



The HP OpenCall XML Document Management Server allows service providers to securely store, in a central location, their subscribers' customized group profile information, which can be shared across applications and access networks.

The HP OpenCall XML Document Management Server (XDMS) is a next-generation-network element that stores and manages service group membership information using simple standards-based interfaces. It provides an extensible data model using XML schema that allows application servers to easily access and manipulate XML documents.

Key features and benefits

- The HP OpenCall XML Document Management Server allows a client to manipulate XML documents via the XCAP and SIP interfaces. It is simple for service providers to extend the data model used in the XML documents. Therefore, new types of customized XML documents can be created easily.
- The HP OpenCall XML Document Management Server brings the capability for multiple server devices to access and manage group list information at a shared point in a network.
- The authorization feature provides a default authorization policy for manipulating documents. It is possible to associate an access policy with a document of any kind.

- The XDMS-XCAP interface allows XML Document Management (XDM) clients to access and manipulate XML documents via XCAP interface.
- The XDMS-SIP interface allows subscription to notification of document changes, a critical feature when the document is shared among many XDM clients.

Previously referred to as "HP OpenCall Group List Management Server," the HP OpenCall XML Document Management Server extends its scope to include the XML Document Management Server (XDMS) functionality. The HP OpenCall XML Document Management Server is a key IP Multimedia Subsystem (IMS) service enabler and a common service-independent building block that can be used to deliver innovative, instantaneous, person-to-person applications. To do this, the HP OpenCall XML Document Management Server provides the functions required to store and manage group membership information and establish multi-user communication sessions. In addition, it enables status information to be shared.

HP's evolutionary approach based on building blocks protects your business investment today while preparing you for tomorrow's IMS applications and services.

A key IMS services enabler

The HP OpenCall XML Document Management Server can provide numerous IMS services, including:

- Providing an integral part of extended user profile (application specific)
- Personal information: display name, e-mail, card, homepage, icon, sound, map
- User preferences: notification preference, preferred method of contact
- Presence and location information
- Directory and contact information: synchronize buddy lists with other application servers (presence)
- Privacy management
- Creating and sharing virtual communities with friends
- Multi-casting Instant Messaging and Multimedia Messaging Services
- Establishing multi-user communication sessions (Push-to-Talk over Cellular, conferencing)
- Filtering incoming communication (e.g., DnD= "Do not Disturb" by inclusion/exclusion lists)
- Management of network-based list of buddies and groups by end user
- Synchronizing contact info in multiple devices
- Push-to-Share: pictures and video
- Using one Uniform Resource Identifiers (URI) list in multiple applications without re-provisioning

Simplify sharing and handling of XML documents

With the HP OpenCall XML Document Management Server, the client can manipulate XML documents via the XCAP and SIP interfaces defined in the Open Mobile Alliance (OMA) XDM specification. The XML documents stored in HP OpenCall XDMS can be shared with multiple clients. The content of the document can include service profile or subscriber list profile information defining how the service or services are to be provided in the network. HP OpenCall XDMS also offers an extensive access policy for every XML document far beyond the OMA standards. This is an important feature to protect the privacy of the document owner when sharing documents among multiple clients. IETF SIP Subscription/Notification protocol is used to synchronize shared documents with the clients that subscribe to changes. Application servers will be able to provide uninterrupted and quality services because critical changes from end users and other application servers are received in seconds.

Flexible and extensible architecture

The HP OpenCall XDMS's approach is to provide a flexible and extensible architecture to allow XML documents to be easily manipulated and shared. Several OMA-specified XML schemas are provided by default to enable faster deployment of services (e.g., Push-to-Talk over Cellular, Presence and Group-related services). Deploying other new services involves a few simple configuration steps from the provisioning interface, i.e., by specifying a new XCAP Application Unique ID (AUID) and setting up the access policy. Clients can immediately start storing, manipulating and sharing XML documents. XML schema is not

required but may be added for schema validation of new services. Besides the Graphical User Interface (GUI) provisioning interface, a Simple Object Access Protocol (SOAP) plug-in is provided to manipulate XML documents (instead of using XCAP interface) and configure XDMS subsystems, regardless of the development environment.

Easy document access using XDMS XCAP interface

With HP OpenCall XML Document Management Server, XDM clients can access and manipulate XML documents using the XCAP interface. XCAP allows clients to manipulate documents and to update documents using an XCAP URI (Uniform Resource Identifier) that references elements and attributes of an XML document. The URI looks very similar to a directory tree structure.

The following XDM operations are provided:

- Creating, replacing, deleting or retrieving a document
- Creating, replacing, deleting or retrieving an XML element
- Creating an XML attribute for an XML element, deleting or retrieving an XML attribute

HTTP GET, PUT, DELETE methods are used to perform the above XDM operations. The HP OpenCall XDMS also supports XCAP server capabilities and XML documents directory queries from XDM clients. Each document stored in HP OpenCall XDMS is associated with an Entity Tag (ETag). The ETag enables clients to determine whether the document kept in its cache is the most current. Conditional HTTP operations can be used to compare the ETags in the clients and HP OpenCall XDMS prior to retrieving the document.

Authorization

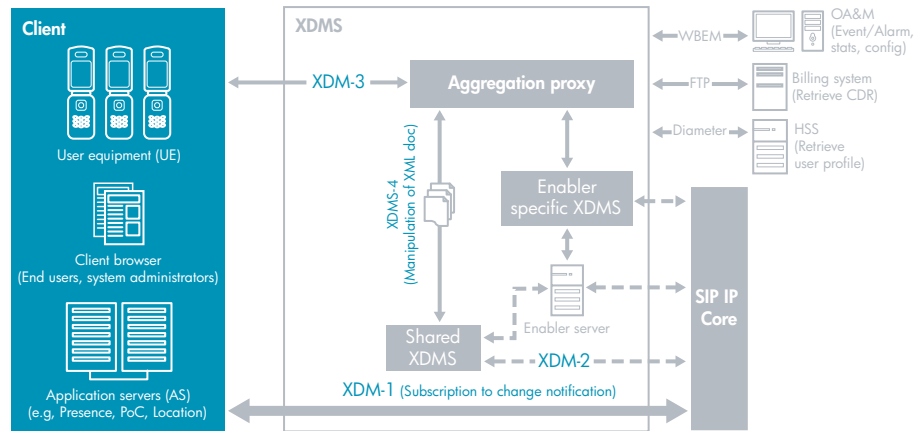
The HP OpenCall XML Document Management Server provides a default authorization policy for manipulating documents. It is possible to associate an access policy with a document of any type. If none is provided, the default policy is used. This default policy can also be defined by administrators. It is not necessary to create a new access policy each time a new type of XML document is added. An existing access policy can be used.

An access policy consists of an inclusion list (allowed) and an exclusion list (except) and the XDM operations that the members are allowed or not allowed to perform. Members in the lists can include end users, application servers, and administrators. Instead of specifying the full URI of a member in the list, wildcards can be used, for example domain names, any identity, and anonymous domains. An access policy can contain a validity timeframe. Once the timeframe expires, the policy no longer applies. In the future, an access policy will offer information on document filtering.

Subscription to notification of document changes using XDMS-SIP interface

Subscription to notification of document changes is critical when the document is shared among many XDM clients. Using an IETF extension of SIP Subscription and Notification, clients register to receive notifications each time an XML document is modified. Subscription to document changes is not limited to one document. Clients can subscribe to one or more documents changes. Depending on what the clients support, HP OpenCall XDMS attaches the document or sends back an indirect reference in the SIP NOTIFY message. The use of indirect reference with XCAP document retrieval reduces the data load on the SIP interface.

Figure 1.
XDMS Architecture. The architecture of an XDMS according to OMA.



An XML document can contain a lot of data. It may not be practical to send the entire document each time there is an update. To reduce the amount of data sent in transport layer, HP OpenCall XDMS sends partial notification to the clients that support partial update.

Powerful OMA XDMS functions

The HP OpenCall XML Document Management Server provides the following OMA XDMS functions.

- Presence Enabled XDMS:
 - Presence Enabled XDMS stores subscription authorization and presence content authorization XML documents. These documents can be accessed by end-user clients or presence servers.
- Push-to-Talk over Cellular (PoC) Enabled XDMS
 - PoC Enabled XDMS stores PoC groups and PoC user access policy. These documents can be accessed by end-user clients, PoC servers and other application servers.
- Shared XDMS
 - A shared XDMS condition can be specified and stored in a URI list. Each URI list contains a collection of URIs that can be shared by multiple end users or resources.
- Resource List Server (RLS) XDMS
 - An RLS XDMS is the repository for XML documents that define services associated with a list of resources, e.g., Presence List, allowing subscription to the presence status of a list of presentities.

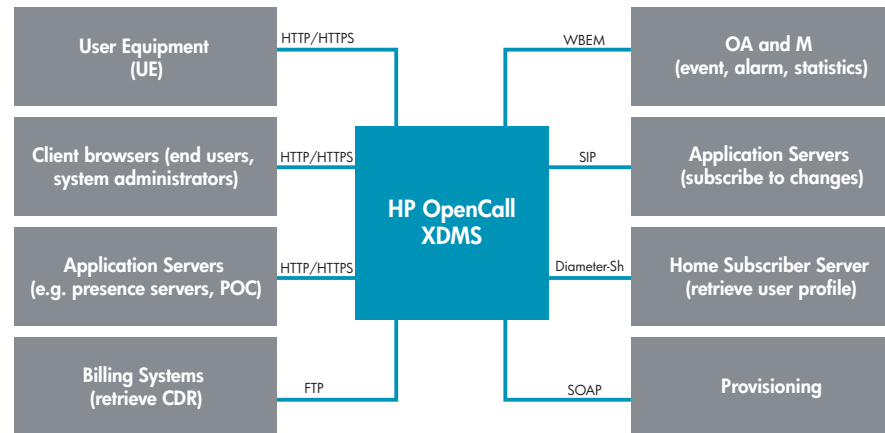
Architectural description

Figure 1 shows the architecture of an XDMS according to OMA.

- XDM1 interface – This is the SIP interface that allows subscription to document changes. SIP IP/Core corresponds with 3GPP/3GPP2 IMS. All SIP traffic goes through the SIP/IP Core for authentication. If authentication passes, the SIP message is routed to the appropriate SIP application server.
- XDM2 interface – This interface is similar to XDM1, except that it is specific for use between a Shared XDMS and the SIP IP/Core.
- XDM3 interface – This is the XCAP interface between the XDM client and the Aggregation Proxy. An Aggregation Proxy is responsible for authenticating the XDM client and then routing to the appropriate XDMS.
- XDM4 interface – This XCAP interface is specific for use between a Shared XDMS and the SIP IP/Core. This interface provides the XDMS operations (i.e. manipulation of XML documents) capabilities. It is similar to the interface between the Aggregation Proxy and the Enabler-specific XDMS.
- Sh interface – This Diameter interface allows XDMS to query the user profile information from the Home Subscriber Server (HSS) as specified in 3GPP TS 29.328 and 3GPP TS 29.329[†].
- XDMS-Billing System interface – This interface allows the billing system to download CDR via File Transfer Protocol (FTP).
- XDMS-Provisioning interface – This interface allows a provisioning client to manipulate XML documents (instead of using XCAP interface) and configure XDMS subsystems. In the future, this interface will be used by application servers to develop plug-in services.

Figure 2.

HP OpenCall XDMS. HP OpenCall XML Document Management System stores information in a central location. Information can be shared across applications and networks.



- XDMS-OA&M – This interface allows events, alarm and statistics information that have been generated by XDMS to be transferred to an Operations, Administration and Maintenance (OA&M) system via a Web Based Enterprise Management (WBEM) interface.

Storing and managing group membership information

Besides the XDMS functionality, the HP OpenCall XML Document Management Server also stores and manages group membership information.

HP OpenCall XDMS supports centralized database access and management through simple industry-standard interfaces. Group and list information can be maintained and managed by the end-user subscriber, service provider, and/or application server.

The HP OpenCall XML Document Management Server performs the following functions:

- Stores, maintains and manages group information (e.g., contact lists, group lists and access lists) in a centralized database. It authenticates every HTTP request using HTTP Digest to verify user credentials for a higher level of security.
- Group information (group list, contact list and access list) can be maintained and managed by the end-user subscriber, service provider or an application through the HTTP/HTTPS interface. Every request is authenticated before the request is processed. The subscriber can use any device allowed in the service provider network, such as cell phone, PDA, PC, etc.
- Allows subscription of event notification of group information SIP/SIMPLE

- Creates comprehensive charging records based on event type and timestamp for every user request that can be downloaded via FTP upon request
- Generates and collect statistics values for every successful or unsuccessful group information request
- Generates a Call Data Record (CDR) each time an HTTP or SIP request is received and processed. The CDR contains the following information: requested action, status, principal that requested the action, and timestamp. The CDR can be downloaded by the service provider's billing system through FTP.
- OA&M implementation is based on open and simplified WBEM, and includes logging and tracing events as well as alarm notification.

Security

The HP OpenCall XML Document Management Server supports authentication in the ISC and Ut interfaces outlined in 3GPP Security specifications: HTTP Digest authentication is used over TLS to authenticate users in the Ut interface. The HTTP requests from a client can also be routed through an Authentication Proxy. If the request is routed through a proxy, the proxy will insert X-NCAP-Asserted-Identity in the HTTP header if authentication is successful. This identity is used by HP OpenCall XDMS to check whether the user's request is authorized.

If integrity and confidentiality protection is required between the Serving-Call Session Control Function (S-CSCF) and the HP OpenCall XDMS (ISC interface) and between the Authentication Proxy and XDMS (Zb interface), HP OpenCall XDMS supports Pre-Shared Key TLS based authentication mechanism outlined in the 3GPP 33.222 specification.

HP OpenCall XDMS assumes that all SIP messages will be routed through S-CSCF, performing authentication prior to routing the messages to HP OpenCall XDMS. The trusted entities are to be provisioned in the Home Subscriber Server (HSS) and downloaded by the S-CSCF.

Event and alarm management

The HP OpenCall XML Document Management Server logging framework records platform events and provides a means of capturing specific platform activities and unusual but significant events. The logging is based on the standard logging and tracing mechanism. It provides information about system network activity, such as state changes, errors and connections. Events are assigned log severity levels but the logs are passed to the system without severity filtering, allowing the user to choose which severity levels are displayed. Events can be monitored through WBEM Indication. It enables customers to monitor and control resources from diverse sources, thus enabling increased control of their enterprise control at lowest cost. Event framework can be integrated with HP System Insight Manager, which provides filter capability of events. Automatic Event Handling in System Insight Manager enables you to configure actions to notify appropriate users of failures through e-mail, pager or SMS gateway or event forwarding to enterprise platforms such as HP OpenView Network Node Manager. Event framework's catalog enables localization of messages.

System architecture

The high-availability HP OpenCall XDMS platform is based on a cluster of HP Proliant BL25p blade servers.

- Servers with no cabling required for the cluster, rip and replace capability, DC support, redundant power supplies, and lights-out management
- Flexible, providing optimized support for existing and next-generation services
- Up to 4 AMD Opteron™ cores per blade.
- Up to 32 GB memory per blade
- Optimized density per square meter

The HP Proliant BL25p are configured with:

- Red Hat Enterprise Linux AS 4.0
- High availability based on HP ServiceGuard for Linux

About HP OpenCall

Leading carrier-grade platforms

HP OpenCall software is an integral part of HP's portfolio of wireline, wireless, IP and media solutions and enables service providers to transition to IMS-based networks and effectively manage the triple play of voice, data and multimedia services. Deployed in 40 of the world's top 50 service provider networks, HP OpenCall is the market leader in many industry categories, facilitating the convergence of the Internet with the world of voice communications.

A complete solution

Providing you with a first-to-market advantage

HP provides high-quality software that addresses all aspects of your software application lifecycle needs. With HP as your partner, you have access to standards-based, modular, multi-platform software coupled with best-in-class services and support. HP offers premier development services, including developer training, consulting and assistance; integration services for hardware and software; start-up services such as administrator training and onsite activation; in-production telco 24x7 base-level foundation support; and mission-critical support.

For more information

For further information on HP OpenCall platforms, visit www.hp.com/go/opencall.

*Please ask your HP representative for availability dates.

© Copyright 2006 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein. AMD Opteron is a trademark of Advanced Micro Devices, Inc.

For more information, visit www.hp.com/go/opencall.

4AA0-4758ENW, Rev. 1, July 2006

