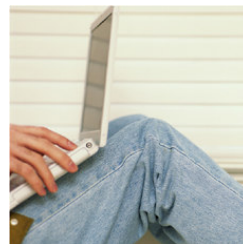
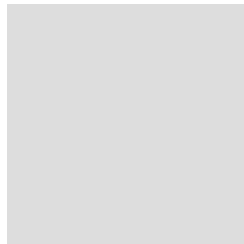
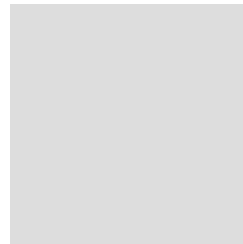
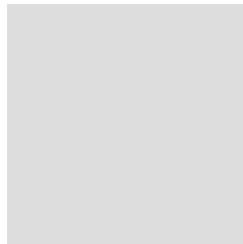


DDR Design and Implementation

Morfeo

P R O J E C T



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Introduction

- **Developing high quality and optimized mobile web applications requires content adaptation**
 - Content adaptation processes need device descriptions
- **Not only mobile web applications**
 - Messaging, content management, entertainment, ...
- **Most popular and deployed technologies (WURFL, UAProf) have still unresolved issues**
- **There is an opportunity of filling the gap in existing technologies and define an universal device description technology and repository**
 - Try not to reinvent the wheel. Use existing technologies as much as possible
 - W3C Technologies: XML, XML-Schema, XML-Enc, SOAP
 - Web Technologies: RSS, Atom
- **Seamless integration with existing standards**
 - OMA UAProf, OMA-DPE



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Introduction (II)

- **UAProf Lacks**
 - There is not a set of mandatory properties that each device vendor must provide.
 - There is no advanced data model for simplifying device description provisioning.
 - There is a limited vocabulary set that is not oriented towards the development of mobile web applications.
 - There is no standard repository of UAProf documents
- **WURFL Lacks**
 - There is not a distributed model or central/public repository.
 - ever-growing unique XML file.
 - There is not a validation and trust model for device description.
 - Anyone can collaborate and may provide an inaccurate device description.
 - There are neither versioning nor updates publication mechanisms.
 - There is no guarantee about how long will be supported this repository.



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DDR Architecture

- **Repository architecture should be open and extensible and should cover different models:**
 - The repository is deployed locally under application working environment.
 - The repository is maintained privately by an organization.
 - It is used by different mobile applications within that organization.
 - There is a fully distributed and federated model where different device descriptions are maintained by different organizations.
 - This model might lead to the definition of a worldwide public repository.
- **Repository APIs will hide the user from the underlying architecture**
- **It should be provided mechanisms that allow an application to override locally a device property.**
 - We are thinking in something similar to the successful WURFL patch file.
- **The actual protocols used for repository access will be left to each implementation**
 - they will be transparent to repository clients by means of the APIs

DDR Vocabulary, Data Model and Persistence



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- **Specify a framework for defining vocabularies associated to device descriptions.**
 - Structured around modules and profiles that define groups of capabilities related to different device features (browsing, MMS, SMS, WAP Push, J2ME, ...)
 - Each module or profile could be of interest to different members of the mobile development community
 - highly-specialized Device Description Repositories provided by different companies
 - W3C-DDWG vocabulary standardization effort should focus on mobile browsing capabilities
- **Data model will**
 - Have strong data typing using XML-Schema
 - Be based on inheritance
 - Allow a device to belong to one or more categories, enabling the definition of clusters of devices.
 - Support device description versioning issues
 - including device deprecation
- **Repository Persistence**
 - Will be left to each implementation (XML, RDBMS, CMS, etc)
- **Interoperability at data level**
 - There will be an standardized exportation format (XML)

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Device Description Provisioning

- **The provisioning of new devices should be done in a very straightforward manner and will support different scenarios**
 - Addition of a device profile provided by a vendor (UAProf)
 - Massive importation of device descriptions
 - Specified in the standardized exportation format
 - Easy addition of new devices based on existing ones
 - Easy correction of incorrect device capabilities
- **Workflow mechanisms that govern the process of device description provisioning.**
 - Updates to device descriptions will have to be finally approved by the repository data manager.
- **Mechanisms that allow to mark as private different device descriptions**
 - To allow access to them only to pay-per-use users.
- **Device descriptions will be always under versioning control.**
- **Device description updates will be available as RSS/Atom feeds**
 - Existing tools can automate the process of receiving notifications of new device descriptions when they are available



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DDR Security Model

- **The security model should include the following user profiles:**
 - **Anonymous User.**
 - User who connects to the DDR to retrieve device descriptions. This user will have read permission to all the device descriptions made public by the repository.
 - **Premium User.**
 - Pays for using the DDR and connects to it to retrieve device descriptions. This kind of access allows a user to read all the device descriptions of the repository (public and private).
 - **Provisioning User:**
 - Has write permission to provision new devices or to update existing ones.
 - The additions or updates will not be available to other users until the repository data manager approves them.
 - **Validation User.**
 - Is in charge of validating (and correcting if necessary) device descriptions by means of testing them on each real device.
 - For example, operator people working in the device certification department could achieve this role.
 - **Repository Data Manager.**
 - Will be in charge of approving new device descriptions or updates to existing ones.
 - The user in this role has the last word in accepting and making available new device descriptions.

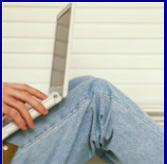


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DDR Validation and Trusting Model

- **Validation**
 - The process of verifying that a device description is correct by means of actually testing the capability values in the physical device.
- **The workflow process that models the device description feeding should be aware of validation and users should be able to know if a device description is validated or not.**
 - There will be critical environments where a device description will not be made available until the validation team has tested it against each device.
- **Trusting implies that device description information is digitally signed by an organization which guarantees that the data made public cannot be repudiated and that really comes from that organization.**
 - The consumer of the device description could claim on that organization if there are errors on that.
 - In Open source repositories there will be no signed device descriptions
- **Trusting should be supported by existing W3C technologies**
 - XML-Enc, XML-DSig



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DDR APIs and tools

- **DDR APIs will be specified using OMG-IDL**
 - Will provide universal access to the Device Description Repository from any programming language, network or hardware architecture.
 - DDR interfaces should also be described using WSDL in order to implement an adaptation layer between DDR and Web Services.
 - Device Independent Working Group has been working in the definition of APIs to retrieve static and dynamic properties that comprise the delivery context (DCI interface)
 - As device properties are part of the delivery context, actually an static one, we think that the design of the DDR APIs should be aligned with the existing work performed under DIWG
- **We envision the following tools for the DDR**
 - **Web Admin tool.**
 - It will provide to repository managers a user-friendly interface for feeding and managing the repository.
 - **Web Query Tool.**
 - It will allow final users or developers to query, search and browse device descriptions.



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Relationship with OMA-UAPProf and OMA-DPE

- **Device Description Technology developed under W3C should be fully compatible with OMA technologies allowing a seamless integration between them.**
- **We must ensure that integration at least in the following points:**
 - **Compatibility at least at the provisioning level of UAPProf descriptions and W3C DDR**
 - **Compatibility between W3C vocabulary framework and OMA existing and future vocabularies.**
- **It should be established liaisons between the two organisations.**
 - **Internally, we are coordinating efforts between our OMA and W3C representatives, but we expect a more formal liaison between OMA and W3C.**
- **A correct alignment between DDR APIs, OMA-DPE and DCI APIs, avoiding duplicated efforts, will be fundamental to obtain good results under our standardization task**



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Reference Implementation

- The reference implementation of the DDR should be developed under an open source schema.
- The development effort should be coordinated by W3C and sponsored by different members of the W3C-MWI.
- Telefónica is very committed to be involved with these implementation activities
- Telefónica offers its open source development community and infrastructure (based on G-Forge), MORFEO, to host the implementation project.
 - <http://www.morfeo-project.org>
 - <https://forge.morfeo-project.org>



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Conclusions

- **There is a need for new device description technology that overcomes current issues present in today available technologies. Features**
 - A flexible data model for device description which simplifies provision and facilitates device clustering.
 - An standardized and well-defined vocabulary capable of integrating vocabularies defined by other standard bodies such as OMA.
 - A simple provisioning model based on standardized XML formats for interchanging device descriptions.
 - A validation and trusting model for device descriptions.
 - A repository for accessing device description with an open and flexible architecture, which could be distributed and federated.
 - A security model that defines the different user roles and access permissions to the repository.
 - An universal API for accessing the repository, which will be independent of the programming language.
 - Graphical tools that provide an user-friendly view of the repository.
- **Joint development effort to code a reference implementation of a universal DDR**
 - Open source

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