

# Multimedia Terminal Architecture: An Inter-Operable Approach

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# Outline of the Presentation

- Problem Statement
- Challenges and Opportunities
- Proposed Solution
- Terminal Middleware Architecture
- Digital Item Browser Architecture
- Conclusion
- Acknowledgement



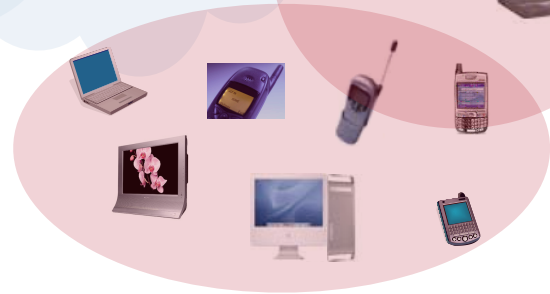
# Heterogeneity

different types of core and access networks

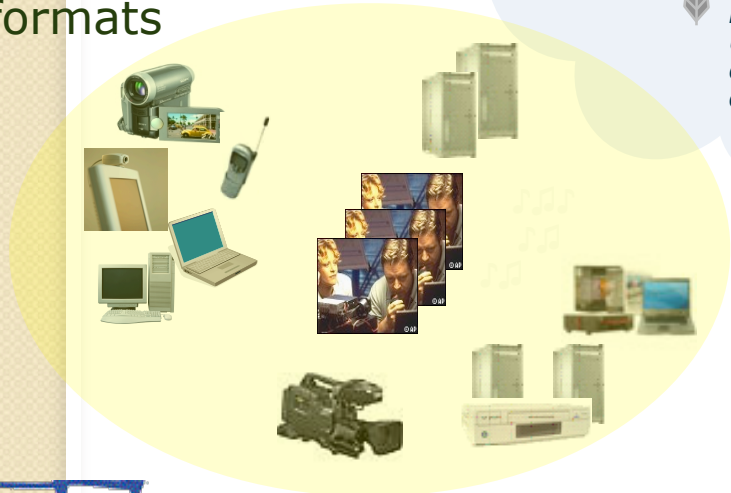


*DVB-T/S/C/H  
UMTS, GPRS,  
cable, ADSL,  
dial-up, ...*

diversity in client devices



diversity of content formats



# Challenges and opportunities

- Universal Media Access (UMA) concept
  - benefits from the use of open and common formats;
  - useful and complete descriptions about the context of usage;
  - new forms of presenting and allowing the consumption of the content.
- MPEG-21
  - a complex and complete open framework to address the UMA requirements, among which
    - Digital Item “model” (DID, DIDL, DII)
    - Digital Item Adaptation tools (DIA)
    - Rights Expression Language (REL)
- Still, many decisions to take on how to use and combine available tools



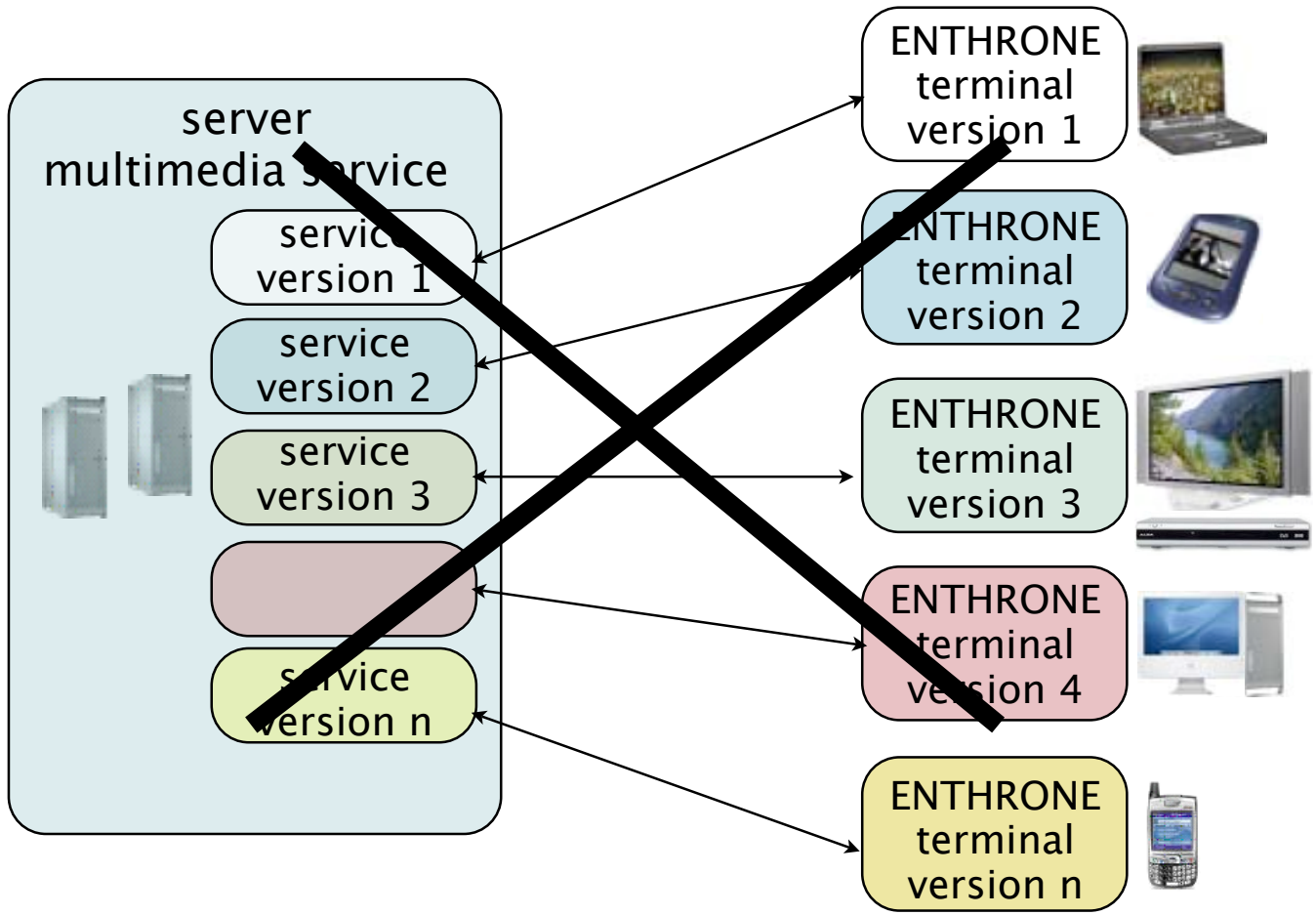
# Approach

- Modular approach
  - software “agents”:
    - collecting relevant contextual information
    - dealing with DRM
    - presenting the content
    - playing/reproducing the content
    - monitoring perceived quality
  - middleware acting as the “glue” and coordinating actions with server
- Distributed, services-oriented strategy
- Content presented and interacted with as MPEG-21 Digital Items

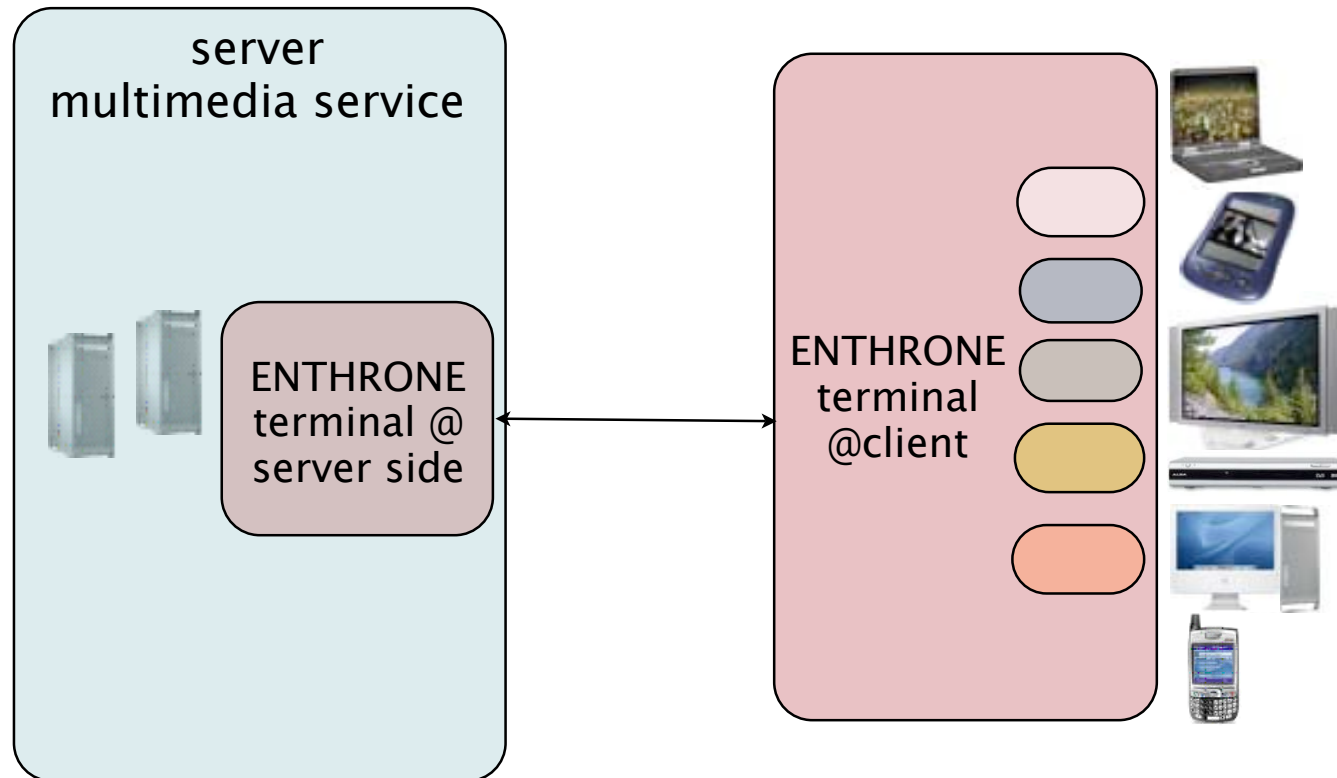




# Approach

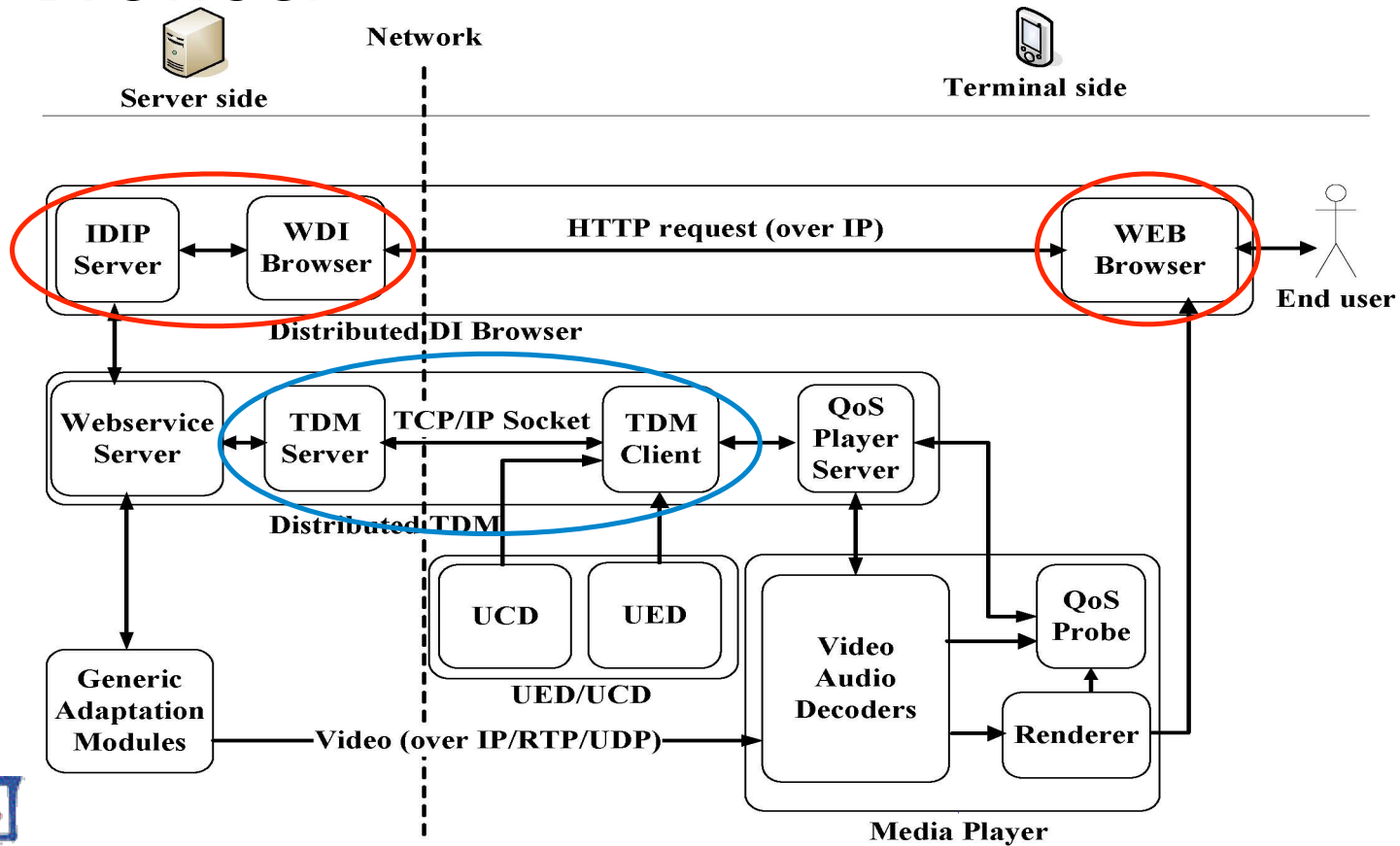


# Approach



# Terminal Architecture

- Distributed architecture based on Browser





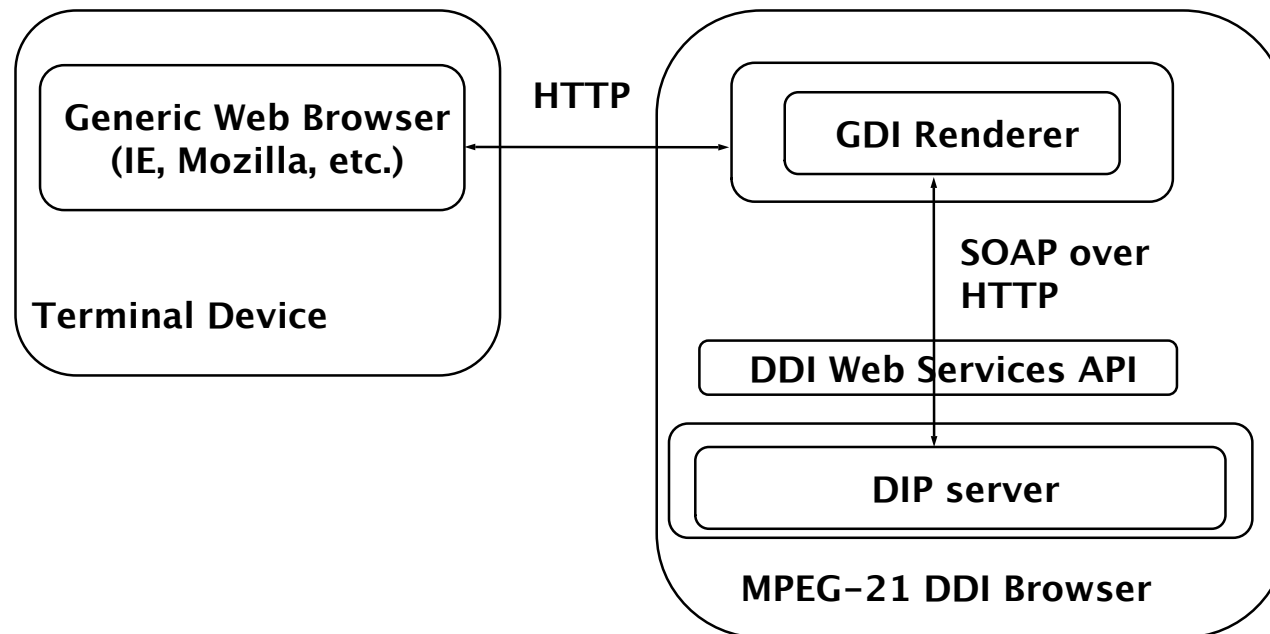
# Approach for content presentation

- Client–Server distributed architecture
  - optimized processing and distribution of load
  - enabling different graphical interfaces
- Service–oriented architecture
  - based on Web Services technologies
  - promoting interoperability
  - enabling software re–usability
- Web–oriented strategy
  - user–friendly
  - working in off–the–shelf software

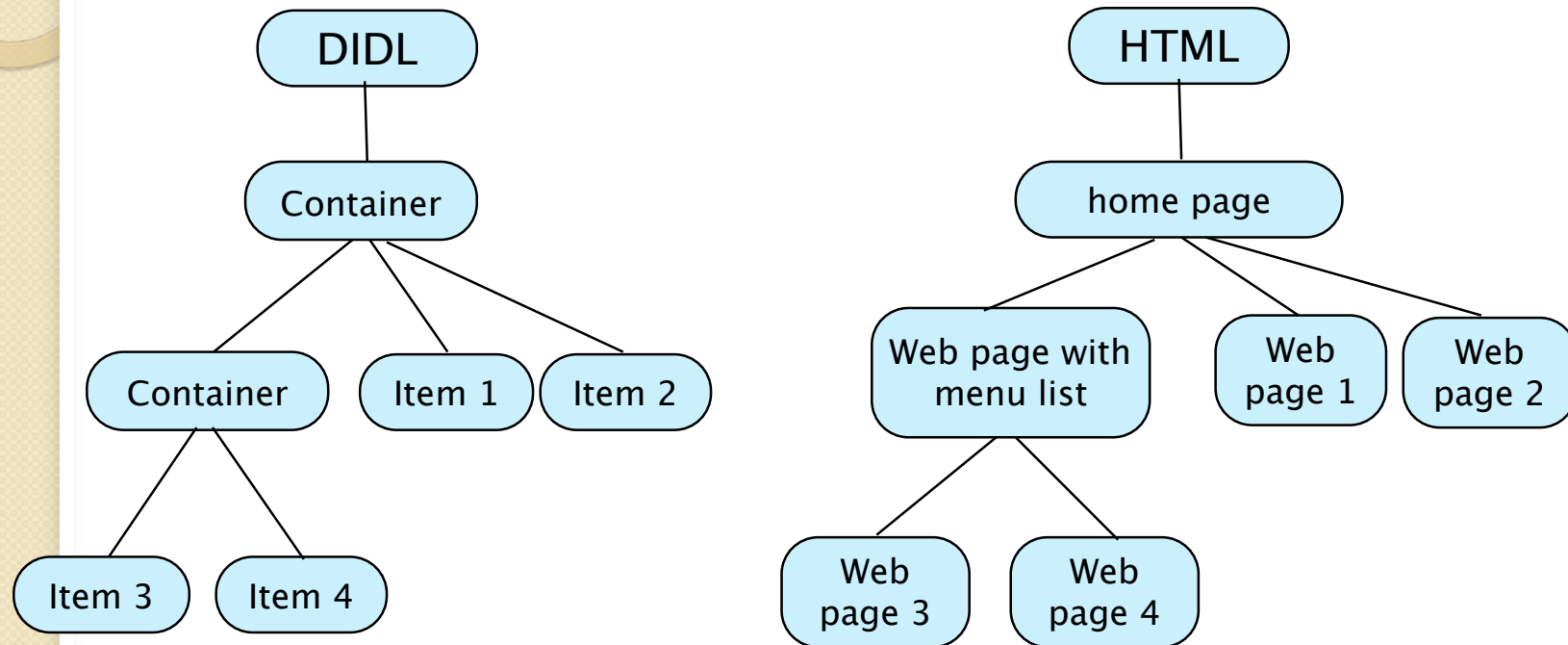


# DDI Browser: Distributed approach

- Architecture overview

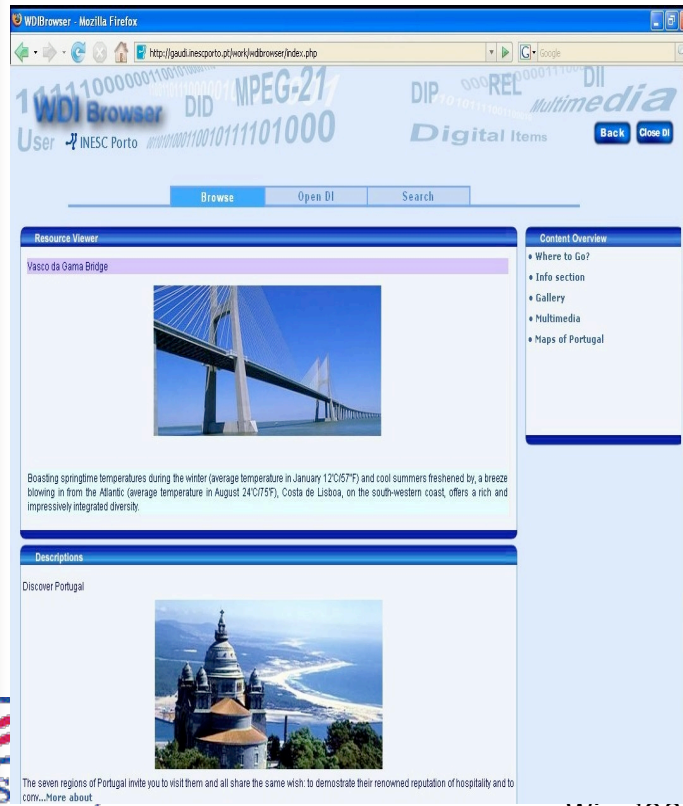


# DDI Browser Web-based strategy



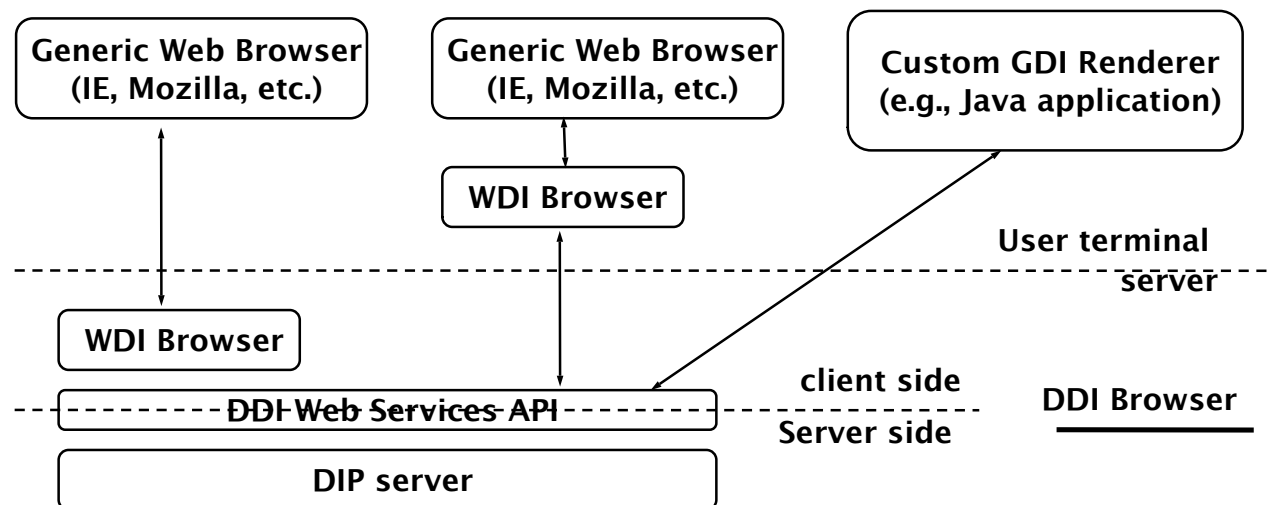
# Seamless presentation on different platforms

- using off-the-shelf Web browsers



# Alternatives for graphical generation

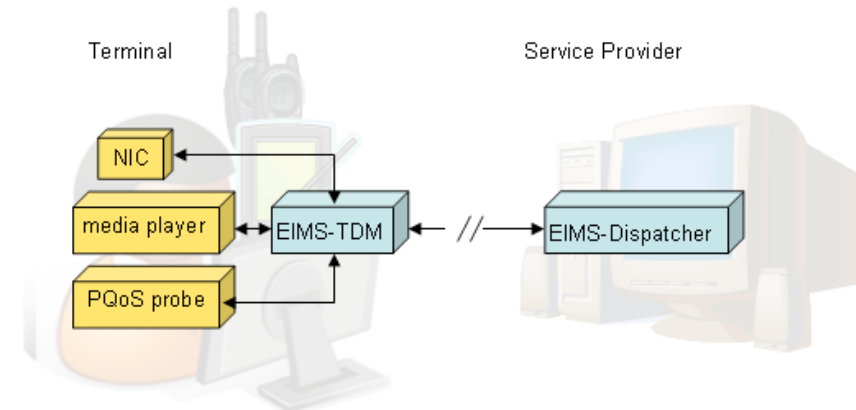
- Separation between GUI generation and processing
  - same processing module with different GUIs





# Terminal middleware

- TDM, Terminal Device Manager
  - providing device independence
  - binding together the different functionalities offered by the ENTHRONE terminal
  - appropriately routing the data
  - filtering the communication with the server
  - logging events

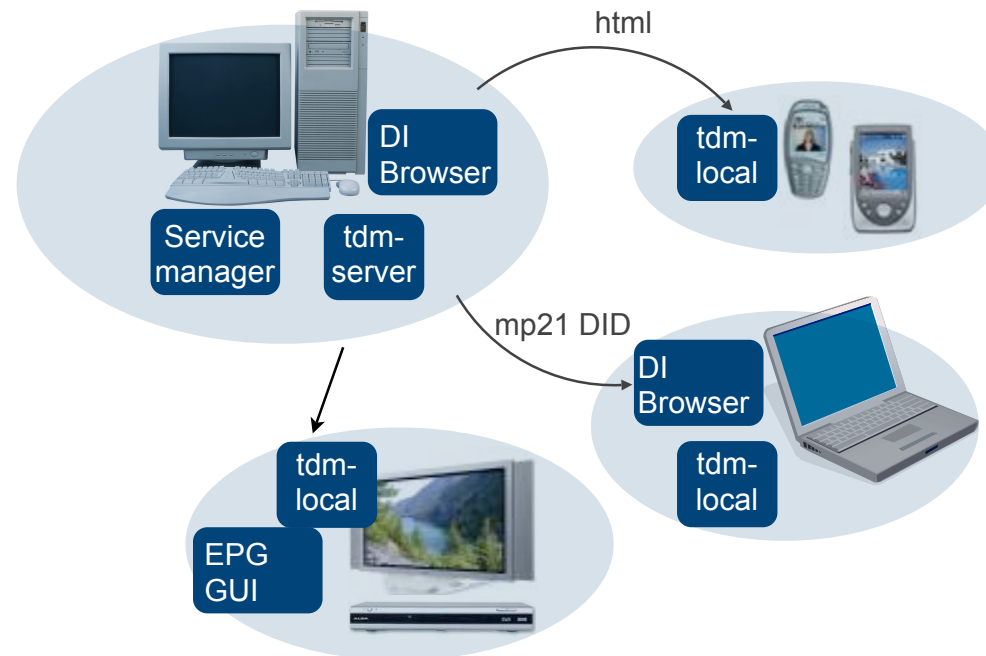


# TDM

- provides to the DDI Browser functionality for the complete presentation of MPEG-21 DIs, supporting the use cases:
  - search for Digital Items
  - get a requested Digital Item
  - select a Digital Item for consumption
  - verification and purchase of licenses
  - play the selected Digital Item



## Alternatives given the distribution and separation of graphical/processing



# Conclusion

- Supporting inter-operability of multimedia terminal through digital item browser
- Optimized architecture with client-server distributed architecture, Web oriented applications, Web services communication interface
- Modular terminal architecture, offering multiple functionality for UMA, bind via the terminal middleware



# Acknowledgements

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- ENTHRONE Partners





Thank you very much for your  
attention!

