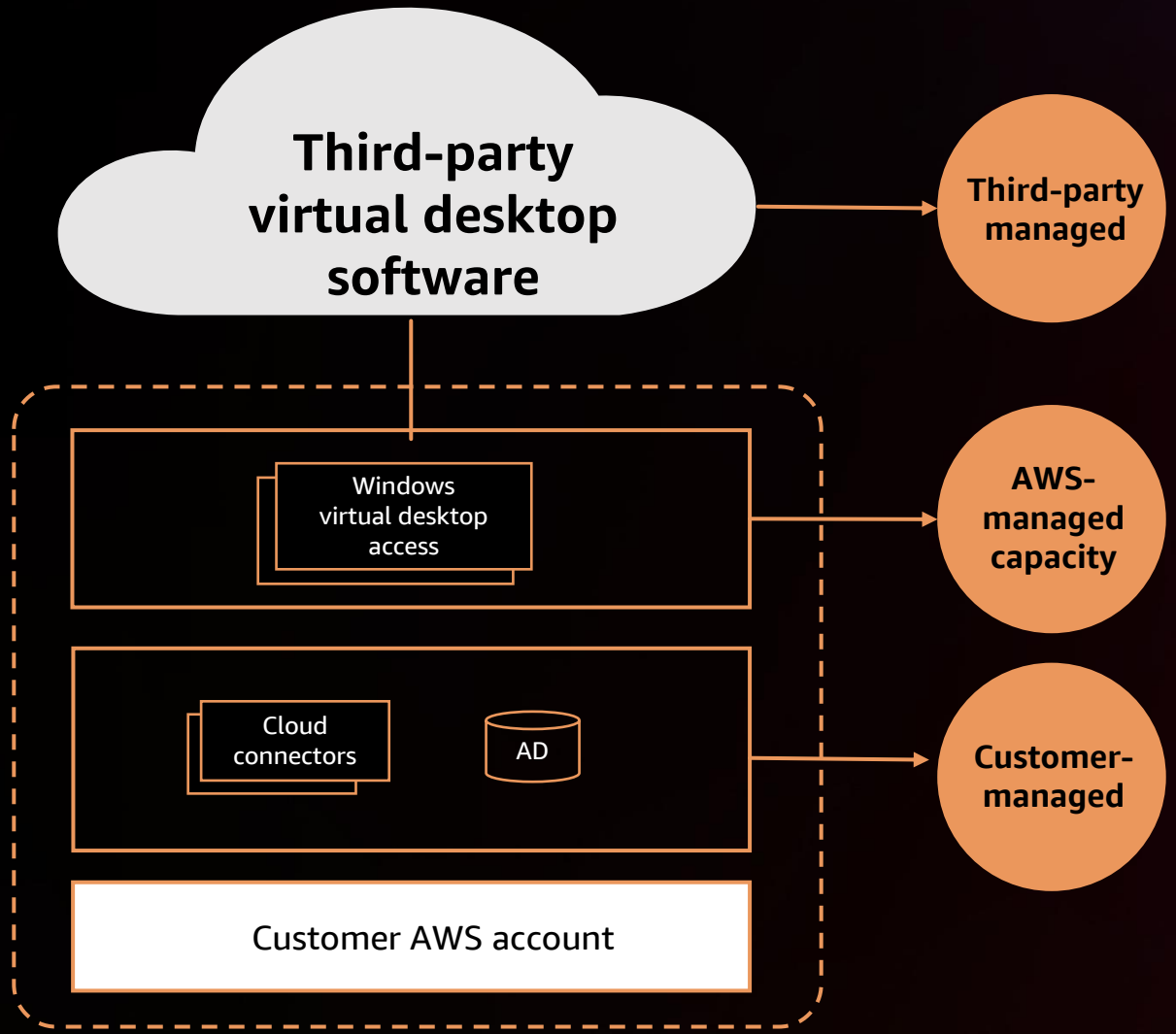
WorkSpaces Core

WorkSpaces Core allows customers and partners to build customized VDI solutions (like virtual desktops) using select, purpose-built APIs that leverage at-scale infrastructure management capabilities of WorkSpaces service



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WorkSpaces Core architecture

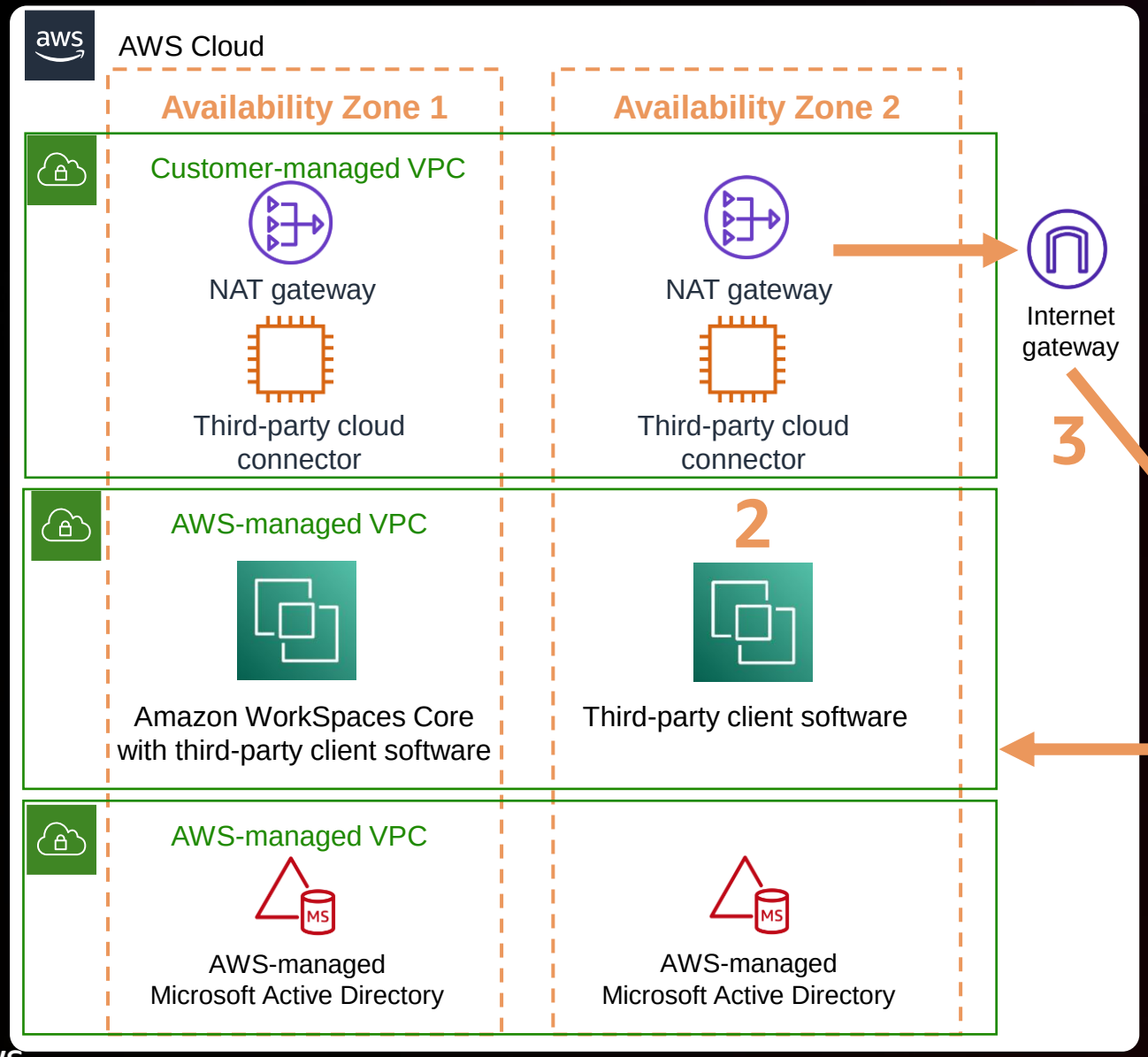


Billing options:

- Flat monthly rate per user
- Hourly fee + nominal monthly flat fee

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WorkSpaces Core architecture



1) Third-party cloud service deploys desktop resource from AMI into AWS
2) Third-party client software configured via Active Directory group policy to use cloud connector domain name
3) Third-party client software communicates and registers with third-party cloud service
4) Users access third-party virtual desktop via third-party protocol and gateway service



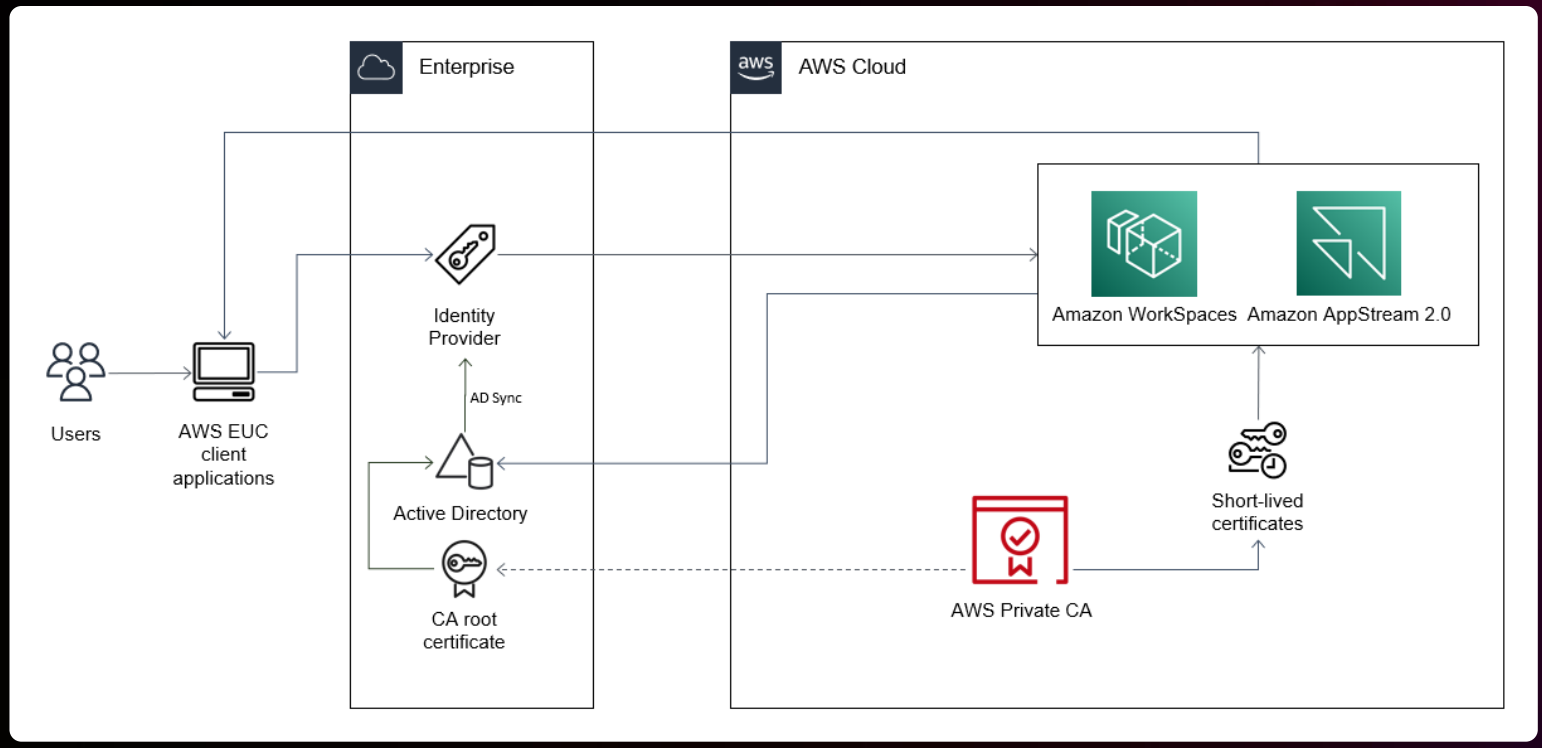
Third-party cloud service

- Third-party virtual desktop software
- Gateway service
- Analytics service
- Virtual desktop UI

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SAML 2.0 / certificate-based authentication

UNIFY / STREAMLINE WORKSPACES AND APPSTREAM 2.0 AUTHENTICATION FOR WORKFORCE IDENTITIES



Architecture for WorkSpaces SAML 2.0 authentication with certificate-based authentication to Active Directory, using Active Directory Connector directory type

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SAML 2.0 / certificate-based authentication

UNIFY / STREAMLINE WORKSPACES AND APPSTREAM 2.0 AUTHENTICATION FOR WORKFORCE IDENTITIES

Standardize identities
Attach IdP workforce identities to AppStream 2.0 and WorkSpaces authentication workflow

Enhance security
Attach strong authentication features of IdP and reduce the validity period for end-user AD credentials using short-lived certificates

Streamline user experience
Authenticate users to Active Directory automatically

Reduce administration
Automatically rotate certificates to reduce dependence on password policies

AS2 CBA blog

WS SAML 2.0/CBA blog

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Native-like video conferencing

FEATURING ZOOM

Improved productivity
Native-like audio and video performance when using Zoom on WorkSpaces.

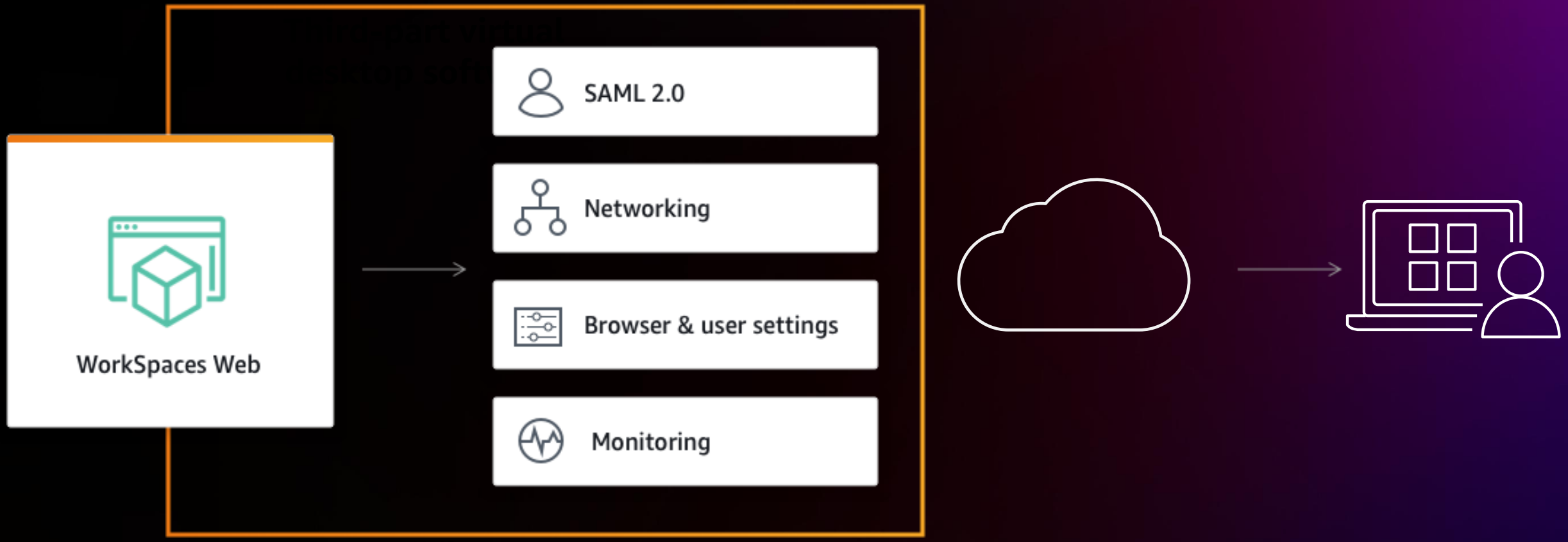
Security
AV traffic securely offloaded onto a virtual channel, allowing direct communication between the local client and Zoom platform.

Cost savings
AV data processing occurs on local client device, reducing processing.
Customers may achieve cost savings by choosing lower-cost bundles.

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WorkSpaces Web

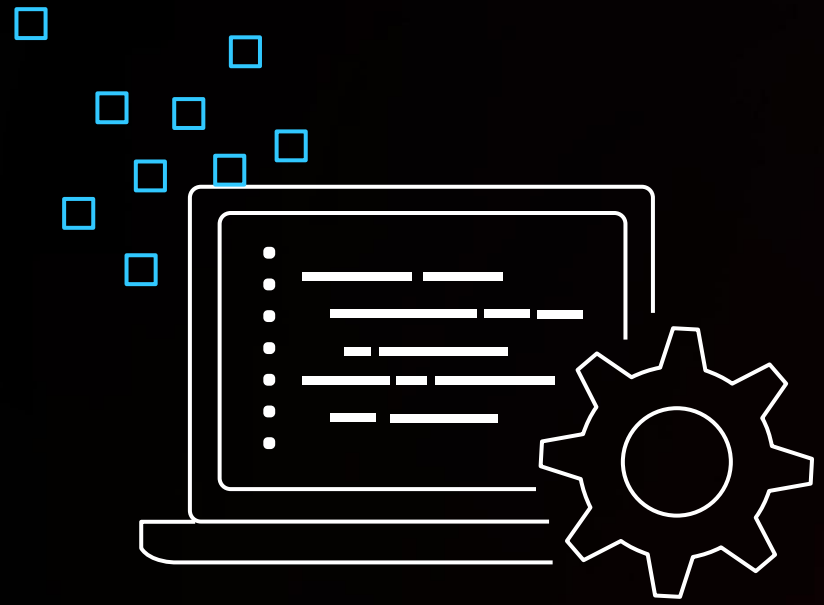
FULLY MANAGED, SECURE BROWSER ACCESS TO INTERNAL WEBSITES AND SAAS APPLICATIONS



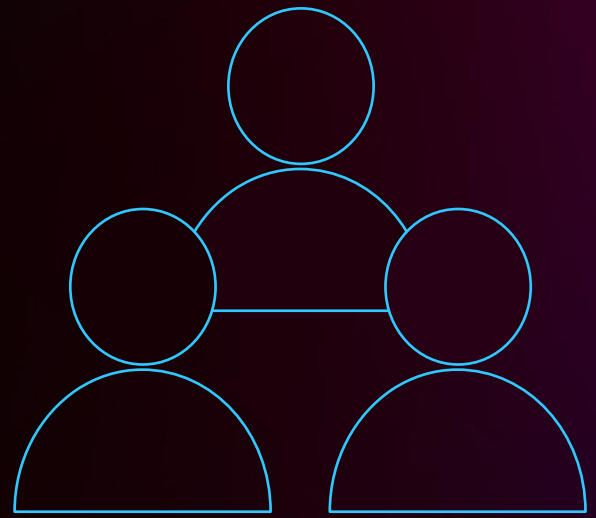
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WorkSpaces Web releases

Enhance administrator experience



Enhance user experience



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Predictable pricing

No upfront commitments, no surprises

WorkSpaces Web billing example



Value – Affordable $7/ monthly active user* fee when secure web browsing is the primary need

Simple budgeting – Per user billing makes expense planning easy

Flexibility without commitment – Scale active users up/down when necessary

- For up to 200 hours of streaming. Streaming hours above 200 are available for $0.035 per hour. Cost per monthly active user can vary by Region.
- https://aws.amazon.com/workspaces/web/pricing

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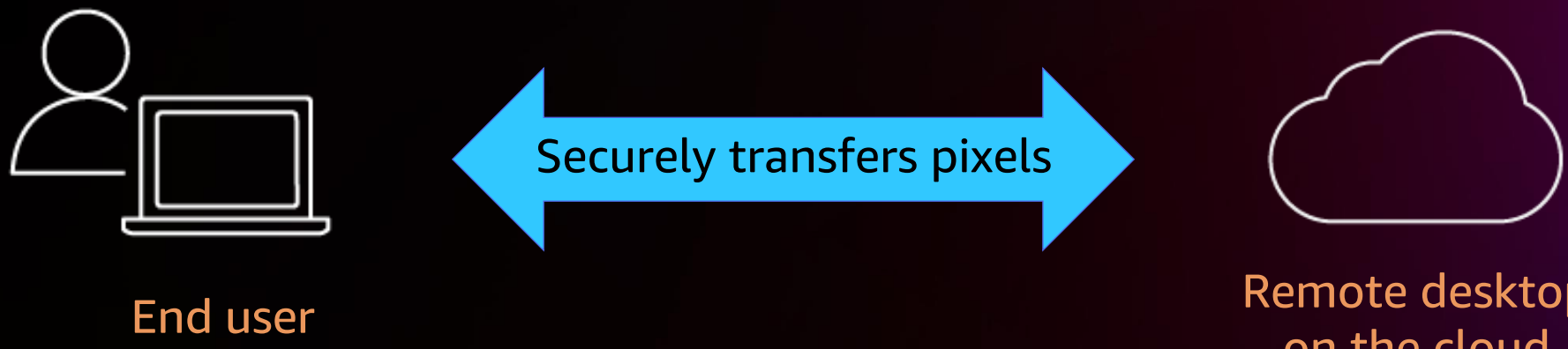
WorkSpaces Streaming Protocol (WSP) updates

Rey Wang (she/her)
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WorkSpaces Streaming Protocol (WSP)

ENABLES CLOUD-BASED VDI



WorkSpaces Streaming Protocol (WSP)

- Cloud-native, generally available since re:Invent 2020
- Enabled additional features such as webcam and smart card support

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WSP built using proven DCV protocol









amazon | project kuiper



Amazon Nimble Studio



AWS ParallelCluster



AWS RoboMaker



Amazon WorkSpaces Web



Amazon AppStream 2.0

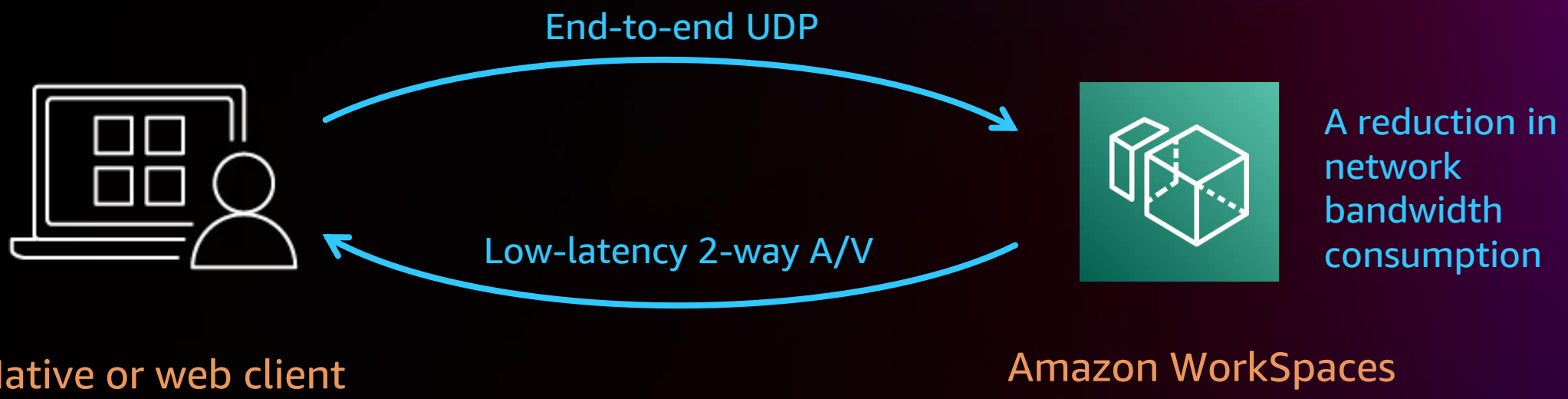


Amazon WorkSpaces

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Performance is top priority for WSP



WSP is designed to:

- Deliver a responsive experience, regardless of network condition
- Create the best video conferencing experience to increase productivity
- Provide more resources for the user's applications

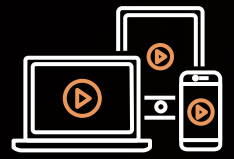
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New features for WSP

POWERED BY DCV TECHNOLOGY



Included in Ubuntu Desktop for Amazon WorkSpaces



New native Windows, MacOS, and web clients

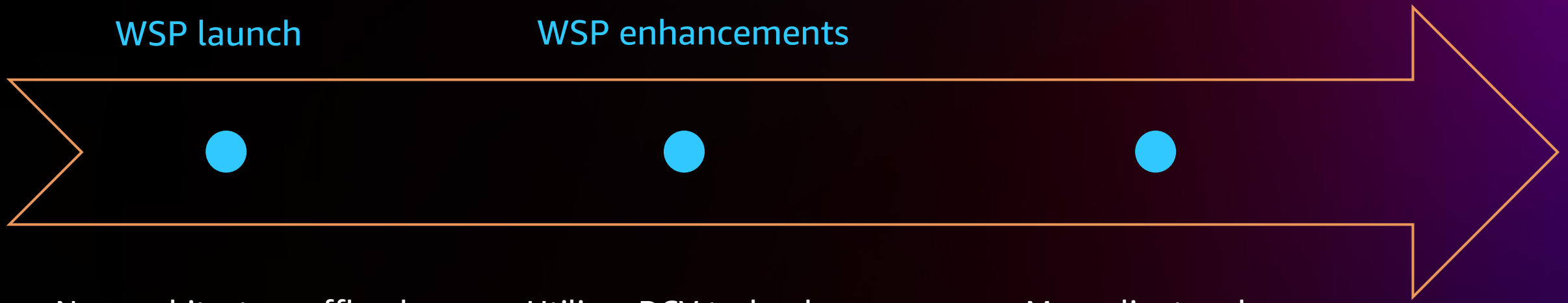


7 new web client features including webcam, microphone support, streaming metrics, and time zone redirection

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The evolution of WSP



- New architecture offloads metric analysis, codec selection, and encoding

- Utilizes DCV technology
- Improved streaming quality
- New native and web clients
- Ubuntu WorkSpaces support

- More client and server platform support
- More AWS Regions
- More in-session features

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Amazon WorkSpaces Multi-Region Resilience

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Head of Product

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Advancing business continuity management



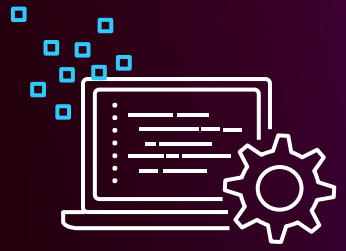
Productivity

Keep users online and productive during disruptive events



Cost optimization

Optimize the costs of building redundant, cloud-based, virtual desktop infrastructure across multiple Regions



Administration

Reduce the administrative burden of maintaining standby deployment across multiple Regions

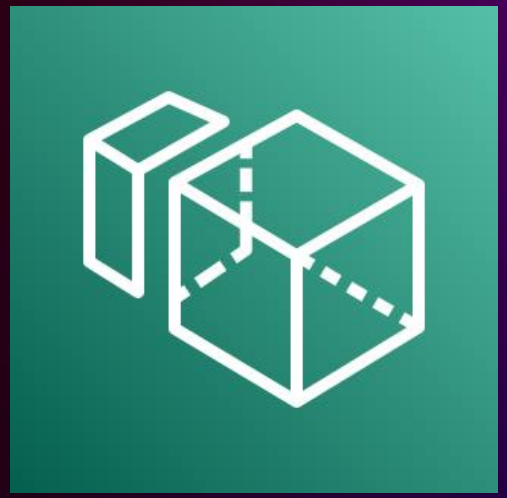
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Amazon WorkSpaces Multi-Region Resilience

Minimize productivity loss
Redirect users to standby WorkSpaces in the secondary Region with <30-min recovery time objective (RTO)

Cost-effective
Each standby instance requires a small, fixed monthly fee to cover infrastructure and storage costs and a low flat rate for each hour of usage during the month

Operational efficiency
Streamline standby deployment and maintenance



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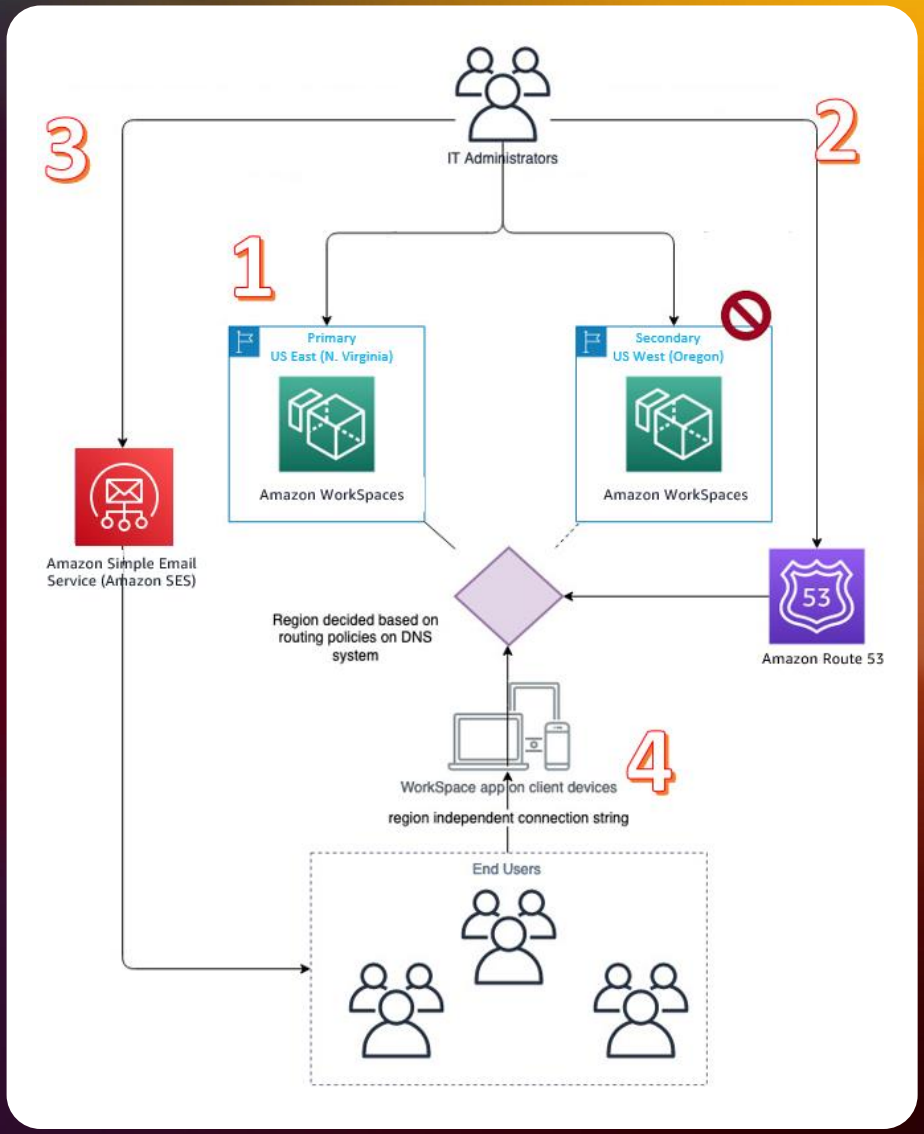
MRR architecture and deployment

1. Deploy WorkSpaces in primary and secondary Regions
   - Create user directories in primary and secondary Regions
   - Create instances in primary Region and standby instances in secondary Region
   - Create and associate connection strings with user directories in both Regions

2. Configure DNS service and set up DNS routing policies

3. Notify Region-independent connection string to end users

Get started now



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maximus

Moving people, technology, and government forward.

Wylie N. Hartwell

SVP of Information Technology
Maximus

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About Maximus

Provider of technology services, digital customer experiences, and clinical health services that change lives

53,000+ employee hybrid workforce in 10 countries

300M call minutes processed YTD in 2022 by contact center agents

500+ cloud-based applications in support of 400+ contracts

400+ federal, state, and local government customers

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Maximus application and services users

- Complex set of business leaders, people managers, contact center agents, assessors, and clinicians
- Multiple technical stakeholders including architects, engineers, technicians, IT PMs, developers, and DBAs
- Security, privacy, and compliance guardrails to protect company and customer data and systems



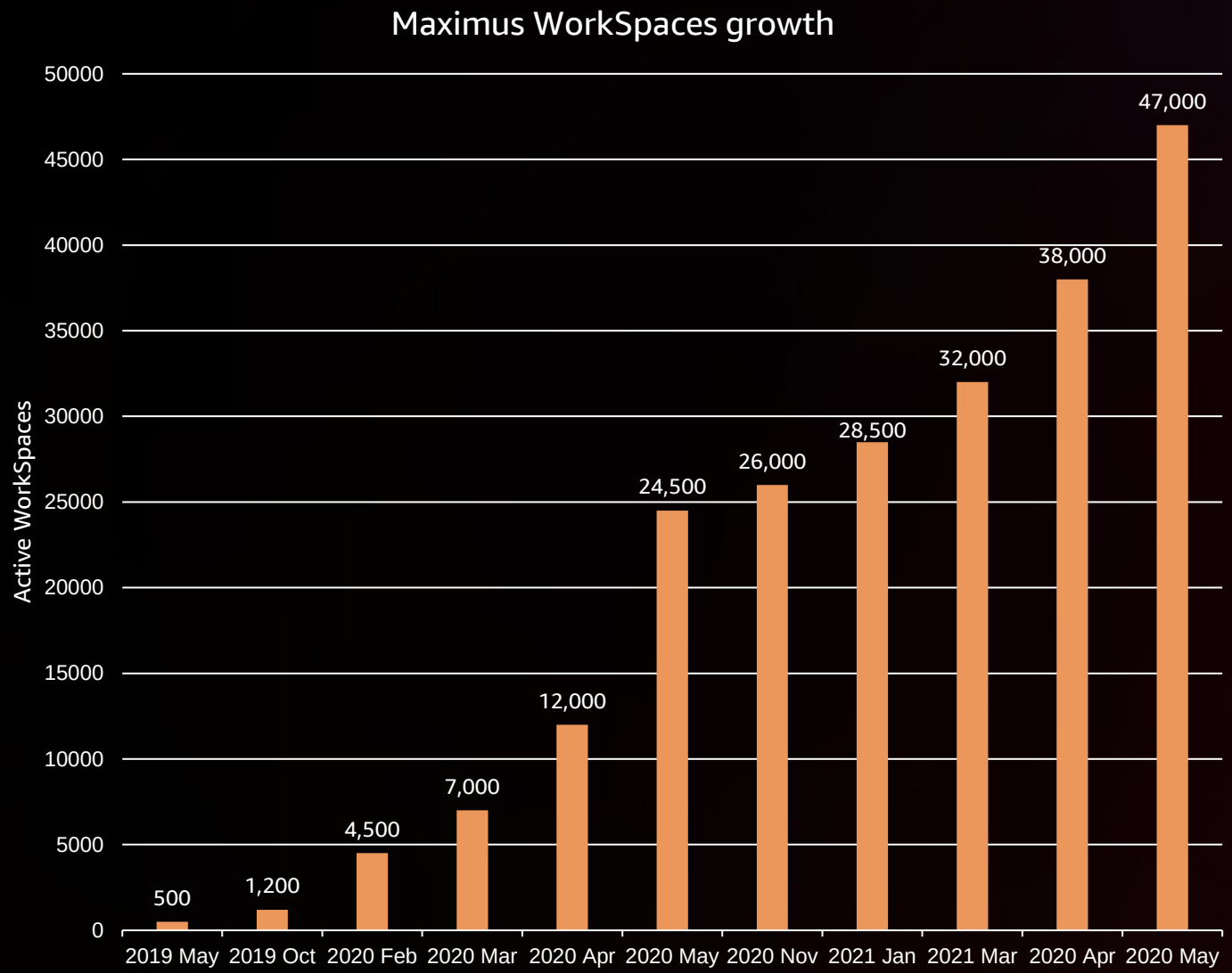




Requires a highly flexible and scalable solution for end-user computer

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Maximus' WorkSpaces deployment



- **Mid-2018** – adopted cloud-first strategy/deployed Amazon WorkSpaces
- **Mid-2019** – set goal to add 3,000 users in next 6 months
- When COVID hit, fast scaling was essential to success

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Challenges

Wide range of customer requirements

Aggressive uptime SLAs

Overloaded service desk

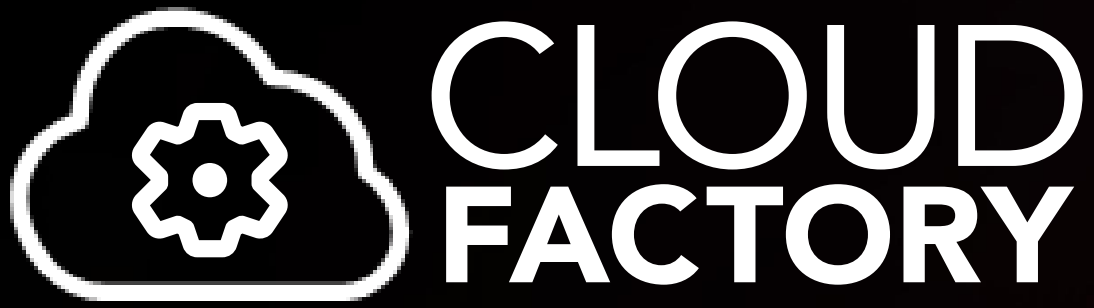
Multiple system logins

Financial accountability

BYOD work environment

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Solution overview



- Continuous optimization with Amazon automation baseline
- Profile and directory tagging
- Resilience – 4 Regions, 86 directories, 3 images, 600+ Active Directory security groups
- Amazon WorkSpaces Multi-Region Resilience – in testing for production rollout
- One location for end-user support and self-service support for WorkSpaces

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AWS engagement and results

Highly collaborative AWS engagement – understanding strategy and requirements, supporting in-house dev teams, resolving issues

Results

- Flexibility to meet rapidly changing business needs
- Support calls for WorkSpaces-related issued down 60%
- Users empowered to address issues before contacting IT Support
- Streamlined troubleshooting
- Improving end-user satisfaction
- Quicker return to work times for WorkSpaces users

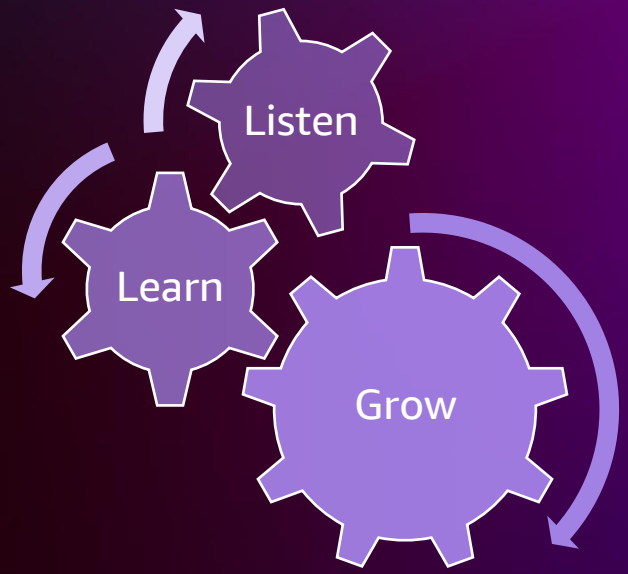


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Learning and growing

How are we doing this?

- Deploy Amazon WorkSpaces with WSP protocol
- Recognize there is always an opportunity to improve
- Actively engage our business unit to understand requirements
- Act upon end-user feedback
- Zero Trust is on the horizon for security
- Leverage upcoming WorkSpaces functionality
- Leverage Amazon AppStream 2.0 for application-specific needs and simplified distribution of workloads to multiple users
- Establish end-to-end visibility to the desktop – growing our tools



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WorkSpaces launches in 2022

Feature launch	Regional expansion
• Ubuntu Desktop for WorkSpaces • Amazon WorkSpaces Multi-Region Resilience • EUC seamless logon • WorkSpaces SAML 2.0 • Virtual meeting experience/WorkSpaces extension SDK • WorkSpaces Core • WSPv2 support (Windows WorkSpaces, Windows client, macOS client, Web Access) • CreateWorkSpacesImage API • WorkSpaces client diagnostic log uploads • WorkSpaces audio optimization for Amazon Connect • G4dn graphics for AWS GovCloud (US) & Commercial Regions • Client self-service customizable cobranding: APIs • User access logging (WorkSpaces Web) • WorkSpaces limits management with AWS service quotas • Standby WorkSpaces discounted pricing • HP Thin Client (with ThinPro 7.0) and WorkSpaces collaboration	• WorkSpaces Region launch in Cape Town • WorkSpaces Web Region expansion – London, Frankfurt & Montreal • WorkSpaces Web Region expansion – Singapore, Sydney, Tokyo

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AppStream 2.0 launches in 2022

Feature launch	Region expansion
• Session scripts to customize sessions for elastic fleets • Image Assistant GUI for Linux • Application-level entitlements • UDP support for Windows native client • Webcam support for Linux • Larger instance types for general purpose instance family • Certificate-based authentication seamless logon	• São Paulo Region launch • Ohio Region launch • Montreal Region launch

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End User Computing: Other track sessions

Type	Code	Level	Day/time	Title
Breakouts	EUC 202	200	11/28, 5:30–6:30 PM	What's new with Amazon WorkSpaces, Amazon AppStream 2.0 & WorkSpaces Web
	EUC 204	200	11/29, 2:00–3:00 PM	Creating remote work environments that optimize security and productivity
	EUC 201	200	11/29, 5:00–6:00 PM	Creating the workplace of the future with AWS end user computing
	EUC 307	300	11/30, 8:30–9:30 AM	Accelerating SaaS conversion of legacy applications
	EUC 203	200	11/30, 10:00–11:00 AM	Creating flexibility and choice for VDI management with Amazon WorkSpaces
Chalk talks	EUC 310	300	11/29, 12:30–1:30 PM	Streamlining log-on experience for Amazon WorkSpaces and AppStream 2.0
	EUC 205-R1	200	11/29, 2:45–3:45 PM	Managing application deployment in an Amazon WorkSpaces environment
	EUC 302	300	11/29, 3:30–4:30 PM	No refactoring required: Turning legacy applications into SaaS
	EUC 309	300	11/30, 10:00–11:00 AM	Choosing an Amazon AppStream 2.0 fleet to reduce costs & optimize experience
	EUC 312	300	11/30, 2:30–3:30 PM	Securing end user computing workloads on AWS end user computing services
	EUC 308	300	11/30, 5:30–6:30 PM	Best practices for migrating on-premises VDI workloads to the cloud
	EUC 301-R1	300	12/01, 11:45 AM–12:45 PM	Securely stream AWS workloads to your remote workers

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End User Computing: Other track sessions

Type	Code	Level	Day / Time	Title
Workshops	EUC 303	300	11/29, 2:45–4:45 PM	Getting started with Amazon AppStream 2.0
	EUC 304	300	11/30, 11:30 AM–1:30 PM	Enable secure access to private resources with Amazon WorkSpaces Web
	EUC 306-R1	300	11/30, 3:15–5:15 PM	Getting started with Amazon WorkSpaces
Builders	EUC 313	300	11/29, 11:00 AM–12:00 PM	Building streaming applications using Amazon AppStream 2.0 Elastic fleets
	EUC 313-R1	300	11/30, 4:00–5:00 PM	Building streaming applications using Amazon AppStream 2.0 Elastic fleets
Theater	EUC 001	NA	11/30, 2:30–2:50 PM	Maximize employee experience with Amazon WorkSpaces & AppStream 2.0
	EUC 002	NA	11/30, 3:00–3:20 PM	Modernize your virtual desktop infrastructure with Amazon WorkSpaces

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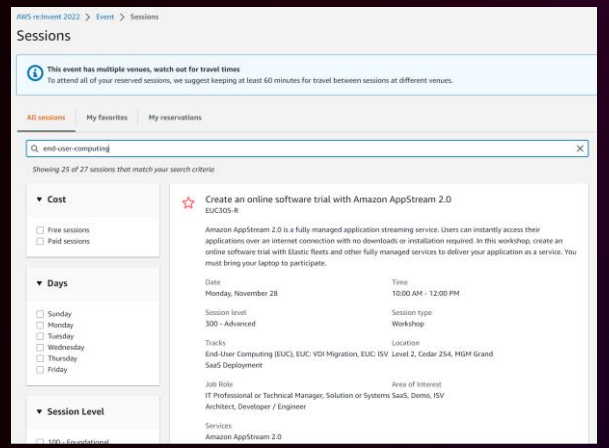
AWS End User Computing Reception

November 30, 2022 | 6:00PM - 9:00PM PST

Electra Cocktail Club, 3325 South Las Vegas Boulevard, Las Vegas, NV 89109

bit.ly/3hMzcVB

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