intel
GAME DEVELOPERS
CONFERENCE
STREAMED CLOUD GAMING SOLUTION:
MOBILE & PC GAMING
Evan Zou (Tencent), Xinda Zhao (Tencent), Zhihong Yu (Intel)

Speakers

Evan Zou:

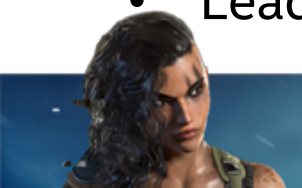
- Director, Tencent Instant Play
- Director of Business Planning, NEXT Studios, Tencent Games
- Director of Game Platform Solutions, Tencent Games

Xinda Zhao:

- Senior developer, Tencent CMatrix platform
- Senior developer on Android Cloud Gaming solution in Tencent WeTest

Zhihong (George) Yu:

- Solution Architect in Intel Visual Cloud Division in DCG/NPG
- Lead architect on cloud gaming solutions with Tencent



Agenda

- Intel Products for Cloud Gaming
- PC Cloud Gaming by Tencent Instant Play
- Android Cloud Gaming by Tencent CMatrix platform

CLOUD GAMING: A FAST-EVOLVING ECOSYSTEM

Streamed frames, files or commands from cloud/edge to device.

- Technology has evolved reducing latency enabling subscription models
- End user pays monthly fee and can access a catalog of games or ones they have purchased
- Several business models out there to deal with content ownership
- Lots of data, with different ways to manage latency/BW constraints.

#1B business in 2017, projected to grow at 26%

- Examples of cloud gaming services: Gamestream, PlayGiga, Tencent utilizing scalable Intel cloud platforms
- Intel and Tencenet NEXT Studios and WeTest work together to make high-quality cloud game dreams come true across many devices:
  - https://mp.weixin.qq.com/s/ZDP-PGmXOs3Rn_UcEaC_AA
  - https://cloud.tencent.com/developer/article/1398289
- PlayGiga moving to KBL-G for scale https://www.accesswire.com/viewarticle.aspx?id=513153
- Gamestream evolving on KBL-G https://itpeernetwork.intel.com/gamestream-intel-cloud-gaming-telecom/
- Strong positions being taken by Microsoft, AWS and ISVs

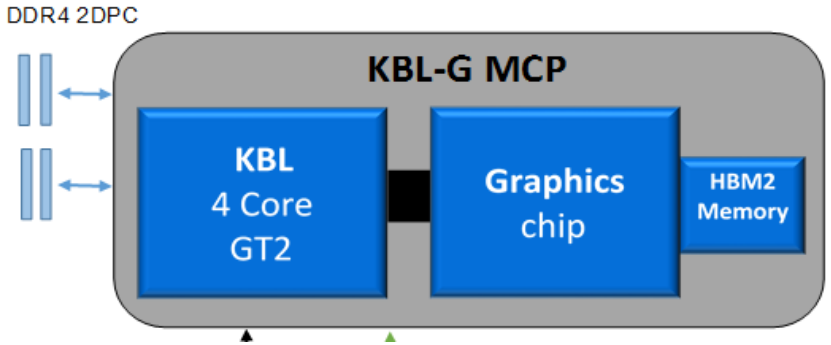
GAMESTREAM LIQUIDSKY playgiga PlayStation Now GAMEFLY Polystream any cloud, any scale, anywhere

INTEL CLOUD GAMING ARCHITECTURE: VCA2 AIC, KBL-G AIC & PC FARM

Two GPU design - Radeon VEGA graphics with 4GB HBM memory and integrated GT2 graphics

OEM Ecosystem

- KBL-G PC Farm – 8x nodes in 2U Form Factor, low cost custom designed server
- Artesyn Maxcore Gamestreamer – High dense server in a 3U Form Factor (16x KBL-G)
- KBL-G PCIE Add-in-Card -- 2x nodes in standard PCIe card



VCA2

PC Farm

Artesyn Gamestreamer

Intel Cloud Rendering Add-In-Card

High density Android Cloud Gaming AIC

Intel® Xeon® Processor

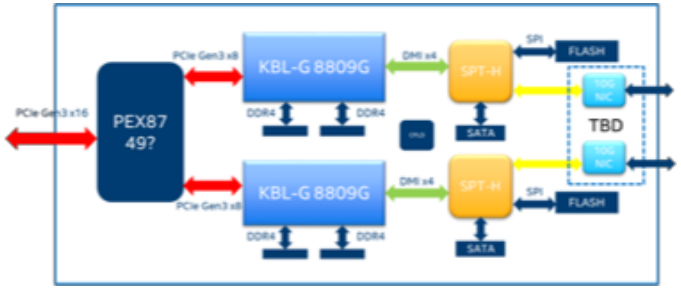
VCA2 PCI-e add-in card

Value Proposition

- Balanced rendering & encoding for high-density Android cloud gaming
  - 3x Intel Xeon E3 with Intel integrated GPU
  - Multiple Android game instances per card
  - High-density and low-latency H.264, H.265 encoding
- Target usage cases:
  - Android Cloud Gaming
  - Virtual desktop (VDI)

High density graphics rendering AIC for PC games

Intel® Xeon Processor



PCI-e add-in card
2 x Intel Core I7-8709G (KBL-G)

Value Proposition

- High performance rendering and encoding accelerator
  - Multiple windows games per PCIe card
  - High 3D performance at competitive TCO
  - Low-latency rendering and encoding capability
- Target usage cases:
  - Cloud gaming, cloud graphics
  - Virtual desktop
  - Cloud VR

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Embrace 5G with Cloud Gaming

Evan Zou

Speaker's Background

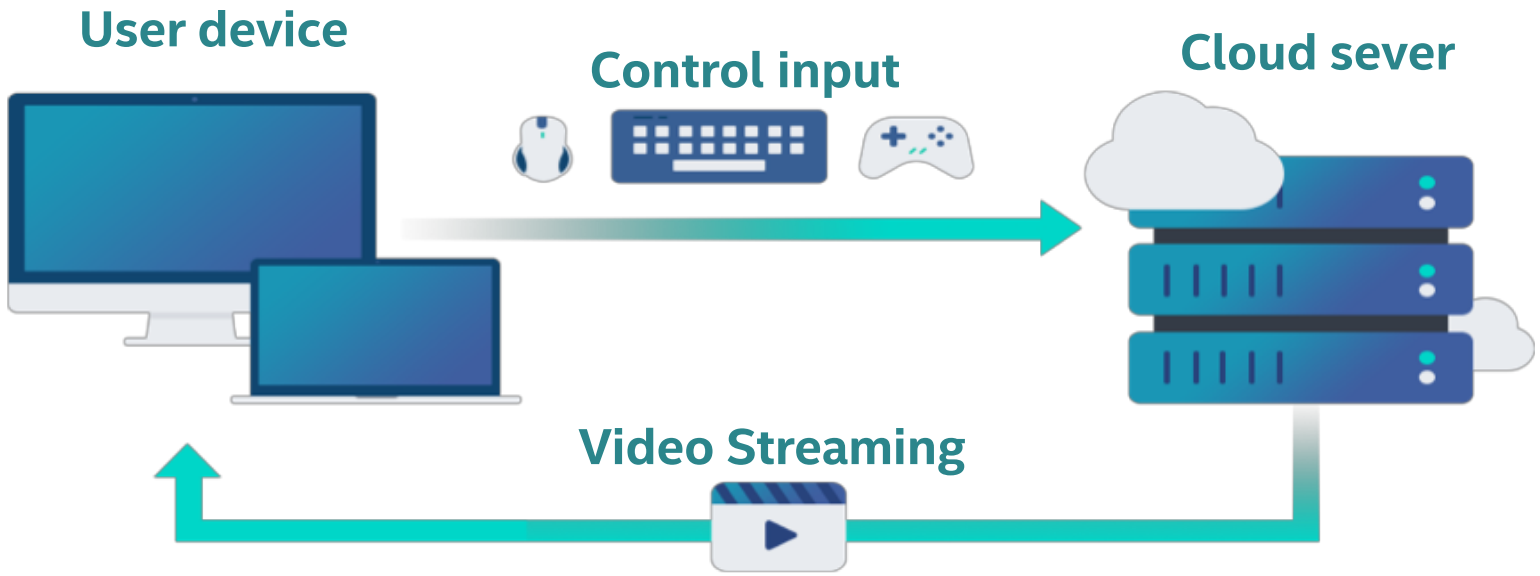
Evan Zou

- Director, Tencent Instant Play
- Director of Business Planning, NEXT Studios, Tencent Games
- Director of Game Platform Solutions, Tencent Games

Agenda

- What is Cloud Gaming and what are the benefits of Cloud Gaming
- Introducing Tencent Instant Play
- Advice for game developers

What is Cloud Gaming



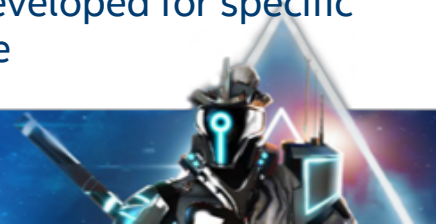
No need for local premium graphics

Cross-device compatibility

Play anywhere, anytime

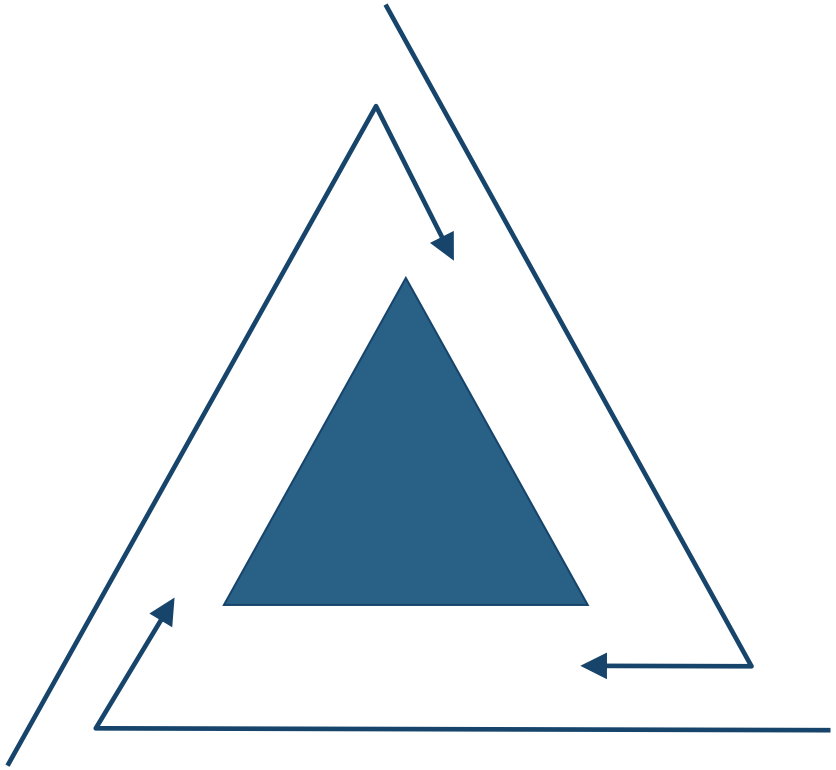
What are the Benefits of Cloud Gaming

	Trends and Pain Points	Benefits of Cloud Gaming
Distributor	• Trends: hardware requirement to play 3A games is increasing • Pain point： the high-end user base is limited	• **No need for local premium graphics** • Attract more gamers to premium games
Developer	• Trends：Emergence of highly popular cross-platform games • Pain point：Difficult to develop games for different devices	• **Compatible with various devices** • Testing for games become easier
Gamer	• Trends： Leisure time are becoming more fragmented and users spend more time on mobile devices • Pain point： Most AAA and high quality games are still being developed for specific devices such as console	• **Play anywhere, anytime** • No need to download games before playing



Why we believe Cloud Gaming is coming

- **Server solutions getting more mature and cost-effective**

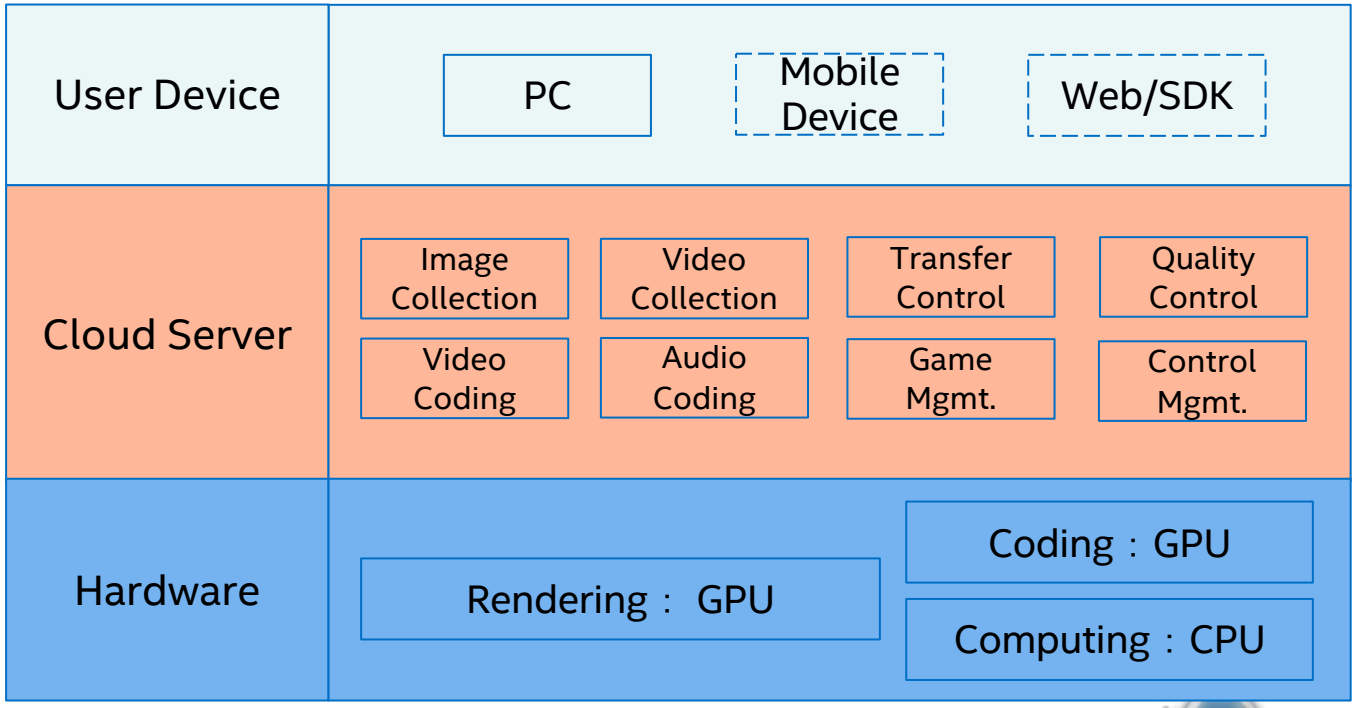


- **Telecommunication Infrastructure improving**
- **Collaboration and Investments increasing**

Introduction of Tencent Instant Play

- Continuous research and development of streaming technology for better gaming experience
- Proactively support the growth of cloud gaming industry and related ecosystem
- Actively explore Cloud Gaming business model

Product Architecture



Current Performance Level (lab environment)

FPS：**60**

Latency：**40ms**

Resolution：**1920*1080**

Cloud Gaming Product Demonstration

Bladed Fury （Next Studios）

Traditional PC
（Core i7+Geforce 1060）

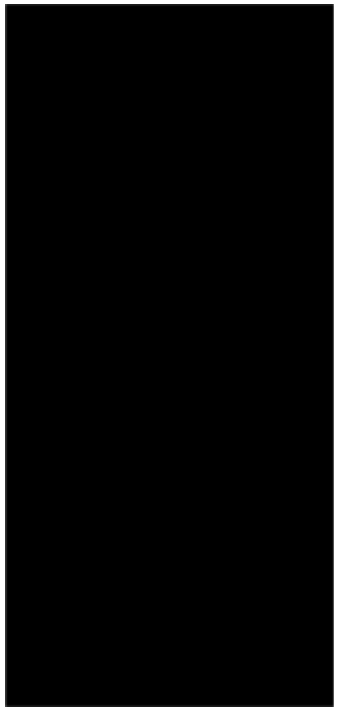
Tencent Instant Play

Cooperation with Tencent Social Ads

腾讯社交广告
Tencent Social Ads

+

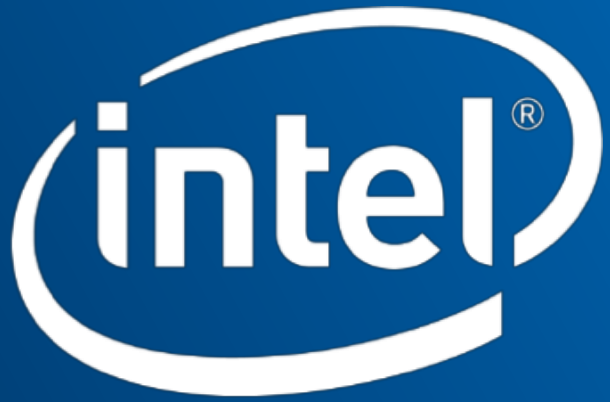
腾讯即玩
TENCENT INSTANT PLAY



Advice for Game Developers

- Create innovative gameplay tailored specifically cloud gaming experiences
- Be open to explore new distribution business models such as subscription model
- Technology aside, quality content is still the king

The future is near, we look forward to the journey to explore together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Tencent WeTest Container Based Android Cloud Gaming

Xinda, Zhao
WeTest, Tencent

28-Mar-19

About me

Xinda Zhao

Senior Software Engineer,
CMatrix, WeTest

CMatrix
Tencent Cloud Gaming Service Platform

WeTest Center

Tencent Game CROS
Common R&D and Operation System

About us

Gamer
Game Distributor
Android
Cloud
Gaming
Game
Developer
CMatrix
Platform Solution
Provider
What we offer is the platform solution of Android cloud gaming.

Agenda

1. What is Android Cloud Gaming
2. Why is it Container based
3. How to implement it
4. Advantages
5. Challenges

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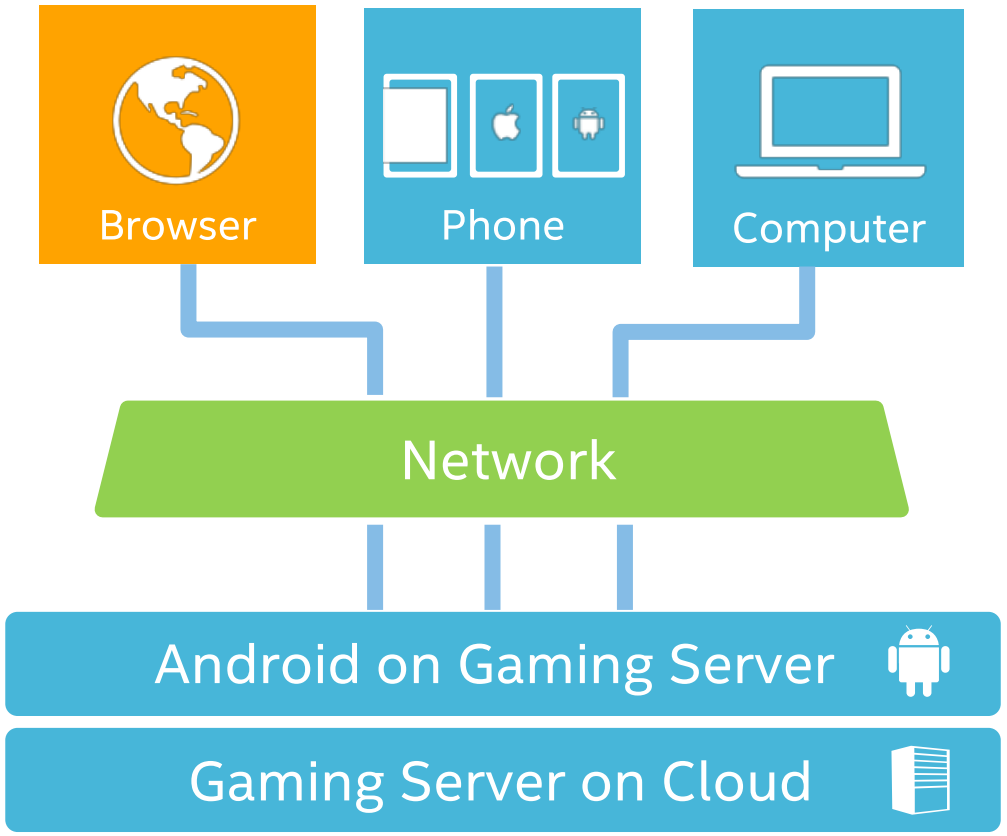
What is Android Cloud Gaming



A relatively new way of playing Android games that takes advantage of the power of Servers.

Through your browser or app, on TV, computer or phone - Anywhere!

MORE CHOICE
Easier to experience more games on the same mobile phone

MORE

GAME TRIAL EXPERIENCE
Opportunity to experience games that are not officially released

24x7 ONLINE
An option for game developers who need their game to be online 24 hours a day

LESS

NO GAME PLUG-IN
Guarantee the
fairness of the game

LESS TIME
CONSUMPTION
The server will upgrade
the game in time

REDUCTION OF
ANDROID FRAGMENTATION
Less difficulty in adapting

LOW HARDWARE REQUIREMENT
Less storage space
Less GPU performance requirement

Looking Forward to the Future

Innovative design of new games based on the cloud gaming model will come into being and far beyond your imagination !

PC Gaming	Console Gaming	Mobile Gaming

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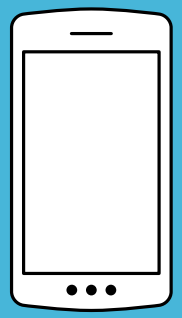
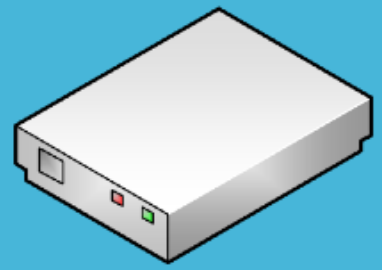
Solutions on the cloud

Cloud Phone



Limited Scalability

Development Board



Inconvenient Upgrade

Android Emulator

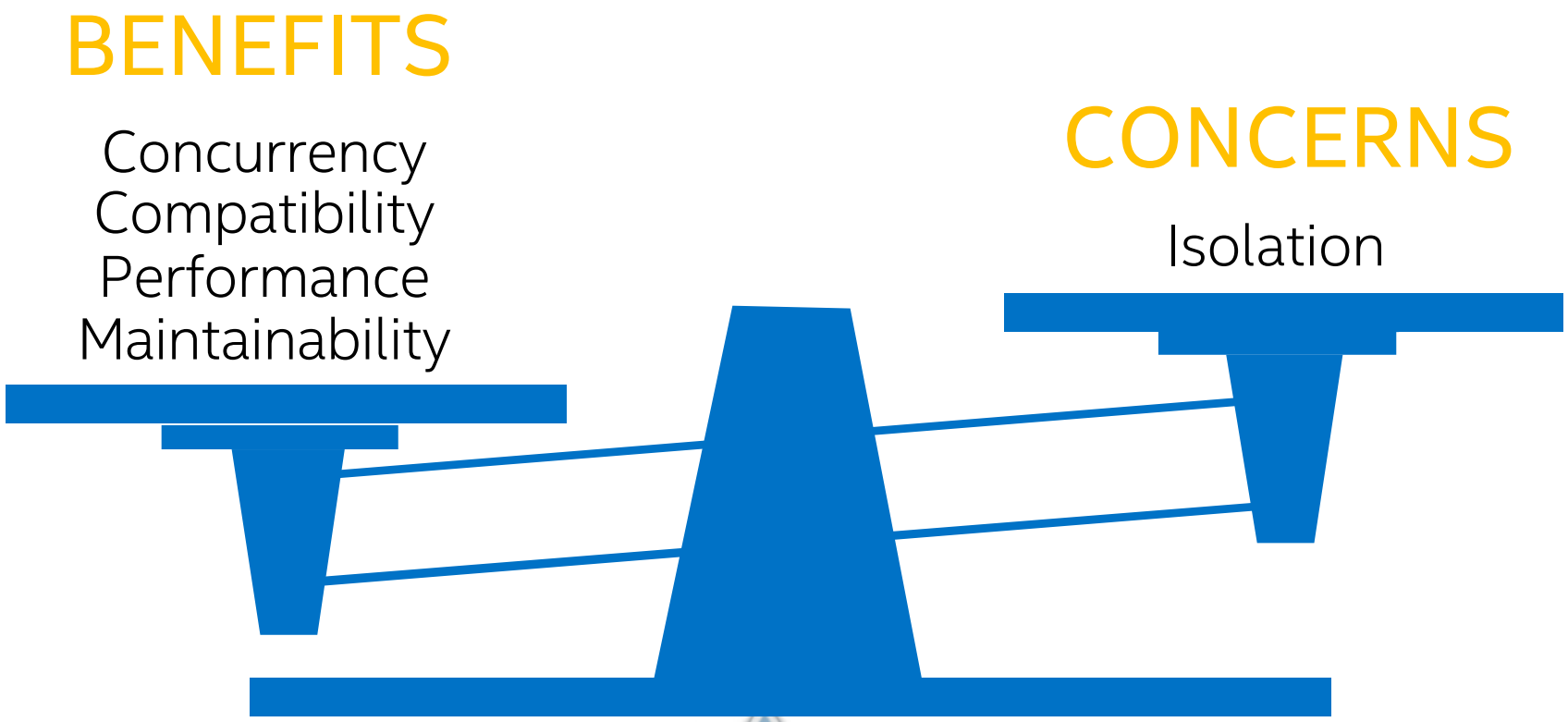
Heavy Weight

Android Container

Weak Isolation

Risks and Rewards in Game Scenarios

Android Container solution seems to be a better choice!



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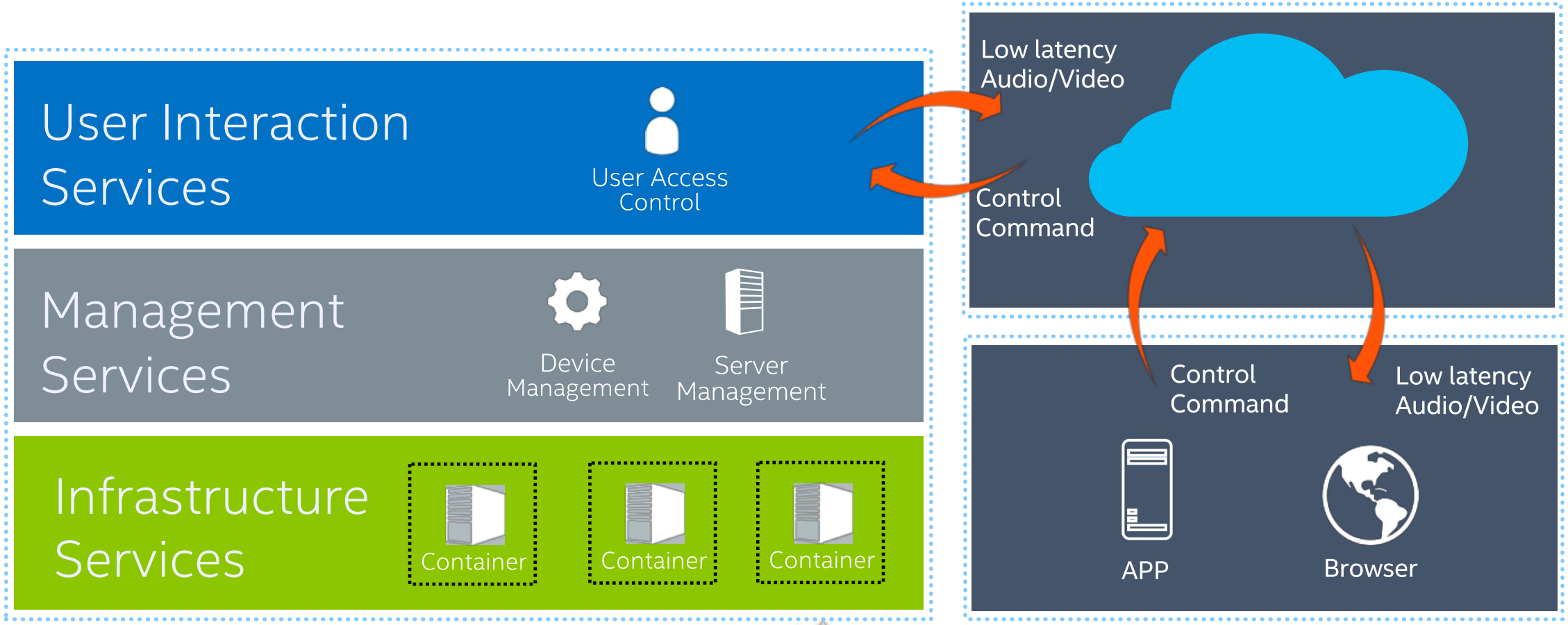
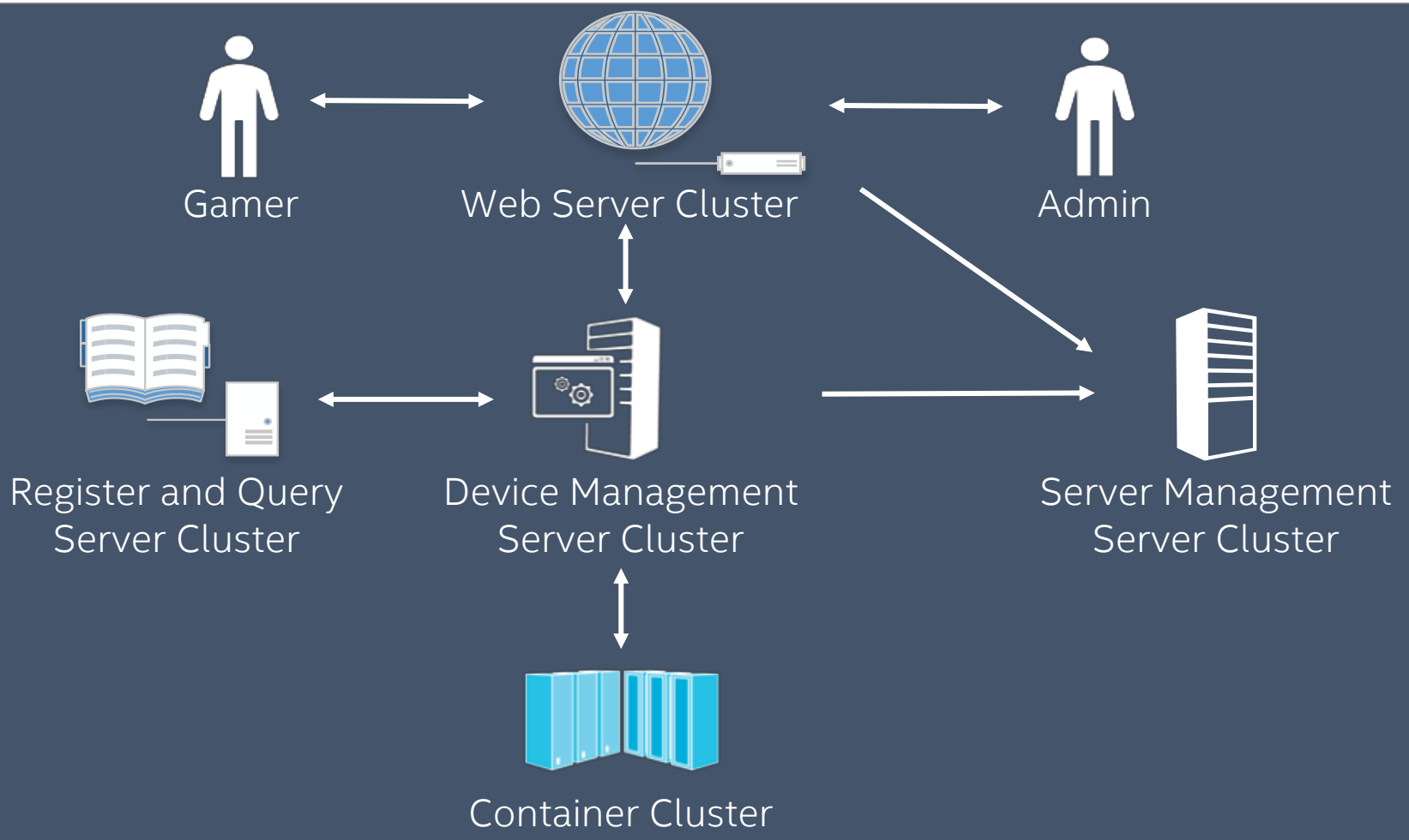
Orchestration Overview



Technical Overview



User Access Control

Who

End user types that can access our games

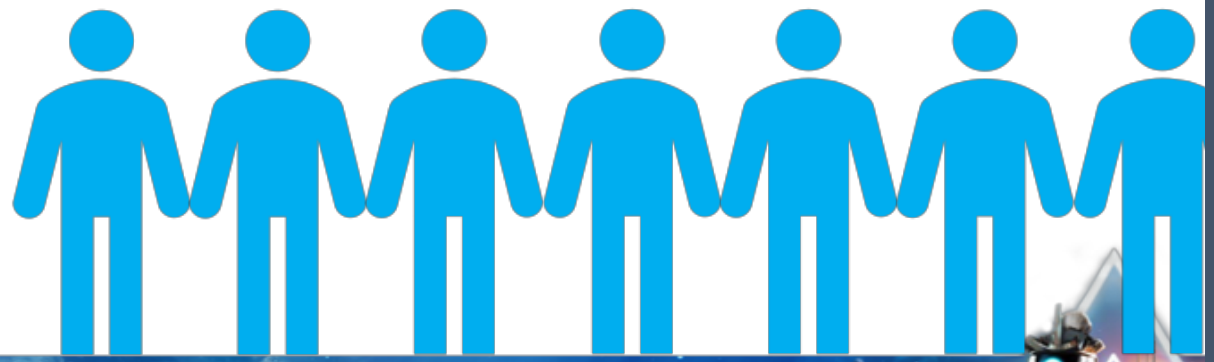
- registered or unregistered
- gamer or admin
- domestic or foreign

What

Game accessible to us

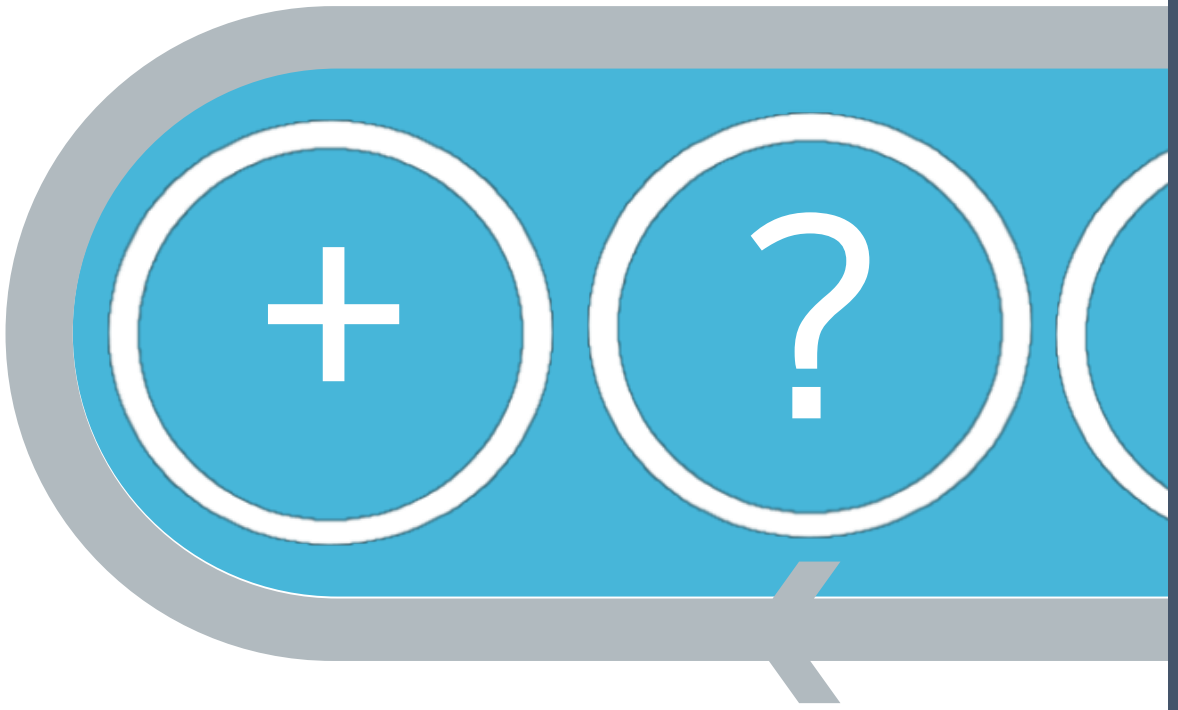
Device that game runs

Inputs/Outputs that a interacting with users



- **Throughput Isolation**
  Provide different servers for different purposes
- **Intelligent Allocation**
  Provide servers with the shortest response time
- **Disaster Recovery**
  Process after a server crash or hang

Device Management



Start/Stop/Reboot Device

Device Status

Inst

Dynamic Expansion

Ability to deploy a large number of devices

Disaster Recovery

Process after a device crash or hang

Server Management

Device Management Server

Scheduling of Android Insta
Transit service for framebuf

Register and Query Server

Store and update the status

Intelligent Allocation

Provide servers with the best route choice

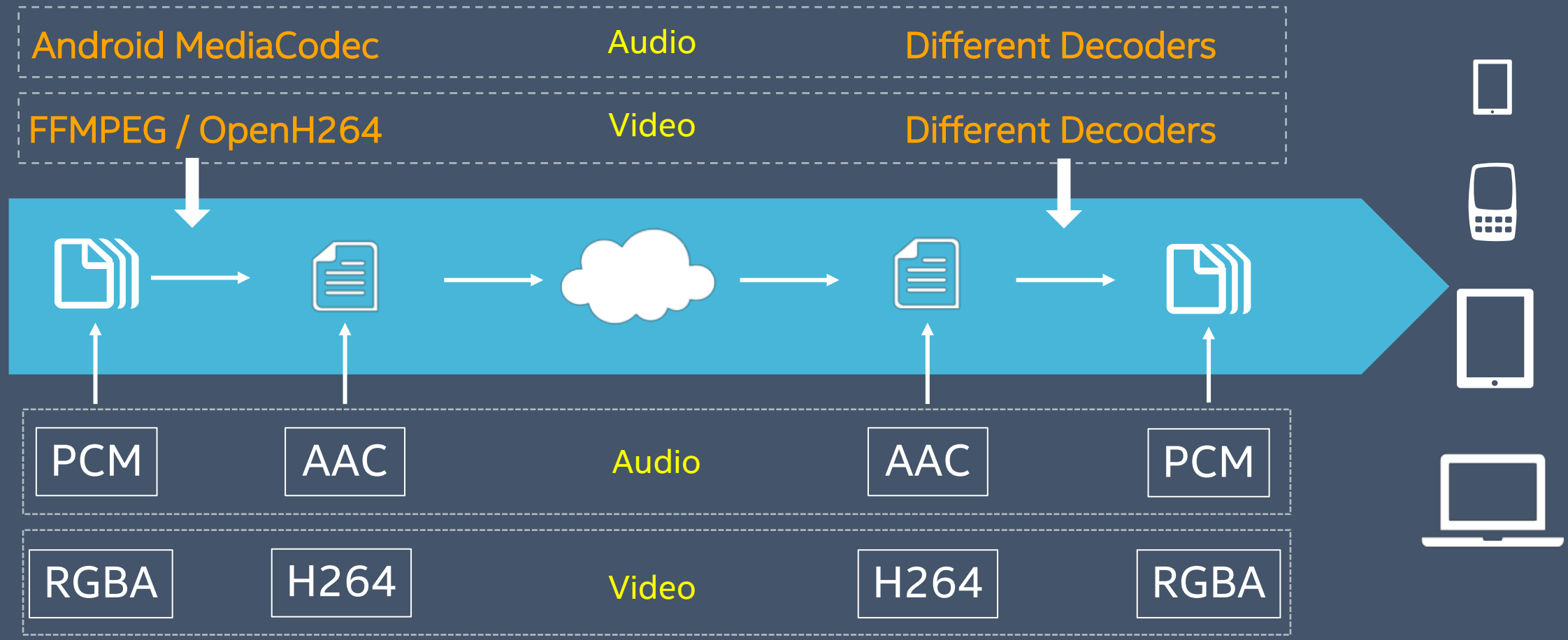
Dynamic Expansion

Add or Remove servers as needed

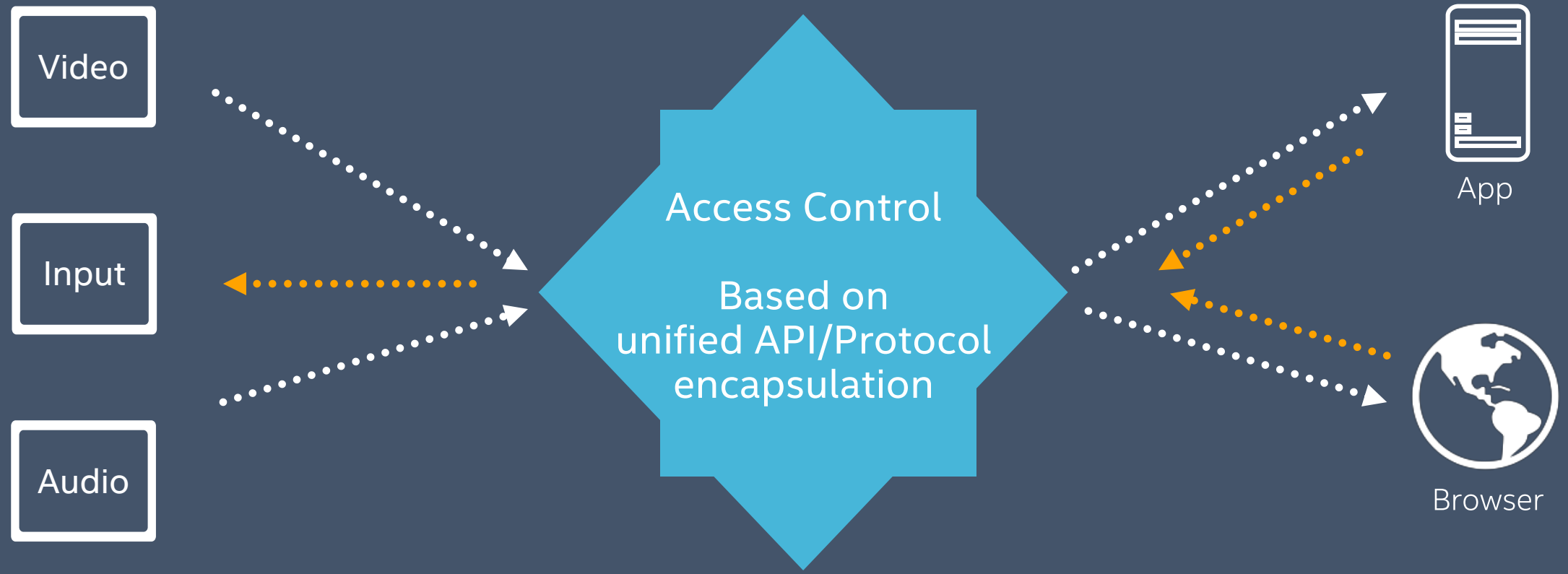
Disaster Recovery

Process after a server crash or hang

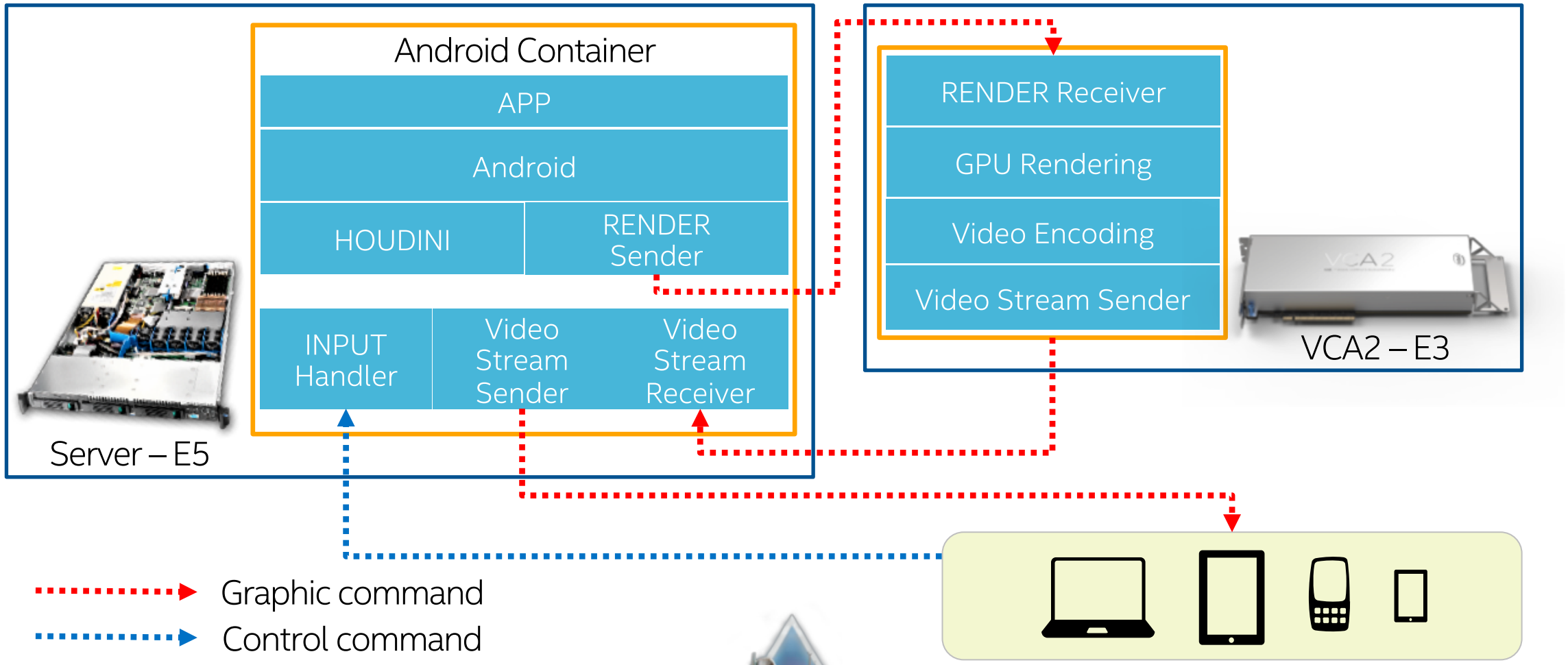
Misc. - Video and Audio Handling



Conclusion - Consistent Game Experience



Supporting Hardware Platform



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Advantages of our Solution

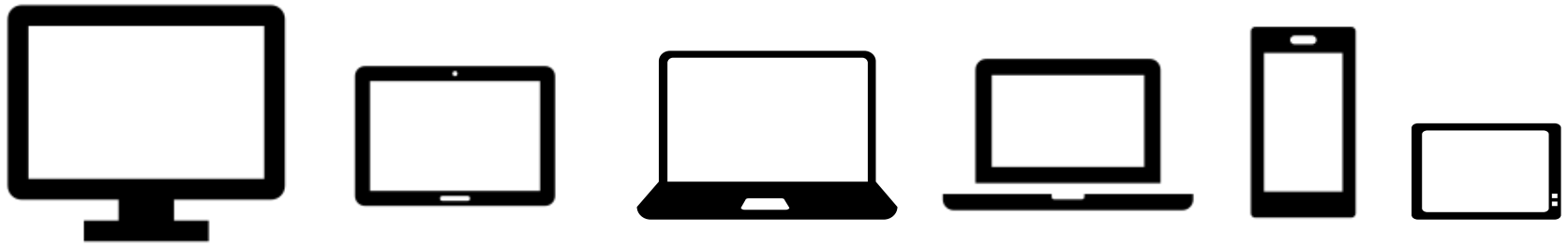
Perfect Compatibility

Zero Cost Migration

Speed of Deployment

Perfect Compatibility

Heterogeneous Devices

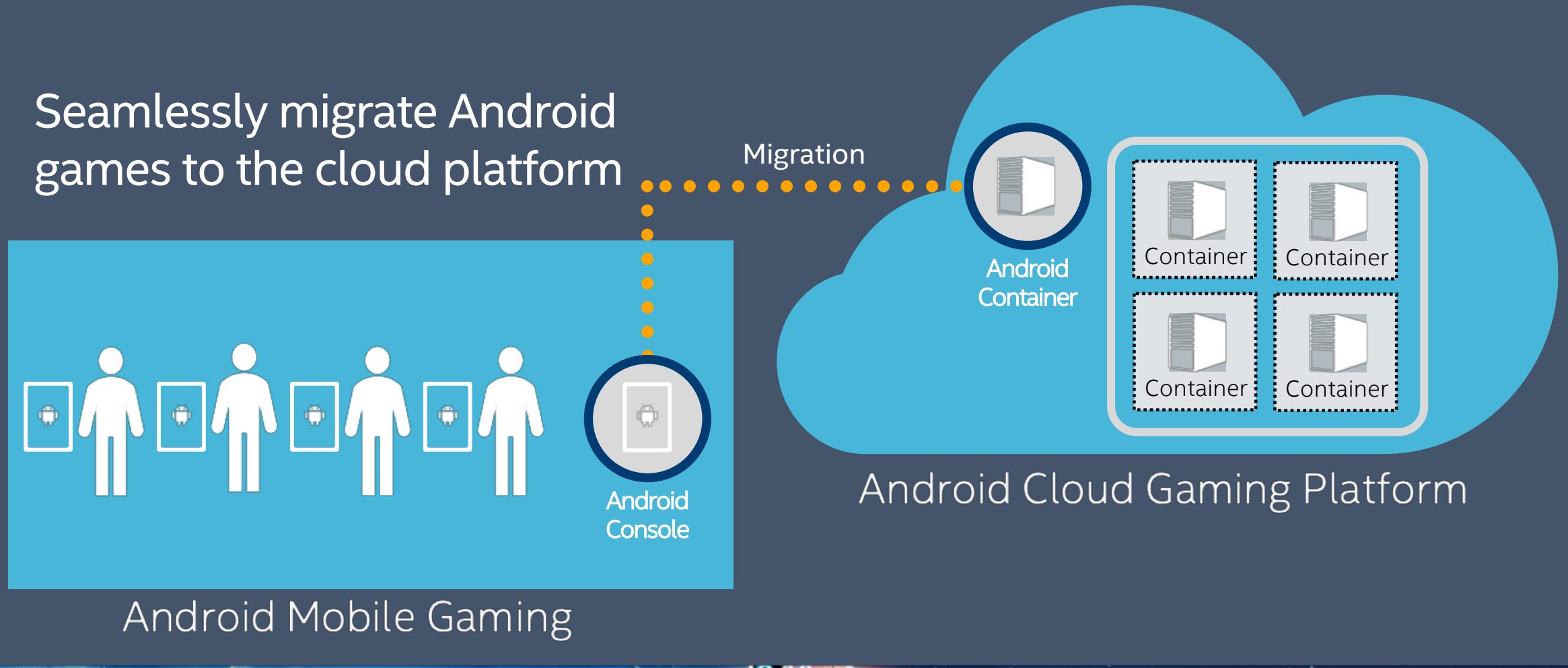


Heterogeneous OSes

One time is enough!

Zero Cost Migration

Seamlessly migrate Android games to the cloud platform



Speed of Deployment

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Challenges

Can we chat while playing games?

It was found that there was frame skipping in the image.

Can the game be preloaded?
Can it be started immediately?

Can all the games on the market be found here?

EMAIL

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olinazhang@tencent.com PM

CMatrix – Tencent Cloud Gaming Service Platform

Thanks !

DEMO