Converged Infotainment Delivery Platform for Smart Vehicles

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A page from history

1973

Smartphones revolutionized society in less than a decade
A much more powerful “device”

From “feature” car to “smart” vehicle

A wish list for smart car infotainment

- Ubiquitous coverage
- Uncompromised quality
- Rich contents; minimum costs
- Seamless experience
A wish list for smart car “infotainment”

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No single-solution available to deliver all the promises
A new paradigm for the design challenges

From “link”-based to “content”-centric multimedia delivery

Core Technologies

network convergence

Content Centric

Satellite, Cellular (4G/5G), WiFi etc.

Communications, Computing, & Caching

C^3 resources
A new paradigm for the design challenges

From “link”- based to “content” centric multimedia delivery

Core Technologies

C³ resources

network convergence

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A new paradigm for the design challenges

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Network convergence

C³ resources

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Communications, Computing, & Caching
Network convergence

The high demand content can be delivered far more efficiently via broadcasting and device caching. Individualized and niche content is requested and delivered via unicast.

Title Popularity, Audience Size, or Time from Content Release
"Communications", "Computing", and "Caching" make up the three primary resources, akin to the three primary colors, for a mobile system.
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Content/Information centric networks

mobile content accessing via a link session (IP-based) form a bottleneck in massive multimedia delivery

content or information-centric networking (ICN) decouples content from its sources, allowing it to be placed anywhere
Smart vehicle infotainment delivery architecture

1. Hundreds of HD audio channels through vehicle sound system (IVI interface)

2. Tens of HD video channels to individual passengers’ personal devices (WiFi/APP)


4. Built-in emergency/precision navigation/interactive capabilities

Silkwave L-band dual-satellite

Program production
Program aggregation
Data mining
Context protection
Packaging formatting

3G/4G retransmission/interactivity
<table>
<thead>
<tr>
<th>Region</th>
<th>Population (m, % of global)</th>
<th>GDP ($b)</th>
<th>Media market size ($b, % of GDP)</th>
<th>Smartphone penetration</th>
<th>Mobile data traffic (PB/month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>1,115 (16%)</td>
<td>2,450</td>
<td>17 (0.7%)</td>
<td>11%</td>
<td>144</td>
</tr>
<tr>
<td>Middle East</td>
<td>430 (6%)</td>
<td>2,976</td>
<td>21 (0.7%)</td>
<td>20%</td>
<td>56</td>
</tr>
<tr>
<td>India</td>
<td>1,260 (18%)</td>
<td>2,050</td>
<td>25 (1.2%)</td>
<td>11%</td>
<td>60</td>
</tr>
<tr>
<td>Indonesia</td>
<td>251 (4%)</td>
<td>889</td>
<td>11 (1.2%)</td>
<td>26%</td>
<td>88</td>
</tr>
</tbody>
</table>

Source: CMMB Vision
Three classes of data pipes

Satellite-only data pipe:
- Satellite data broadcast
- Erasure channel reception
- “Free” data flow to vehicles

Integrated data pipe:
- Satellite as prime channel
- Cellular as auxiliary channel
- Lowest cost of data flow

Mobile internet data pipe:
- Cellular data unicast
- Internet protocol
- Standard mobile data fee
Infotainment tailored for smart vehicles – personalized services

User profile
- User portrait, favorite channels, real-time news/recommendations/alerts
- User ID based Management & Control System

Versatile services
- Telematics, SBAS navigation etc.
- Location-based content pushing
- Big data and precision advertisement
Infotainment tailored for smart vehicles – rich form-factors
Factory pre-installed Portable After market Plugged-in Anywhere Mobile Entertainment To Go

Infotainment tailored for smart vehicles – rich form-factors