



OneMediaHub

Version 14.5

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OVERVIEW

OneMediaHub is a white-label personal cloud solution that enables users to:

1. SECURE digital content from devices into the cloud;
2. SYNC this content across the user's devices to make it accessible, anytime, anywhere, regardless of where the content was generated;
3. SHARE content with friends and family via email links or social sites.

This document is provided for informational purposes and should be used for reference only.

The Digital Content

OneMediaHub supports different types of data:

- Pictures
- Videos
- Music
- Files (documents, archives, html...)
- Contacts
- Calendar events

Depending on the data type, different functionality is offered, but in general, OneMediaHub enables data to be secured in the cloud and synchronized with connected devices.

The Devices

The user can access OneMediaHub functionality using various “screens”:

- Smartphones
- Tablets
- Computers

The solution's design and technology allows extending this set of screens by developing custom software for any programmable connected device e.g. TVs, cars.

The Architecture

OneMediaHub consists of a central server (the “Cloud”) and applications that allow users to upload data to the cloud and to access and operate on them from any device. These applications consist of three types:

- Mobile applications, installed on user smartphones and tablets
- Computer applications, installed on user computers
- A Web application (Portal) via any computer browser (no software download needed)

Additionally, the solution comes with a Web Console for Customer Service Representatives and a number of tools and scripts for administration.

THE APPLICATIONS

On mobile devices, OneMediaHub applications are available for the most popular platforms:

- Android
- iOS
- Windows Phone
- BlackBerry

On computers, users can install the OneMediaHub application, available for Windows PCs and for Mac, or can access the OneMediaHub Web app via a browser.

In general, to view and manage cloud content, the user can access the Mobile and Web apps, on mobile devices and computers, respectively. To seamlessly upload content, the user can use the Mobile Apps and the Computer apps (see THE APPLICATIONS).

There are no limits on the number of OneMediaHub applications or platforms used with a single user account.

Table 1 lists the supported platforms for OneMediaHub screens:

<i>Screen</i>		<i>Device</i>	<i>Supported Versions</i>
Mobile	Android	Smartphones, Tablets	2.3.x, 4.x
	iOS	iPhone, iPad, iPod Touch	7.x, 8.x
	Windows Phone	Smartphones	8.x
	BlackBerry	Smartphones	4.5, 4.6, 4.7, 5.0, 6.0, 7.0
Computer	Windows PC	Computer	7, 8, 8.1 – (32/64 bit); <i>for PIM: Outlook 2010, 2013 – (32bit)</i>
	Mac	Computer	10.7, 10.8, 10.9, 10.10
	Web	Computer	Mozilla Firefox (v32 and later), Google Chrome (v38 and later), Internet Explorer (v10 and later), Safari (on Mac only – v7 and later)

Table 1: Supported platforms and versions

Table 2 indicates which data types are available on the different screens:

<i>Screen</i>		<i>Data Types</i>						<i>Notes</i>
		<i>Pictures</i>	<i>Videos</i>	<i>Music</i>	<i>Files</i>	<i>Contacts</i>	<i>Calendar</i>	
Mobile	Android	Yes	Yes	Yes	Yes	Yes	Yes	
	iOS	Yes	Yes	Yes	Yes	Yes	Yes	
	Windows Phone	Yes	Yes	Yes	Yes	–	–	
	BlackBerry	Yes	Yes	–	Yes	Yes	Yes	
Computer	Windows PC	Yes	Yes	Yes	Yes	Yes (*)	Yes (*)	(*) Outlook required
	Mac	Yes	Yes	Yes	Yes	Yes	–	
	Web	Yes	Yes	Yes	Yes	Yes	Yes	

Table 2: Content types available on the different screens

FROM MOBILE DEVICES

OneMediaHub provides different types of applications for smartphones and tablets, depending on the platform maturity and popularity:

- Mobile Applications for Popular Platforms, like iOS and Android
- Mobile Applications for Emerging Platforms, like Windows Phone
- Mobile Applications for Legacy Platforms, like BlackBerry.

In the rest of the document, when referring to Mobile Apps, the reference is to the first category, and sometimes applies to the second category as well.

Mobile Applications – Popular Platforms

These are the apps available for the most popular and advanced platforms (as per Table 1):

- iOS (iPhone, iPad, iPod Touch)
- Android (smartphones and tablets).

They are available from the reference store for the device (Apple App Store and Google Play Store, respectively).

These apps offer a graphical UI and capabilities that optimize the exchange of data between the device and the cloud while offering the maximum functionality to the user. By auto-downloading lightweight thumbnails and metadata for the user's cloud content, these apps make the user's digital content easily and quickly accessible, and provide all of the information that the user needs, while minimizing impact on the device battery life, bandwidth use and device storage.

For pictures and videos, OneMediaHub automatically backs up device content from the camera roll/native gallery to the cloud to secure device content without requiring manual effort; automatic backup applies to all pictures and videos taken by the device camera after installation of the application.

The user can browse through the local repositories for pictures, videos, music and files to select more items to upload to the cloud and to make them available for viewing, streaming or downloading to other devices.

For all content types, the user can directly upload items to the OneMediaHub cloud account as well from other applications on the device (e.g. an email attachment from the email application).

Seamless synchronization of contacts and calendar events ensure that the user's address book and calendar are in sync across their devices.

In addition to efficiently presenting users with their cloud content and auto-securing new device content in the cloud, the apps offer capabilities such as viewing cloud content, saving content to the device, organizing content, or removing content from the cloud; sharing content is possible via email, through social networks, or cloud to cloud to family members through the family cloud functionality.

The main functionalities in this type of app consists of:

- Up-to-date view of cloud content organized by type and sorted (see APPENDIX – ORDERING), on the home page and on dedicated pages for each data type
- Ability to view large pictures, play videos and music, open files within the app or by using native or 3rd party applications (on iOS, music tracks and long videos not stored on the device are played only under Wi-Fi coverage, to comply with Apple iOS7

- guidelines)
- Filtering based on Albums/Playlists/Sets according to the data type, or based on items belonging to the folders selected for being synchronized on user computers (for more details, refer to **Computer Applications**)
- Ability to organize cloud content by grouping/tagging items in Albums/Playlists/Sets according to the data type
- Addition (Upload) of more items to the cloud:
 - either automatically (for Pictures and Videos)
 - or through manual selection (on iOS, not for Files)
 - or from within other native or third party apps
 - Notes applicable to all upload modes:
 - max item size is 2GB: larger items will be discarded
 - an antivirus check is performed while uploading (for Files only): items detected as infected will be rejected with proper notification (optional feature, see **APPENDIX – ANTIVIRUS**)
- Selective download of high-fidelity content for better viewing or for offline access
- Graphical and textual indication for items not yet uploaded to the cloud (e.g. pending for a proper network connection), or for items available only on the cloud, without a local copy on the device (e.g. unavailable for offline use)
- Graphical indication for items whose upload or download is currently in progress, with summary report of remaining items in the side menu; with additional information when uploads and downloads are pending for a proper network connection
- System notification for successful uploads
- Removal of items from the cloud: deleted items are moved to the trash (see **APPENDIX – TRASH** and **APPENDIX – LOCAL STORAGE AND DELETIONS FROM THE CLOUD**)
- Instant sharing of one or multiple items via email
- Instant sharing of one or multiple items to Facebook, Twitter, Flickr, Google+ or YouTube (see **INTEGRATION WITH EXTERNAL SERVICES: IMPORT AND SHARING**)
- Family cloud, with cloud-to-cloud instant sharing of content with family members, and access to content shared by family members (see **APPENDIX – FAMILY CLOUD**)
- Bandwidth saver, to minimize traffic on cellular networks and to reduce data consumption
- Synchronization of contacts and calendar
- Advanced functionality for contacts and calendar, such as the ability to import from other accounts (Android only) (see **INTEGRATION WITH EXTERNAL SERVICES: IMPORT AND SHARING**) and to reset (replace the local data set with the one on the cloud, or vice versa)
- Ability to view and modify user's personal information (first and last name, profile picture, contact information) (Android only)
- Ability to see the amount of storage currently used, including the amount of storage in trash and ability to empty the trash (Android only)
- Ability to buy or change subscriptions to plans, normally associated with different amounts of online storage size (see **APPENDIX – PLAN MANAGEMENT**)
- Invitation to rate the app in the corresponding store, for users that have been successfully using the app for a while
- Integration with Capptain, allowing monitoring and messaging to stimulate app usage, with setting to enable/disable the feature at device level; in particular, detailed focus for monitoring is on sharing capabilities (Capptain support is Android only)
- Ability to trigger the flow for password reset
- Ability to register to the service from the device.

Mobile Applications – Emerging Platforms

The app currently available for Windows Phone is built with the same philosophy as the ones for iOS and Android, including a subset of the functionalities available in them.

As per Table 1, only Windows Phone smartphones are supported; on those devices, the app is available from the Windows Phone Store.

As for Android and iOS apps, this app offers a graphical UI and capabilities that optimize the exchange of data between the device and the cloud while offering the maximum functionality to the user. By auto-downloading lightweight thumbnails and metadata for the user's cloud content, it makes the user's digital content easily and quickly accessible, and provides all of the information that the user needs, while minimizing impact on the device battery life, bandwidth use and device storage.

OneMediaHub app for Windows Phone backs up recent pictures from the camera roll to the cloud to secure device content, but in order to do that it is required that the user manually opens the app. At that point, the app automatically detects which are the pictures that the user has taken since last upload, and starts the uploading of those. This rule applies to all pictures taken by the device camera after installation of the application. For older, the user can browse through the camera roll to select those pictures to be uploaded to the cloud, in order to secure and to make them available for viewing, sharing or downloading to other devices.

In addition to the upload of pictures to the cloud, through this app the user can see all pictures, videos, music tracks and files already on the cloud, uploaded from any of the user's devices, and save content to the device or remove content from the cloud; sharing of content via email is also possible.

The main functionalities in this app consists of:

- Up-to-date view of cloud content organized by type and sorted (see APPENDIX – ORDERING), on the home page and on dedicated pages for each data type
- Ability to view large pictures, play videos and music, open files within the app or by using native or 3rd party applications
- Addition (Upload) of Pictures to the cloud semi-automatically (i.e. the user is required to open the app in order to start the auto-detection of new pictures and the consequent upload) or through manual selection (max item size is 2GB: larger items will be discarded)
- Selective download of high-fidelity content for better viewing or for offline access
- Graphical and textual indication for items not yet uploaded to the cloud (e.g. pending for a proper network connection), or for items available only on the cloud, without a local copy on the device (e.g. unavailable for offline use)
- Removal of items from the cloud: deleted items are moved to the trash (see APPENDIX – TRASH and APPENDIX – LOCAL STORAGE AND DELETIONS FROM THE CLOUD)
- Instant sharing of one or multiple items via email
- Bandwidth saver, to minimize traffic on cellular networks and to reduce data consumption
- Ability to buy or change subscriptions to plans, normally associated with different amounts of online storage size (see APPENDIX – PLAN MANAGEMENT)
- Ability to trigger the flow for password reset
- Ability to register to the service from the device.

Mobile Applications – Legacy Platforms

The currently supported legacy platform is BlackBerry: for smartphones running this OS (see Table 1 for details), OneMediaHub can be accessed through an app which provides a simple UI to perform bi-directional synchronization between the device and the user's cloud account.

The BlackBerry application may be installed:

- From the reference market of the device (Blackberry App World), or

- From the Web app, upon selection of a BlackBerry device, by following the instructions

The primary goal of this app is the so-called “onboarding”, i.e. allowing users to change devices by migrating data from the old device to a new one. The app provides a simple UI and associated capabilities.

In brief, the application allows:

- Synchronization of contacts and calendar
- Upload of local media content from the native phone gallery to the cloud
- Upload of files from OneMediaHub folder on device to the cloud
- Download of media content in the cloud (coming from other devices) to the native phone gallery (optional through a setting)
- Download of files in the cloud (coming from other devices) to the OneMediaHub folder on the device (optional through a setting)
- Account creation.

Onboarding to a device running the mobile apps for popular or emerging platforms is particularly efficient because only the required metadata, thumbnails and selected previews are downloaded to the new device without downloading original cloud content (described in above paragraphs).

FROM COMPUTERS

OneMediaHub enables users to access the cloud from computers in two ways – via:

- Computer apps that need to be downloaded and installed
- A web app in a browser.

The two ways can be used separately or together, and they complement each other. For example, the Computer apps use the Web app to view cloud content and to operate on items, for example, for sharing.

Upload of local items to the cloud or downloads of cloud content to the computer can be accomplished with either the computer apps or the web app: the former performs these functions automatically in bulk, while the latter is more appropriate for manual and selective operations.

Computer Applications

OneMediaHub Computer apps are available for computers running (refer to Table 1 for details):

- Windows
- Mac OS.

These applications must be downloaded (from the Web app or via links in email the user receives from the system) and the user must login; if the password is forgotten, there is a way to trigger its reset.

Once the applications are launched, they run as background tasks, identified by the icon in the Taskbar or in the Menubar (for Windows and Mac, respectively); from there, a menu is available, for status information and for quickly performing the most common operations. The icon changes its graphical representation to indicate the app status:

- when there is no activity in progress, the icon is still; by hovering over it, information about the status of the last refresh is shown (the latter, for Windows only)
- when data exchange is in progress, the icon is pulsating; by hovering over it, information about the progress of the ongoing refresh is shown (the latter, for Windows only)
- when a network is unavailable and the computer is not interacting with the cloud, it is grayed out

- when an error occurs, it presents an error sign in a corner, and the user is guided to open the menu for more details.

Upon installation, a “magic” folder is created: by default, the name of this folder is OneMediaHub, but it gets customized per deployment; for users who install a Computer app for the first time, the magic folder is empty; otherwise, it is auto-populated with content from the same folder on computers where the application was installed.

For Windows only, it is possible to define at system level one or more items (e.g. a user manual) that the user can find in the magic folder upon installation.

In addition to the magic folder, the user can go to the Preferences of the application and add more custom “watch” folders to the list of folders handled; when a folder is enabled, all of its subfolders are included.

Any folder (magic or watch) enabled in the Folders tab in Preferences is monitored and kept automatically in sync with the cloud, so that:

- any new item is uploaded to the cloud (and made available to other devices)
- any update to existing items is reflected in the cloud (and in other devices), and vice versa
- any item deleted remains in the cloud (and visible on other devices), but without the association with the original folder: actual deletes need to happen from the cloud directly, which means either from the Web app or the Mobile apps (see **APPENDIX – LOCAL STORAGE AND DELETIONS FROM THE CLOUD**).

For uploads, the same limitations apply as for Mobile:

- max item size is 2GB; larger items will be discarded
- for deployments with antivirus enabled, all Files uploaded are checked before being saved to the cloud, and items detected as infected will be rejected with proper notification (see **APPENDIX – ANTIVIRUS**)

The magic folder is the only folder which gets created automatically upon installation, and is always enabled: as such, being available on all computers where the app is installed, its content is kept in sync across all computers accessing the same account. This is valid for the scenario when a single user has multiple computers, or when the user replaces an old computer with a new one, for backup and restore.

There are no watch folders enabled upon installation, but the user can add, enable or disable folders at any time through Preferences; as an advanced feature, the user can choose to monitor only a subset of data types for a given folder (e.g. in the ‘Desktop’ folder, consider only pictures). Currently, there is no way to add content to the watch folders in the mobile and web applications, therefore, watch folders are mainly used to bulk move to the cloud the user content already on the computer, keeping the existing organization for a quicker access from the mobile and web apps, without needing to drag the folder structure in the magic folder.

For the magic and all selected watch folders, in Windows, a graphical indication is shown in the file system next to each file, folder and subfolder, representing the status that can be:

- item already on the cloud
- item waiting to be uploaded to the cloud (e.g. in queue while other uploads are in progress)
- item that cannot currently be uploaded due to an error condition (e.g. not enough storage available, or item infected)
- item excluded from the refresh process (e.g. item larger than 2GB, or item belonging to a type excluded for the given folder).

Another special folder is named ‘Mobile and Web Uploads’ and is a subfolder of the magic folder: all items uploaded through the mobile or web applications get auto-downloaded in it, for offline access via the computer file system, or for backup.

This option can be enabled or disabled on each computer, making the folder present or not on it, while keeping the folder always visible when browsing cloud content from mobile and web

applications.

A user might want to disable the option to limit network and local storage use; an intermediate possibility is offered as an advanced feature, allowing to save, on a specific computer, only a subset of data types (e.g. on a given computer, do not auto-download videos or music when uploaded from mobile devices or web browsers).

Computer apps also keep in sync the computer's contacts and calendar (according to [Table 2](#)), with the cloud and with the user's other devices.

Among the actions available from the Taskbar/Menubar icon are:

- ability to trigger a refresh of content (although the application keeps content in sync automatically, the user can manually trigger a refresh to have new content immediately exchanged)
- ability to open the magic folder (although a shortcut is also created where the operating systems keeps these sorts of links)
- ability to view cloud content (by opening the Web app in the default browser)
- ability to see the activity history, where the list of the most recent operations is tracked, with details
- ability to open the Preferences panel, including the account information
- ability to quit the app, to stop all the activities.

Web Application (Portal)

The Web app (Portal) is an additional way to access content in the cloud, via an internet browser on a computer. The default URL is <https://onemediahub.com/> but it is customized per deployment. There is no need to download and install any software, and most popular browsers are supported (see [Table 1](#)).

The Web app is primarily used to view cloud content from any computer, finding specific content (e.g. pictures from a particular time), organizing content (e.g. by tagging/grouping pictures in albums, or music tracks in playlists), and for sharing items, via email, through social networks, or cloud to cloud to family members through the family cloud functionality. It also allows users to upload specific items from computers to the cloud, and to download specific items from the cloud to computers.

Computer apps as well leverage the web app to offer these capabilities.

The main functionality in the Web app are:

- Up-to-date view of cloud content organized per type and sorted (see [APPENDIX – ORDERING](#)), on the home page and on dedicated pages for each data type
- Quick link in the toolbar allowing download of the proper Computer app, with hints for installation and launch
- Ability to view large pictures, play videos, play music tracks, display files information within the browser
- Filtering based on Albums/Playlists/Sets according to the data type; or based on the items belonging to the Folders selected for being synchronized on user computers (for more details, refer to [Computer Applications](#)); or by date (taken, uploaded or modified, according to data type); or by file type
- Ability to organize cloud content by grouping/tagging items in Albums/Playlists/Sets according to the data type; capability to rename or delete an Album/Playlist/Set
- Addition (Upload) of more items to the cloud; max item size is 2GB: larger items will be discarded; an antivirus check is performed while uploading (for Files only): items detected as infected will be rejected with proper notification (optional feature, see [APPENDIX – ANTIVIRUS](#))
- Removal of items from cloud: deleted items are moved to the trash (see [APPENDIX – TRASH](#))
- Selective download of high-fidelity content for better viewing or offline access
- Ability to view trash content, permanently delete or restore items, or empty trash (see

APPENDIX – TRASH)

- Instant sharing of one or multiple items via email
- Instant sharing of one or multiple items to Facebook, Twitter, Flickr, Google+ or YouTube (see INTEGRATION WITH EXTERNAL SERVICES: IMPORT AND SHARING)
- Family cloud, with cloud-to-cloud instant sharing of content with family members, and access to content shared by family members (not available on Windows Phone) (see APPENDIX – FAMILY CLOUD)
- Ability to view the list of Contacts and Calendar events saved in the cloud; ability to add or remove contacts and calendar events
- Advanced functionality for contacts and calendar, such as ability to import from other accounts and to restore deleted items (see INTEGRATION WITH EXTERNAL SERVICES: IMPORT AND SHARING)
- Ability to fix unintended duplication of contacts: the duplicated address book entries are merged and the change is propagated to all other devices accessing the account
- Tab-based panel to host all information and actions about the user account: profile information; dynamic list of devices connected to the account with following information displayed for each device: device name as configured in the device settings (for Windows Phone devices, the name is a generic one), platform type, last activity date; ability to download the computer app; external service connections with ability to establish or remove connections; online storage usage
- Ability to buy or change subscriptions to plans, normally associated with different amounts of online storage (see APPENDIX – PLAN MANAGEMENT)
- Ability to remain logged in the account through different browser sessions (by default for 90 days, configurable at server level)
- Ability to trigger the flow for password reset
- Ability to register to the service from the browser

INTEGRATION WITH EXTERNAL SERVICES: IMPORT AND SHARING

OneMediaHub allows connecting to a user's third party services to import data or to share/post content.

All sharing is done from the cloud, significantly reducing impact on bandwidth, battery life and wait times typically associated with shares on mobile devices that require a separate upload each time the item is shared.

The infrastructure allows customizing the set of services that are supported, extending or reducing the list.

Import

The following table illustrates which types of data can be imported into the OneMediaHub cloud, and from which OneMediaHub screens.

<i>Data Type</i>	<i>External System</i>	<i>Screen</i>		<i>Notes</i>
		<i>From Web App</i>	<i>From Android App</i>	
Contacts	Gmail Address Book	Yes	Yes	
	Facebook Friends' Profile Pictures	Yes	–	Replaces contact pictures with the most recent profile picture from Facebook.
	Other Address Books	–	Yes	
Calendar	Gmail Main Calendar	Yes	–	

Table 3: Systems from which it is possible to import data into OneMediaHub

Export / Share to social sites

The following table illustrates which types of data can be posted to social sites for sharing.

<i>Data Type</i>	<i>External System</i>	<i>Mode</i>	<i>Screen</i>	
			<i>From Web Application</i>	<i>From Mobile Apps (*)</i>
Pictures	Facebook	Item	Yes	Yes
	Twitter	Link	Yes	Yes
	Google+	Item	Yes	Yes
	Flickr	Item	Yes	Yes
Videos	Facebook	Item	Yes	Yes
	Twitter	Link	Yes	Yes
	YouTube	Item	Yes	Yes

Table 4: Systems to which it is possible to export data from OneMediaHub
(*) Not on Windows Phone

Share with contacts

It is also possible to share data with selected contacts.

<i>Data Type</i>	<i>Channel</i>	<i>Mode</i>	<i>Screen</i>	
			<i>From Web Application</i>	<i>From Mobile Apps</i>
Pictures	Email	Link	Yes	Yes
	MMS	Link	–	Yes (*)
Videos	Email	Link	Yes	Yes
	MMS	Link	–	Yes (*)
Files	Email	Link	Yes	Yes

Table 5: Sharing options
(*) Requires integration with customer's MMS backend

LOCALIZATION AND BRANDING

As a white-label solution, OneMediaHub's screens can be localized and branded.

Localization

OneMediaHub can be localized into any language, upon request, and the strings to be used can be chosen per deployment, allowing flexibility in the way the service provider communicates to users.

Deployments include a list of supported languages, with one set as default: the applications automatically use this language; if a device is configured in a language out of the list, the applications switch to the default.

Branding

OneMediaHub allows branding for all applications. Branding includes the applications' name, icons, set of supported sources and more. Please refer to the branding documents for more information.

THE CUSTOMER SERVICE REPRESENTATIVES (CSR) CONSOLE

OneMediaHub offers a CSR console, accessible via any Internet browser. It presents basic interfaces for management of users on the platform, from the CSR's perspective. Its main features include:

- Disable/Enable user accounts
- Search for users to retrieve account information
- Monitor the last activity for devices connected to user's account
- View the amount of content on the cloud, per data type
- Remove user accounts
- Suspend/Activate plan subscriptions (e.g. a given amount of a storage) for users
- Assist users in accessing the account (e.g. through a reset of a password)
- Introduce new comments and read previous comments about user accounts

THE CLOUD aka THE SERVER

The server, also referred to as “the cloud” in this document, is the core of OneMediaHub, by handling:

- User authentication
- Upload and download of pictures/videos/music/files (see Table 2), and in particular:
 - Video transcoding (with reference to APPENDIX – VIDEO TRANSCODING)
 - File Antivirus check, when enabled (with reference to APPENDIX – ANTIVIRUS)
- Cloud-to-cloud data transfers (with reference to APPENDIX – FAMILY CLOUD)
- Contacts and calendar synchronizations (see Table 2)
- All the communication mechanisms with data repositories and storage systems
- All the communication mechanisms for sharing peer-to-peer (see Table 5) or for communicating with external systems (see Table 3 and Table 4)
- Sending all communications to the user, via email or SMS.

REQUIREMENTS

The server, to run properly, requires:

- Operating System: GNU/Linux 32/64 bits distributions
- Database: MySQL 5.5 or 5.6
- Java Development Kit: Oracle JDK 1.7

COMMUNICATION TECHNOLOGY

There are two main protocols used by OneMediaHub applications to communicate with the server:

- Server API
- OMA/DS (aka SyncML)

Server API

Server APIs are APIs used by applications to communicate with the server to perform all operations related to pictures/videos/music/files, and about contacts/calendar except the actual synchronization.

They use REST-style architecture over the HTTP protocol, and all information is delivered in JSON format.

The combination of Server APIs and the OneMediaHub architecture offers a level of flexibility that permits customization and integration with 3rd party services.

OMA/DS (aka SyncML)

SyncML is the well-known name of the Data Synchronization protocol, introduced as a standard by the Open Mobile Alliance. Applications use SyncML to sync device contacts and calendar events with the server.

INTERNAL ARCHITECTURE

The server includes several components, each with a specific task related to the end user functionality in the various applications/screens, or to the customer service representatives through their console. Here are the most relevant components with a brief overview of the relative function:

- Portal: presenting all the functionality in the Web app (see Web Application (Portal))
- CSR Portal: presenting all the functionality in the CSR console (see THE CUSTOMER SERVICE REPRESENTATIVES (CSR) CONSOLE)
- Server API: the server includes the APIs described in COMMUNICATION TECHNOLOGY; The Portal and the CSR Portal are built using this API layer
- DS Service: handles all data exchanges based on the SyncML protocol as described in COMMUNICATION TECHNOLOGY
 - Database: stores all of the information to run the service, regarding users and the system, including user Contacts and Calendar events
- Media Storage: the repository where pictures/videos/music/files are stored; It can be a local file system or Amazon S3

SYSTEM INTEGRATION

Although OneMediaHub can be used as a standalone service, due to its nature, it is common that it is integrated with other services. The most common system integrations are:

- User provisioning: whether users create accounts directly via OneMediaHub, or as provisioned by external systems
- Authentication: whether the built-in AAA processes are used or if OneMediaHub should leverage an external system (see APPENDIX – AUTHENTICATION)
- Plan management: usually OneMediaHub users need to upgrade their accounts to use more storage on the cloud, this integration concerns how payments are handled and communicated for upgrades (see APPENDIX – PLAN MANAGEMENT)
- SMS Service integration: most communication with users are done via SMS; OneMediaHub provides a built-in SMS notification system but can also integrate with other SMS gateways

Integration work is considered a customization and must be evaluated on a case-by-case basis by Funambol's professional services team.

DOCUMENTATION

The Server API Developer Guide is available at <http://docs.onemediahub.com>; the Installation and Operation Guide is made available to customers upon deployment. The documentation, targeting administrators and developers, refers to the OneMediaHub standard product.

APPENDIX – AUTHENTICATION

OneMediaHub can use either OAuth2 or a proprietary authentication mechanism. With the latter, it is possible to use an out-of-the-box AAA system or to integrate with other external AAA systems. The core OneMediaHub module for this functionality is called the Officer: it has a java interface used by components to authenticate against the AAA system. In the case of an external AAA system, the Officer can be customized to support the required formats and protocols.

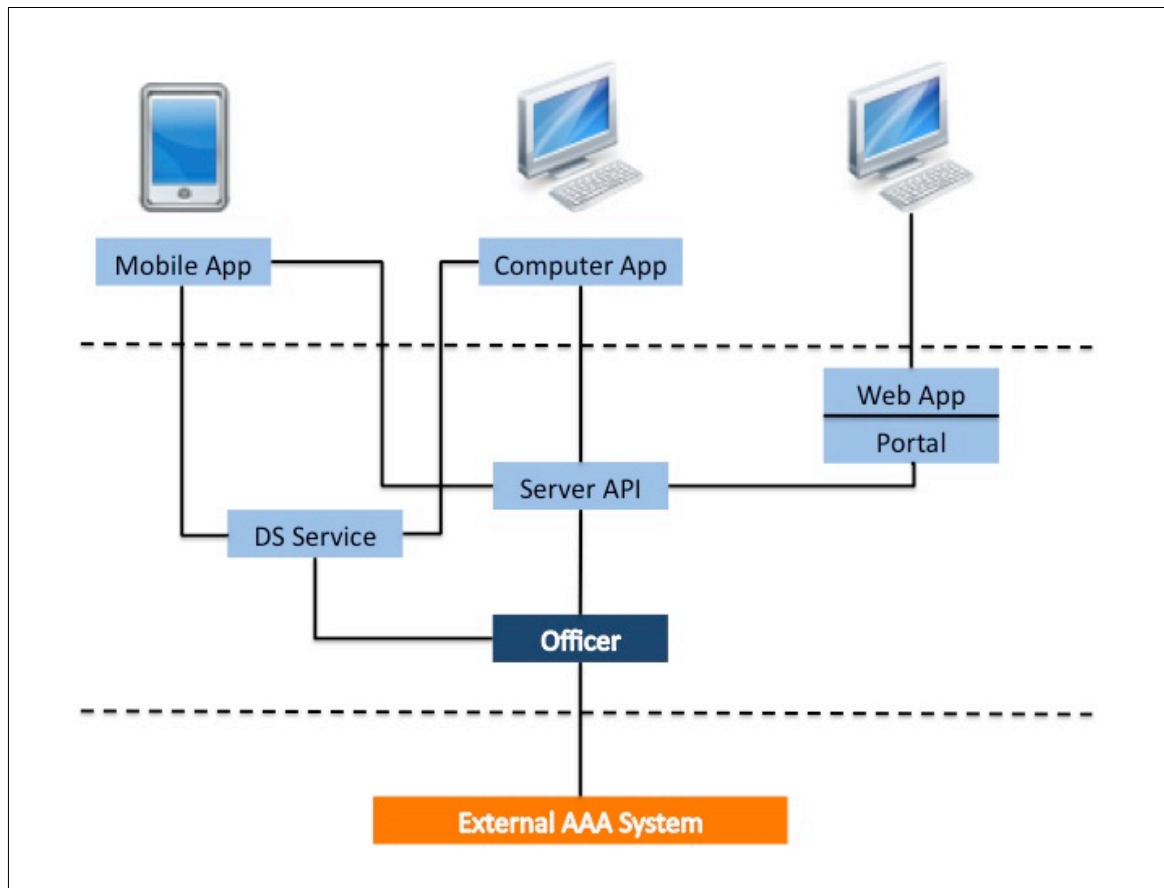


Figure 1: AAA Flows and involved components

APPENDIX – PLAN MANAGEMENT

OneMediaHub includes infrastructure to support the customer's 'service packaging' needs. The most important concepts are explained in this appendix, together with the currently available policies.

General concepts

Each user account is associated with a **Plan**; the plan can change during the life of the account, but at any time, there is only one plan associated with an account.

A plan for an account means a given amount of online storage, available for a given period of time (with some logic upon expiration), for a given cost.

Examples of plans:

- 10 GB @ \$10 per year one-time fee (i.e. upon expiration, the user must renew it or the storage won't be available anymore)
- 20 GB @ \$5 per month automatically renewed (i.e. the user has to explicitly request to end the plan)

The association of a plan with a user account (i.e. the purchase of a plan by a user) is called **Subscription**. When the account is created, there is a default associated plan; the user can subscribe to a plan either

- Automatically, based on a deployment's commercial logic (e.g. auto renewals of expired subscriptions), or
- Manually, upon user choice due to different reasons (e.g. expiration of the current subscription; need for more storage)

The latter can be performed from Mobile or the Web apps.

Storage is used for saving the user's pictures, videos, music and files, through the applications/screens. Once a user's content fills the storage, the user cannot upload any more additional items: either the user frees up storage by deleting items or they subscribe to a plan with more storage (also called **Upgrade** of the account). The opposite action is **Downgrade**, when the users realize that their storage is too much or the subscription is too expensive, and accordingly subscribe to a lower cost plan with less storage.

Some sample scenarios:

- The default plan for a newly created account is a free plan, with no expiration, providing an amount of storage large enough to try the service, but not suitable for permanent usage; if the user decides to keep the service, a subscription to a plan with more storage (i.e. upgrade), upon payment, is required
- New accounts are associated with a paid plan with a defined interval (e.g. a month), and once it expires the user can decide whether to renew the plan or to subscribe to a different one

Policies

OneMediaHub offers out-of-the-box options for purchasing and managing plans. Additionally, it is possible to delegate related logic to an external module, invoking the Server APIs to communicate changes of plans for user accounts.

The built-in possibilities are:

- Standard: covering the basic case when the purchase is triggered through the Web or the Android and Windows Phone Apps; this method requires custom integration with the customer payment/billing system

- Apple: this is the channel for iOS Apps that leverages the Apple In-App Purchase mechanism

If the subscription purchase is successful, the account can be upgraded to the associated plan. For downgrades to succeed, it is also required that the storage used is less than the storage associated with the new plan. While upgrades are immediate, downgrades become effective when the current subscription expires.

OneMediaHub supports two out-of-the-box policies for expiration handling:

- One-Time payment subscriptions
- Auto-renewable subscriptions

One-Time payment implies that the user is billed when the plan is chosen the first time, and the user is properly notified when the expiration date is about to be reached (N days before – configurable) but the account is not billed further without explicit user action.

If the plan reaches the expiration date without renewal, the account enters the so called Grace Period (M days long – configurable), in which upload of new content is blocked; during the Grace Period the user is still allowed to synchronize contacts and calendars, and to use apps to view and download stored content.

When also the Grace Period is over, the account is removed and all data is deleted.

For **Auto-renewable** plans, upon the expiration date, the system will automatically try to renew it. If all goes well, the user is properly notified of the billing that took place. If an insufficient amount of money is available for the user account (Insufficient Funds error case) the system will make a number (N – configurable) of daily retries, and if all fail, the account enters the Grace Period, with the same logic as above.

The user is notified (via email and/or SMS – configurable) in case of:

- Successful purchases
- Reach of X% (configurable; default=80%) of used storage of the total for the associated plan
- Unsuccessful subscription renewal due to Insufficient Funds, after all retries
- Subscription expiration date about to be reached
- Grace Period expiration – Account removal

APPENDIX – VIDEO TRANSCODING

OneMediaHub offers video playback across smartphones, tablets and the web application by using transcoding technology. Here is an overview of transcoding and its significance for the solution.

What Is Transcoding?

Transcoding a video compresses and converts it into a format that can be transmitted faster, uses less bandwidth and power on a mobile device (as the video file is smaller) and can play across multiple devices i.e. cross-platform, so the video 'just works' as users expect.

Why Is OneMediaHub Supporting Transcoding And What Are Its Benefits?

Transcoding enables users to upload virtually any video to their personal cloud account and play them remotely on their smartphones, tablets or a web browser regardless of the video format, where it was recorded (camera, phone, downloaded from the web, etc.), how it was recorded (e.g. sideways, upside down, etc.) and how it was uploaded (from the smartphone, from a PC, etc.).

How Does Transcoding Work With OneMediaHub?

Transcoding is transparent to users as it is a 'back-end' (server-based) operation. When a video uploads to the cloud, it is processed automatically, and in addition to the original video, a transcoded version is also created. This transcoded version of the video is what is played by the OneMediaHub web app, and mobile apps on iOS and Android.

What Transcoding Services Does OneMediaHub Support?

OneMediaHub works with the Amazon Elastic Transcoder web service. OneMediaHub can work with other transcoding services, however, customization is required and the resulting capabilities may differ from Amazon Elastic Transcoder.

Transcoding Usage Notes

- A video file is only transcoded once, when it is uploaded
- Transcoding reduces HD video file size by 80–90% (roughly) with little loss of video quality when viewed on a device screen i.e. a mobile device or computer
- Both the original video and transcoded video are stored in the user's account. Users can only play the transcoded version, but may download and play the original
- There is a brief delay (e.g. one to a few minutes) from the time a video is uploaded and when it can be accessed due to processing time
- When played, transcoded videos use progressive download, which allows a video to play in most cases within a few seconds, without downloading entirely and which is more than adequate for most users and videos

APPENDIX – ANTIVIRUS

Antivirus check is an optional feature, which is offered through integration with McAfee's Antivirus product. The goal of this feature is to prevent users from storing infected files in the cloud to avoid the spread of viruses to other devices and users (via sharing).

When enabled, the check applies only to files only i.e. no check is applied to pictures, videos and music.

The check is performed during upload: if the item is detected as infected, it is rejected, and the user is informed within the App that uploads the item; otherwise, the item is saved in the cloud.

APPENDIX – TRASH

Media items (pictures/videos/music/files) deleted from the Mobile or Web apps are placed in a trash bin. The trash bin can be accessed from the Web application, where the user can:

- view the trash content for each data type, ordered by deletion date
- restore one or more items
- permanently delete one or more items
- empty the bin (i.e. permanently delete all items in Trash)

An item remains in the trash bin until the user deletes or restores it, or until the trash bin is emptied.

Items in the trash bin count against the user's total online storage.

APPENDIX – ORDERING

The Mobile and Web apps present the items ordered in a way to provide the best user experience. In particular:

- in the home page, the content is displayed ordered by last activity date, where an activity is each manual or automatic operation done on the item (e.g. upload, share, add to Album/Playlist/Set... note: viewing a picture, playing a track or a video, opening a file are not considered as activities impacting the ordering)
- in the pages where specific data types are shown (e.g. the Pictures page, the Videos page...), the items are ordered in the way most significant for that data type (e.g. creation date for pictures, alphabetical for music...)

The following table summarizes the ordering for each data type in their different pages:

	<i>Home page</i>	<i>Data type page</i>
Pictures	Last activity date (*)	Creation date
Videos	Last activity date (*)	Creation date
Music	Last activity date (*)	Alphabetical (by track name)
Files	Last activity date (*)	Modification date (**)

Table 6: Ordering for the data types, in their different pages

(*) for Windows Phone app, the order in home page matches the one in its source page

(**) for Windows Phone app, the order is alphabetical

This way of sorting items allows users to quickly find on the home page the most recent content that was touched, or anything that has been recently uploaded from another device.

In the data type pages, the content is ordered as a user would normally expect to find content when auto-organized, for best retrieval and experience (for example: all pictures taken on the same day but uploaded through different devices in different moments are grouped together).

APPENDIX – LOCAL STORAGE AND DELETIONS FROM THE CLOUD

This appendix describes the case of deletions from the cloud viewers/managers i.e. the Mobile and Web apps, in particular for items stored on the device, whether a mobile device or computer.

Any item deleted from the cloud is moved to the cloud's trash bin (see APPENDIX – TRASH) and can be restored any time, and as such, it can re-downloaded on the device at any time. The following paragraphs describe what happens instead to the copy saved on the device's local storage.

On mobile devices

Items can be stored on the device for two reasons:

- items originated on the device (the most common are pictures and videos taken with the device and auto-uploaded to the Cloud)
- items downloaded/saved from the Cloud to the device (for offline access of backup purpose, mainly)

In the first case, items are present in the native gallery or file system of the device and they remain present there, even if they are deleted from Mobile or Web apps.

In the second case, items are stored in different places depending on the item type and platform, as summarized in the following table:

	<i>Android</i>	<i>iOS</i>	<i>Windows Phone</i>
Pictures	Gallery	Camera Roll	Camera Roll
Videos	Gallery	Camera Roll	App's sandbox
Music	File System	App's sandbox	App's sandbox
Files	File System	App's sandbox	App's sandbox

Table 7: Where items are saved, when downloaded from the cloud

Deletes will remove the items in the sandbox (it is not useful to keep them, since they cannot be accessed any more) while they will not remove the items in the native gallery or file system.

On computers

Items originated from the Computer apps (uploaded from magic folder or “watch” folders) are always removed from the computer's file system (in particular, from the folder where they were uploaded) when a delete is performed from a Mobile or Web app.

APPENDIX – FAMILY CLOUD

Family Cloud is a feature that allows the user to easily share selected pictures, videos and files with her family members, by posting them in a common shared space called the Family Hub.

Families will be provisioned by the mobile operator through integration at API level, and usually map to the mobile operator's definition of families according to billing or other such groupings. A user can belong to only a single family and family members must have a personal cloud account of their own. There is no user interface for the user or for the system administrator to create families, and to define the members of a family.

If a user is not defined as a member of any family, the feature would simply not appear in her applications. As soon as a user is associated to a family, a new Family Hub section would appear within the Android, iOS and Web apps. In this section, pictures, videos and files posted by all family members are shown in a single space, ordered by date posted with the most recently posted on top.

Items in the Family Hub do not take up any additional storage: they are essentially shortcuts to the items already in the publisher's personal account.

Accordingly, updates to posted items will be reflected in the Family Hub, with the posting date updated as well; posted items deleted in the account will disappear also from the Family Hub.

The Family Cloud operations that a user can perform are the following:

- Post one or multiple items from her account to the Family Hub, to make it visible to all family members
- View items in the Family Hub, posted by the user herself or other family members
- Remove from the Family Hub an item previously posted by herself, to hide it from other family members; this has no effect on the user's account
- Search of items in the Family Hub, by file name or by publisher (feature not available on iOS)
- Import one or multiple items posted by other family members from the Family Hub to the user's account: this is needed to perform all other actions on the item, such as download, organize in albums or share

Imported items will be copied in the user's account: they will take storage from it as well; updates and deletions in the account of who posted the items will not be reflected on the imported items; and if the items will be removed from the Family Hub, the imported items would still remain in the user's account.