Network-Assistance and Server Management in Adaptive Streaming on the Internet

Media Lab, Corporate Research, Huawei Technologies

The 4th W3C Web &TV Workshop, March 12-13, 2014

www.huawei.com

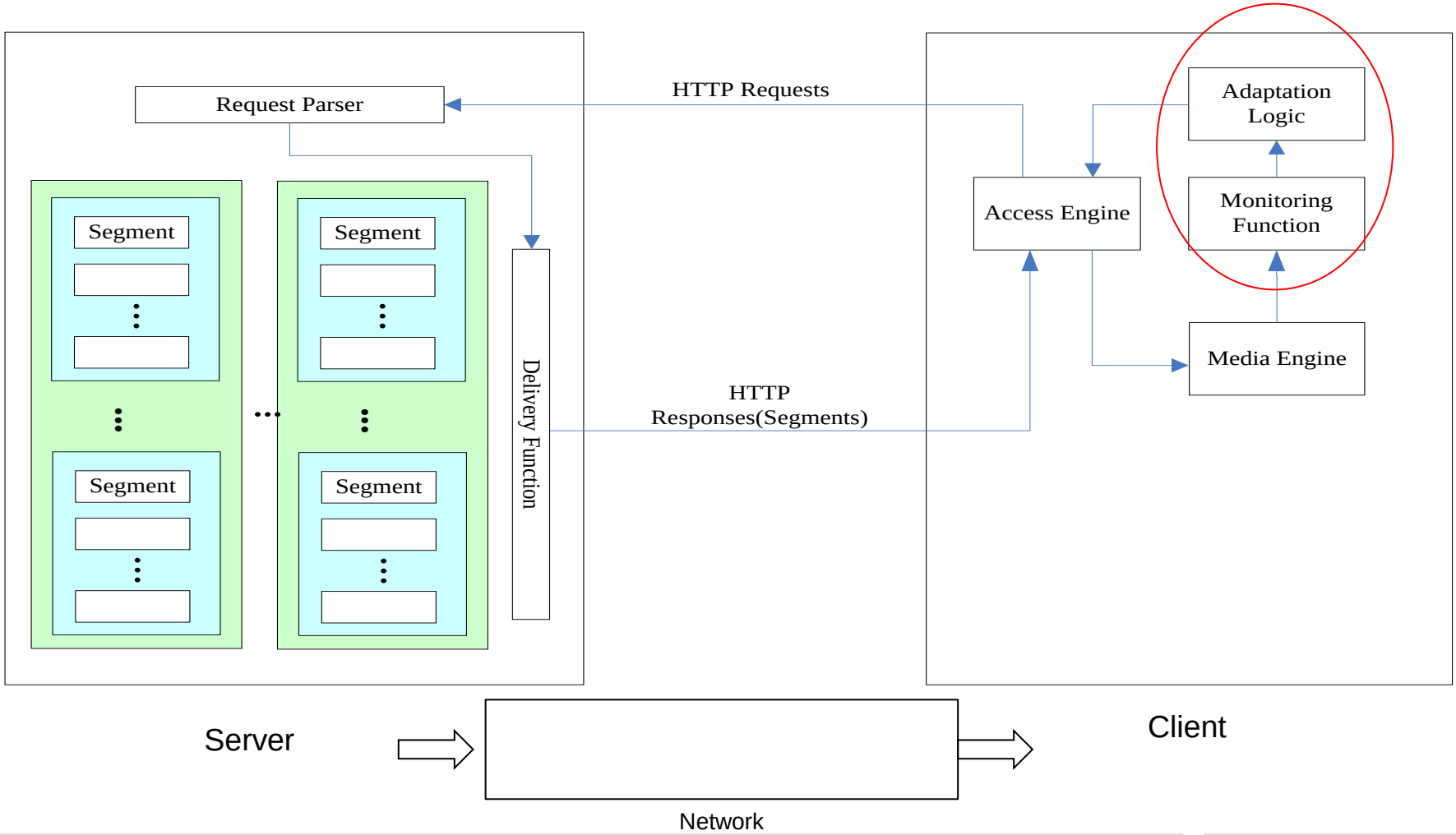
HUAWEI

Adaptive Streaming over the Internet

- **Enable efficient and scalable delivery of multimedia services**
  - leverage on the existing Internet infrastructure and Web technologies
  - client-driven (pull) nature of streaming adaptation, over HTTP

- **DASH (Dynamic Adaptive Streaming over HTTP)**
  - ISO/IEC 23009 standard from early year 2012
  - endorsed by many industry standards and organizations, and deployed in YouTube, Netflix, Hulu …
  - freely available browser-based player, dash.js, leveraging W3C media source extensions for extensible, adaptive, multi-bitrate playback to a browser (e.g., IE and Chrome)

Current: **Client Managed** DASH



Issues with **Client Managed** DASH

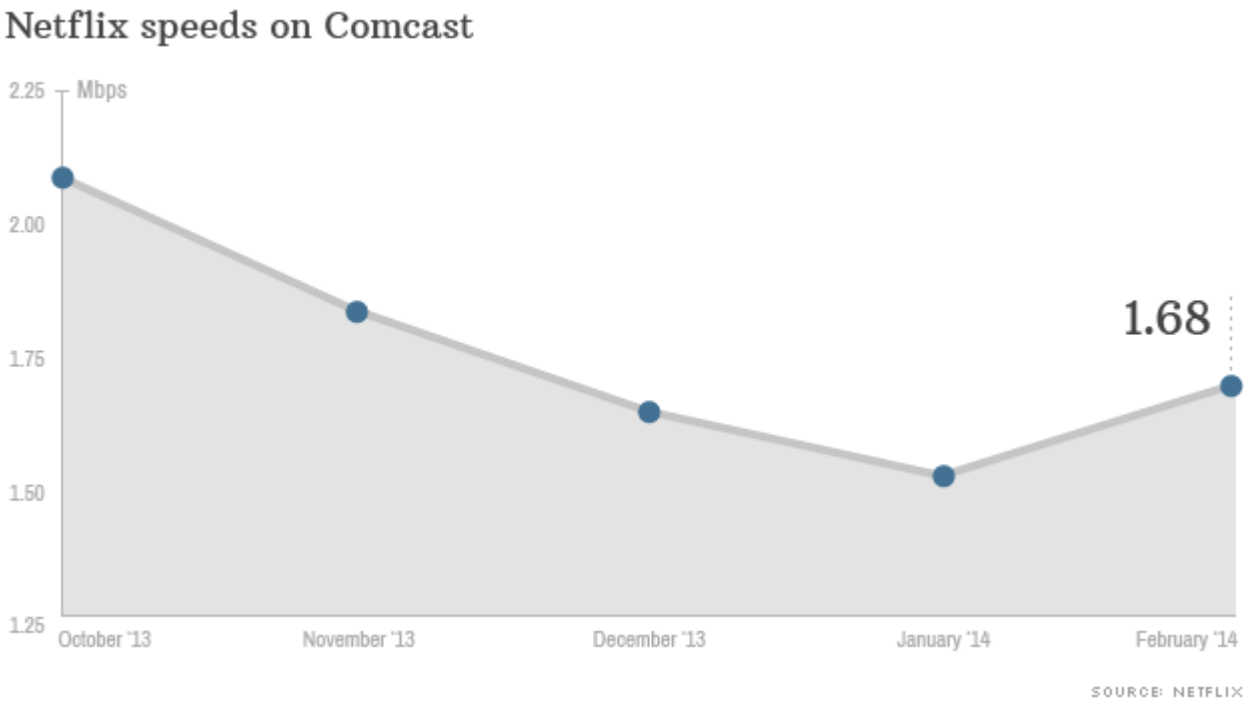
- **No Network/Server involvement in adaptation management**
  - No guaranteed and coherent QoE, when involving many clients of different types and screens from different vendors
  - No global optimization, in allocating network and server resources across many different clients
- **No Network QoS support for differentiating users and services to facilitate viable business models for network operators**
  - No incentives for network operators to participate, to guarantee QoS

Streaming Market Development

- **Service providers collaborate with network operators to provide best end-to-end streaming experiences**

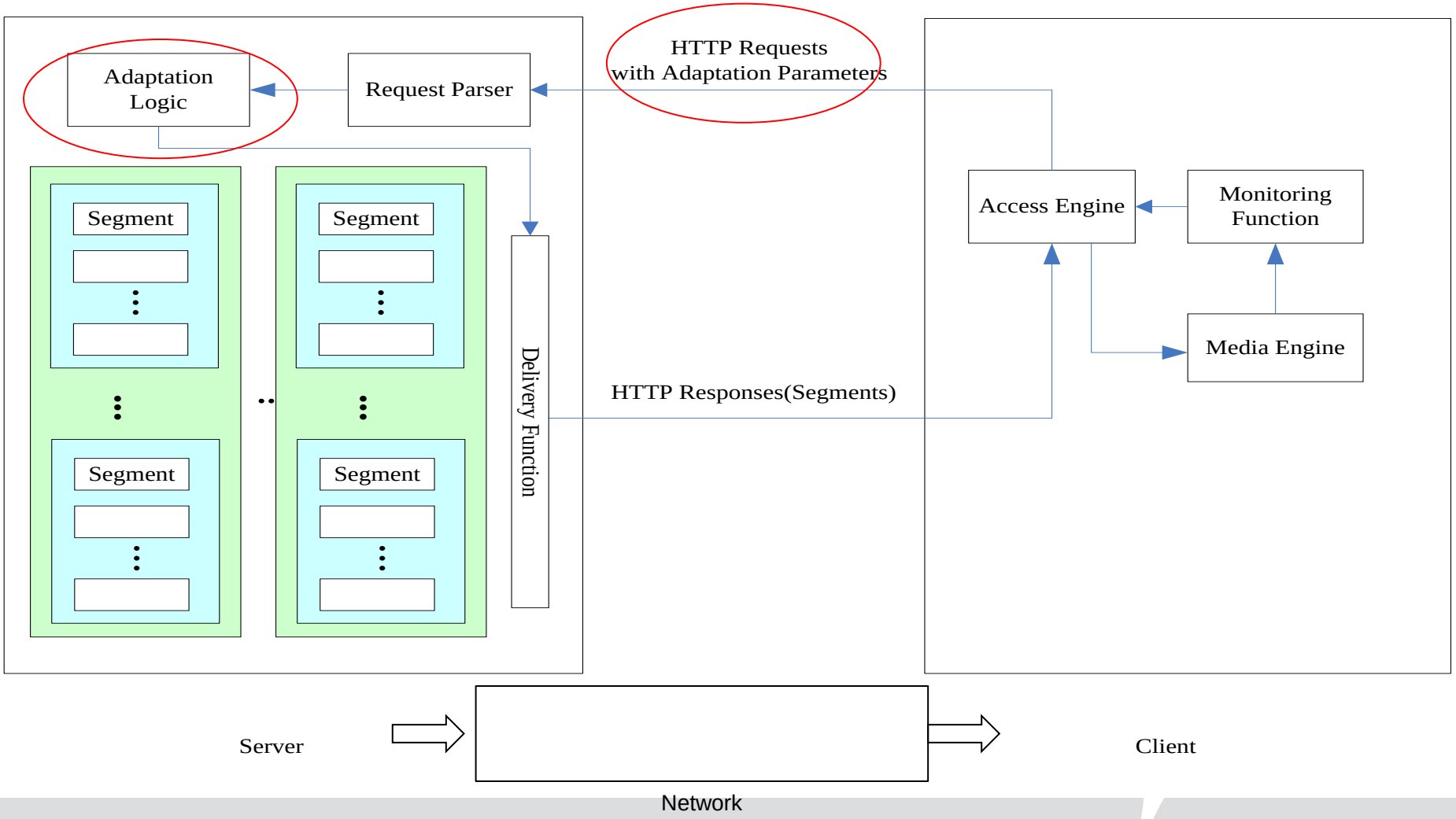
“**Netflix faster on Comcast, after deal**”

http://money.cnn.com/2014/03/11/technology/netflix-comcast/



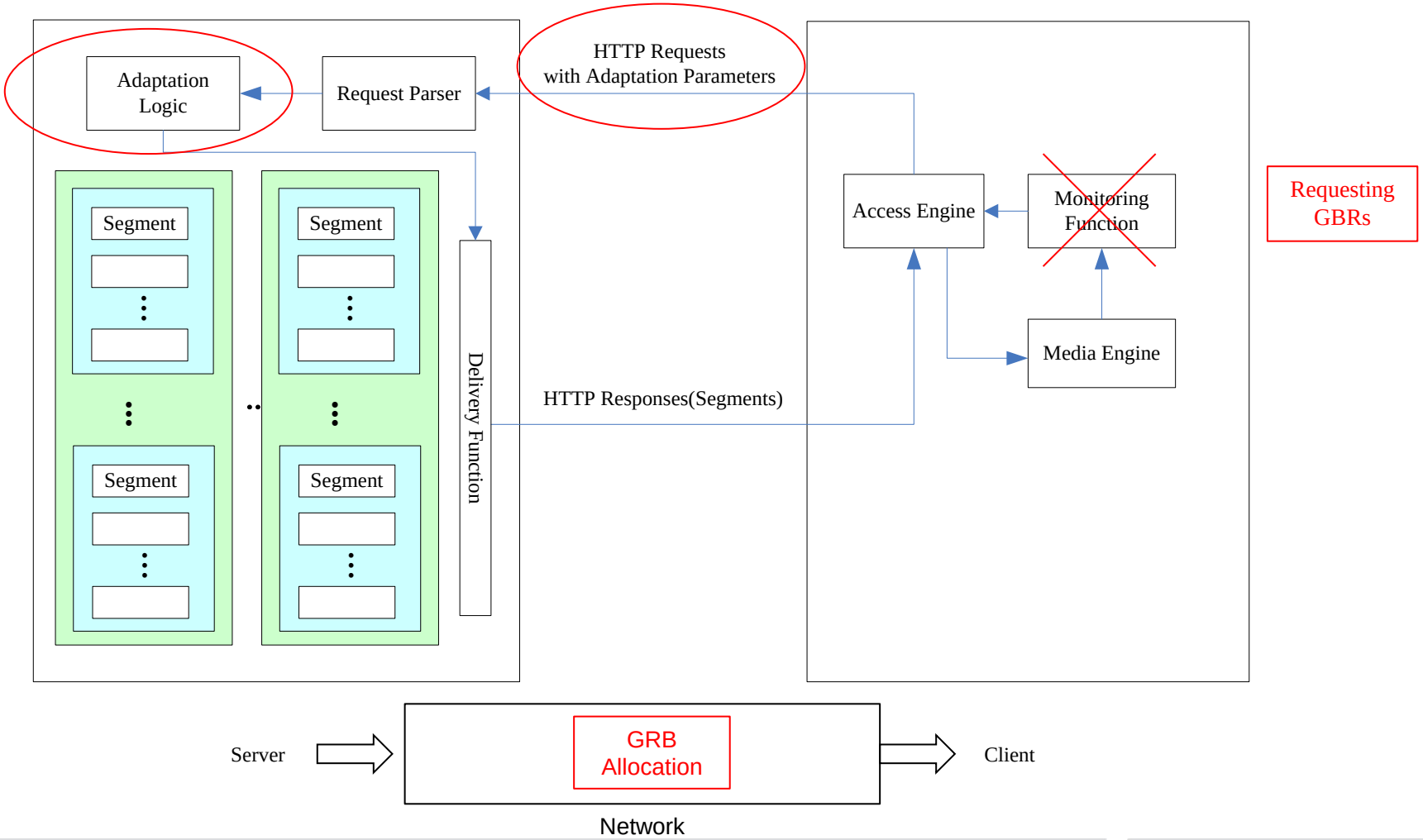
New: **Server Managed** DASH

Move “Adaptation Logic” from Client to Server



New: **Network Assisted** and **Server Managed** DASH

Client requests Network to provide guaranteed bitrates(GBR)
Move “Adaptation Logic” from Client to Server



User Cases Supported by NA/SM

- **QoS Differentiation in Services and Subscriptions**
  - Different levels of subscriptions from different streaming service providers will receive different network assistance and guarantee in network QoS
- **Dynamic Events**
  - Dynamic event description updates
- **Customized and late binding Advertisements**
  - Just-in-time event/content description updates for dynamic Ad insertion
- **Forced play out**
  - Client supplies play out evidence for Server/Network to verify before fulfilling subsequent segment requests
- **Spatial adaptation within full-field view**
  - Client specifies arbitrary ROIs or view angels

What need to be Standardized @ W3C

- **Parameters**
  - service description
  - subscriber information
  - network QoS information
- **Interfaces/Protocols**
  - support for server adaptation management requests and responses
  - support for network QoS assistance request and responses

Thank You

www.huawei.com