5G Network Slicing Enabled Gaming Industry

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用心创造快乐
Dedicated to creating joy

TENCENT | 腾讯互动娱乐
INTERACTIVE ENTERTAINMENT

腾讯游戏
Tencent Games

用心创造快乐
Dedicated to creating joy

腾讯游戏是全球领先的游戏开发和运营机构，也是国内最大的网络游戏社区。以"用心创造快乐"为理念，通过在多个产品细分领域的耕耘，致力为玩家提供"值得信赖的"、"快乐的"和"专业的"互动娱乐体验。旗下产品布局从最基本的用户需求、最简单的应用入手，注重产品的可持续发展和长久生命力，打造绿色健康的精品游戏。在开放性的发展模式下，腾讯游戏采取内部自主研发和外部多元化合作两者结合的方式，已经在网络游戏的多个细分市场领域形成专业化布局，并取得良好的市场业绩，为国内游戏行业的领军者。

Tencent Games is a global leading player in game development and operation with the biggest online gaming community in China. In the philosophy of "dedicated to creating joy", Tencent Games dedicates itself to providing users with "joyful", "professional" and "reliable" gaming experiences via a diversified product portfolio. We meet players' basic needs with simple products and focus on premium games with sustainable development and lasting vitality. Under the open development model, together with external partners, our development team consistently strives for new concepts/creating new games and has formed a professional layout in multiple segments of online games and achieved strong business performance. Today, Tencent is the leader in Chinese online gaming industry.

Real-time multiplayer based battle type of game

Mobile gaming formats become more diverse than before and have high demands for mobile system performance.

Latency

0 ms   40 ms   120 ms

Professional   Normal
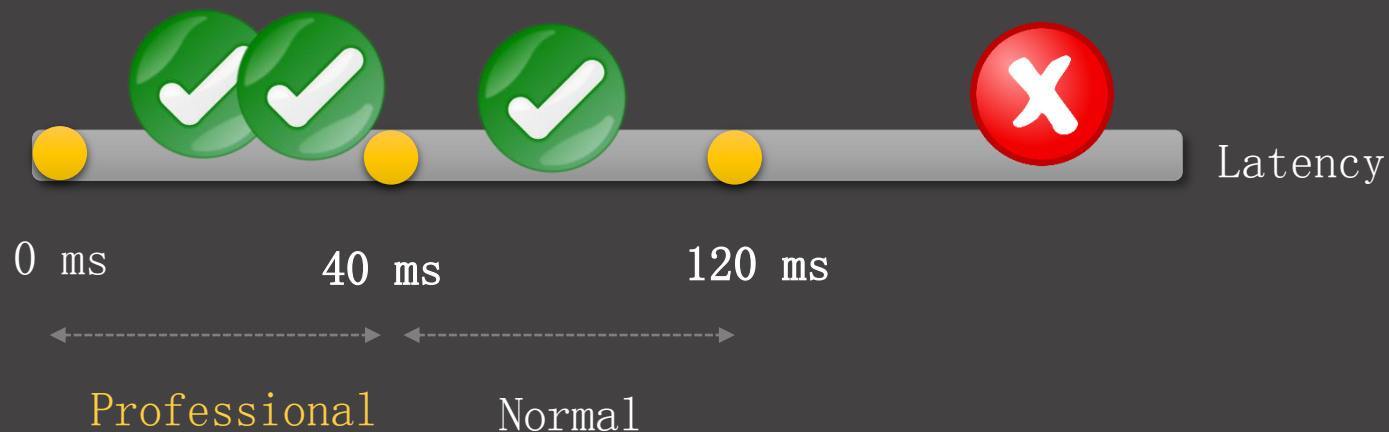
"Winner Winner, Chicken Dinner"

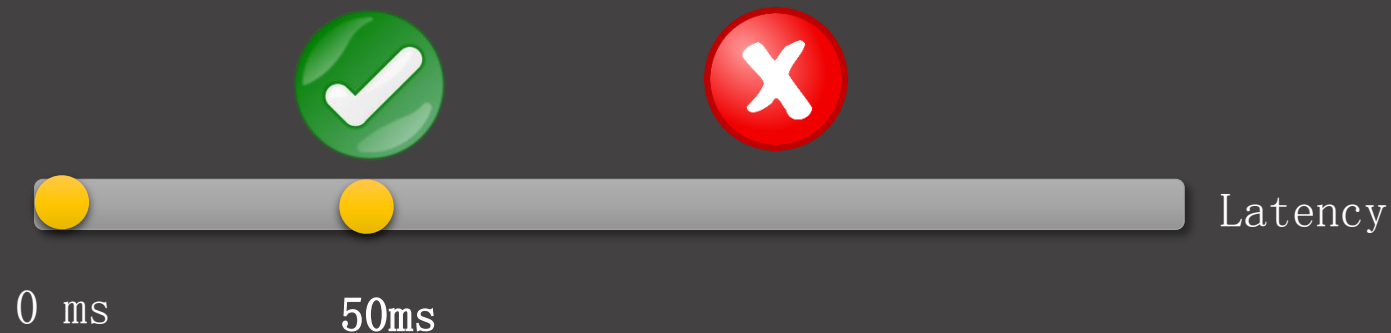Mobile gaming formats become more diverse than before and have high demands for mobile system performance.

Latency

0 ms　　　　　　　　　100ms　　　　250 ms

A team with 100 people, bandwidth > 300KB/s

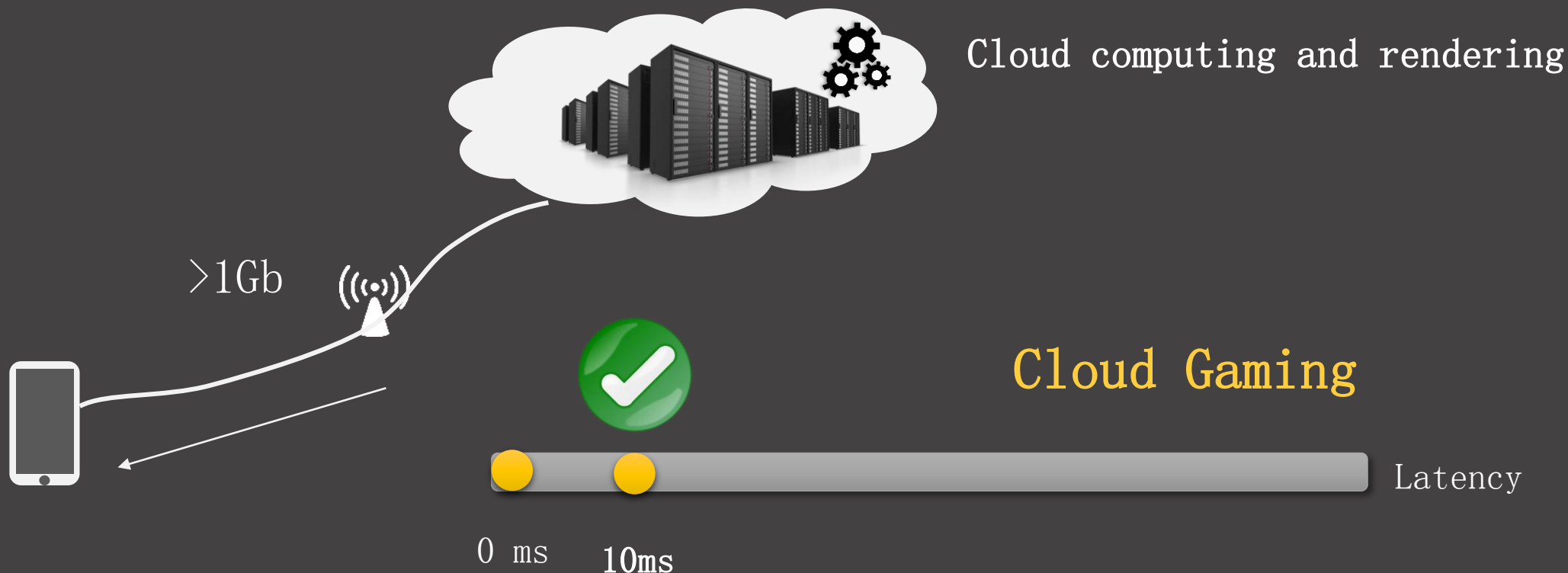## Location Based Game + Augmented Reality

Mobile gaming formats become more diverse than before and have high demands for mobile system performance.

0 ms   50ms   Latency

1 second localization, high user density (1000 – 10000), randomly formed crowd (based on game design)

What is the next?

Cloud computing and rendering

>1Gb

Cloud Gaming

Latency

0 ms   10ms

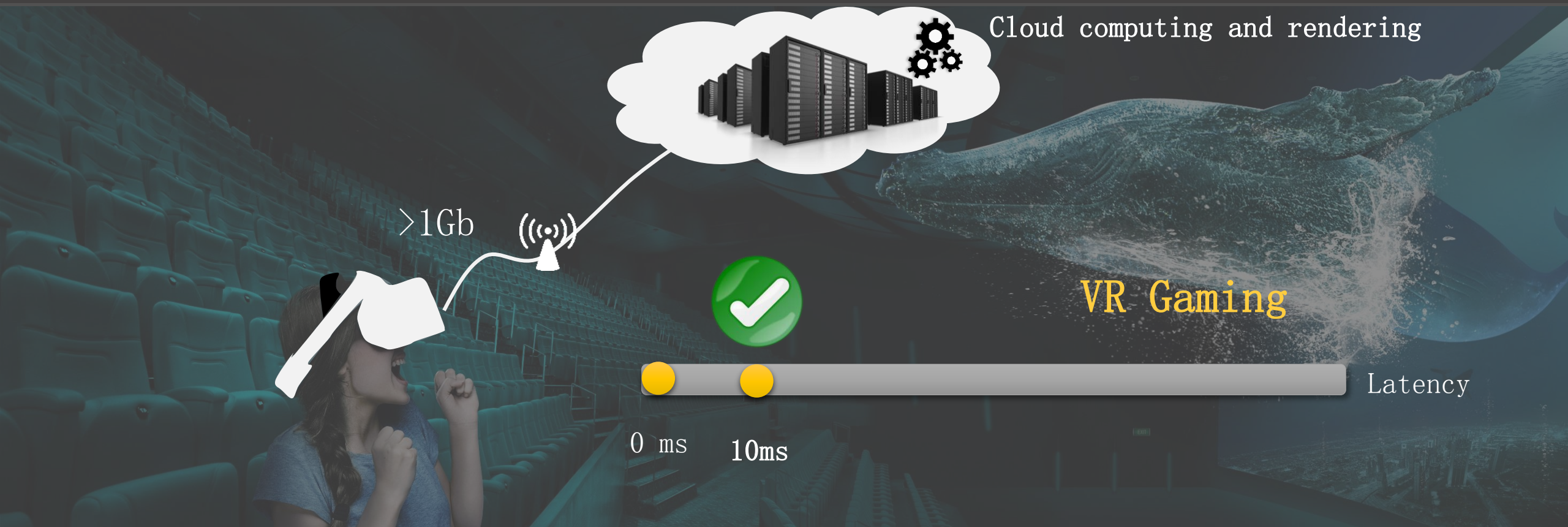Current:
- 1 hour RPG game, download 1G file
- Pre-download

1920x1080 resolution, 8
compression rate -> 60 frames is
360Mbps

>1Gb and <10ms:
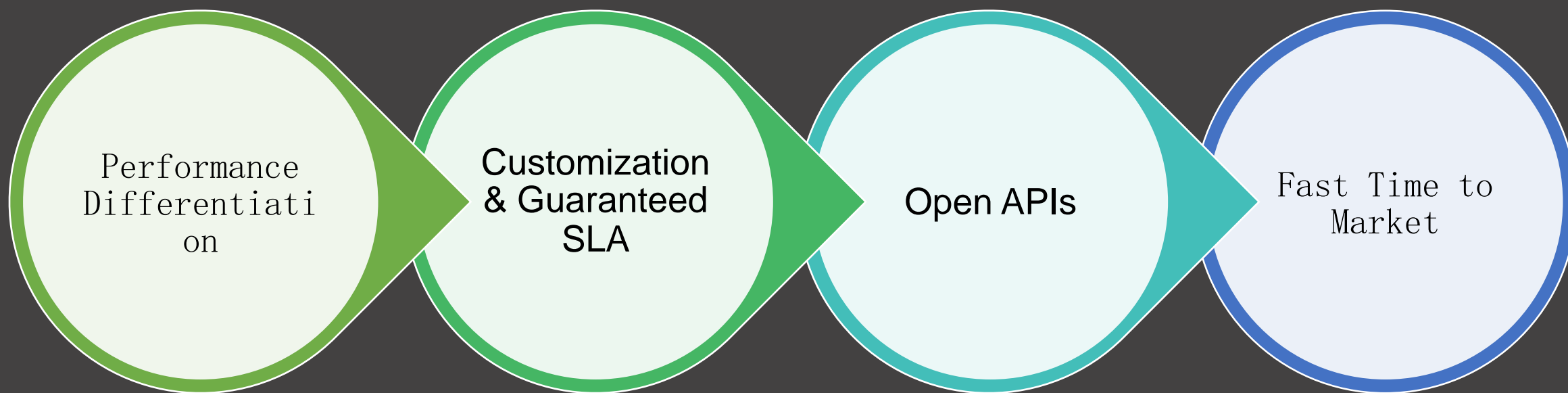- Cloud computing and rendering
- Only display on user terminal

What is the next?

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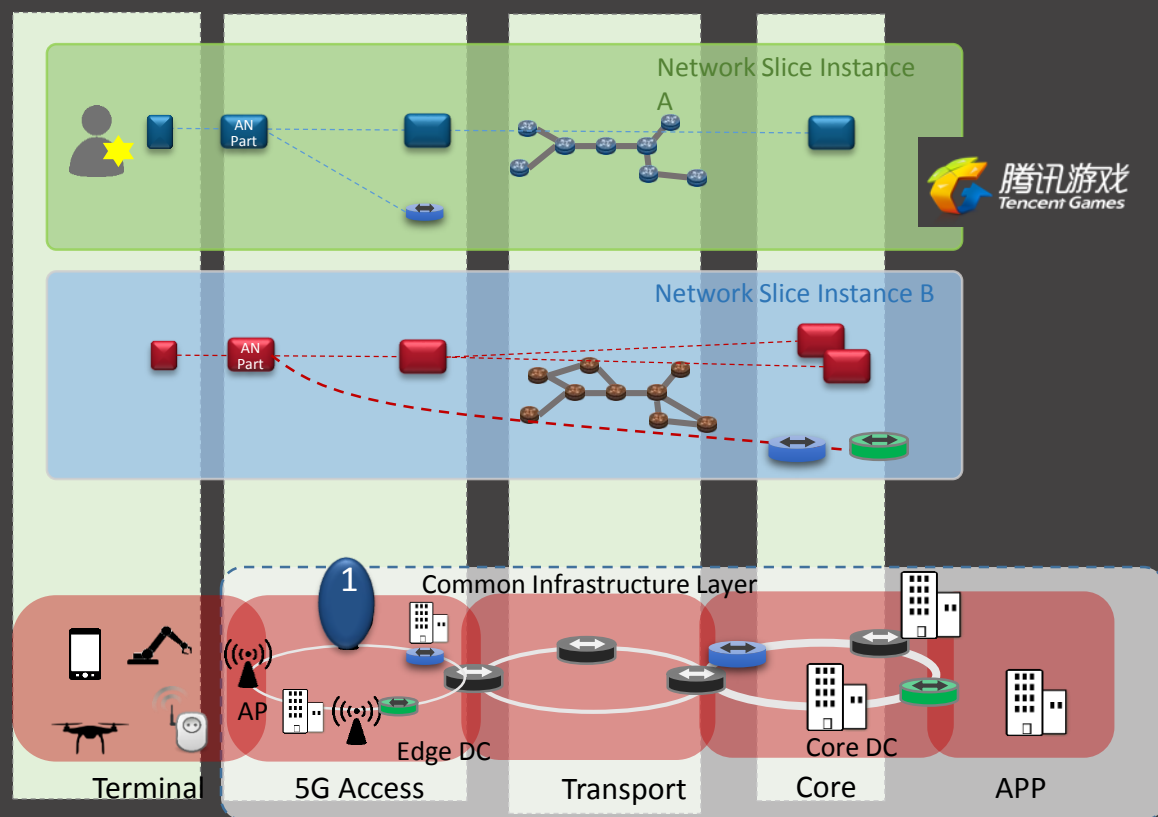
Cloud computing and rendering

>1Gb

VR Gaming

Latency

0 ms   10ms

Bring full immersive and superior user experience

5G Promises

Performance Differentiation

Customization & Guaranteed SLA

Open APIs

Fast Time to Market

5G Network Slicing

- Bring business and service innovation
- Enable differentiated user experience

Network Slice Instance A

Network Slice Instance B

Common Infrastructure Layer

Terminal | 5G Access | Transport | Core | APP

AP · Edge DC · Core DC

Without slicing

Orthogonal

Service provider · Operator · End User

With slicing

Correlative

Service provider · Operator · End User
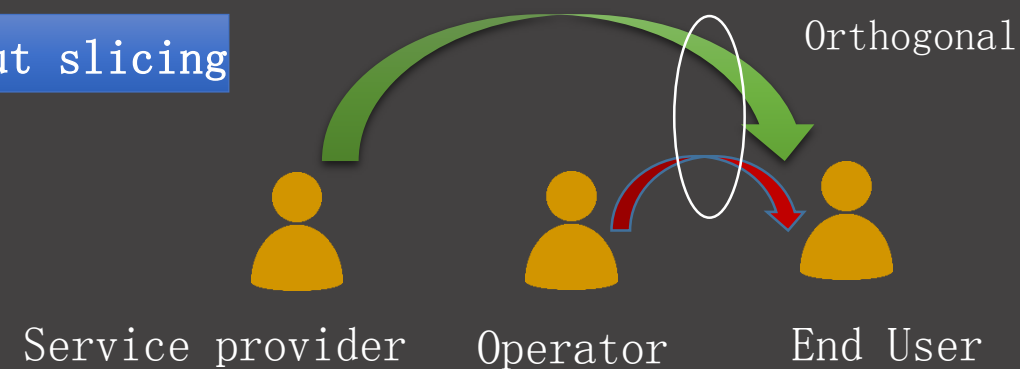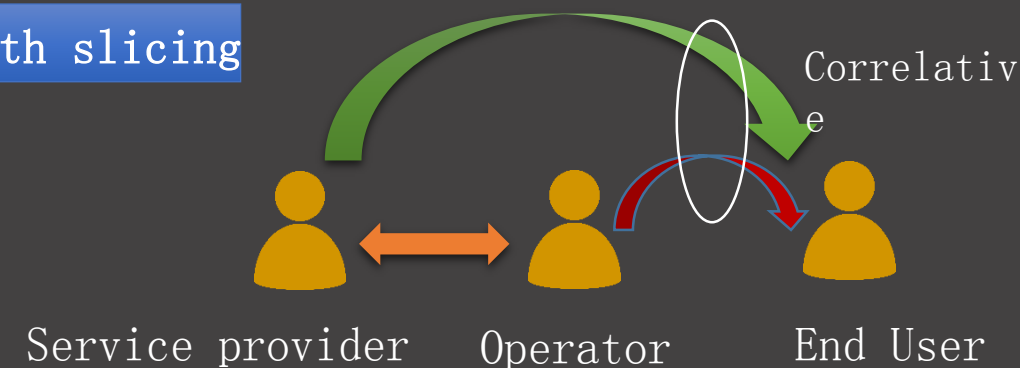
World 1st Terminal Slice

Enable the Industry-leading End to End Network Slicing Solution!

CN Network

Slice policy

GAME

API

Provide the best
for what you care

Android Framework
Slicing SDK

More time-slicing | High Class

Kernel
Job scheduler | Task manager

Access Control

Protocol Stack
MP | TCP/UDP | BigWinSize

IP | IP1 | IP2

Hardware
Modem | Wi-Fi

Slicing instance
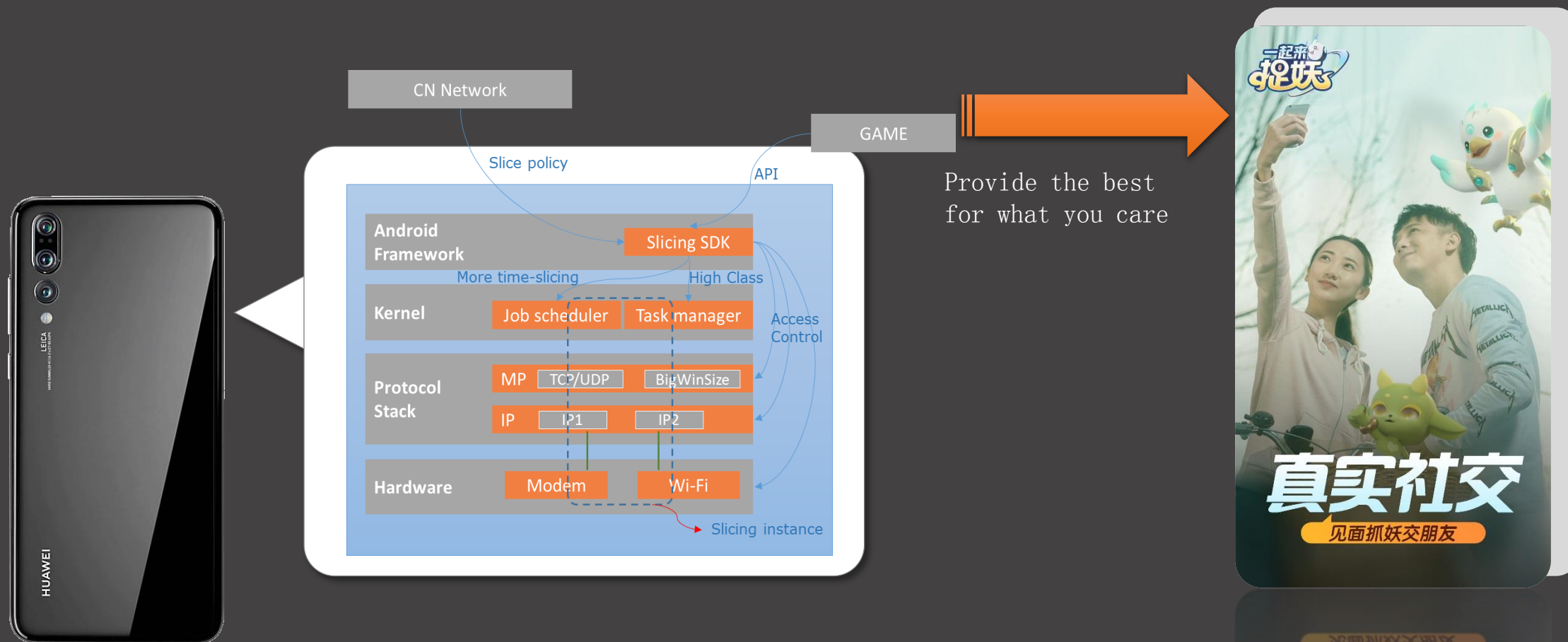
5G Network Slicing Trial Highlights

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2 Slice enabled O&M capability

1 World 1st Terminal Slice

	APP	APP
OS	High priority	Normal Priority
Protocol Stack	High speed queue	Common queue
CPU	Large/multi-core	Share Core
RAM	Continuous storage	Share storage
Network	high bandwidth	Share bandwidth

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中国移动通信 CHINA MOBILE

requirement

Slicing Support System

command

Slicing SDK

UE　　　　　AN　　　　　CN　　　　　AppServer
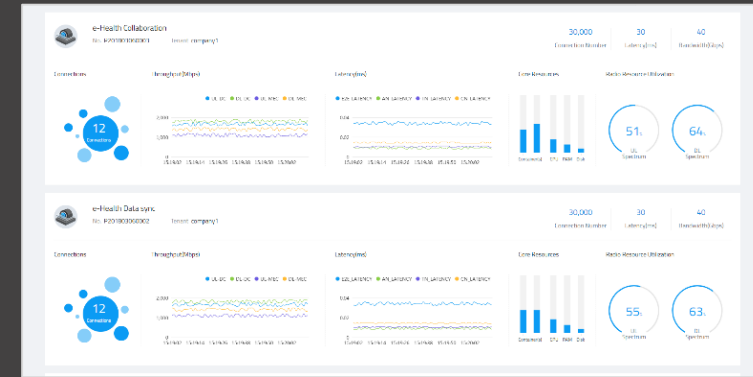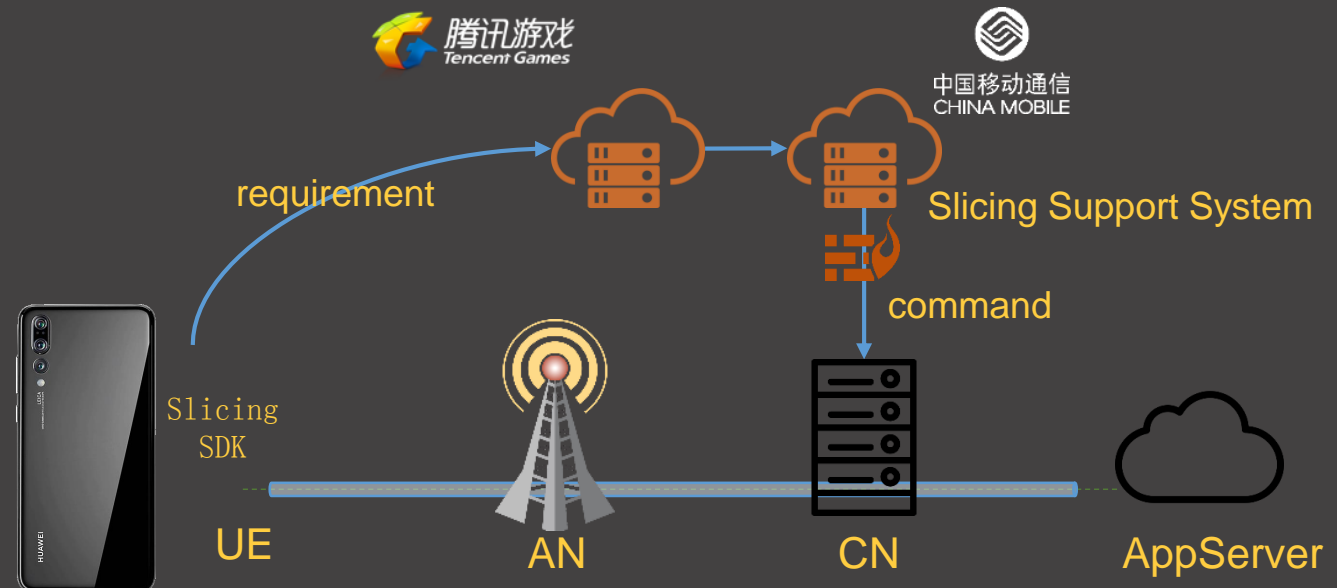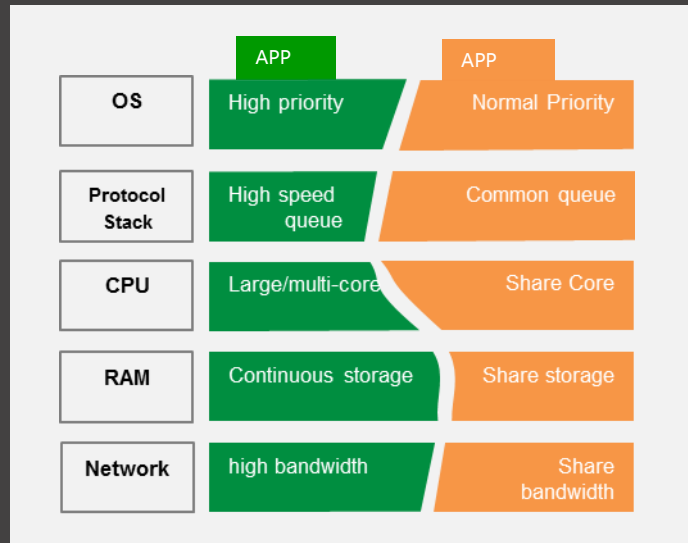
5G Network Slicing Trial Highlights

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3 Performance Illustration

(1) Without Background Traffic (but weak Signal)

	<100ms	100-200ms	>200ms
Normal Terminal	0.084	0.854	0.062
VIP Terminal (with Slicing)	0.113	0.887	0

■ Normal Terminal   ■ VIP Terminal (with Slicing)

(2) With Background Traffic

	<100ms	100-200ms	>200ms
Normal Terminal	0	0.043	0.957
VIP Terminal (with Slicing)	0.593	0.407	0

■ Normal Terminal   ■ VIP Terminal (with Slicing)
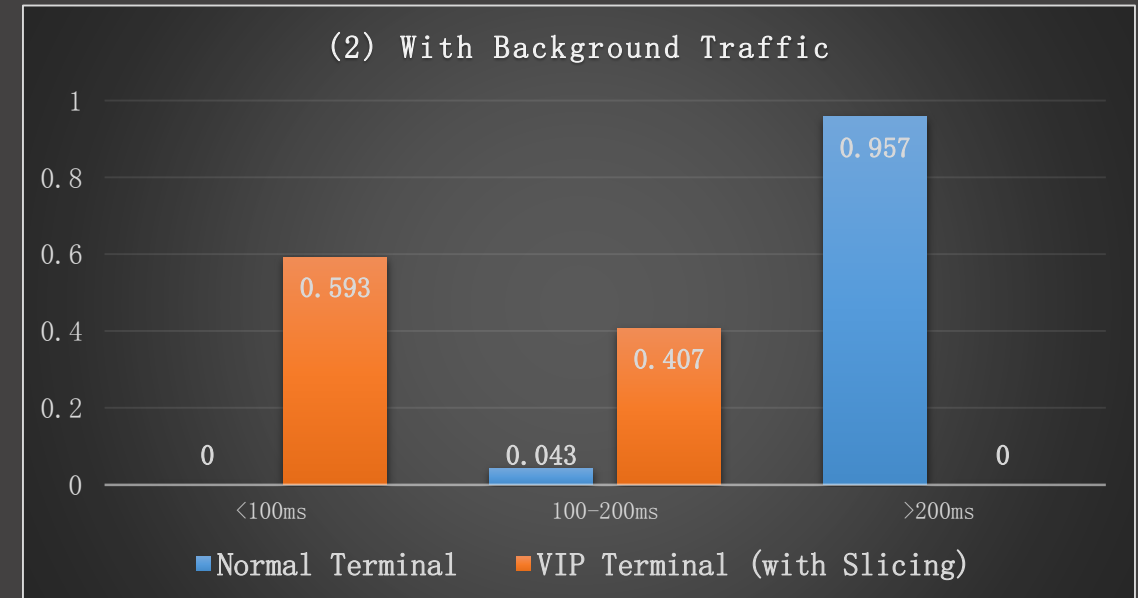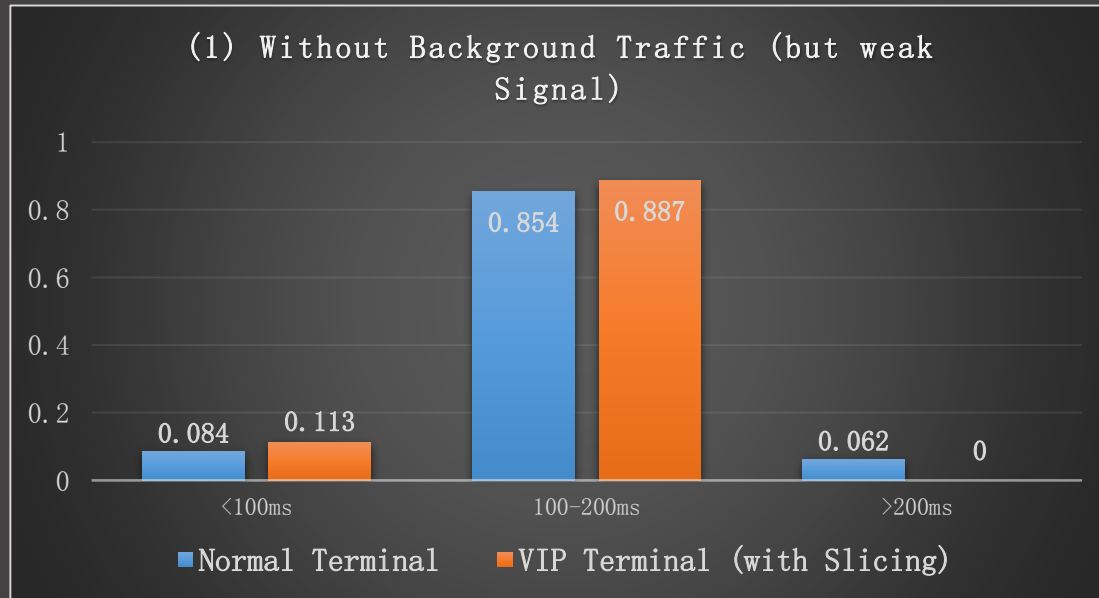
Thank You!

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