

Delivering on the Cloud Gaming Promise: Strategies for Success

September 29, 2022
1:00 PM CT

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Strategies for Success

- Size and State of the Market
- Gaming Adoption and Appeal
- Gamers and What's Driving their Playing
- Challenges with the Experience
- Solving for Technical Challenges
- Investment in Multiplatform
- Pricing of Subscription Services



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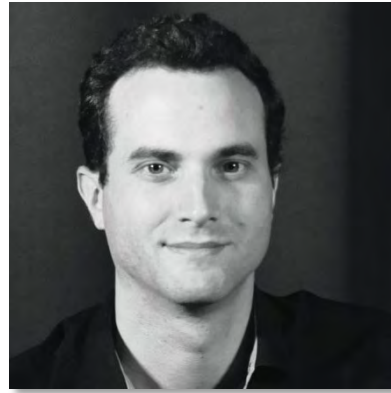


GameBench.



**Karthik
Hariharakrishnan**
Founder and CTO
GameBench

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Asher Kagan
Founder
Componetix

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Dr. Dhananjay Lal
Senior Director,
Advanced R&D
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President & CMO
Parks Associates

Modern Living: A Service Driven Market



53% of US broadband households report **they value technology now more than before** the Pandemic



24% with fixed broadband service **are likely to upgrade** in the next six months



60% of 65+ are considering some **technology to enable** to safe living at home



11M broadband households **bought a Smart TV** in 2020

65% of multi-family builders report **smart home technology differentiate properties** and adds value

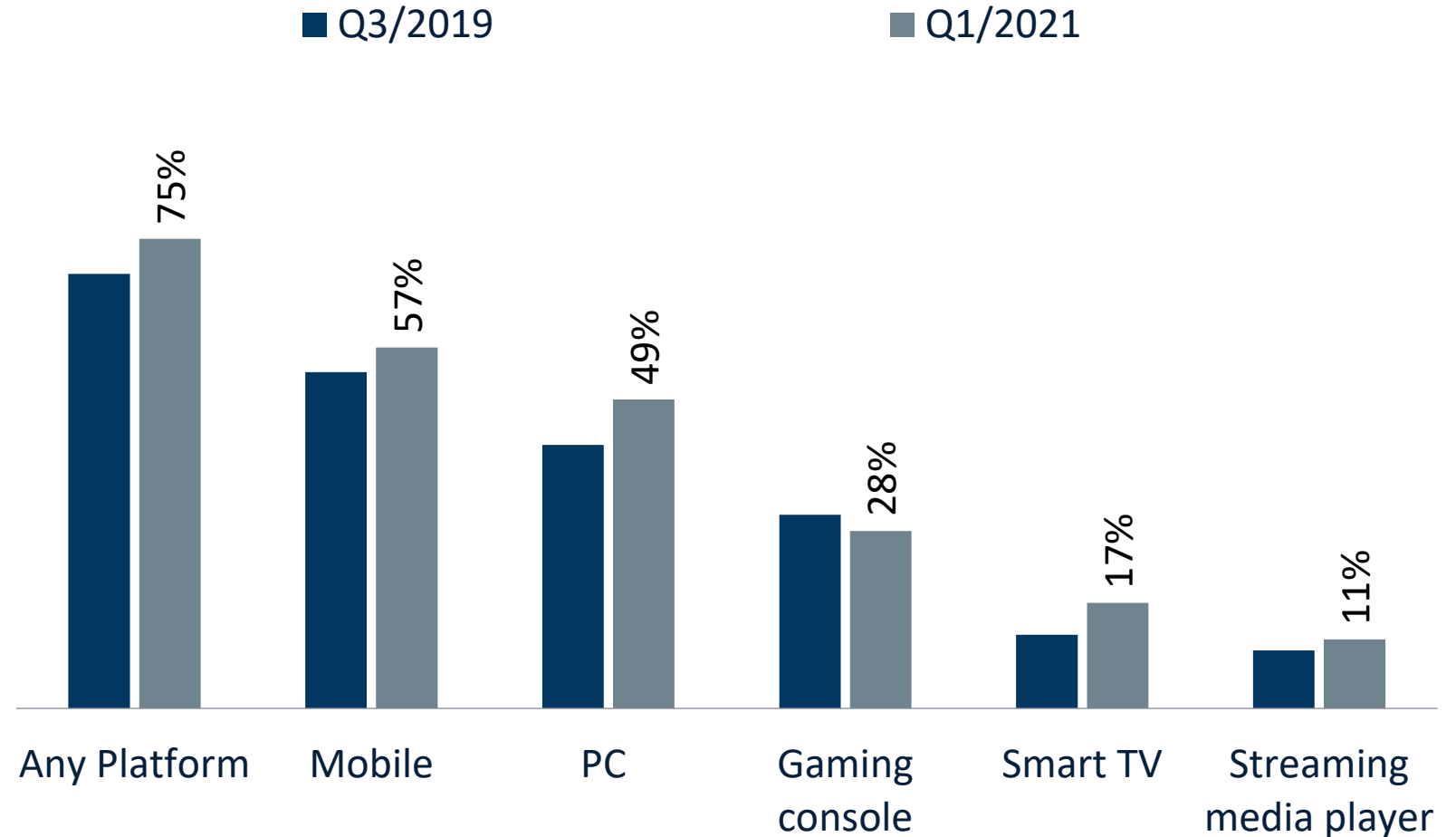
74% households have a **home network router** and 50% purchase from their ISP



75% of US Broadband Households Game



Platforms Used for Gaming



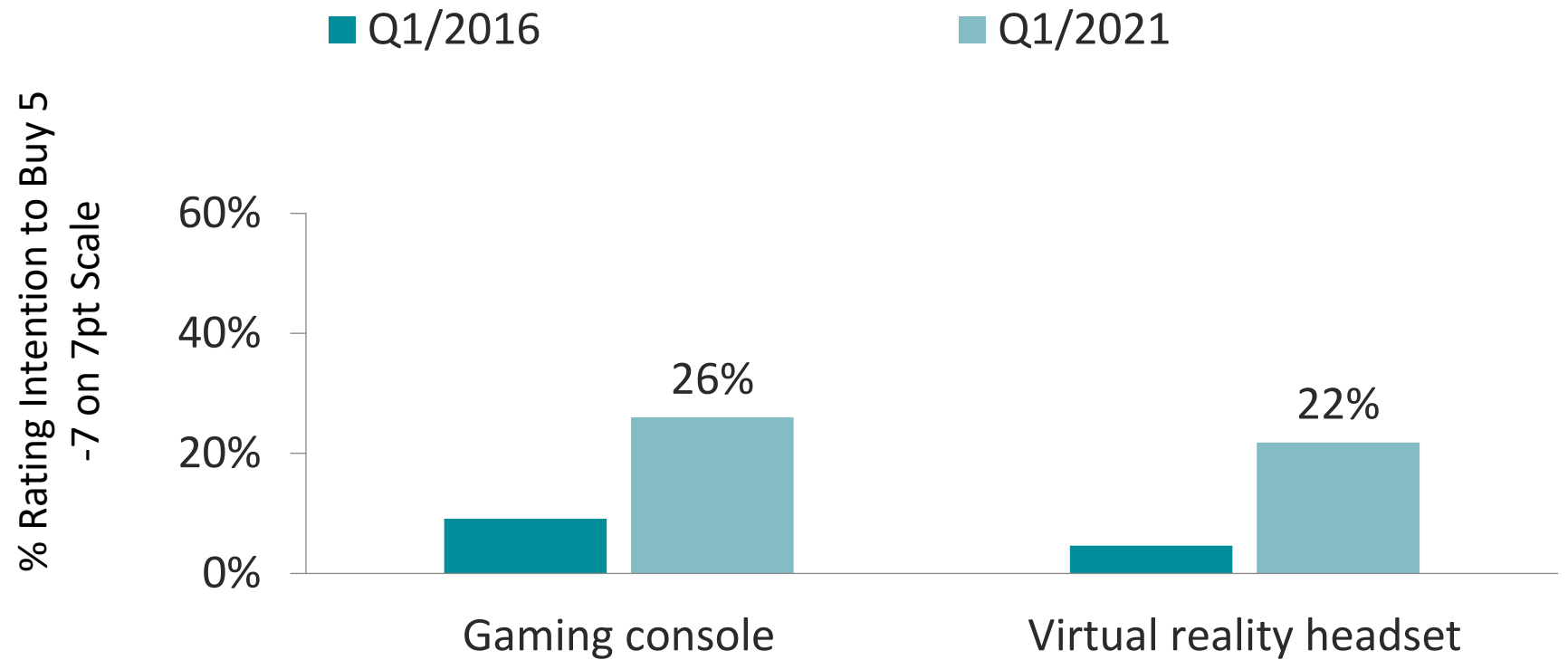


Purchase Intentions Are Rising

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12% of households have a VR Headset

Gaming Device Purchase Intentions

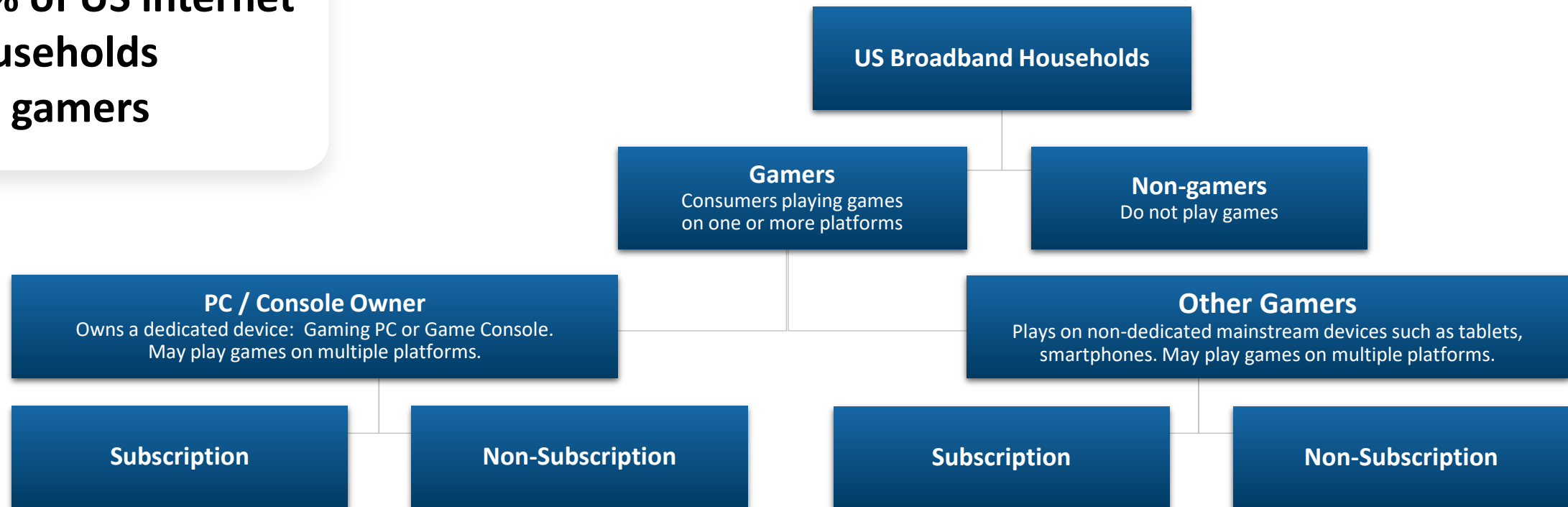


What is Cloud Gaming?

Cloud gaming is a method of accessing and playing video games by using servers in a datacenter, the cloud, to load the game and stream it over an internet connection. Cloud gaming services either allow already-owned games to be loaded and run on cloud-based resources for play on an internet-connected device such as a PC, mobile phone, or smart TV, or combine content access (subscription access or individual per-title purchase capability) with the same capability.

75% of US internet households are gamers

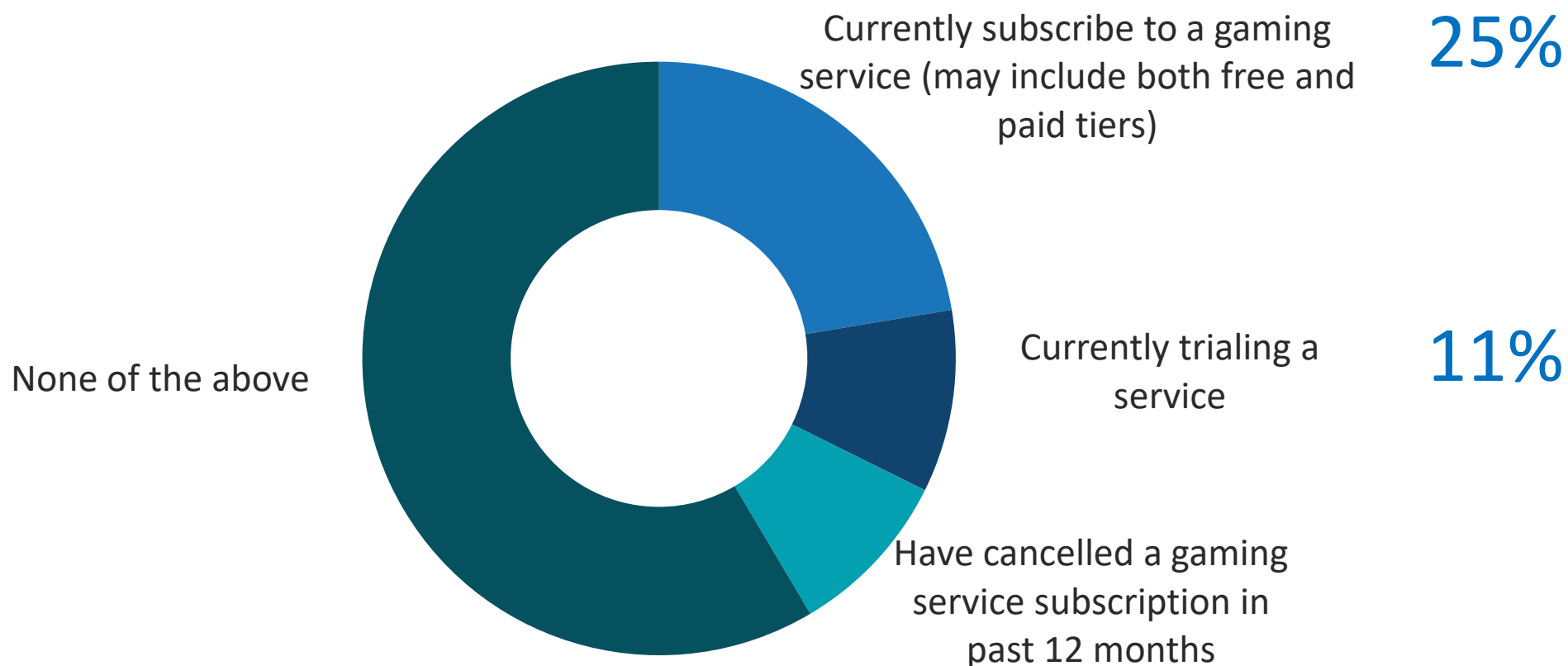
Gamer Hierarchy



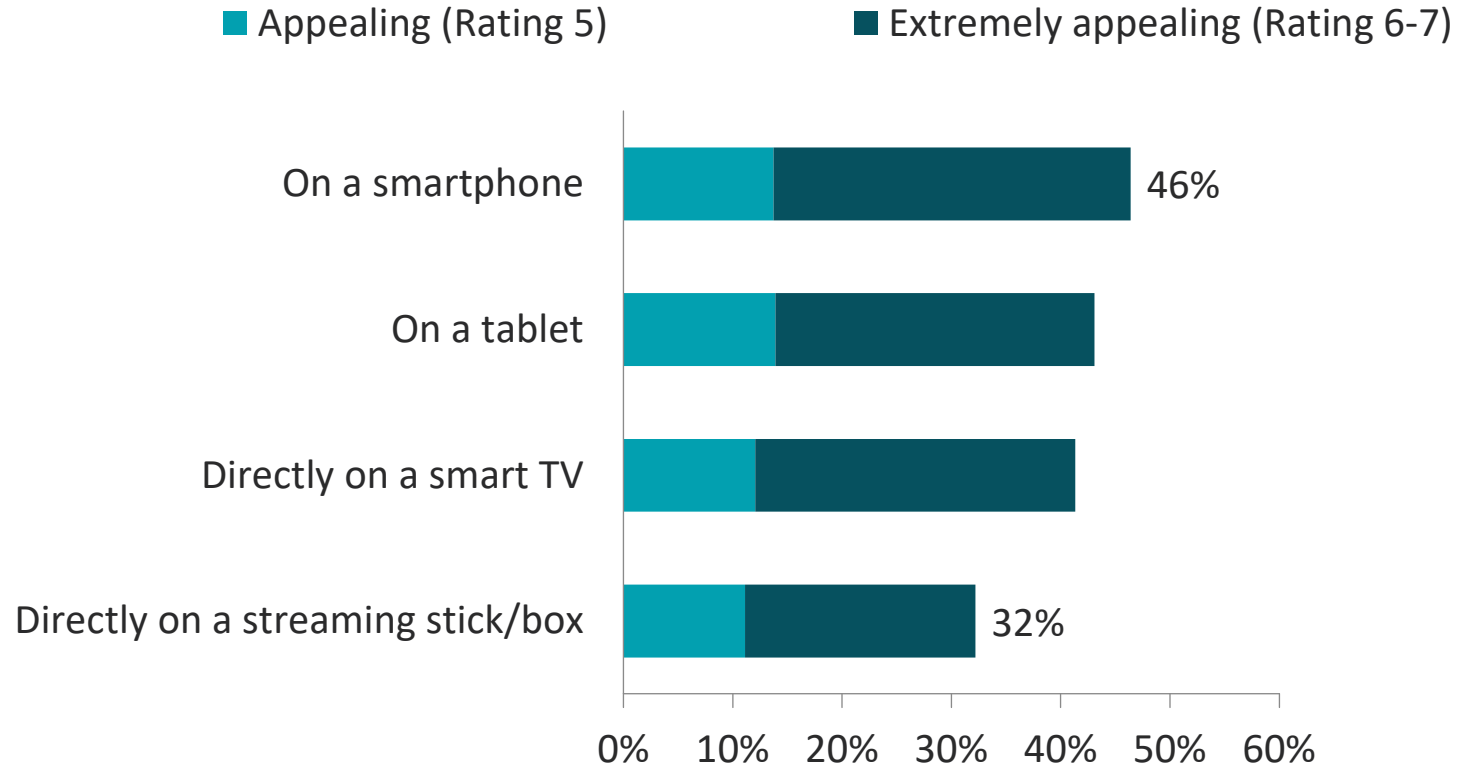
73M Households are **NOT** Subscribing to a Game Service Yet



Video Gaming Service Subscriptions and Trials



Appeal of Cloud Gaming Services



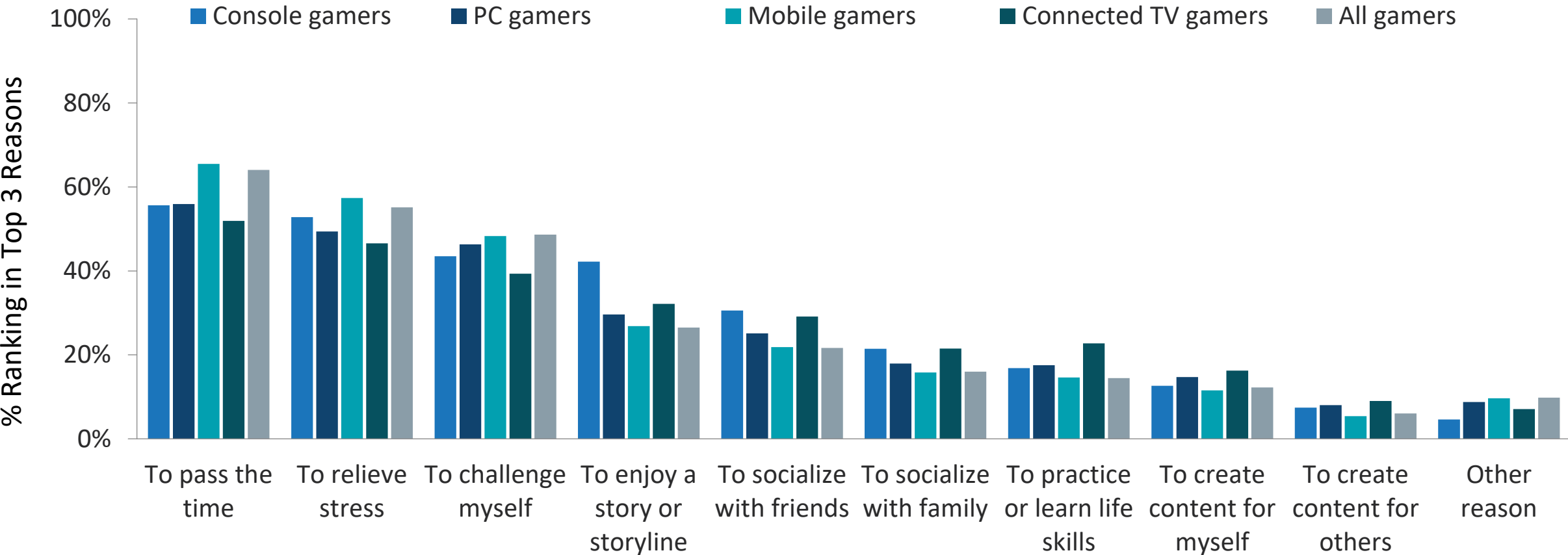
45% of HEAVY GAMERS—those playing 20+ hours per week—report they find cloud gaming appealing



Mobile Gamers Play to Pass the Time or Relieve Stress

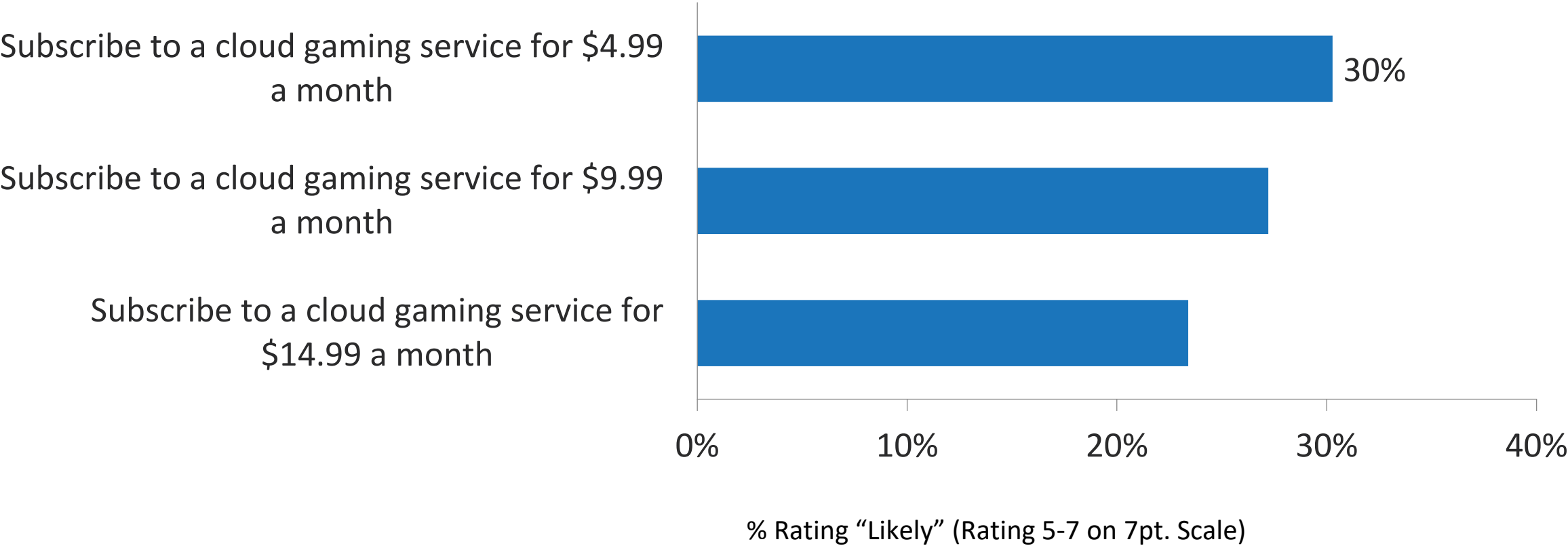


Reasons for Playing Video Games by Gaming Platforms



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Interest in Cloud Gaming by Pricing Tier



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Pioneering Game Performance Management

Performance for Networks	Performance for Publishers
Testing and monitoring tools for engineering and QA	
PRONET Automated, cross-platform tool for network testing and analysis. Real-world, end-to-end user latency	STUDIO SDK Performance monitoring and alerts at every stage of production STUDIO PRO Track and analyse performance of your own portfolio or run competitor analysis.
Independent assessments and reports for marketing	
GAMEBENCH LABS FOR NETWORKS Game performance benchmarking services for Network infrastructure providers	GAMEBENCH LABS FOR PUBLISHERS End-End Game performance benchmarking services for game developers and publishers.

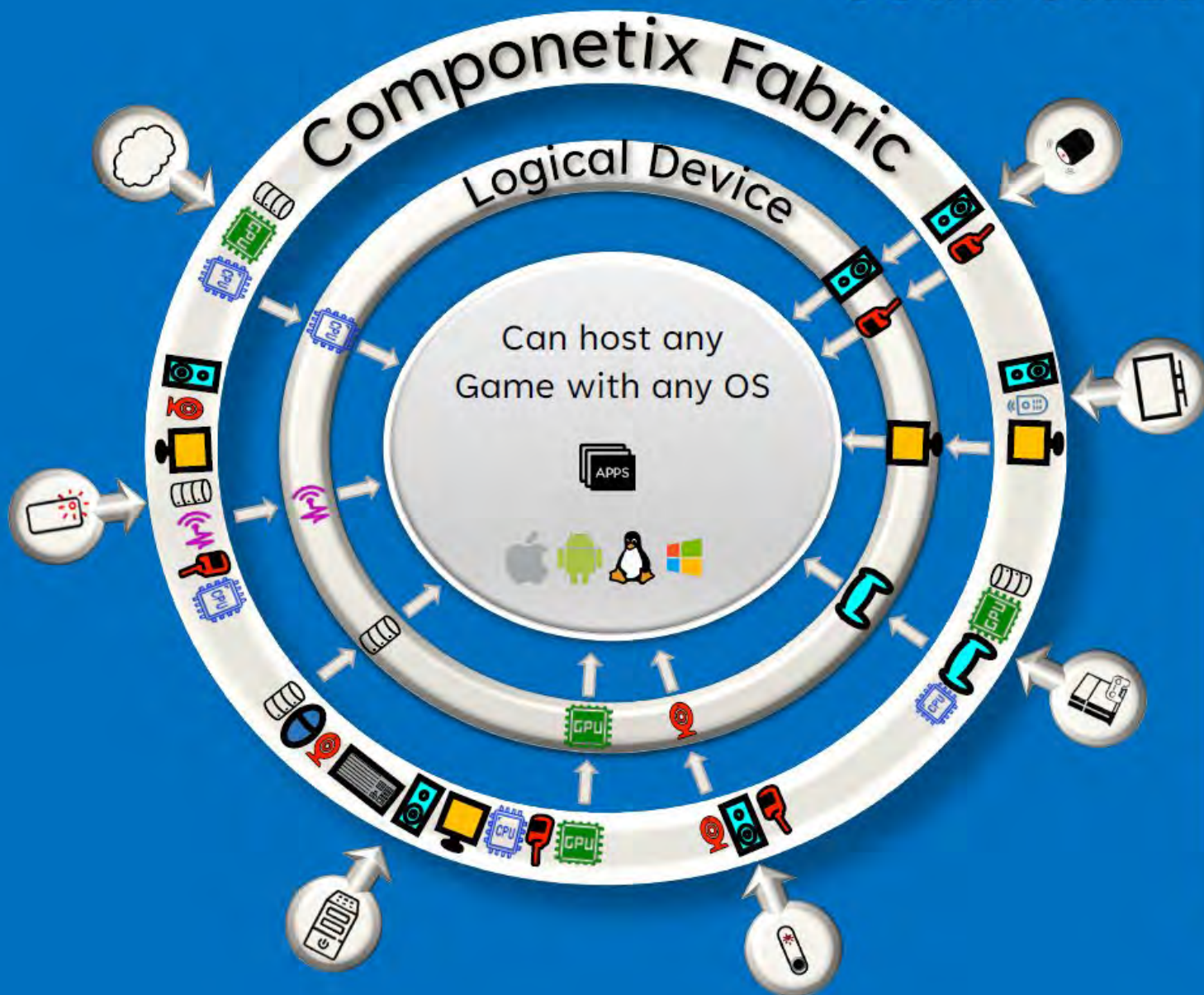
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How it works

1. Detects all the devices in the environment.
2. Disaggregates the hardware components in each device.
3. Stitches the individual components into a Fabric.
4. Spawns new Logical Devices to run any Platforms, Games or Apps.

Fabric Gaming

The Fabric spawns a logical device to provide a cloudless gaming experience

- Allows execution of any game across multi-physical devices.
- Enables you to play your game anywhere.
- Can run multi-games on the same CPU/GPU.
- Capable to change components in real-time (while the game is running).

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Advanced R&D

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Explore

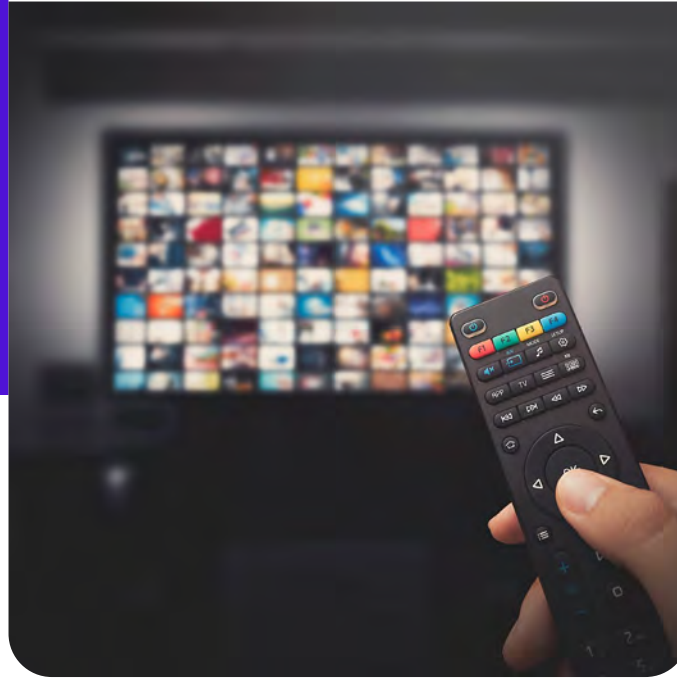
Universal Search

Unified discovery that spans live, recorded, on-demand and streaming content sources.



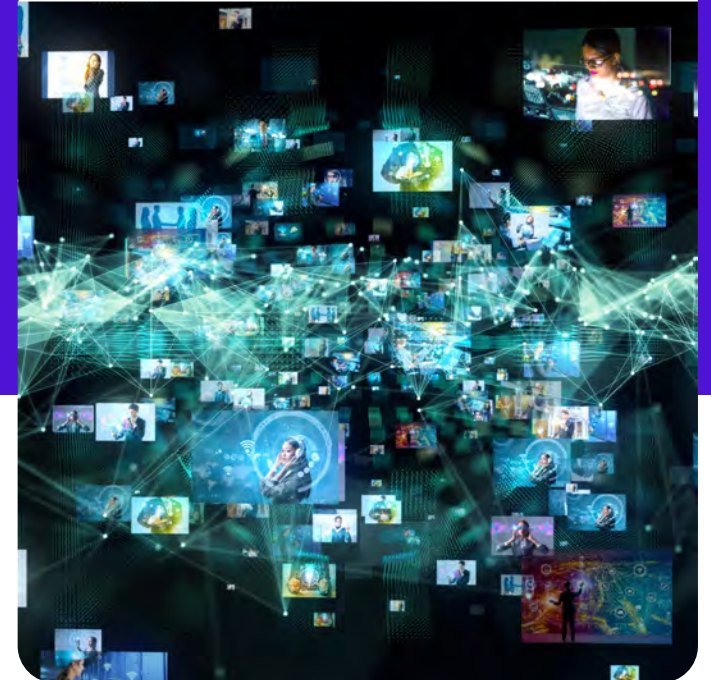
Personalized Discovery

Wide variety of content discovery experiences, including recommendations, predictive results and trending content.



Conversational Interface

Interpret voice commands and requests, and support natural, conversational dialogue and interaction with smart responses.



Experience

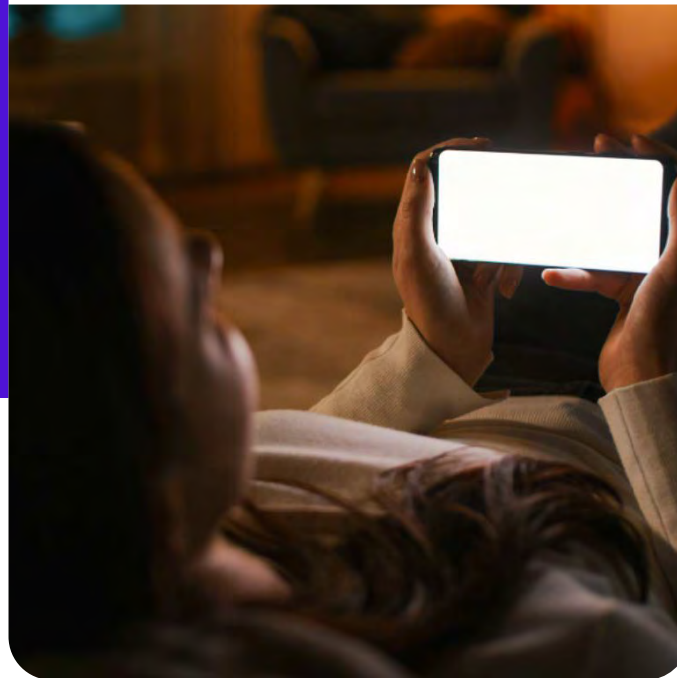
Multi-Device Experience

Start watching on one device and seamlessly transition to another without missing a second of the action.



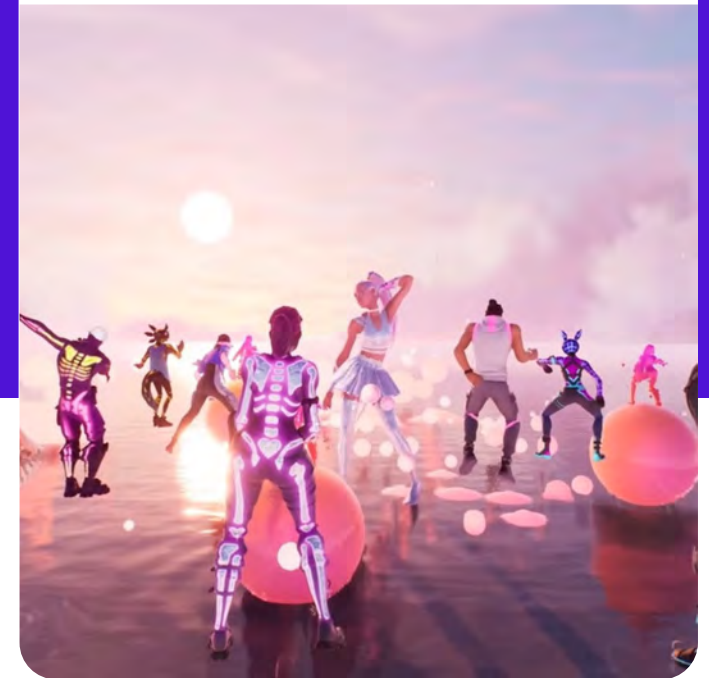
Binge Watching

Connecting viewers with entertainment on their terms.



Immersive / Metaverse

Unconstrained experiences that are more engaging and gratifying than ever before: dynamic advertising, gaming and shoppable video seamlessly integrated into content.



Enhance

Greater Functionality

3D integration plays an increasingly vital role in enabling new and enhanced functionality in mobile, cloud, storage & AR/VR devices.



Higher Performance

Hybrid bonding with ultra-high-density 3D interconnect allows chip architectures to be redefined, enabling higher bandwidth, lower latency and less power.



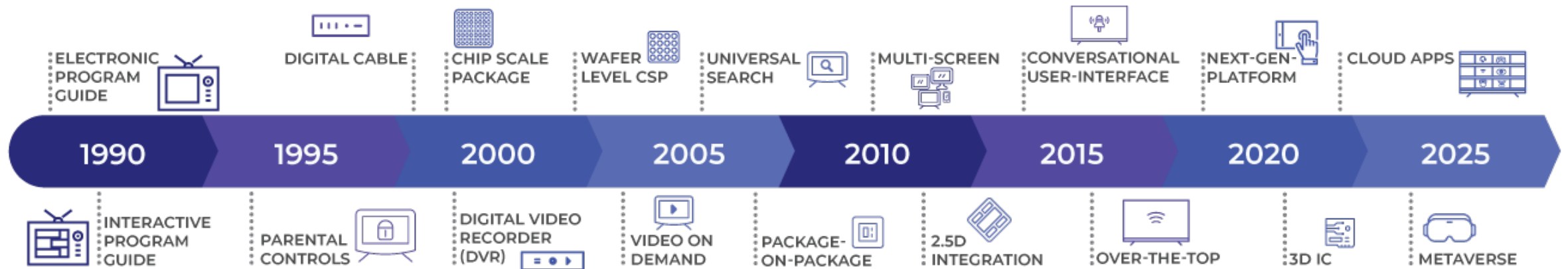
Smaller Size

Innovative 3D miniaturization technologies reduce device footprint and thickness resulting in more compact electronics.



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Cloud gaming performance metrics

- **What metrics matter**

- End - End Latency / Input Lag
- Streaming Resolution
- Streaming framerate

- **Network Requirements**

- 1080p 60 ~ 40 Mbps minimum
- 1600p 120 ~ 60 Mbps minimum

- **Numbers for a good gaming experience**

- Input Latency < 100 ms (16 ms jitter)
- 1080p stream with 60 FPS (Frames per second) for laptop form factor
- RTT < 15 ms

- **Measuring performance metrics**

- Streaming platform provided logs
- WebRTC Statistics
- High Speed Camera
- ProNet Suite - GameBench

- **Comparison with Gaming PC (Fortnite)**

- Input Latency < 40 ms
 - 70 - 85 ms on Geforce Now (GfN)
- Frame rate dependent on GPU
 - GfN does 120 fps

Thank You



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