IIT Real-Time Communications Conference
Trivia & Gaming with WebRTC
Headlines Tell the Challenges with Today’s Streaming Video

- **NBC’s coverage of the Olympics is atrocious. There’s a simple reason why.**
- **CBS’ streaming apps crashed late in the Super Bowl for many, throughout the game for others.**
- **DAZN hopes to solve its Canadian streaming issues in 2018.**
- **Major Latency delays for Amazon Prime’s US Open coverage.**
- **Optus under fire after World Cup streaming leaves fans frustrated.**
- **Streaming NFL Games Still Sucks.**
- **Facebook loses Copa Libertadores exclusivity after streaming issues.**
- **YouTube team working on fix for major buffering issues affecting users.**
- **Liberty Media’s Formula 1 OTT Snafus Underscore the Importance of Video Infrastructure.**
PHENIX VS OTHER LIVE FEEDS

In Stadium
00:00:50:62

+0.42s

App
+28.2s

 CBS SPORTS.com
+36.8s

 YouTube TV
+36.9s

 CBS ALL ACCESS
+46.5s
2019 Super Bowl: Measured Latency Behind Real-Time

Conclusion: Viewers on all platforms are significantly delayed, leading to spoilers and a degraded user experience.

Full Study: [https://phenixrts.com/sports-latency.html](https://phenixrts.com/sports-latency.html)

TVTechnology: [Latency Plagues Super Bowl Video Streams, Finds Phenix](https://phenixrts.com/sports-latency.html)
2019 Super Bowl: Measured Audience Drift

Conclusion: Viewers on all platforms are out of sync, preventing viewers from interacting with each other over social media and messaging without spoiling the game.

Full Study: [https://phenixrts.com/sports-latency.html](https://phenixrts.com/sports-latency.html)
TVTechnology: [Latency Plagues Super Bowl Video Streams, Finds Phenix](https://phenixrts.com/sports-latency.html)
## Those Not Focused on Real-Time Will Not Survive

<table>
<thead>
<tr>
<th>Existing Live Streaming Technology</th>
<th>Negative Business Impact</th>
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<tbody>
<tr>
<td>Long Time to First Frame (TTFF)</td>
<td>Reduces user acquisition, Increases churn</td>
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<tr>
<td>No audience synchronization</td>
<td>Incites spoiler alerts from social and push-notifications, Prohibits gamification and interactivity, Limits betting opportunities</td>
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<tr>
<td>High latency</td>
<td>Increases churn, Reduces user acquisition, Limits betting opportunities, Incites spoiler alerts from social and push-notifications</td>
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<tr>
<td>Crashes from flash crowds joining streams</td>
<td>Leads to loss of entire audience, Creates social media outrage, Damages brands</td>
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</tbody>
</table>
Sports Betting: Conventional Streaming Fails

Every second behind real-time shortens betting window and decreases revenue

Frustrating user experience from delays and spoilers (e.g. tweets, texts and push notifications)

Potential for fraud and arbitrage
“Would you be more likely to stream a live sporting event online if you knew it wasn’t delayed from the TV broadcast?”

Source: Limelight Networks, “The State of Online Video 2018,” Sep 25, 2018
Phenix Value Proposition

- < ½ Second Latency
  Real-Time Streaming
- Broadcast Size Audiences
- Synchronized Viewing
- Secure Data Channel Syncs
  With Video in Real-Time
Benefits of Phenix Real-Time Streaming

Acquisition

Retention

Engagement

Monetization
Phenix Enables Real-Time Sports Betting

Real-Time Streaming

More Bets Available & More Time To Bet

More Bets Placed

Higher Revenues
23 Global PoPs
(expanding to 30 by end of 2019)

• North America (9): Oregon, California, Arizona, Iowa, Virginia x 2, South Carolina, Ottawa, Quebec

• South America (1): São Paulo

• Europe (8): London x 2, Belgium, Frankfurt x 2, Finland, Zurich, Amsterdam

• Asia (4): Mumbai, Singapore, Taiwan, Tokyo

• Australia (1): Sydney

Global Data Center Network Delivers Content Everywhere
Workflow is Built on Standards for Delivery Everywhere

<table>
<thead>
<tr>
<th>Source</th>
<th>Contribution Encoding</th>
<th>Ingest</th>
<th>High Availability CDN</th>
<th>Edge Transformation</th>
<th>Egress</th>
<th>Viewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDI</td>
<td>phenix</td>
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<td>Private Fiber Network</td>
<td>MBR</td>
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<td>MPEG-TS</td>
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<td>mpeg-DASH</td>
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<td>HDR</td>
<td>H.265</td>
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</tbody>
</table>

- Source: Contribution Encoding
- Ingest: High Availability CDN
- Edge Transformation: Egress
- Viewer:

<table>
<thead>
<tr>
<th>Time</th>
<th>120ms</th>
<th>50ms</th>
<th>70ms</th>
<th>200ms</th>
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</thead>
</table>

<500ms
Designed to Deliver the Best User Experience at Scale

- Flash Crowds
- Multi-Bitrate Adaptive Streaming
- Scale in Channels and Concurrent Viewers
- Real-Time Analytics
- Flexible Ingest Options
Engineered for Availability, Reliability and Efficiency

- Multi-Cloud Architecture
- High Availability Encoding
- Micro and Macro Level Fault Tolerance
- High Availability Ingest
- Global Capacity Reservation and Delivery Optimization
- Service Oriented Architecture
250,000 viewers joined in less than 60 seconds proving both scale and flash crowd handling capabilities.
Ecosystem Support

WebRTC Browser Support
- Chrome
- Firefox
- Safari
- Opera
- Edge

Native SDKs
- iOS
- Android
- tvOS
- androidtv

Encryption & DRM
- AES-128 bit encryption
- Working with Widevine on multi-rights DRM

Server Side Ad Insertion
- Freewheel
- DoubleClick by Google

Coming Soon For Real-Time
- Roku TV
- LG webOS
- XBOX
- Samsung Tizen
- PlayStation Vue
Phenix Customers See the Future of Interactive Streaming
Selected by ABC for 2019 OSCARS Awards

• Streamed real time Audience Cam in first Official Oscar Game
• Viewers competed for $50K prize
• Total views: 1.4M
• Stream join rate > 80K per second
• Phenix stream < ½ sec vs ABC.com 93+ sec latency!
• Big success for ABC

Parker Tilley 8:12 PM
@Bill live audience cam video feed is amazingly fast, and perfect

Kolby Mac @kobyoldime - Feb 24
Not only a solid start but the #OscarGame streaming inside the auditorium is pretty dope!!! I see u @TheAcademy

shelly @LFreenor - Feb 24
#OscarGame
So much fun!!!! Do this every #Oscar. @ABCNetwork this was a fun activity
Ex Machina Group sought streaming technology for their new white label mobile live trivia product, PlayTrivia.

- Required low latency, synchronous delivery, and high reliability at global scale
- Utilized Phenix’s lightweight JavaScript WebSDK to create a web-based producer console for publishing content to Phenix channels
- Real-time adaptive bitrate streaming for highest possible quality for each device and connection
- Trivia app Q12 serves 200k+ concurrent users on iOS and Android

"Being able to utilize genuine real-time streaming has allowed us to unify video and interactivity on mobile for the first time."

- Jeroen Elfferich, CEO of Ex Machina Group
Your Call Football (YCF) is an interactive football league empowering fans to control the live action on the field by voting on the next playcall from their mobile devices.

To enable real-time interactivity and fast pace of play, YCF needed minimal latency.

Phenix enabled YCF to partner with Barstool Sports talent to add real-time commentary on the action for 50k+ participants.

“We’ve worked with different providers, but have never seen the innovative technology Phenix delivered. The high quality, real-time streams were really impressive”
- Pete Overmyer, Head of Media Tech at Barstool

“Phenix’s near zero latency stream is a perfect fit for YCF, so fans can call the plays and then watch the majority-voted play run on the field all in Real-Time”
- Julie Meringer, CEO & Founder of Your Call Football
Phenix Confidential & Proprietary 2019

• SAFEIS and GER launched the first ever Saudi Arabian FIFA18 eSports Tournament in 2018
• Tournament included 64 gamers playing in Saudi Arabia on both PlayStation and Xbox
• Phenix provided split-screen real-time streaming on GER and SAFEIS websites, distributed worldwide
• Integrated Twitter feed for interactive commentary

“Given the historic nature of this first ever FIFA 18 eSport tournament in Saudi Arabia...only the world’s best technology would have been acceptable.”
- Tom Smith, General Manager of GER

“Making this competition immediately available to viewers worldwide in crystal clear quality on split screens without any time lags or distortions is a reflection of our commitment to advancing the state of Saudi electronic gaming”
- Prince Faisal Bin Bandar Bin Sultan Al Saud, President of SAFEIS
World’s largest automotive resale marketplace, facilitating the sale of 7 million cars worth $50B annually

- **Real Time Interactivity**: Auction participants are both in-person and online, requiring real time video and audio

- **Scalability**: 1000+ live auction channels and 100K bidders daily

- **Secure**: Serve 1M+ car buyers and 40K+ auto dealers in real time
Connecting Olympians with Family Overseas at 2018 Winter Games in PyeongChang

• Creative Technology Agency wonderMakr partnered with Canadian Tire on “Red Door”, a unique marketing effort for the 2018 Winter Olympics in South Korea

• Red Door program enabled athletes to video chat with HD 1080p quality in real-time with family and friends across the globe to celebrate their Olympic performances

• Phenix exercised its global private fiber network to minimize data losses and maximize available throughput

“Delivering Full HD 1080p content across the world with less than 1/2 second of delay is a massive undertaking, and Phenix was the only company we met with that could make this possible.”
- Mark Stewart, CEO of wonderMakr
World Class Team with Deep Domain Expertise

Roy Reichbach  
Chief Executive Officer

Leading streaming executive; sold NeuLion to Endeavor for $250 million

Dr. Stefan Birrer  
Co-Founder & Chief Software Architect

M.S. & PhD in computer science, streaming expert, and WebRTC visionary

Tripp Welge  
Chief Operating Officer

Finance and sales leader with strong private equity background

Bill Wishon  
Chief Product Officer

Led Akamai innovation engineering from CTO’s office; responsible for $400m in revenue as Sr. Product Manager

Jed Corenthal  
Chief Marketing Officer

Deep marketing and corporate sales background at leading brands; successful startup exit

Bill Wishon  
Chief Product Officer

Bill Wishon

Brett Fasullo  
SVP, Global Sales

Helped build $100m carrier business unit at Akamai; led South American sales efforts

Kyle Bank  
VP, Sales Ops & Strategy

Multi-faceted global thinker with strong background in finance, marketing and sales

Jed Corenthal  
Chief Marketing Officer

Jed Corenthal

Brett Fasullo
The Time for Real-Time Is Now

- Stream in real-time with < ½ second of latency
- Reach broadcast scale global audiences
- Synchronize playback across your audience
- Improve user experience with < 1 second time to first frame
- Enable interactivity to drive engagement