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STREAMING OPPORTUNITY AND CHALLENGES IN EMERGING MARKETS

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Agenda

INTERNET OPPORTUNITIES IN EMERGING MARKETS

China Market

As of early 2024, China had **1.09 billion** internet users, which is **76.4%** of the country's population.

The average revenue per user (ARPU) is expected to be **$1,553** in 2024.

China's live streaming e-commerce market reached nearly **$700 billion** in 2023, up from $59 billion in 2019

884 million people shop online

statista, 2024

Streaming Opportunities in China

China Internet Market:

- Largest Internet Community: As of early 2024, China has 1.09 billion Internet users, reflecting an Internet penetration rate of 76.4% of the total population (China Internet Watch) (DataReportal – Global Digital Insights).
- Mobile Netizens: There are 1.091 billion mobile internet users, accounting for nearly 99.9% of all internet users (China Internet Watch).

China Streaming Market:

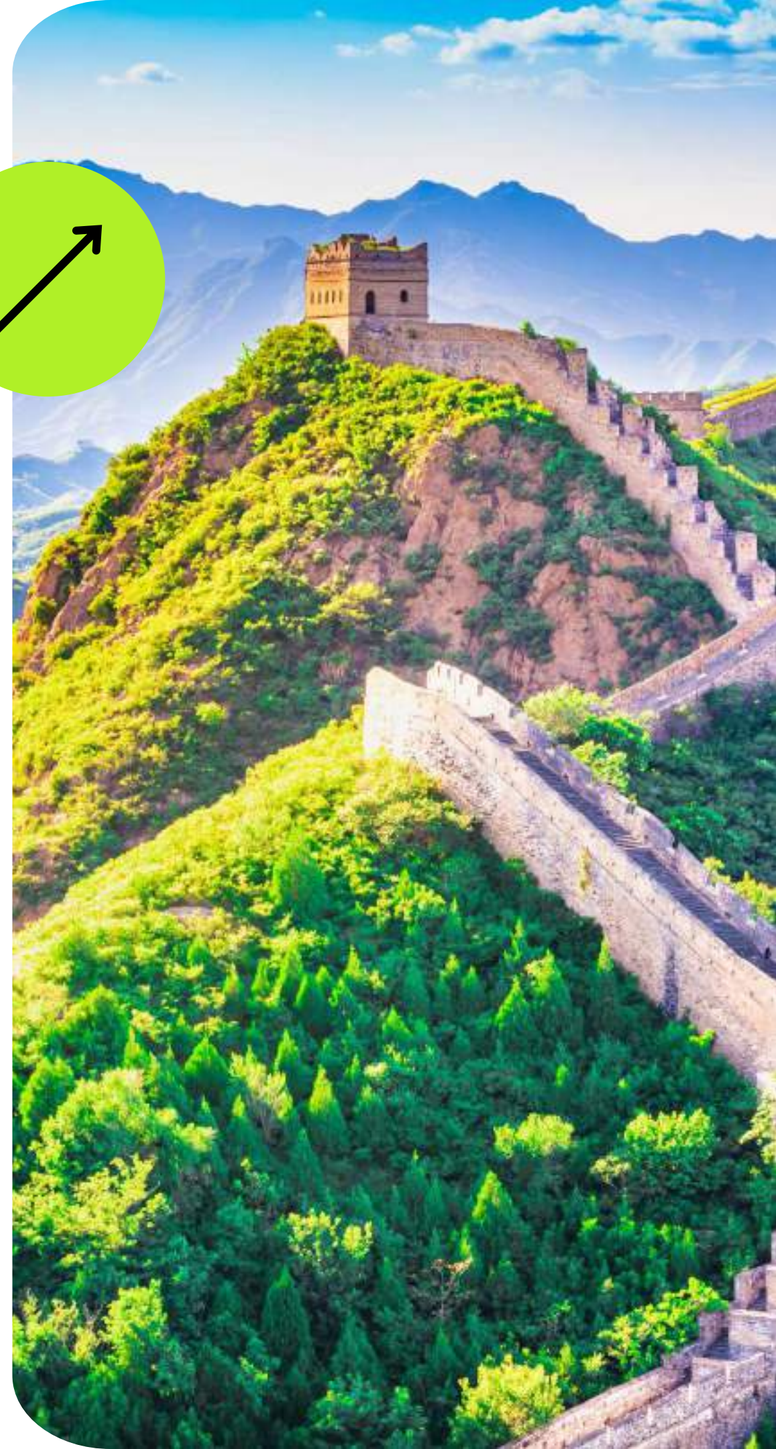
- Live Streaming Users: China has the world's largest live streaming user base, with 816 million users as of December 2023 (China Internet Watch).
- Gaming Market: China remains the world's largest game market, with live game streaming growing rapidly.

Drivers:

- Extended access to mobile internet
- Faster internet service with a lower cost
- Popularity of live e-commerce; online gaming, short-videos; social streaming, etc
- Strong economy and spending power

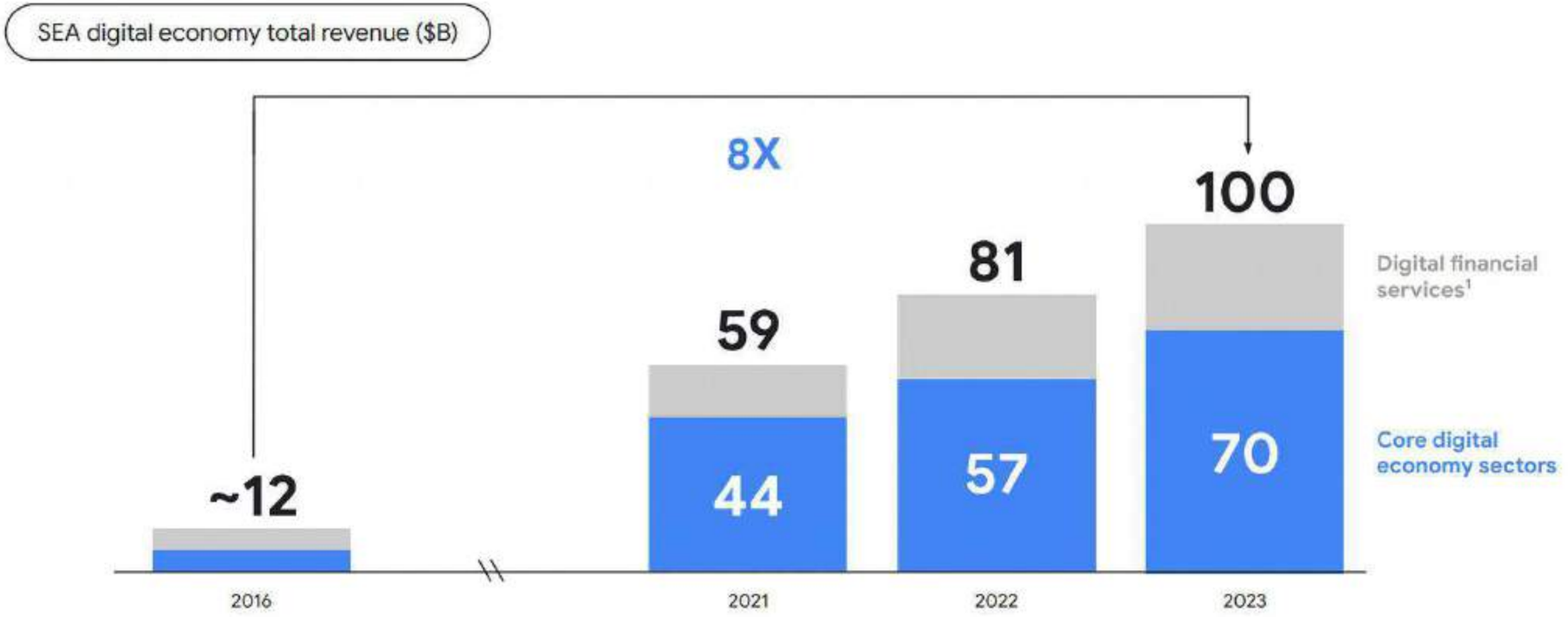
Impact:

- Regardless of strong local competition, China has a growing appetite for streaming services from outside of the country, such as enterprise conferencing/streaming solutions, e-sport/game streaming; luxury brand event streaming; online education streaming, etc.



SEA Market

The region has reached a key milestone: $100B in revenue across all digital economy sectors – or 8X over the past 8 years



Note: (1) Includes revenue from payments (average merchant discount rates), lending (gross interest rates), insurance (annualised premium equivalent, APE, for life and gross written premiums, and GWP, for non-life insurance), and wealth (mutual funds management fees and platform fees).
Source: Bain analysis

Google TEMASEK BAIN & COMPANY

Streaming Opportunities in SEA

SEA Internet Market:

- **Large User Base:** As of 2024, Southeast Asia has approximately 440 million internet users, demonstrating rapid digital growth across the region.
- **5G Coverage:** The rollout of 5G in SEA is progressing rapidly. According to the Ericsson Mobility Report, 5G subscriptions in Southeast Asia and Oceania are expected to reach 570 million by 2027, reflecting significant growth (ericsson.com).

SEA Streaming Market:

- **Rapid Growth in User Base**: Southeast Asia is experiencing a significant increase in the number of live streaming users, with the market expanding rapidly across countries like Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.
- **Substantial Market Value:** The combined subscriptions for paid OTT video streaming services in these countries are projected to exceed 50 million by the end of 2024, translating to a market value of about $1.90 billion (S&P Global) (Seasia.co).

Drivers:

- Increased access to internet
- Mobile devices becoming more affordable
- World's fastest growing mobile gaming market
- Rising middle class; uplifted living standards

Impact:

- Social entertainment, online gaming, online payment and e-commerce live-streaming are gaining strong momentum
- Now is strategic time to enter the emerging markets and grow as consumers develop mobile internet habits

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Streaming Opportunities in EMEA

EMEA Internet Market:

- **4G Coverage:** The EMEA region has extensive 4G coverage, particularly in Europe. Countries like the Netherlands, Cyprus, and Malta have near-total 4G coverage, providing high-speed mobile internet access to nearly all households.
- **5G Coverage:** The rollout of 5G technology in the EMEA region is progressing rapidly. According to the Ericsson Mobility Report, 5G subscriptions in the MEA are expected to reach 30 million by 2024, representing 2% of total mobile subscriptions. This growth is driven by advanced ICT markets like the GCC countries (Saudi Arabia, UAE, and Qatar) and increasing momentum in South Africa.

EMEA Streaming Market:

- **Large User Base:** The EMEA region has a diverse and growing streaming market. Europe alone has a combined population of 453 million people, while the Middle East and North Africa (MENA) region has around 600 million people.
- **Market Value:** The video streaming market in Europe is projected to grow by 18% annually over the next decade, with the OTT video revenue in Europe increasing from €1.3 billion in 2013 to €14.5 billion in 2022. The MENA region's SVOD revenue is expected to reach $4 billion by 2027.(SymphonyAI)

LATAM 4G/5G Coverage

4G Coverage:

- **High Penetration:** As of 2024, 4G remains the dominant mobile technology in LATAM, with nearly **70%** of total mobile connections expected by the end of 2025. (ericsson.com) .

5G Coverage:

- **Emerging Networks:** The rollout of 5G technology in Latin America is progressing steadily. By early 2023, 8 countries in the region had launched commercial 5G services, including Brazil, Colombia, Peru, and Chile. The number of 5G connections in Latin America is projected to grow to **86 million** by 2025 and **330 million** by 2028, representing around 43% of mobile subscriptions by the end of 2027 (ericsson.com) .

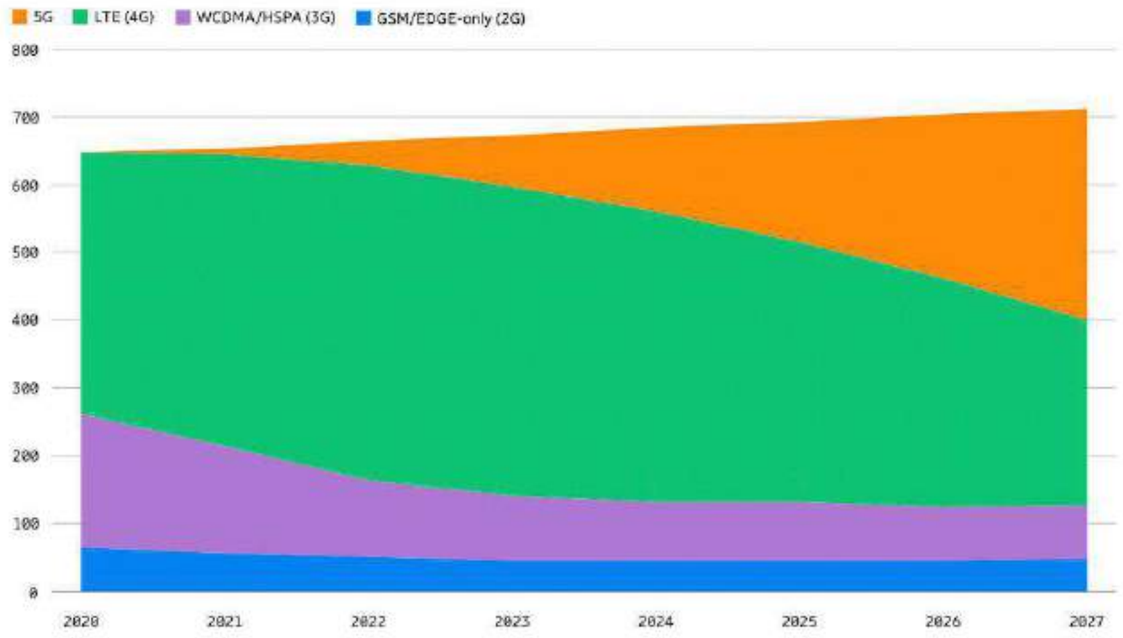


Figure 7: Latin America mobile subscriptions by technology (million)

LATAM Streaming Market

The media streaming market in Latin America is estimated to grow from **USD 11.34 billion in 2024 to USD 17.46 billion by 2029**, reflecting a CAGR of 7.57%.

The e-sports market in Latin America is expanding, with Brazil and Mexico leading the way. The market is projected to reach **$300 million** by 2027.

Challenges for Streaming Delivery to Emerging Market

Network

- Unique network environment
- Network coverage; in-country service PoPs
- Interconnectivity with local carriers and ISPs

Security

- Sophisticated cyber-attack types
- Higher cyber-attack volume vs. other regions in the world
- Importance of customer data/ privacy protection

User Experience

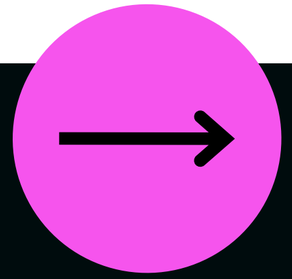
- Slow video playback
- Poor service availability
- High buffer rate
- Compromised user experience and decline of viewership

Local Compliance

- Network setup and operation rights
- ICP registration requirement
- Local compliance on nature of content delivery in China and SEA countries.

5G coverage of these markets

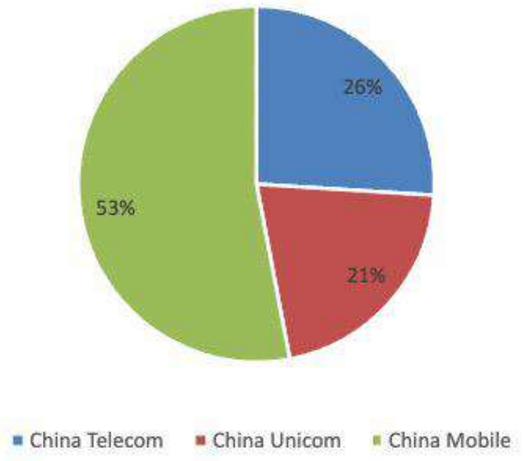
BEST PRACTICES



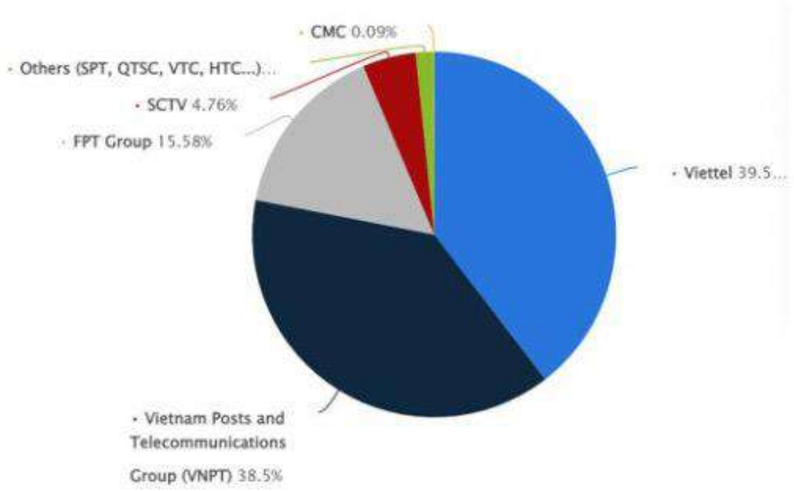
Best Practice 1 – Understand Your User Distribution

- PoP location matters. Understand your audiences' geographical distribution and network environments then choosing the solution provider with the most appropriate resources.
- China and many SEA countries are dominated by state-owned telecommunication providers with limited peering between each other.

Chinese ISP 5G User Market Share Breakdown



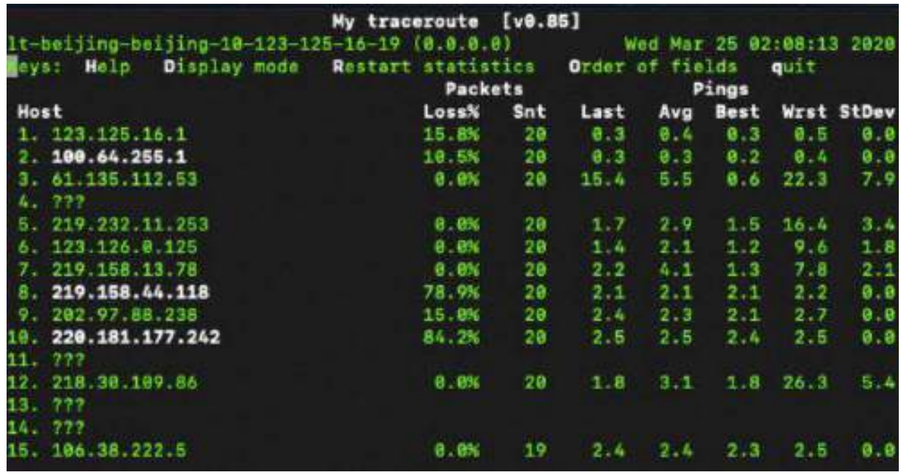
Vietnam ISP Market Share Breakdown Based on Number of Subscribers



Source: Statista 2022

Best Practice 1 – Understand Your User Distribution (Cont'd)

China Cross-City and Cross-ISP Network Latency Data: EdgeNext backbone monitoring		
	Shanghai, CT	Shanghai, CM
Shanghai, CT	0.06 ms	3 ms



```
                    My traceroute  [v0.85]
lt-beijing-beijing-10-123-125-16-19 (0.0.0.0)          Wed Mar 25 02:08:13 2020
Keys:  Help   Display mode   Restart statistics   Order of fields   quit
                                 Packets               Pings
 Host                         Loss%   Snt   Last   Avg  Best  Wrst StDev
 1. 123.125.16.1              15.8%    20    0.3   0.4   0.3   0.5   0.0
 2. 100.64.255.1              10.5%    20    0.3   0.3   0.2   0.4   0.0
 3. 61.135.112.53              0.0%    20   15.4   5.5   0.6  22.3   7.9
 4. ???
 5. 219.232.11.253             0.0%    20    1.7   2.9   1.5  16.4   3.4
 6. 123.126.0.125              0.0%    20    1.4   2.1   1.2   9.6   1.8
 7. 219.158.13.78              0.0%    20    2.2   4.1   1.3   7.8   2.1
 8. 219.158.44.118            78.9%    20    2.1   2.1   2.1   2.2   0.0
 9. 202.97.88.238             15.0%    20    2.4   2.3   2.1   2.7   0.0
10. 220.181.177.242           84.2%    20    2.5   2.5   2.4   2.5   0.0
11. ???
12. 218.30.109.86             0.0%     20    1.8   3.1   1.8  26.3   5.4
13. ???
14. ???
15. 106.38.222.5              0.0%     19    2.4   2.4   2.3   2.5   0.0
```

- **PoP location matters**. Understand your audiences' **geographical distribution** and **network environments** then choose the solution provider with the most appropriate resources.
- When testing solutions providers, make sure to test from the cities and ISPs where your users are.
- Useful metrics: connect time, time to the first frame, play perusers, buffer rate, and duration per user.
- Useful tools to understand your users' network environment for China and SEA countries:
  IP database: https://www.ipip.net/
  Network latency: https://www.17ce.com/

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Best Practice 2 – Optimize Your Stream Quality and Availability

Users are expecting high quality streams at their fingertips.

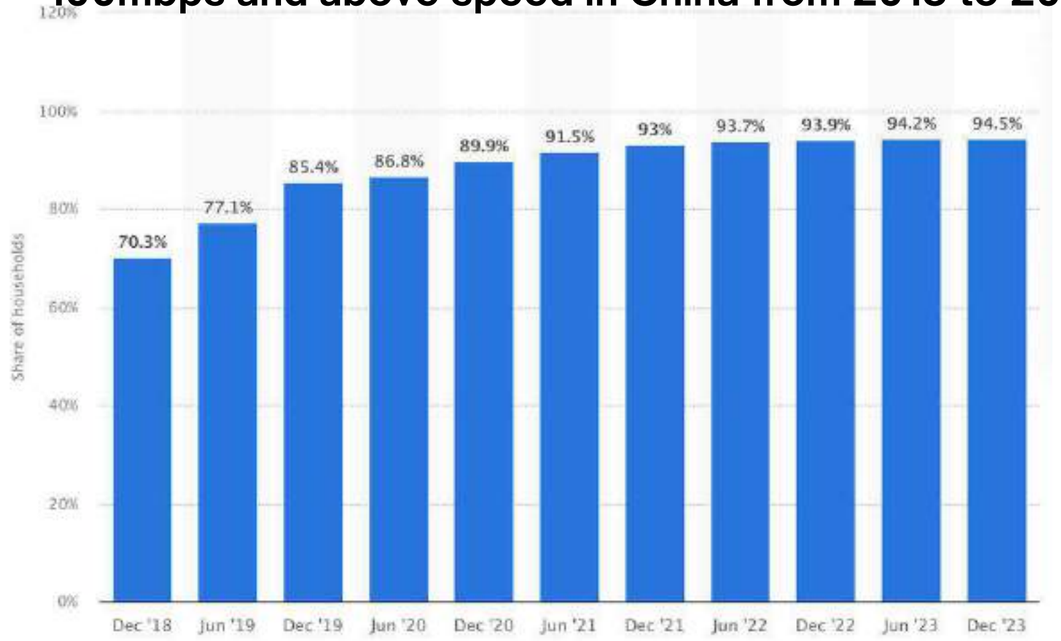
- Move library or stream source closer to the users.
- Set up redundancy and programmatic failover for both VOD and live streaming.
- Adaptive bitrates from the lowest to the highest bitrate to cover all network types and clients.
- Cache manifest file for live streams.
- Real-time logging to react instantly.

Average Network Latency

EdgeNext backbone monitoring

	Taiwan	Hong Kong	Tokyo	Seattle	Paris	London
China	22.3 ms	3.64 ms	58.3 ms	173 ms	244 ms	267 ms

Share of households connected with broadband internet with 100mbps and above speed in China from 2018 to 2023



EdgeNext Network Latency

Data: Baishan backbone monitoring

	Taiwan	Hong Kong	Singapore	Thailand	Vietnam	Malaysia
Taiwan	0.07	21	49	68	80	52
Hong Kong	21	0.2	35	53	25	34
Singapore	6	31	0.2	23	23	6
Thailand	68	59	23	0.5	50	29
Vietnam	43	24	28	47	0.7	44
Malaysia	52	33	7	29	45	0.1

Qatar	Kuwait	UAE	Saudi Arabia	Oman	Brazil	Chile	Argentina	Colombia	Peru
18	67	12	32	18	25	65	53	25	119

Unit: ms

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Best Practice 3 – Ensure Content Compliance

- Audit the content to ensure compliance with regulations and to avoid getting on the local government's radar.
- Review your content library.
- For user-generated videos or live streams
  - Enable instant content control to purge sensitive content without impacting other broadcasters
  - Implement image-based filtering logic to audit streams frame by frame.
  - Recruit local support for auditing the content manually.
  - Work with solution providers with established abuse reporting processes with local ISPs.

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Best Practice 4 – Recognize Regional Hijacking Behavior

- **Content hijacking from ISPs is prevalent in China and Southeast Asia.**

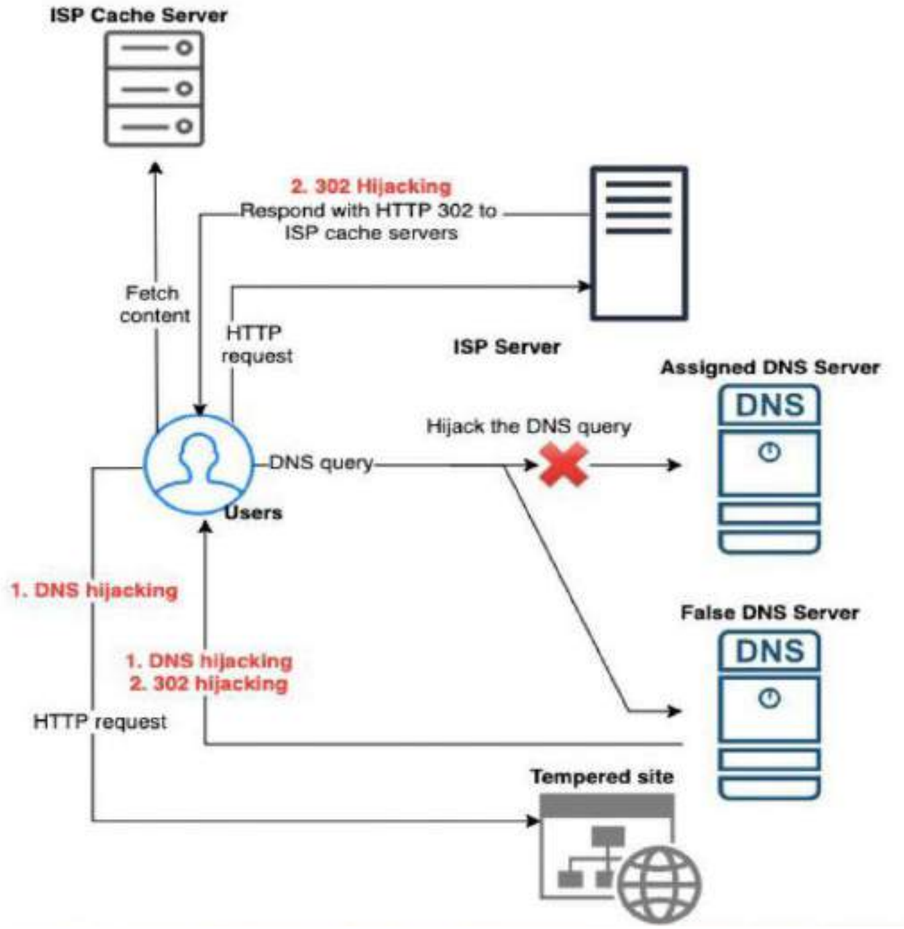
- **Reasons for the hijacking users' requests:**

1. Reduce cross-network bandwidth cost
2. Advertisement monetization
3. Prevent users from accessing the site

- **Two common types of ISP hijacking:**

1. DNS hijacking – respond with false DNS records to lead users to tampered sites with advertisements.
2. Domain hijacking by issuing 302 redirection – redirects users to their cache servers to serve the requests within network.

- **Work with solution provider to report to ISP**



ANY QUESTIONS?

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