# Vulkan과 모바일 게임의 미래

김형일 수석 / 김정우 수석

삼성전자 ㈜

2016. 11. 18

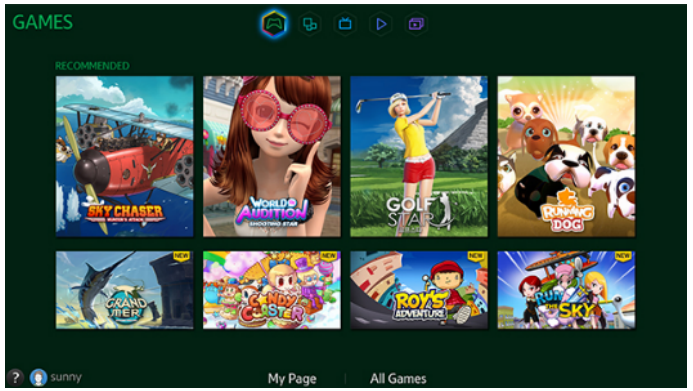
# 삼성 겜보이를 아십니까?

SAMSUNG
Electronics
오라! 오라!
재미있고 신나는
겜보이 의 세계로-
신 제 품
₩119,000
SAMSUNG
야호!
오늘은 즐거운 징글벨-
겜보이 맥스
신제품
삼성겜보이
삼성전자

# 삼성전자 게임 사업 연혁

1989

2005




2014

Samsung GALAXY PRO-GAME TEAM

2013

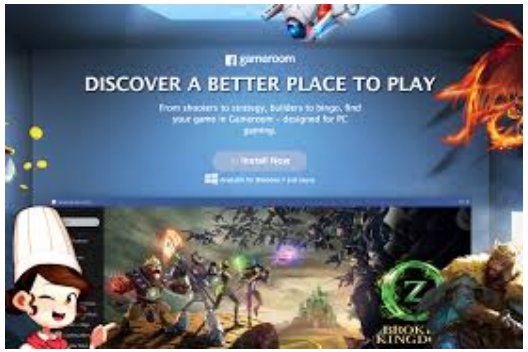
Game Launcher & Tools

2016

# 최근 게임 시장 동향

Google Play Games

STEAM™



# Global Games Market 2013-2017

## Key Moments Towards 2017 | Revenues Per Year and Market Segment

| CASUAL WEBGAMES | MMO GAMES | (MID)-CORE PC/MAC GAMES | MOBILE PHONE GAMES | TABLET GAMES | HANDHELD GAMES | TV/CONSOLE GAMES |
|---|---|---|---|---|---|---|
| CAGR: +5.8% | CAGR: +11.2% | CAGR: +3.3% | CAGR: +15.2% | CAGR: +28.2% | CAGR: -14.7% | CAGR: +0.8% |

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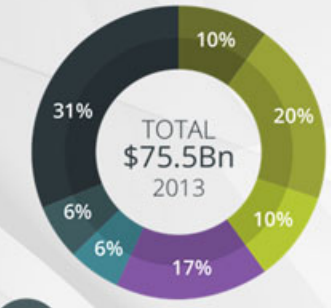
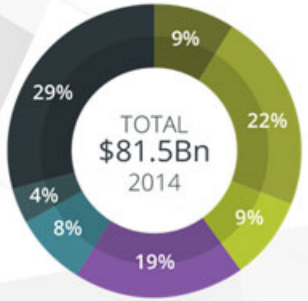
### 2013

- 2013 Global Revenues Exceeded Expectations Driven by Continued Growth in China and Mobile Gaming on a Global Scale.
- Between 2013 and 2017, the Global Games Market Grows at 8.1% (CAGR) per Year to $100bn in 2017.



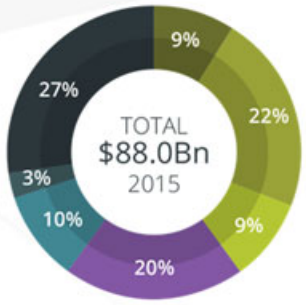

### 2014




- Smartphones and Tablets Generate More Revenue than Consoles Globally.
- Tencent Takes 10% of World Games Market.
- Physical Sales Evaporate, Dropping Below 20% in the US.

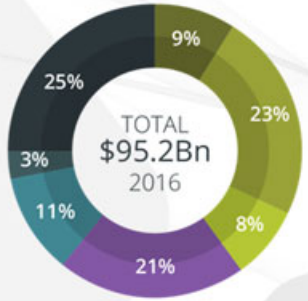
- Apple, King, Gungho Generate More Annual Game Revenues Than Nintendo.
- The Asia-Pacific Region Contributes 82% of $6Bn Global Games Market Growth.

### 2015



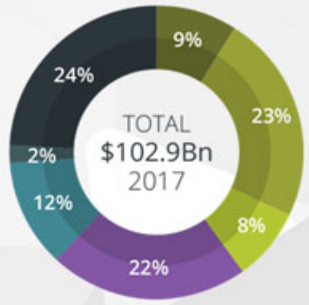

- China Overtakes US as Worlds' Biggest Games Market with over $25Bn Revenue.
- The Global Number of Gamers Surpasses 2.0Bn, Up From 1.6Bn in 2013.

### 2016




- Mobile Games Market Share Rises to 35% with $35Bn Revenue.
- Global MMO Revenues Equal Those of TV / Consoles at $24Bn.
- The Asia-Pacific Region Takes 49% of Global Market.

### 2017




## Global Report & Service

Newzoo's global report and service secure you of the latest revenue and gamer figures across all market segments, screens, regions and business models. It is used by the majority of the top game companies worldwide. The service adds granular datasets, quarterly updates and custom analysis support to the annual PDF report.

2014 GLOBAL REPORT

2013-2017 DATASETS

QUARTERLY UPDATES

www.newzoo.com/globalgamesdata

newzoo

# Next Generation GPU APIs

Only Windows 10

Only Apple

Cross Platform

Any OpenGL ES 3.1/4.X GPU

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Jungwoo Kim, Samsung Electronics

# Advanced Mobile Gaming with Vulkan

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# Vulkan is

- Open Standard
- Cross Platform
- Ultra light weight
- Predictable/Explicit Control
- Including bunch of great optimization features, so we can expect

→ Higher and more stable performance
→ Longer battery life and reducing heat problem
→ Using more GPU for higher quality visual graphics

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# What Samsung did about Vulkan

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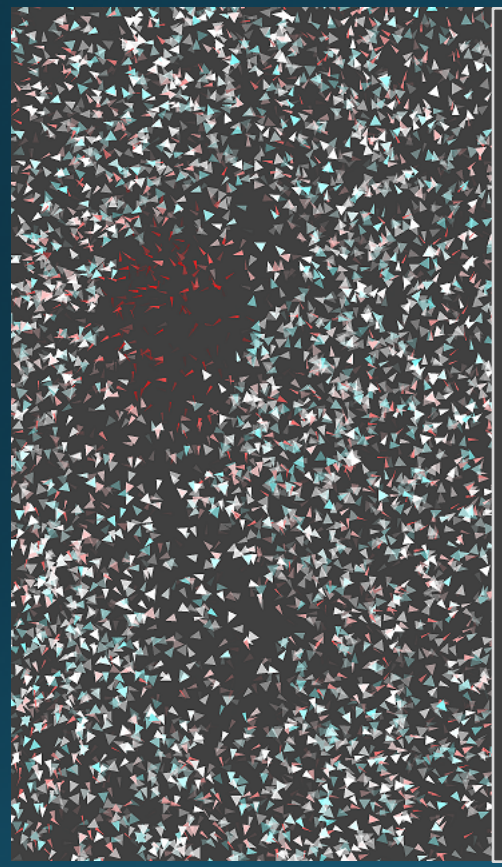
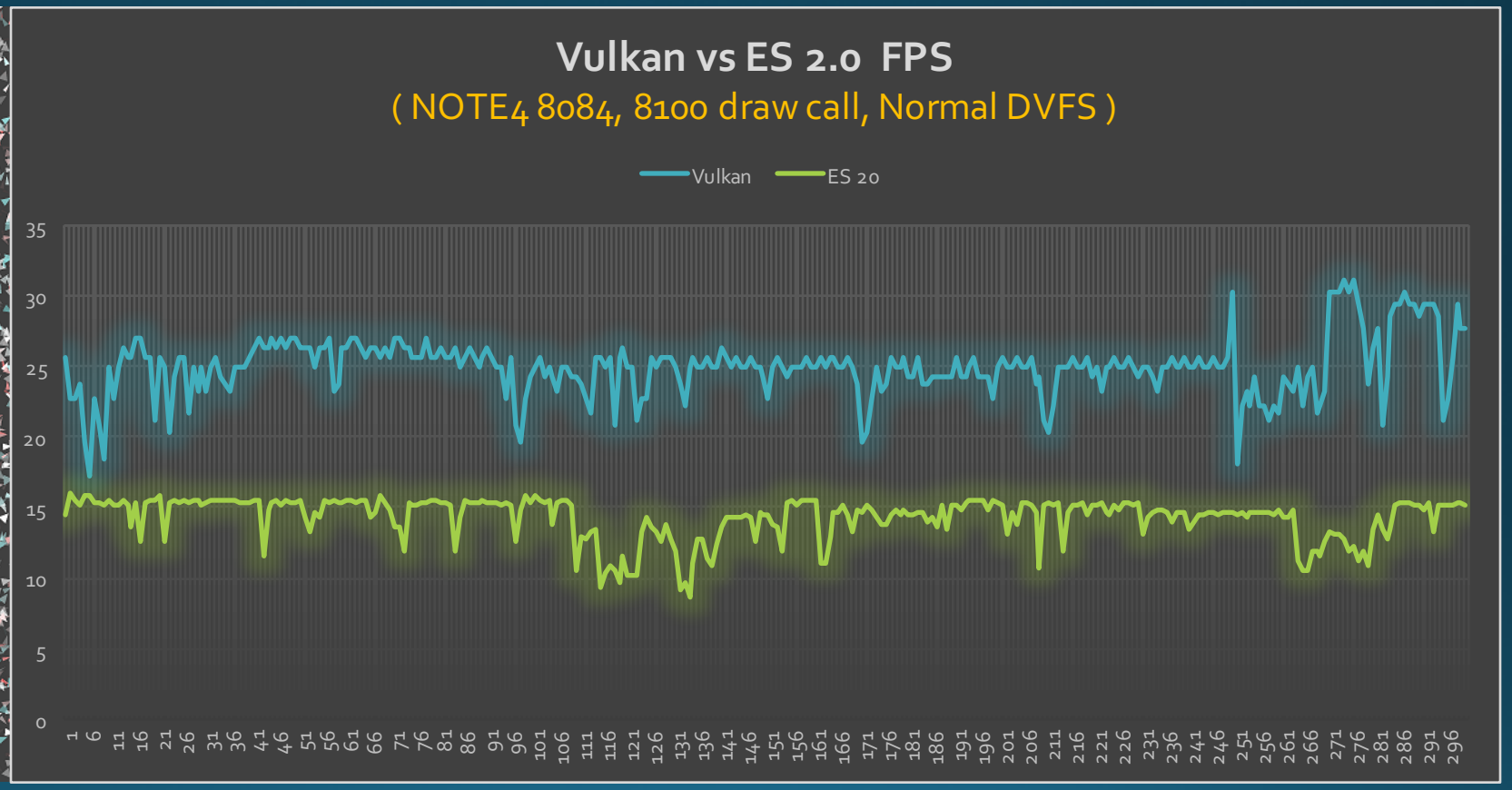
# Early studies : Heavy Drawcalls!!!






**AVERAGE 23.2 FPS / 14.5 FPS**

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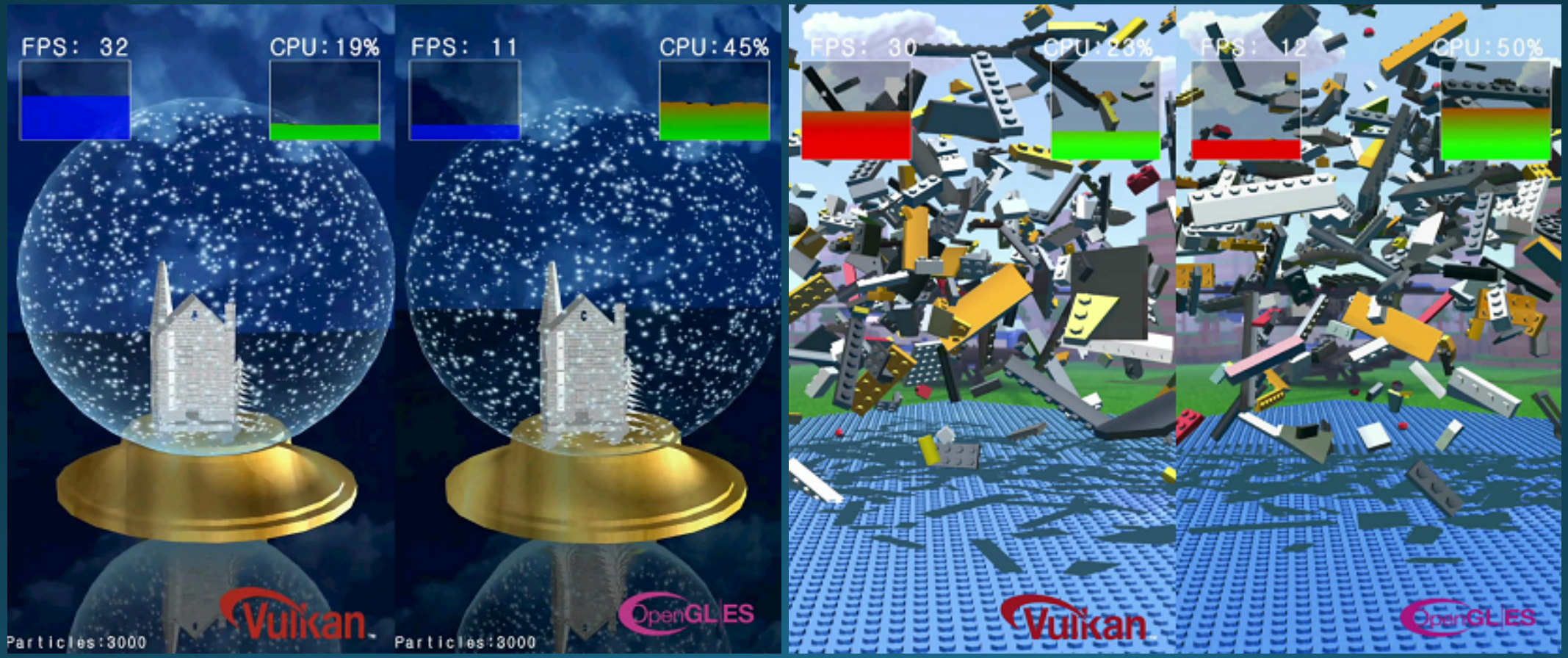
# Proof of Concept demo

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# Porting Real Game Engine

- Ronin project with Epic Game for porting UE4 support Vulkan
- First goal was running Tappy chicken and SunTemple

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# Developing cool demo : ProtoStar

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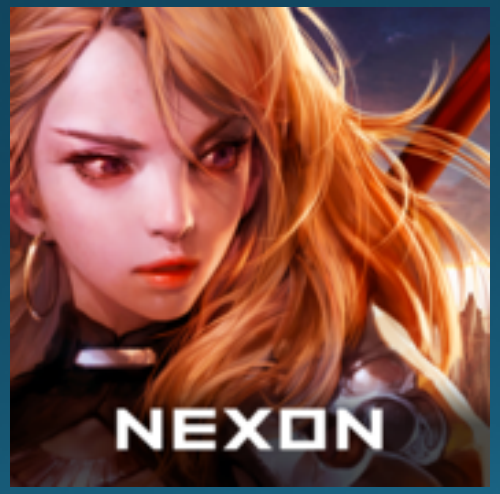
ProtoStar.wmv
or
https://youtu.be/zr6u5wJEs4w

# Developing Real Vulkan Games

- We decided support game companies to port their games
- We focused on showing specific benefit for each game title



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# VainGlory : Performance Gain

- VainGlory was already well optimized and still near 60 fps in GLES
- But Vulkan gives everlasting 60 fps in any case with huge reduction in memory usage by ASTC

| | | |
|---|---|---|
| Performance | Normal | 4 % |
| | Throttling | 30 % |
| Power usage | | 5 % |
| Memory usage | | 25 % |

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Vainglory.wmv
or
https://youtu.be/Kjdi7K7ec3c

# HIT : More Visual Quality

- HIT is UE4 based mobile action RPG game
- We focus on adding more graphics effects with same performance

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mosh53
9,999,999 / 9,999,999
1
00:27
samsung-0.65046.67662
52.196.22.59:8000
20 Lv
10 Lv
자동
전투

HIT.wmv
or
https://youtu.be/dltMVVCUahg

# Tech Wrap-up

Vulkan can improve fundamental health of Android gaming

- Better performance with lower battery / heat situation
- More immersive visual quality with higher performance
- Smaller package size and less memory usage during gameplay

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# Further Plan

- More Vulkan GameDev support
  - for UE4 and Unity based game titles
  - for porting in house game engines and their game titles

- More Marketing support
  - Samsung and Google planned Vulkan games featuring in Google Play

- More Vulkan devices
  - estimated 80M devices in Feb 2017 (expected 100+ M devices in mid 2017)

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# PC to mobile

More easy to bring Single Contents – Multiple Platform Strategy

- API limitation is gone
  - You can have one single API for targeting both PC and mobile
  - You also can use UE4 or Unity to build the contents for any target platform with the similar feature and performance with Vulkan

- Hardware performance
  - Mobile device's performance is getting better

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# Contact

Samsung will keep go on supporting game developers and players!

If you have any questions, offers or suggestions, please contact gamedev@samsung.com

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# 갤럭시 게임서비스 진화

휴대폰에서 게임기로

단편화 문제를 해결

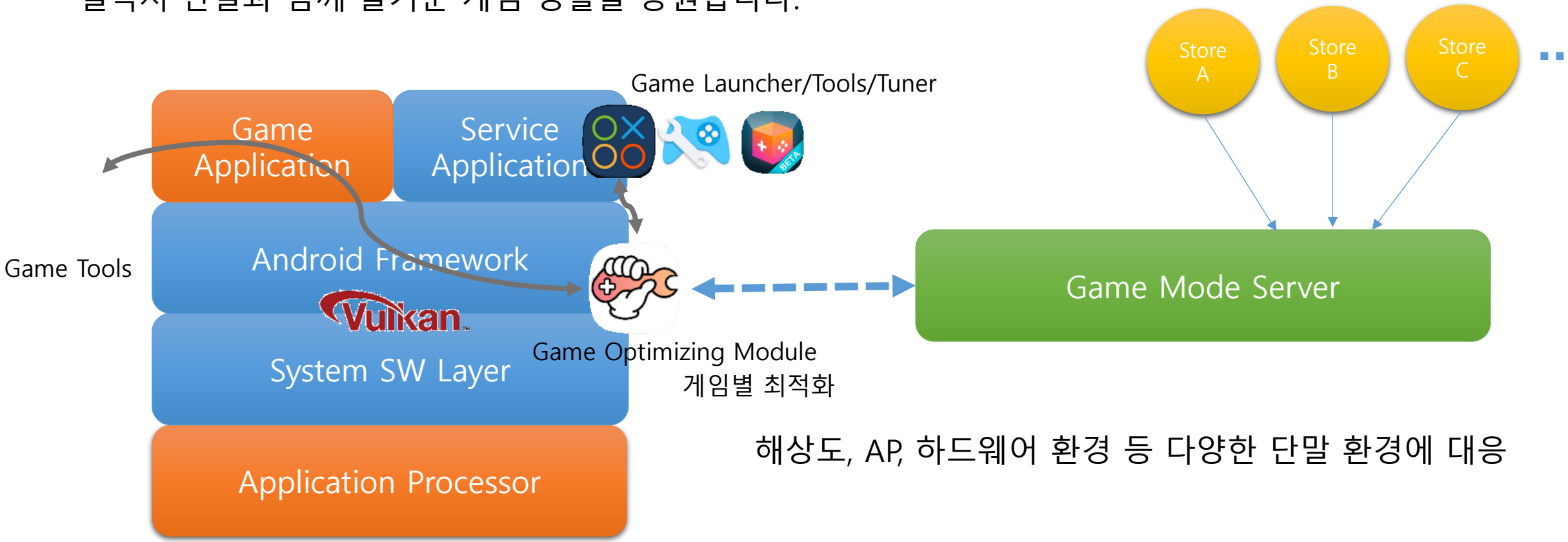
에코 시스템 활성화

게임시장의 확대

- 1단계 - 게임 관련 성능 발열에 대한 해결을 단말 최적화
- 2단계 – 게이머와 개발자 간의 빅 데이터를 통한 부가가치 발굴
- 3단계 – 갤럭시 단말의 활용 가능한 게임 영역을 확대

# 갤럭시 게임서비스 개요

갤럭시 단말과 함께 즐거운 게임 생활을 응원합니다.




해상도, AP, 하드웨어 환경 등 다양한 단말 환경에 대응

서버 기반으로 사용자 동의 하에 게임 정보를 빅데이터로 분석 및 활용

# 게임튜너 소개

게임별로 튜닝이 필요할 때

https://youtu.be/VWQnn2I9KI0

# 게임런처&툴즈 소개

게임을 모아주고, 게임 기능을 모아주고, 게임을 발견하고!

https://youtu.be/F3ERf5PCOzo?t=24s

# 게임박스런처 소개

갤럭시 단말을 게임기로 만들어보자

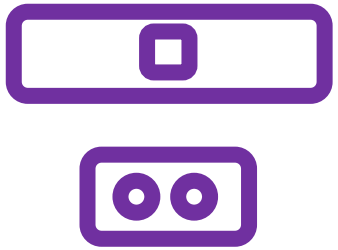
http://youtube.com/watch?v=832IA4jORiE

# 갤럭시오브게임즈 소개

빅데이터를 분석하여 게임을 추천하고 게임에 대한 의미 있는 데이터를 제공

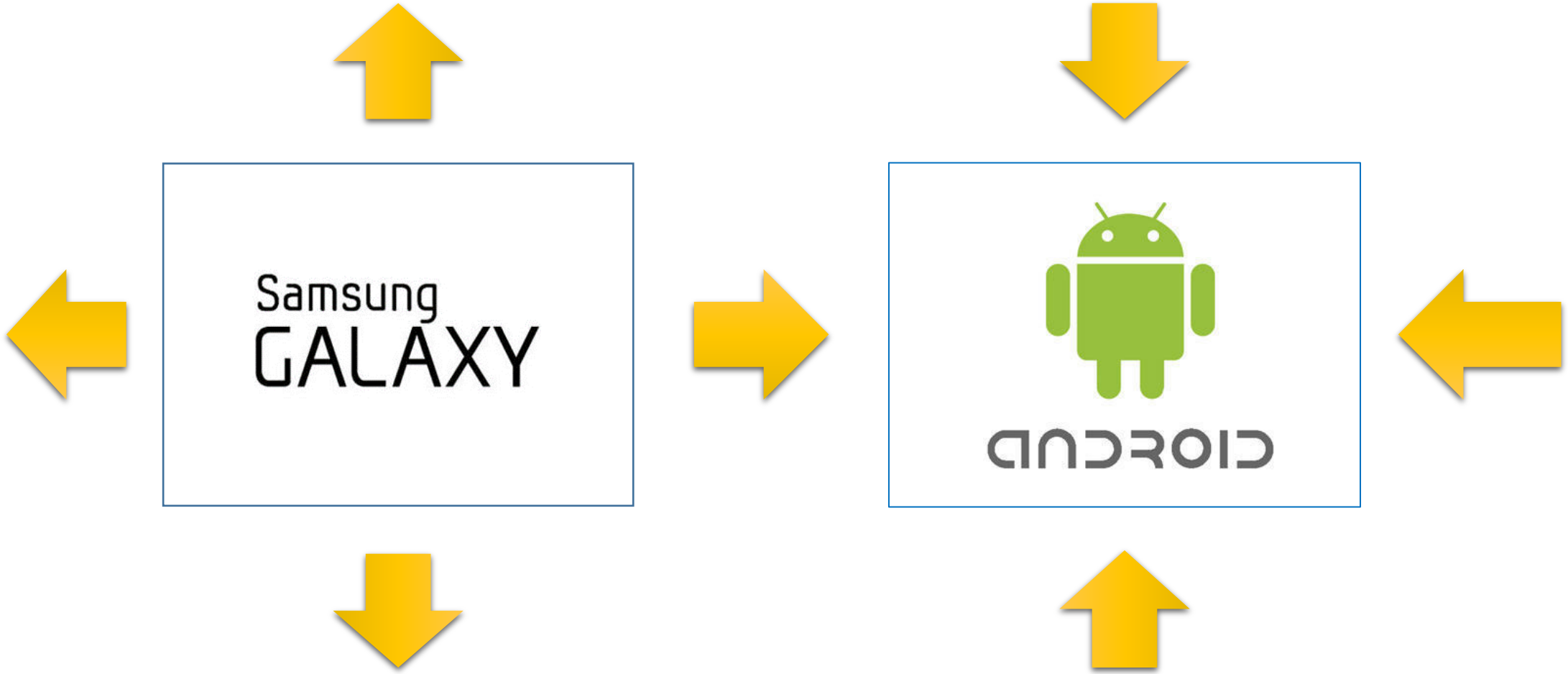
# 게임서비스 발전방향 – 게임/단말의 확장

Samsung SMART TV



# 게임서비스 발전방향 – 게이머/개발자 지원

# 게임서비스 발전방향 - 에코시스템



# 발표 요약

- 모바일 게임은 앞으로도 **중요한 시장**
- 게임시장에 대한 **투자와 노력은 지속**
- 단말 차별화 중심에서 **게임 생태계 중심**으로 확대
- 모바일 게임 뿐 아니라 **PC나 콘솔 게임**의 활용도 증대