



ASPEN CLOUD SERVICE

Development Guideline

Defining next generation of cloud based grid

Power-All Networks Ltd.

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1. Change Log

Changes	Page	Date
Support Http POST file upload.	16, 72	2009-06-11
Limitation on file name character, Slash under specific no. i.e 12	15, 43, 62	2009-06-11
Max file name length is increased from 70 to 160	15	2009-06-11
Dot Character (.) is not allowed for box name.	14	2009-05-25
Support a new error type, OwnerACPrb in most API.	26, 28 ...	2008-12-09
Adopt RFC 1738 for URL encode.	Section 9	2008-12-09
Get partial file via support of http header, "Range". <ul style="list-style-type: none"> Client can develop resume failed download Client can adopt multi-download for better download performance. 	43	2008-11-01
New web service API, <code>get_all_grids()</code> , for showing all available grids worldwide.	54	2008-11-01
New web service API, <code>file_rename()</code> , for file rename in same box.	50	2008-11-01
Support Conditional Header (<i>If-Match</i> , <i>If-None-Match</i> , <i>If-Modified-Since</i> , <i>If-Unmodified-Since</i>) in existing API, <code>get_file()</code> (ID : 2.4) and <code>rename_file()</code> (ID : 2.7).	44, 51	2008-11-01
Add new field, <i>BoxCreationDate</i> for <code>list_all_box</code> API (ID : 1.3)	24	2008-11-01
Add a new field, <i>LastUpdateDate</i> for following API XML output. <ul style="list-style-type: none"> <code>list_files_inbox</code> (ID : 1.4) <code>get_file_attribute</code> (ID : 2.3) <i>LastUpdateDate</i> is new added field so old uploaded file has no such attribute until it is updated. (e.g. Rename the file)	27, 41	2008-11-01
Adopt ISO 8601 (e.g. 2008-10-30T09:06:23Z) date format in following XML output API. <ul style="list-style-type: none"> <code>list_all_box</code> API (ID : 1.3) <code>list_files_inbox</code> (ID : 1.4) <code>get_file_attribute</code> (ID : 2.3) 	17, 24, 27, 41	2008-11-01

2. Overview

With the wide use of Web 2.0, there is an explosive growth of digital media and user generated content. Video streaming and big file sharing becomes more and more popular. Everyday there is lot of new launched websites providing free services for file download or video streaming. These kind of services required huge size of storage, CPU power and bandwidth. To build and maintain a scalable and reliable Internet storage is a complicated and expensive work.

Power-All's Aspen Cloud Storage resolves these traditional storage issues and lets user to enjoy high quality and availability storage in low price. It provides simple and useful REST web services for developers who don't care how backend storage work and the maintenance done. Developer only stores the files in remote storage with the Aspen Cloud Storage provided web service function calls.

The web services are easy to understand and to be called. It is as simple as local file storage handling but developer doesn't concern the storage availability, stability and security.

By this development guide, developers can well understand how to use our provided storage web services to meet your target.

3. About Aspen Cloud Storage

About Traditional Storage

What is traditional storage? It widely includes backup storage devices and software such as backup tape, SAN, NAS, storage software, and applications. Deploy and maintain these storage devices are professionalism. If user requests high availability and more backups in different locations, cost is one of the major consideration factors.

Disadvantages of Traditional Storage

- High price in purchasing storage devices and software.
- Professionalism is required to deploy and maintain the storage.
- A well designed plan and infrastructure diagram is required before deploy storage system.
- Related professional IT staff should be employed for the storage system maintenance in long term.
- Upgrade of devices and software are complicated and expensive.
- Internet bandwidth is difficult to be predicted if your company requests remote storage system. Besides, the costs for lease line or rack in data center are in high price.

What is Aspen Cloud Storage?

Aspen Cloud Storage stands for *Cloud Based Service Storage* which belongs to PaaS (Platform as a service). It provides a high quality and availability storage to user by web services. By the RESTful web services, user stores the files in Aspen Cloud Storage and retrieve in anywhere and anytime. Aspen Cloud Storage is a “Pay on Usage” system. User only pays the usage storage and bandwidth monthly (Just like electricity bill). There is no upfront cost. This billing model suits for most company to avoid resources wasting due to over-estimation in planning stage.

To user, Aspen Cloud Storage is black box storage. User doesn't care the maintenance and how it can work. Aspen Cloud Storage does all for you in backend. User only

considers how many copy you will upload enough.

3. About Aspen Cloud Storage (continued)

Features of Aspen Cloud Storage

- No upfront cost because user doesn't purchase any new hardware and software for the storage.
- No consideration in hardware and internet bandwidth in startup
- Reasonable billing model – “Pay on Usage”
- No consideration in software and hardware upgrade in the future.
- No professional storage administrator is required in your company.
- Data redundancy and unlimited scalability are easy targeted.
- Using port 80 and reduce trouble made by firewall.
- Can be used in anywhere and anytime.
- Easy to learn and develop.
- Programming language independent. Developer can use his/her favorite language to call Aspen Cloud Storage services.

4. What skill is required?

Before starting, everyone will ask a question, “what’s skill I should know for calling Aspen Cloud Storage”? To a programmer, this question is more important than pricing. Aspen Cloud Storage provides the world-wide popular method and powerful method. i.e. REST. All provided web services are in RESTful.

Nowadays, REST is a hot web service method because of its flexible and easy to understand. REST is similar to browse a web page via http URL only. In browser, you always utilize the GET method in HTTP to browse web page. In rest, we will take advantages of other HTTP methods such as PUT, DELETE and so on. You can visit http://en.wikipedia.org/wiki/Representational_State_Transfer for details understand of REST.

It is program independent function call so different developer can develop own program base on his/her favorite programming platform and language. Web service call uses http protocol (port 80) to communicate so it can reduce the trouble made by firewall. Besides, all result queries are in XML format.

Even you are a newbie in web service. We can sure you can understand how to start your first step via this development guideline.

What skills required?

- Basic XML knowledge
- Basic knowledge of web services especially in REST.
- How to call REST web service in your favorite programming language. Most programming language such as JAVA and PHP provides toolkit and framework for fast development of web services. User can achieve the target easily.

4. What skill is required? (continued)

Which programming language platform supported?

The advantage of Aspen Cloud Storage is platform and language independent so you can use what language you like. Main point is that your language can call web services. In general, following language can call our services.

- Java
- PHP
- .Net including C# and VB.Net
- Python
- C++
- Perl
- Ruby
- Even some old language such as Visual Basic v6.0

What software required?

If programming language support general XML handling functions and http access functions (Best have specified REST call modules), then you can use Aspen Cloud Storage more easily. No any installation or add-on software is required.

4. What skill is required? (continued)

Sample of REST call in Aspen Cloud

Using REST to call remote API is similar to browse a web page. The different is that developer may use other HTTP method except GET method.

```
HTTP Method : PUT http://food.s.mygrid.asia

Submit Header Content :

Host: food.s.mygrid.asia
Content-Length: 0
Date: Mon, 03 Mar 2008 12:00:00 GMT
Authorization: 112122334214:dsfdksfjdklsfjkldsfj-dsfd=
x-pan-box-loc: HK0001
x-pan-acl-list: PUBLIC-READ
```

Explanation:

In your coding, you only assign the required http headers information and also submit via a specified URL and http method (PUT). Then you can create a “box” in Aspen Cloud Storage.

In above example, header, “Host”, is used to assign what box name you want to create. Other Headers, “Date” and “Authorization” are required for security. The header, “x-pan-box-loc”, is used to assign where you create the box. e.g. Hong Kong or China. Header, “x-pan-acl-list” is used to assign the access right of the created “box”.

After you create the headers, you submit the headers via the URL <http://food.s.mygrid.asia> by PUT method.

Now, you can know that “creation of box” is similar to visit a web page. In following sections, we will explain details what functions we provided and how to use.

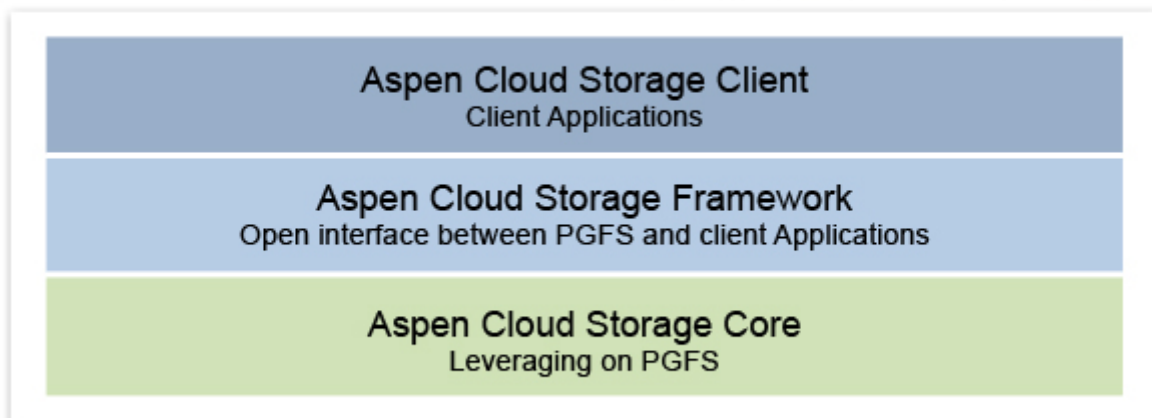
5. Terminology

Before use Aspen web services, you should understand our terminology.

Terms	Description
1. Home Service URL	http://s.mygrid.asia is the home web services URL of the Aspen Cloud Storage.
2. Grid	Grid is regarded as a basic unit of storage location. e.g. Hong Kong PCCW data center is a single grid. Hong Kong NTT data center is other grid. Link up different grid in different countries to form global storage. Regard Grid as a storage location.
3. Box	It is just like a folder which includes all uploaded files. Each box should relate to one grid. No box can relate more than one grid. Once creation of box, it should specify the Grid belonged to. After assign, can't be changed. The aim of box is to decide the storage grid. i.e. the file storage location. e.g. http://fruit.s.mygrid.asia/ (fruit is the box name) http://game.s.mygrid.asia/tvgame.jpg (game is the box name)
4. File	No folder concept in Aspen Cloud Storage but it allows slash (/) file name. Each file must be under a box. e.g. http://game.domain.com/tvgame.jpg (Game is box name and tvgame.jpg is file name) http://game.domain.com/world/japan/tvgame.jpg (world/japan/tvgame.jpg is file name)
5. Access ID	It is a global unique ID for each user a/c. It is system generated and can't be changed. Once user registers in portal, it will be generated.
6. Secret Access Key	It is a global unique key for signature generation. This key is secret except of owner. Don't share this key to other people. It can be regenerated by owner via web management page. Use this key to generate resource signature for authorization.
7. ACL	Access control list (ACL) which record 3 access rights supported in Aspen Cloud Storage. i.e. Owner Only, Public Full Control, Public Read Only.
8. REST Http Method	In Aspen Cloud Storage, some http methods are supported. i.e. PUT, GET, DELETE PUT – creation of box or upload of file DELETE – deletion of box and file GET – get the resources information or download/display of the resources.

6. More on Aspen Cloud Storage

1. All web services are in REST which is the most popular and easy to learn method today.
2. Most web services request service related information such as date. The data is passing via http header.
3. Each grid represents one location. Each new box should declare the grid. It decides where the file will be stored to. e.g. create a box, food which is in Grid 1 (HK).
4. For security issue, most web services request user to pass a signature in header. The signature includes the access resource information, user secret id, current date time and other related information. After we get your request, we will try to authenticate your role with your coming header. The signature is valid within 15 minutes after generated. Later, regarded as expiry.
5. Except upload and download of files, Aspen Cloud Storage provides file and box query functions. The outputs are in XML format. Developer can easy catch the information.

Layer of Aspen Cloud Storage


6. The diagram above is Aspen Cloud Storage infrastructure. Developer doesn't care the bottom layer i.e. Aspen Cloud Storage Core. Role of developer is in top layer i.e. Aspen Cloud Storage Client. Developer writes own programs which call the Aspen Cloud Storage Framework. The Aspen Cloud Storage Framework is program and platform independent so developer can use any coding to call the framework. e.g. JAVA, php, perl, .net and also Python. It can be web page and application too.

7. More about Box

What is Box?

Box is used to group your related files together. You can imagine that Box is similar to “folder” in file system. In Aspen Cloud Storage, the main purpose of Box is to identify where you store the files because each box relates to one location i.e. Grid. If you create a Box in Grid A (Suppose Grid A in Hong Kong), then you upload files to the new Box means you upload to our Hong Kong Server.

Box name is DNS record of Aspen Cloud Storage i.e. <http://s.mygrid.asia> Example. You create a box named “food”. The URL is <http://food.s.mygrid.asia> Therefore, after creation of Box, user should wait a short period of time to update in DNS server. After update of DNS record, you can try access <http://food.s.mygrid.asia>. Before update of DNS, you can't access the URL

7. More about Box (continued)

Features of Box

1. Each registered member can own 100 boxes in maximum.
2. Box name is global namespace. i.e. no 2 same box name in the world.
3. Each box should assign one location i.e. Grid
4. The aim of box is to assign the file storage location. e.g. Create a box named food and assigned to HK grid. Then upload files to HK box means the uploaded files are stored in Hong Kong.
5. Box can be created or deleted but no edit is allowed.
6. After assign the grid of box, it can't be changed.
7. The ownership of box can't be transferred.
8. Box name is the DNS record so the naming convention of box must follow DNS naming strictly.
9. After creation of box, use may wait short period of time (few minutes) for effective of DNS record.

You should follow the naming convention of box naming regulations.

Box Naming Regulations

1. Lowercase Alphanumeric.
2. Dash (-) is allowed but not in start and end position
3. dot (.) character is not allowed
4. Minimum is 3 characters and maximum is 60 characters
5. First character must be in alpha.
6. Can't be in IP address format e.g. 192.168.0.1

8. More about File

What is File?

File is the uploaded file by user. The file name is specified in the URL and support multi-language (UTF-8) file name. Not same to general file system. There is no “folder” concept Aspen Cloud Storage.

Features of File

1. Each file should be under a box.
2. File name is in multi-language (UTF-8).
3. File name in URL should be encoded with RFC 1738 format for http transfer. e.g. 世界 world will be encoded as %E4%B8%96%E7%95%8C%20world.
4. The storage location of file depends on box.
5. The ownership of box can't be transferred.
6. Maximum file size is 5GByte.
7. There is no “**folder**” concept in Aspen Cloud Storage. i.e. You can't create a folder and sub-folder and upload the file to it. However, file name accepts slash (/) character. It can simulate the folder concept in file system. e.g. You can name file with “**food/hongkong/apple.jpg**”. It is a file name. By searching web service, developer can specify to search file prefix “food” only. Then all “food” prefix files are shown. It is similar to folder concept in file system.

You should follow the naming convention of file naming regulations.

Box Naming Regulations

1. Multi-language so you can enter what language you like.
2. Character # % & = ? + \ “ ‘ can't be used as file name.
3. File length can't more than 160 characters.
4. No. of slash “/” is controlled to be used for file name. Maximum is 12.

9. Authentication

Aspen Cloud Storage uses signature to identify the access user role. The signature is composed in client side (i.e. your developed program) and then sends via http header "Authorization". It is the standard http header. For security issue, most provided functions require user to provide "Access Proof" when access the resource. A valid signature is a proof.

After Aspen Cloud Storage side received the web service request from client. It will check whether the requests need authentication. If needs, it will check the incoming header whether has "Authorization".

For POST file upload, the authentication algorithm is little different.

Example:

User lists all created box by service. The http header should be similar to following. From following example, the header "Authorization" is specified in header. The format is "access id + signature".

```
GET / HTTP/1.1
Host: s.mygrid.asia      (optional. If not passed, URL will be used.)
Date: Wed, 01 Mar 2006 12:00:00 GMT
(or "x-pan-date" instead of "Date" because some language (e.g. C#) don't let user to edit "Date")
```

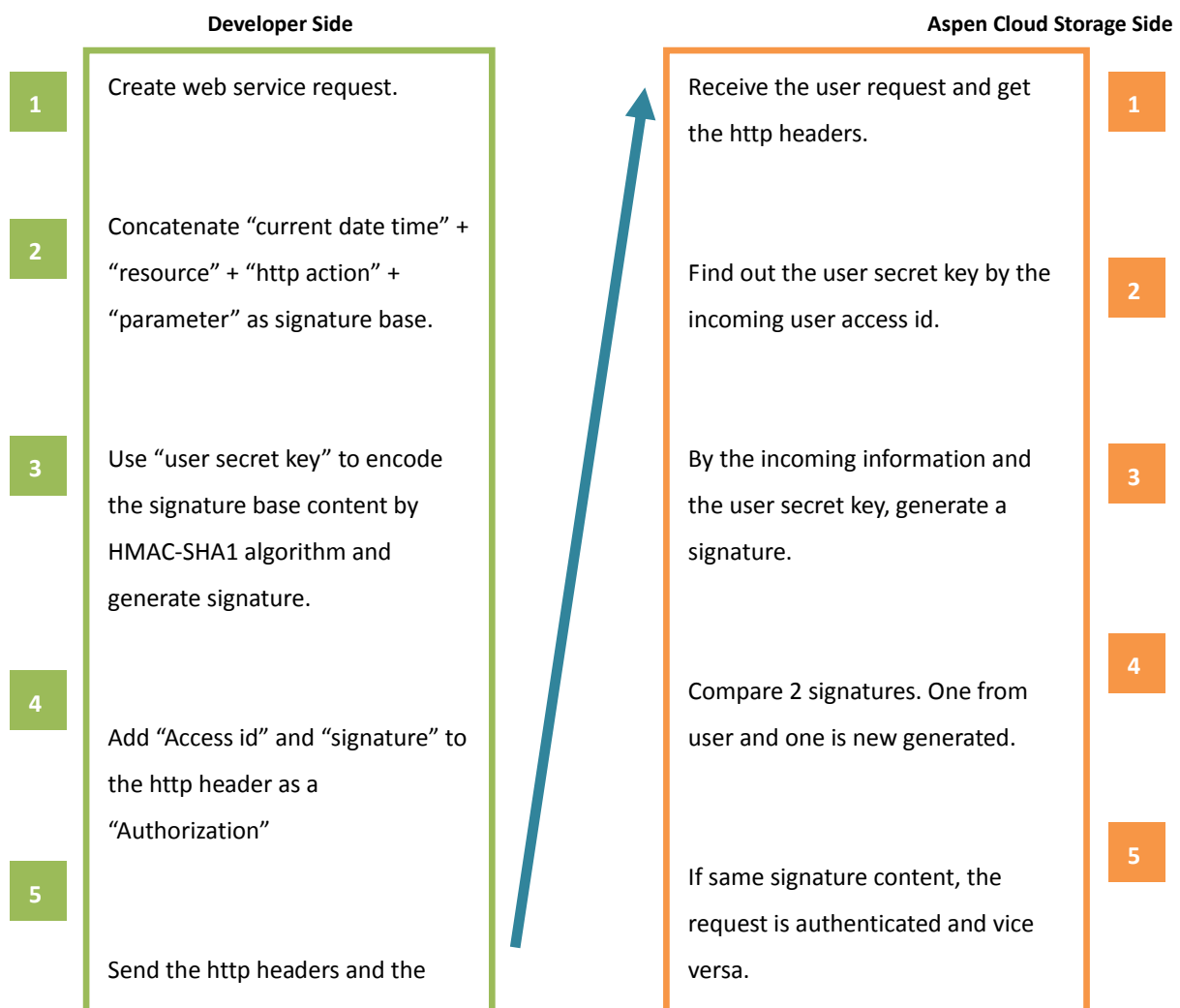
Formula of Authorization header

```
Authorization = access ID + colon + signature
(e.g. Authorization: 0000001:dskfjdsklfjdksljfdk9890dsffsdsf)
```

The access ID is given to user after he/she registers. The signature is generated by developer who wants to access Aspen Cloud Storage. Without "Authorization", Aspen Cloud Storage must reject your request. Thus, developer must understand how to create a signature.

9. Authentication (continued)

The signature is composed of date time, access resource and user secret key. The access id and user secret key are global unique. After Aspen Cloud side receives the submitted http header information. Aspen Cloud Storage will try to generate an identical signature by the provided information such as header time, host, and resource and so on. Then compare the system generated signature to user provided signature. If same, that's mean the user is authenticated and vice versa.



The generated signature will be expired after 15 minutes for security issue.

9. Authentication (continued)

Three steps to generate signature.

Step 1. Form “request content base”

```
Request Content Base = "<" + HTTP Action (PUT, GET, POST, or DELETE) + ">" +
    "<" + current date time (Use RFC 2822 format) + ">" +
    "<" + Content Type + ">" +
    "<" + Box Name + ">" +
    "<" + url encoded file name + ">" (Use RFC 1738 encode for file name)
```

Explanation:

HTTP Action is PUT or GET or DELETE or POST of your web service request. It is string. The date format is in RFC 2822 format e.g. Thu, 21 Dec 2000 16:01:07 +0800. The content type is optional. If your request is “upload file” and also provide “content-type” header, then you should enter content-type here. If no “content-type”, let it empty string, i.e. “<>”. Box name means your box name. If no box name is required in your function. Let it empty. Finally, it should enter file if any. The file name should be “URL encode” for prevention of multi-language triggered problems. We adopt RFC1738 for file name encode. (i.e. “ ” **space** character will be encoded as **%20**. Not +)

The parameter is not included for signature generation. e.g.

<http://car.s.mygrid.asia/abc.jpg?extra=show> (only pass abc.jpg as file name.

“extra=show” is parameter. Ignore it.

Example : suppose user upload a file named 中國/人民.jpg to box car.

```
Request Content Base = <PUT>
    <Wed, 11 Jun 2008 23:48:28 +0800>
    <image/jpeg>
    <car>
    <%E4%B8%AD%E5%9C%8B/%E4%BA%BA%E6%B0%91.jpg>
```

Caution : If the filename has slash “/”, the slash can’t be url encoded. It should be kept in unchanged. i.e. slash

9. Authentication (continued)

Step 2 Generate a signature

Every registered member has a “Secret Access Key”. Use it as a key and use algorithm HMAC-SHA1 to encode the “Request Content Base”. Then, use Base64 to encode the output signature. It makes the signature is ASCII string and for header data passing.

1. Incomplete Signature=HMAC-SHA1 (Request Content Base, User Secret Key)
2. Signature =Base64 (Incomplete Signature)

Step 3 Form the http authentication header

There is no “Authentication” in standard http so we only utilize the other attribute “Authorization”. Now, you have a signature and Access ID. You only concatenate together.

```
Authorization: 0000001:dskfjdsklfjdkslfkd9890dsffdsf
```

For POST file upload

If you upload file via http form POST, the authentication algorithm is little different. You only pass in *HTTP method i.e. POST, form expiry date instead of current date, and box name*. No need to pass file name and content-type even you assigned.

Use the same formula to generate the signature with above passing value.

10. Access Control List (ACL)

Concept

Access right of each box/file is controlled base on Access Control List (ACL). Ownership of the box and file can't be changed after creation. The other access right can be changed in anytime via provided web services. i.e. `set_file_acl` and `set_box_acl`.

Two methods to assign ACL to a box / file.

1. When creation of box/file, can define in http header via "x-pan-acl-list". e.g. `x-pan-acl-list: PUBLIC-FULL`. This method is for fast setting for 1 ACL so user can set either `PUBLIC-FULL` or `PUBLIC-READ` only. The storage location of file depends on box.
2. After creation of box of upload of file, user can change the ACL in anytime via `set_box_acl` and `set_file_acl`. User can set the ACL via XML format.

10. Access Control List (ACL) (continued)

There are 3 access right provided in Aspen Cloud Storage.

Access Right	Access Right Code	Description
1. Owner only	OWNER-ONLY	The creator of box/file is the Owner and has OWNER-ONLY right. It is a full control of the resource. Once the box is created or file is uploaded without setting of ACL, the one and only one access right is OWNER-ONLY.
2. Public read only	PUBLIC-READ	Anonymous people can read the file. If set to PUBLIC-READ, no authentication header is required in the request. It's widely used in most internet material. e.g. image of user web site. No authentication for such resources. Apply "PUBLIC-READ" is suitable in this case
3. Public full control	PUBLIC-FULL	Public anonymous people can read and write the file. If set to PUBLIC-FULL, no authentication header is required in the request. It's less to set PUBLIC-FULL to a file but it may set to box and let anonymous people to upload files to such box.

ACL XML for Box and File

```
<?xml version="1.0" encoding="UTF-8" ?>
<AccessControlList>
  <ACL>
    <AccessList>
      <GrantedRight>PUBLIC-READ</GrantedRight>
    </AccessList>
    <AccessList>
      <GrantedRight>PUBLIC-FULL</GrantedRight>
    </AccessList>
  </ACL>
</AccessControlList>
```

Description :

From above example, PUBLIC means anonymous including other member or unauthenticated user can write/read the resource.

11. Billing Method

Before using Aspen Cloud Storage, should register as a member and assign the payment method. i.e. Credit Card information.

We charge based on the box owner. e.g. Box A is owned by Peter and accepts anonymous user uploads. Then other members and unauthenticated user can upload files to Box A. The file upload and access payment is charged to Peter. Not file owner..

Charge user in following situations.

Situation	Description
1. Data Storage Fee	When user store data into Aspen Cloud Storage, it will charge a specified price per GByte.
2. Data Transfer In	When user upload file, it is regarded as data transfer in. It will be charged by counting No. of GByte is used.
3. Data Transfer Out	When user downloads or gets any data, it is counted. It will be charged per GByte.
4. No. of request	Count no. of request. e.g. US\$0.1 per 1000 requests (sample only).

*The update pricing is shown in portal.

12. You should know before coding

Before study our provided web services, you should firstly understand what our services are and what type of output will be returned.

1. Before using our services, you should register as a member via <http://storage.mygrid.asia>
2. After registration, you have a user login and password to access to portal for general member functions such as profile edit, billing, reporting, and Secret Access Key regeneration. Besides, pair of keys is provided for calling web service. i.e. *Access ID* and *Secret Access Key*. Remember that Secret Access Key is very important to you. Don't distribute this key to any person. We never ask user to answer any question about the key.
3. To carry out different functions, different http method such as PUT, DELETE and GET should be identified.
e.g. To create box, specify PUT in http method.
4. Adopt RFC2822 (<http://www.faqs.org/rfcs/rfc2822>) date format. e.g. Fri, 30 May 2008 12:00:00 GMT (Greenwich) or Fri, 30 May 2008 08:00:00 +0800 (Hong Kong and China time zone) Both refer to same time.
"day of week" and "second" are optional. Date and time is local date time. Time zone is the difference from UT/GMT.
5. Adopt ISO 8601 date format in XML output. e.g. 2008-10-30T11:31:05Z. i.e. GMT time zone
(Refer http://en.wikipedia.org/wiki/ISO_8601 or <http://www.w3.org/TR/NOTE-datetime>)
6. In output of each query, Aspen Cloud utilizes the http status code. e.g. Code 201 represents success creation of box or upload of file. Code 204 represents deletion of file successfully. Besides, it also shows the result in XML even it is error message which is shown in XML too.
7. Owner of box and file has the full control (read and write) right. i.e. owner-only
8. Default access right is applied to new box or file if no access right is specified in

creation. The access right can be further changed by other web services.

12. You should know before coding (continued)

9. Creation or deletion of box will add or delete a DNS record and it is not affected in real time (but within a very short period). If developer creates a box, he/she should wait DNS server to add such box record.
10. Most web services request a signature to identify the user. Each signature will be expired after 15 minutes.
11. No file locking provided. For example, user uploads 2 ABC.jpg files to box A simultaneously. It is acceptable action and overwrites to each other. The file locking should be handled by developer themselves.
12. We return http status code and XML but some programming framework or modules has strict limitation on return http status code. e.g. using php PEAR HTTP_Request. If you delete box/file, the return code is 204 No Content but no XML body is shown. If you use php zendframework, both code and XML body will be shown. These filtering feature is depends on what modules and framework you adopted.
13. In each request, user should send "Host" to Aspen Cloud Storage. For example, Host: apple.s.mygrid.asia (apple is the box name and s.mygrid.asia is the domain). If user omits "Host", the http domain will be referred. e.g. http://apple.s.mygrid.asia/. For valid http access, we recommend user adding "Host" for each request.
14. In each request, user should send header "Date" to Aspen Cloud Storage. For example, pass "Date: Sun, 27 Jul 2008 15:25:16 +0800". However, some programming language such as C# protects the standard http header field including "Date". Thus, user can't assign "Date" directly via C#. Aspen Cloud Storage also provides other http header to replace "Date". i.e. x-pan-date. If both "Date" and "x-pan-date" are passed to Aspen Cloud Storage. The "x-pan-date" has higher priority than "Date".
15. For Aspen Cloud Storage connection development, many http connections API or framework have DNS caching and http connection pool reuse function. This caching ability affects box query function. You should disable the caching in your http connection API. e.g. In PHP Curl, CURLOPT_DNS_USE_GLOBAL_CACHE should be FALSE. You should set curl_setopt(\$ch, CURLOPT_DNS_USE_GLOBAL_CACHE,

false);

13. Web Services List for Box

Box related functions

Function Name	Description	Example	http Method
1.1 create_box	Create new box	http://food.s.mygrid.asia/	PUT
1.2 delete_box	Delete existing box	http://food.s.mygrid.asia/	DELETE
1.3 list_all_box	Show all owned boxes of a member	http://s.mygrid.asia/	GET
1.4 list_files_inbox	Show all files in specified box	http://food.s.mygrid.asia/	GET
1.5 get_box_location	Get the box location	http://food.s.mygrid.asia/?extra=location	GET
1.6 get_box_acl	Get access control list for specified box	http://food.s.mygrid.asia/?extra=access	GET
1.7 set_box_acl	Set access control list for specified box	http://food.s.mygrid.asia/?extra=access	PUT

(* In above example, "food" is the box name)

14. Box Web Services – create box (ID:1.1)

Web Service Name	create_box (ID : 1.1)	REST http method	PUT																																													
Description	Create new box. The box name follows DNS naming convention.																																															
REST example	http://food.s.mygrid.asia/																																															
Http Code if success	201 (Created)																																															
Request Signature	Yes																																															
Anonymous access	Not accept																																															
Box Location (i.e. Grid) (optional)	Each box has one grid. It's one to one relationship. If not specify in creation, use default grid which specified by user himself once register user account. Use XML to assign the box grid (i.e. location) e.g. HK0001																																															
Possible Error	<p>General errors</p> <table border="1"> <thead> <tr> <th>Error Description</th> <th>Error Code</th> <th>Http Status Code</th> </tr> </thead> <tbody> <tr> <td>1. Invalid Header format (Not accepted format in this request. Format is different due to situation)</td> <td>InvalidHeader</td> <td>400 Bad Request</td> </tr> <tr> <td>2. Expired signature</td> <td>ExpiredSig</td> <td>400 Bad Request</td> </tr> <tr> <td>3. Fail Authentication</td> <td>FailAuth</td> <td>403 Forbidden</td> </tr> <tr> <td>4. Account problem or suspended</td> <td>ACPrb</td> <td>403 Forbidden</td> </tr> <tr> <td>5. Access deny. Problem encountered in the owner account of box or file.</td> <td>OwnerACPrb</td> <td>403 Forbidden</td> </tr> <tr> <td>6. Unsupported REST action e.g. HEAD not in BOX</td> <td>NoRestMethod</td> <td>405 Not allowed method</td> </tr> <tr> <td>7. Server unexpected error</td> <td>UnexpectedError</td> <td>500 Server error</td> </tr> <tr> <td>8. Service unavailable</td> <td>UnavailableService</td> <td>503 Service Unavailable</td> </tr> </tbody> </table> <p>Conditional Errors</p> <table border="1"> <thead> <tr> <th>Error Description</th> <th>Error Code</th> <th>Http Status Code</th> </tr> </thead> <tbody> <tr> <td>1. Duplicate box</td> <td>DuplicateBox</td> <td>409 Conflict</td> </tr> <tr> <td>2. Invalid box name (not acceptable box name)</td> <td>InvalidBoxName</td> <td>400 Bad Request</td> </tr> <tr> <td>3. Exceed maximum no. of box created</td> <td>ExceedBox</td> <td>400 bad request</td> </tr> <tr> <td>4. Invalid Header ACL</td> <td>InvalidHeaderACL</td> <td>400 bad request</td> </tr> <tr> <td>5. Invalid box location in header</td> <td>InvalidBoxGridID</td> <td>400 bad request</td> </tr> </tbody> </table>			Error Description	Error Code	Http Status Code	1. Invalid Header format (Not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request	2. Expired signature	ExpiredSig	400 Bad Request	3. Fail Authentication	FailAuth	403 Forbidden	4. Account problem or suspended	ACPrb	403 Forbidden	5. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden	6. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method	7. Server unexpected error	UnexpectedError	500 Server error	8. Service unavailable	UnavailableService	503 Service Unavailable	Error Description	Error Code	Http Status Code	1. Duplicate box	DuplicateBox	409 Conflict	2. Invalid box name (not acceptable box name)	InvalidBoxName	400 Bad Request	3. Exceed maximum no. of box created	ExceedBox	400 bad request	4. Invalid Header ACL	InvalidHeaderACL	400 bad request	5. Invalid box location in header	InvalidBoxGridID	400 bad request
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5. Invalid box location in header	InvalidBoxGridID	400 bad request																																														

14. Box Web Services – create box (ID:1.1) (continued)

Web Service Name	create_box (ID : 1.1)	REST http method	PUT
REST Request Header	PUT / HTTP/1.1 Host: food.s.mygrid.asia Content-Length: 0 Date: Mon, 03 Mar 2008 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 112122334214:dsfdksfjdklsfjklfsfj-dsfd= <i>(access_id : signature)</i> x-pan-box-loc: HK0001 <i>(e.g. HK0001 represents HK NTT data center) (optional)</i> <i>(If not specify, use default grid)</i> x-pan-acl-list: PUBLIC-READ (optional. If not set, use default ACL) <i>(case-insensitive) (Only 1 public ACL can be set. i.e. PUBLIC-FULL or PUBLIC-READ. OWNER-ONLY is default)</i>		
REST Respond Header if success	HTTP/1.1 201 Created Date: Mon, 03 Mar 2008 12:00:00 GMT Content-Length: 112 Connection: close Content-Type: application/xml		
REST XML Expected Result	<?xml version="1.0" encoding="UTF-8" ?> <CreateBox> <HttpStatusCode> 201 </HttpStatusCode> (201 means "Created") </CreateBox>		

15. Box web service – delete_box (ID : 1.2)

Web Service Name	delete_box (ID : 1.2)	REST http method	DELETE																																							
Description	Delete the existing box. If there is any file inside the box, deletion will be rejected.																																									
REST example	http://food.s.mygrid.asia/																																									
Return Http Code if success	204 (No Content)																																									
Request Signature	Yes																																									
Anonymous access	No. Only owner of box can delete.																																									
Caution	The XML body may not be shown in some modules and frameworks if return status is 204. Thus checking success deletion is to check the http status code 204.																																									
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15. Box web service – delete_box (ID : 1.2) (continued)

Web Service Name	delete_box (ID : 1.2)	REST http method	DELETE
REST Request Header	DELETE / HTTP/1.1 Host: food.s.mygrid.asia Date: Mon, 03 Mar 2008 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 624206A:xQE0diMblRepdf3YB+FIEXAMPLE=		
REST Respond Header	HTTP/1.1 204 No Content Date: Wed, 01 Mar 2006 12:00:00 GMT Connection: close Content-Type: application/xml		
REST XML Expected Result	<?xml version="1.0" encoding="UTF-8" ?> (XML display or not depends on what program and module you use.) <DeleteBox> <HttpStatusCode> 204 </HttpStatusCode> (204 means "No Content" i.e. deleted) </DeleteBox>		

16. Box web service – list_all_box (ID : 1.3)

Web Service Name	list_all_box (ID : 1.3)	REST http method	GET																											
Description	Show all boxes of user																													
REST example	http://s.mygrid.asia/																													
Http Code if success	200 (OK)																													
Request Signature	Yes																													
Anonymous access	Not accept																													
Possible Error	General errors <table border="1"> <thead> <tr> <th>Error Description</th> <th>Error Code</th> <th>Http Status Code</th> </tr> </thead> <tbody> <tr> <td>1. Invalid Header format (not accepted format in this request. Format is different due to situation)</td> <td>InvalidHeader</td> <td>400 Bad Request</td> </tr> <tr> <td>2. Expired signature</td> <td>ExpiredSig</td> <td>400 Bad Request</td> </tr> <tr> <td>3. Fail Authentication</td> <td>FailAuth</td> <td>403 Forbidden</td> </tr> <tr> <td>4. Account problem or suspended</td> <td>ACPrb</td> <td>403 Forbidden</td> </tr> <tr> <td>5. Access deny. Problem encountered in the owner account of box or file.</td> <td>OwnerACPrb</td> <td>403 Forbidden</td> </tr> <tr> <td>6. Unsupported REST action e.g. HEAD not in BOX</td> <td>NoRestMethod</td> <td>405 Not allowed method</td> </tr> <tr> <td>7. Server unexpected error</td> <td>UnexpectedError</td> <td>500 Server error</td> </tr> <tr> <td>8. Service unavailable</td> <td>UnavailableService</td> <td>503 Service Unavailable</td> </tr> </tbody> </table>			Error Description	Error Code	Http Status Code	1. Invalid Header format (not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request	2. Expired signature	ExpiredSig	400 Bad Request	3. Fail Authentication	FailAuth	403 Forbidden	4. Account problem or suspended	ACPrb	403 Forbidden	5. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden	6. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method	7. Server unexpected error	UnexpectedError	500 Server error	8. Service unavailable	UnavailableService	503 Service Unavailable
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REST Request Header	GET / HTTP/1.1 Host: s.mygrid.asia Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 624206A:xQE0diMbLRepdf3YB+FIEXAMPLE=																													
REST Respond Header if success	Date: Mon, 03 Mar 2008 06:08:42 GMT Content-Length: 311 Connection: close Content-type: application/xml																													

16. Box web service – list_all_box (ID : 1.3) (continued)

Web Service Name	list_all_box (ID : 1.3)	REST http method	GET
REST XML Expected Result	<pre> <?xml version="1.0" encoding="UTF-8" ?> <MemberOwnedBox> <AccessID>12122324324324dafdsf</AccessID> <LoginName>ryangigg1234</LoginName> <NoOfBox>2</NoOfBox> <Boxes> <Box> <BoxName>fruit</BoxName> <BoxLocation>HK0001</BoxLocation> <BoxCreationDate>2008-10-30T09:06:23Z</BoxCreationDate> (ISO 8601 date format) </Box> <Box> <BoxName>Apple</BoxName> <BoxLocation>HK0002</BoxLocation> <BoxCreationDate>2008-10-30T09:06:23Z</BoxCreationDate> </Box> </Boxes> </MemberOwnedBox> </pre>		

17. Box web service – list_files_inbox (ID : 1.4)

Web Service Name	list_files_inbox (ID : 1.4)	REST http method	GET
Description	Show all files under a specified box.		
REST example	http://fruit.s.mygrid.asia/		
Http Code if success	200 (OK)		
Request Signature	Optional. Depends on ACL.		
Anonymous access	Accept if either PUBLIC-READ or PUBLIC-FULL is set.		
Possible Error	General errors		
	Error Description	Error Code	Http Status Code
	1. Invalid Header format (not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request
	2. Expired signature	ExpiredSig	400 Bad Request
	3. Fail Authentication	FailAuth	403 Forbidden
	4. Account problem or suspended	ACPrb	403 Forbidden
	5. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden
	6. No access right	AccessDeny	403 Forbidden
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	8. Server unexpected error	UnexpectedError	500 Server error
	9. Service unavailable	UnavailableService	503 Service Unavailable
	Conditional errors		
	Error Description	Error Code	Http Status Code
1. No such box	NoSuchBox	404 Bad Request	
REST Request Header	GET ?prefix=abc&pointer=1&max=10 HTTP/1.1 <i>(prefix, pointer and max are optional)</i> Host: fruit.s.mygrid.asia Date: Mon, 03 Mar 2008 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 624206A:xQE0diMbLRepdf3YB+FIEXAMPLE=		

17. Box web service – list_files_inbox (ID : 1.4) (continued)

Web Service Name	list_files_inbox (ID : 1.4)	REST http method	GET												
Extra parameters (3 are optional)	<p>There are 3 optional parameters supported in this function.</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>1. ?prefix</td> <td>set the file prefix</td> <td>http://food.s.mygrid.asia/?prefix=abc Search files under box, food. The file name should be starting with string "abc". (e.g. abcde and abcxx) If not assigned, show all records under box</td> </tr> <tr> <td>2. ?pointer</td> <td>set the searching record starting no.</td> <td>http://food.s.mygrid.asia/?pointer=10 Suppose there are 80 files under a box. Set "pointer" to 10 means that show the 10th file as starting record. If "pointer" is not assigned, default is 1</td> </tr> <tr> <td>3. ?max</td> <td>Set the maximum no. of display files</td> <td>http://food.s.mygrid.asia/?max=100 Avoid too many files record display in one time. Use "max" to control the no. of display records. If "max" is not assigned, a default no. of file will be displayed.</td> </tr> </tbody> </table> <p>In general, "pointer" and "max" are used together to do "paging" of file list. e.g. total 100 records in a box, food. Show the files in 5 pages. Each page shows 20 files. For first page, http://food.s.mygrid.asia/?pointer=1&max=20 (page 1) http://food.s.mygrid.asia/?pointer=21&max=20 (page 2) and so on.</p> <p>Suppose there are 3 files in a box. i.e. fruit/apple.jpg, fruit/orange.jpg and food/steak.jpg. By http://food.s.mygrid.asia/?prefix=fruit Only fruit/apple.jpg and fruit/orange.jpg are shown. It can simulate the "folder" concept in file system</p> <p>(* Aspen Cloud Storage has no "folder" concept but you can achieve it via this method).</p>			Parameter	Description	Example	1. ?prefix	set the file prefix	http://food.s.mygrid.asia/?prefix=abc Search files under box, food. The file name should be starting with string "abc". (e.g. abcde and abcxx) If not assigned, show all records under box	2. ?pointer	set the searching record starting no.	http://food.s.mygrid.asia/?pointer=10 Suppose there are 80 files under a box. Set "pointer" to 10 means that show the 10 th file as starting record. If "pointer" is not assigned, default is 1	3. ?max	Set the maximum no. of display files	http://food.s.mygrid.asia/?max=100 Avoid too many files record display in one time. Use "max" to control the no. of display records. If "max" is not assigned, a default no. of file will be displayed.
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REST Respond Header if success	<p>HTTP/1.1 200 OK</p> <p>Date: Mon, 03 Mar 2008 06:08:42 GMT</p> <p>Content-Length: 311</p> <p>Connection: close</p> <p>Content-Type: application/xml</p>														

17. Box web service – list_files_inbox (ID : 1.4) (continued)

Web Service Name	list_files_inbox (ID : 1.4)	REST http method	GET
REST XML Expected Result	<pre> <?xml version="1.0" encoding="UTF-8" ?> <FliesInBox> <BoxName>Fruit</BoxName> <BoxOwner> <BoxOwnerAccessID>1234566</OwnerAccessID> <BoxOwnerName>peterpan</OwnerName> </BoxOwner> <BoxLocations> <StorageLocation>TW0001</StorageLocation> (Grid ID) </BoxLocations> <OutputAttribute> <FilePrefixName>/abc</FilePrefixName> (Show * if not specify) <FilePointer>1</FilePointer> (This value is controlled by parameter, "pointer") <DisplayMaxNo>50</DisplayMaxNo> (This value is controlled by parameter, "max") <HasMoreRecord>YES</HasMoreRecord> (if there are more records to be shown, show YES) </OutputAttribute> <Files> <File> <FileName>Apple</FileName> <CreationDate>2008-02-16T10:18:22.000Z</CreationDate> <LastUpdateDate>2008-10-30T11:31:05Z</LastUpdateDate> <MD>dfkdsfjklldgfggh2324kjhkjfhgkjfd</MD> <FileSize>1023</FileSize> <FileOwner> <OwnerAccessID>1234566</OwnerAccessID> <OwnerName>peterpan</OwnerName> </FileOwner> </File> </Files> </FliesInBox > </pre>		

18. Box web service – get_box_location (ID : 1.5)

Web Service Name	get_box_location (ID : 1.5)	REST http method	GET																																				
Description	Get the box location. i.e. Grid																																						
REST example	http://fruit.s.mygrid.asia/?extra=location																																						
Parameter	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>?extra=location</td> <td>Show the box related grid</td> <td>http://food.s.mygrid.asia/?extra=location</td> </tr> </tbody> </table>			Parameter	Description	Example	?extra=location	Show the box related grid	http://food.s.mygrid.asia/?extra=location																														
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9. Service unavailable	UnavailableService	503 Service Unavailable																																					
Error Description	Error Code	Http Status Code																																					
1. No Such Box	NoSuchBox	404																																					

18. Box web service – get_box_location (ID : 1.5) (continued)

Web Service Name	get_box_location (ID : 1.5)	REST http method	GET
REST Request Header	GET /?extra=location HTTP/1.1 Host: fruit.s.mygrid.asia Date: Mon, 03 Mar 2008 06:08:42 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 624206A:xQE0diMbLRepdf3YB+FIEXAMPLE=		
REST Respond Header if success	HTTP/1.1 200 OK Date: Mon, 03 Mar 2008 06:08:42 GMT Content-Length: 311 Connection: Close Content-Type: application/xml		
REST XML Expected Result	<pre> <?xml version="1.0" encoding="UTF-8" ?> <BoxStorageLocations> <BoxName>Fruit</BoxName> <BoxLocations> <StorageLocation>TW0001</StorageLocation> </BoxLocations> </BoxStorageLocations> </pre>		

19. Box web service – get_box_acl (ID : 1.6)

Web Service Name	get_box_acl (ID : 1.6)	REST http method	GET																																				
Description	Get access control list (ACL) of the specified box																																						
REST example	http://fruit.s.mygrid.asia/?extra=access																																						
Extra Parameter	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>?extra=access</td> <td>Show the ACL of a box</td> <td>http://food.s.mygrid.asia/?extra=access</td> </tr> </tbody> </table>			Parameter	Description	Example	?extra=access	Show the ACL of a box	http://food.s.mygrid.asia/?extra=access																														
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Http Code if success	200 (OK)																																						
Request Signature	Optional. Depends on ACL.																																						
Anonymous access	Accept if either PUBLIC-READ or PUBLIC-FULL is set.																																						
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REST Request Header	GET ?extra=access HTTP/1.1 Host: fruit.s.mygrid.asia Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 624206fasdf23214e:4328934kfdsfds8f9ds8f9sd8fs																																						

19. Box web service – get_box_acl (ID : 1.6) (continued)

Web Service Name	get_box_acl (ID : 1.6)	REST http method	GET
REST Respond Header if success	HTTP/1.1 200 OK Date: Wed, 01 Mar 2006 12:00:00 GMT Content-Length: 185 Connection: close Connection-Type: application/xml		
REST XML Expected Result	<pre> <?xml version="1.0" encoding="UTF-8" ?> <AccessControlList> <Owner> <OwnerAccessID>12122324324324dafdsf</OwnerAccessID> <OwnerName>peterpan</OwnerName> </Owner> <ObjectAttribute> <ObjectType>BOX</ObjectType> <BoxUID>fdskfjdsklfjdsf</BoxUID> <ObjectName>Fruit</ObjectName> <PCode>fjsdfkljfdkjsfkdskfj</PCode> </ObjectAttribute> <ACL> <AccessList> <GrantedRight>PUBLIC-READ</GrantedRight> </AccessList> <AccessList> <GrantedRight>PUBLIC-FULL</GrantedRight> </AccessList> </ACL> </AccessControlList> </pre> <p>About <GrantRight> tag, study access right section.</p>		

20. Box web service – set_box_acl (ID : 1.7)

Web Service Name	set_box_acl (ID : 1.7)	REST http method	PUT																																										
Description	Set access control list of the specified box. The body of upload is the formatted XML ACL.																																												
REST example	http://fruit.s.mygrid.asia/?extra=access																																												
Extra Parameter	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>?extra=access</td> <td>ACL of a box</td> <td>http://food.s.mygrid.asia/?extra=access</td> </tr> </tbody> </table>			Parameter	Description	Example	?extra=access	ACL of a box	http://food.s.mygrid.asia/?extra=access																																				
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Request Signature	Yes																																												
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20. Box web service – set_box_acl (ID : 1.7) (continued)

Web Service Name	set_box_acl (ID : 1.7)	REST http method	PUT
REST Request Header	PUT /?extra=access HTTP/1.1 Host: fruit.s.mygrid.asia Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Content-Length: 409 Content-Type: text/plain Authorization: 624206fasdf23214e		
ACL Content in http body	<pre><?xml version="1.0" encoding="UTF-8" ?> <AccessControlList> <ACL> <AccessList> <GrantedRight>OWNER-ONLY</GrantedRight> </AccessList> <AccessList> <GrantedRight>PUBLIC-FULL</GrantedRight> </AccessList> <AccessList> <GrantedRight>PUBLIC-READ</GrantedRight> </AccessList> </ACL> </AccessControlList></pre> <p>Explanation :</p> <p>OWNER-ONLY is optional in the XML. If user not set it, it will be added automatically in Aspen Cloud Storage side because OWNER-ONLY is the compulsory access right in box and file.</p> <p>The access right such as OWNER-ONLY, PUBLIC-FULL, are case insensitive. User can pass with lower case.</p> <p>In above example, PUBLIC-FULL is duplicated entered. In server side, they are regarded as 1 record only.</p>		

20. Box web service – set_box_acl (ID : 1.7) (continued)

Web Service Name	set_box_acl (ID : 1.7)	REST http method	PUT
REST Respond Header if success	HTTP/1.1 201 Created Date: Wed, 01 Mar 2006 12:00:00 GMT Content-Length: 89 Connection: close Content-Type: application/xml		
REST XML Expected Result	<pre> <?xml version="1.0" encoding="UTF-8" ?> <SetBoxACL> <HttpStatusCode>201</HttpStatusCode> <i>(201 means success creation of ACL)</i> </SetBoxACL> </pre>		

21. Web Services List for File

File related functions

Function Name	Description	Example	http Method
2.1 upload_file	Upload a file	http://food.s.mygrid.asia/fruit/apple.jpg	PUT
2.2 delete_file	Delete a file	http://food.s.mygrid.asia/fruit/apple.jpg	DELETE
2.3 get_file_attribute	Get the file attribute	http://food.s.mygrid.asia/fruit/apple.jpg?extra=show	GET
2.4 get_file	Download the file	http://food.s.mygrid.asia/fruit/apple.jpg	GET
2.5 get_file_acl	Get access control list for specified file	http://food.s.mygrid.asia/fruit/apple.jpg?extra=access	GET
2.6 set_file_acl	Set access control list for specified file	http://food.s.mygrid.asia/fruit/apple.jpg?extra=access	PUT
2.7 file_rename	Rename a file in specified box	http://food.s.mygrid.asia/fruit/apple.jpg	PUT

* In above example, "food" is the box name and "fruit/apple.jpg" is the file name

22. File web service – upload_file (ID : 2.1)

Web Service Name	upload_file (ID : 2.1)	REST http method	PUT												
Description	Upload a file														
REST example	http://food.s.mygrid.asia/fruit/apple.jpg														
Http Code for Success	201 (Created)														
Request Signature	Optional. Depends on Box ACL.														
Anonymous user upload	Accept if box ACL is PUBLIC-FULL.														
Supported http header	<p>You can define your own http header nature for the upload file. Supported header in following.</p> <table border="1"> <thead> <tr> <th>Header Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Content-Type <i>(if not assign, use system default value)</i></td> <td>It indicates the type of entity body sent to the recipient. Example: suppose you upload a jpeg image and display in browser. You can specify "Content-Type: image/jpeg".If not assigned, default "binary/octet-stream" will be applied.</td> </tr> <tr> <td>Content-Disposition <i>(Optional)</i></td> <td>Proposed as a means for the origin server to suggest a default filename if the user requests that the content is saved to a file. Example : set the default download file name as "download.pdf"Content-Disposition: attachment; filename='download.pdf'</td> </tr> <tr> <td>Expires <i>(Optional)</i></td> <td>Set the resource expiry time. Time format in RFC2822 e.g. Thu, 01 Dec 1994 16:00:00 +0800 (HK time zone) . If set to "0", always be expired. If set to later date, not expire yet.</td> </tr> <tr> <td>Content-MD5 <i>(optional)</i></td> <td>User can provide a MD5 of the upload file. If provided, Aspen Cloud Storage will validate the upload file data.</td> </tr> <tr> <td>x-pan-acl-list <i>(optional)</i></td> <td>It is Aspen Cloud Storage defined header for setting the access right. Developer can set "PUBLIC-FULL" or "PUBLIC-READ". If you require setting complicated ACL, you should use web service, "set_file_acl" after upload. If not assigned, use default value i.e. "OWNER-ONLY"</td> </tr> </tbody> </table> <p>* Aspen Cloud Storage doesn't validate any incoming file nature header definition. Developer should validate before upload. (Example : User wrong type "Content-Type: Imag/jpeg) Aspen don't check image or image be correct one.</p>			Header Type	Description	Content-Type <i>(if not assign, use system default value)</i>	It indicates the type of entity body sent to the recipient. Example: suppose you upload a jpeg image and display in browser. You can specify "Content-Type: image/jpeg".If not assigned, default "binary/octet-stream" will be applied.	Content-Disposition <i>(Optional)</i>	Proposed as a means for the origin server to suggest a default filename if the user requests that the content is saved to a file. Example : set the default download file name as "download.pdf"Content-Disposition: attachment; filename='download.pdf'	Expires <i>(Optional)</i>	Set the resource expiry time. Time format in RFC2822 e.g. Thu, 01 Dec 1994 16:00:00 +0800 (HK time zone) . If set to "0", always be expired. If set to later date, not expire yet.	Content-MD5 <i>(optional)</i>	User can provide a MD5 of the upload file. If provided, Aspen Cloud Storage will validate the upload file data.	x-pan-acl-list <i>(optional)</i>	It is Aspen Cloud Storage defined header for setting the access right. Developer can set "PUBLIC-FULL" or "PUBLIC-READ". If you require setting complicated ACL, you should use web service, "set_file_acl" after upload. If not assigned, use default value i.e. "OWNER-ONLY"
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22. File web service – upload_file (ID : 2.1) (continued)

Web Service Name	upload_file (ID : 2.1)	REST http method	PUT
More about upload	<ol style="list-style-type: none"> <li data-bbox="475 472 1402 689">1. If “Content-Disposition” and “Content-Type” are assigned, the “Content-Disposition” is higher priority than setting “Content-Type”. e.g. set “Content-Disposition: attachment; filename='download.pdf' ” and also set “Content-Type: image/jpeg”. The file will be downloaded to user. Not display on user browser. <li data-bbox="475 712 1402 741">2. Regardless of header input even user assign incorrect http header of file. <li data-bbox="475 763 1402 842">3. For good programming habit, we strongly suggest user using url encode for the upload file name if it is foreign language. 		

22. File web service – upload_file (ID : 2.1) (continued)

Web Service Name	upload_file (ID : 2.1)	REST http method	PUT
Possible Error	General errors		
	Error Description	Error Code	Http Status Code
	1. Invalid Header format (not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request
	2. Expired signature	ExpiredSig	400 Bad Request
	3. Fail Authentication	FailAuth	403 Forbidden
	4. Account problem or suspended	ACPrb	403 Forbidden
	5. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden
	6. No access right	AccessDeny	403 Forbidden
	7. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method
	8. Server unexpected error	UnexpectedError	500 Server error
	9. Service unavailable	UnavailableService	503 Service Unavailable
	Conditional errors		
	Error Description	Error Code	Http Status Code
	1. Invalid file name (not acceptable file name)	InvalidFile	400 Bad Request
	2. Upload file error once check the message digest	FailMD	400 Bad Request
	3. File too big	FileTooBig	400 Bad Request
	4. Uploaded file size not match to content-length http header	IncorrectFileSize	400 Bad Request
	5. No Such Box	NoSuchBox	404
	6. Missed "Content-Length"	NoContentLen	411 length required
	7. File existing (duplicate file name)	DuplicateFile	409 Conflict
8. No file is uploaded.	NoUploadFile	400 Bad Request	
9. Too long file name.	TooLongFilename	400 Bad Request	
10. File name has too many slash character.	TooManySlashFileName	400 Bad Request	

22. File web service – upload_file (ID : 2.1) (continued)

Web Service Name	upload_file (ID : 2.1)	REST http method	PUT
REST Request Header	PUT /fruit/apple.jpg HTTP/1.1 Content-Length: 400 <i>(Size of upload file. It is not entered by developer)</i> Host: fruit.domain.com Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(RFC2822)</i> Authorization: 624206fasdf23214e:jgkldfjgkldfjgkdfjgkfgjklfdgjkfjgkdfjg Content-MD5: 15B4D3461F177 <i>(MD5 of uploaded file) (Optional)</i> Content-Disposition: attachment; filename="downloaded.pdf" <i>(Optional)</i> Content-Type: text/plain <i>(if not specify Content-Type, default is binary/octet-stream)</i> <i>(example of Content-Type. Content-type: application/pdf) (Optional)</i> x-pan-acl-list: PUBLIC-FULL <i>(optional. If not set, use default ACL. It is case insensitive.)</i> Expires: Thu, 01 Dec 1994 16:00:00 GMT <i>(Optional)</i>		
REST Respond Header if success	Date: Wed, 01 Mar 2006 12:00:00 GMT Content-Length: 103 ETag: "82dsfdfs8fdfsdfc9ac7f" Connection: close Content-Type: application/xml		
REST XML Expected Result	<pre><?xml version="1.0" encoding="UTF-8" ?> <UploadFile> <HttpStatusCode>201</HttpStatusCode> </UploadFile></pre>		

23. File web service – delete_file (ID : 2.2)

Web Service Name	delete_file (ID : 2.2)	REST http method	DELETE
Description	Delete a file under specified box		
REST example	http://food.s.mygrid.asia/fruit/apple.jpg		
Caution	If the file not exists in server, delete is not completed. http " 409 conflict" error and XML error message return.		
Http Code for Success	204 (No Content)		
Request Signature	Optional. Depends on file ACL.		
Anonymous access	Accept if PUBLIC-FULL is set on file.		
Caution	The XML body may not be shown in some modules and frameworks if return status is 204. Thus checking success deletion is to check the http status code 204.		
Possible Error	General errors		
	Error Description	Error Code	Http Status Code
	1. Invalid Header format (not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request
	2. Expired signature	ExpiredSig	400 Bad Request
	3. Fail Authentication	FailAuth	403 Forbidden
	4. Account problem or suspended	ACPrb	403 Forbidden
	5. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden
	6. No access right	AccessDeny	403 Forbidden
	7. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method
	8. Server unexpected error	UnexpectedError	500 Server error
	9. Server unexpected error	UnavailableService	503 Service Unavailable
	Conditional errors		
Error Description	Error Code	Http Status Code	
1. No Such Box	NoSuchBox	404	
2. No Such File	NoSuchFile	404	

23. File web service – delete_file (ID : 2.2) (continued)

Web Service Name	delete_file (ID : 2.2)	REST http method	DELETE
REST Request Header	DELETE /fruit/apple.jpg HTTP/1.0 Host: food.s.mygrid.asia Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: dsafdsf3254325rdfsafdd:3948kjkjdfklgkldfjgkldfgjklfdgjkldf		
REST Respond Header if delete successfully	HTTP/1.1 204 No Content Date: Wed, 01 Mar 2006 12:00:00 GMT Content-Length: 105 Connection: close Connection-Type: application/xml		
REST XML Expected Result	<pre><?xml version="1.0" encoding="UTF-8" ?> <DeleteFile> <HttpStatusCode>204</HttpStatusCode> </DeleteFile></pre> <p>This XML display or not depends on what framework or modules you used for http request. Some http request function will not shown the http body if code is 204.</p>		

24. File web service – get_file_attribute (ID : 2.3)

Web Service Name	get_file_attribute (ID : 2.3)	REST http method	GET																																							
Description	Get the file attribute including creation time and so on.																																									
REST example	http://food.s.mygrid.asia/fruit/apple.jpg?extra=show																																									
Extra Parameter	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>?extra=show</td> <td>Only output the file attribute in XML format.</td> <td>http://food.s.mygrid.asia/fruit/apple.jpg?extra=show</td> </tr> </tbody> </table>			Parameter	Description	Example	?extra=show	Only output the file attribute in XML format.	http://food.s.mygrid.asia/fruit/apple.jpg?extra=show																																	
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2. No such file	NoSuchFile	404																																								

24. File web service – get_file_attribute (ID : 2.3) (continued)

REST Request Header	GET /fruit/apple.jpg?extra=show HTTP/1.1 Host: food.s.mygrid.asia Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 15B4D3461F177:kdfjksdlfjkl sdfjsdklfjsdklfjsdklfj
REST Respond Header if success	HTTP/1.1 200 OK Date: Wed, 01 Mar 2006 12:00:00 GMT Content-Length: 50012 Connection: close Content-Type: application/xml
REST XML Expected Result	<?xml version="1.0" encoding="UTF-8" ?> <FileAttribute> <FileOwner> <OwnerAccessID>1234566</OwnerAccessID> <OwnerName>Peter Pan</OwnerName></FileOwner> <Nature> <FileName>Fruit</FileName> <MD>dfsfkjkl23j5rr4k5rtjr4ew</MD> <FileSize>3432434</FileSize> <ContentDisposition>attachment; filename="downloaded.pdf" </ContentDisposition> <ContentType>text/plain</ContentType> <Expires>Thu, 01 Dec 1994 16:00:00 GMT</Expires> <CreationDate>2008-03-01 14:55:10</CreationDate> <LastUpdateDate>2008-04-06 21:51:00</LastUpdateDate> <i>(LastUpdateDate fields was added in 2008/10/27. File uploaded before this date is no this field.)</i> </Nature> <RelatedBox> <BoxName>fruit</BoxName> <BoxLocations> <StorageLocation>HK0001</StorageLocation> </BoxLocations> </RelatedBox> </FileAttribute>

25. File web service – get_file (ID : 2.4)

Web Service Name	get_file (ID : 2.4)	REST http method	GET
Description	Get the file including download or display of the resource.		
REST example	http://food.s.mygrid.asia/fruit/apple.jpg		
Http Code for Success	200 for whole file download. 206 for partial content.		
Request Signature	Optional. Depends on file ACL.		
Anonymous access	Accept if either PUBLIC-READ or PUBLIC-FULL is set to file.		
More about respond header	<p><i>Content-Type</i>, <i>Content-Disposition</i>, and <i>Expires</i> were defined once file is uploaded.</p> <p>Now, it only shows the pre-defined headers to user directly without any modification.</p>		

25. File web service – get_file (ID : 2.4) (continued)

Web Service Name	get_file (ID : 2.4)	REST http method	GET
Possible Error	Common errors		
	Error Description	Error Code	Http Status Code
	1. Invalid Header format (not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request
	2. Expired signature	ExpiredSig	400 Bad Request
	3. Fail Authentication	FailAuth	403 Forbidden
	4. Account problem or suspended	ACPrb	403 Forbidden
	5. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden
	6. No access right	AccessDeny	403 Forbidden
	7. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method
	8. Incorrect assign Range value for partial download	IncorrectRange	416 Requested Range Not Satisfiable
	9. Server unexpected error	UnexpectedError	500 Server error
	10. Service unavailable	UnavailableService	503 Service Unavailable
	Conditional errors		
	Error Description	Error Code	Http Status Code
	1. File not modified. (If-None-Match and If-Modified-Since headers)	FileNotModified	304 Not Modified
	2. No Such Box	NoSuchBox	404
	3. No such file	NoSuchFile	404
	4. Both ETag are not same. (If-Match)	FilesEtagNotMatch	412 Precondition Failed
	5. Conflict headers (for all Conditional headers)	ConflictHeaders	412 Precondition Failed
	6. Incorrect time format (If-Modified- Since and If-Unmodified-Since headers)	IncorrectTimeForm at	412 Precondition Failed
7. File modified (If-Unmodified-Since headers)	FileModified	412 Precondition Failed	

25. File web service – get_file (ID : 2.4) (continued)

Web Service Name	get_file (ID : 2.4)	REST http method	GET
REST Request Header	<p>GET /fruit/apple.jpg HTTP/1.1</p> <p>Host: food.s.mygrid.asia</p> <p>Date: Wed, 01 Mar 2006 12:00:00 +0800</p> <p><i>(or passing x-pan-date instead of Date)</i></p> <p>Authorization: 15B4D3461F177 <i>(only for private data)</i></p> <p>Range: 0-1000</p> <p><i>(Optional. Support partial Download. See details in following area.)</i></p> <p>or</p> <p>Range: 1000 <i>(Download from byte 1000 to end of file)</i></p> <p>Conditional headers (Following are optional conditional headers)</p> <p>If-Match: dskfjdsklfjsdklfj243rdfsksjdfkdsjf</p> <p>If-None-Match: jfkldsfsjkdlsfjksdlfjksdlfjksdlfjksdfffj</p> <p>If-Modified-Since: Thu, 23 Oct 2008 19:00:39 GMT</p> <p>If-Unmodified-Since: Thu, 23 Oct 2008 19:00:39 GMT</p>		

25. File web service – get_file (ID : 2.4) (continued)

Web Service Name	get_file (ID : 2.4)	REST http method	GET																								
More on “Range” header	<p>Aspen supports partial download by specified byte range of the download file. Developer can utilize it for concurrent multi-download o a file for speedup or resumes download implementation in client side.</p> <p>Supported format</p> <table border="1"> <thead> <tr> <th>Range Format</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1. Range: [start_byte]-[end_byte]</td> <td>Get file from [start_byte] to [end_byte]</td> </tr> <tr> <td>2. Range: [start_byte]</td> <td>Get file from [start_byte] to end of file</td> </tr> </tbody> </table> <p>The range header value should fit in following rules.</p> <table border="1"> <thead> <tr> <th>Rules</th> </tr> </thead> <tbody> <tr> <td>1. First byte of file is from 0 to [size of file – 1]. e.g. size 1200Byte file is from 0 to 1199.</td> </tr> <tr> <td>2. First byte must be 0 or positive integer value.</td> </tr> <tr> <td>3. First byte can't greater than the [size of file – 1]</td> </tr> <tr> <td>4. start_byte can't be greater than the end_byte</td> </tr> <tr> <td>5. end_byte can be absent.</td> </tr> <tr> <td>6. end_byte must be presented in positive integer.</td> </tr> <tr> <td>7. end_byte can be greater than the actual size of file. If exceeds, Aspen will assume end_byte equal to[size of file – 1]</td> </tr> </tbody> </table> <p>Examples : Suppose to download a file (size : 12000Bytes)</p> <table border="1"> <thead> <tr> <th>Supported Range Format</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1. 0-10000</td> <td>Get file from first byte 0 byte 10000 (total 10000 bytes)</td> </tr> <tr> <td>2. 1000-8000</td> <td>Get file from byte 1000 to byte 8001 (total 7001 bytes)</td> </tr> <tr> <td>3. 1000-2000000</td> <td>2000000 is greater than actual file size so the file will be get from byte 1000 to byte 12000. Not 2000000.</td> </tr> <tr> <td>4. 1000-100</td> <td>Cause 416 error</td> </tr> </tbody> </table>			Range Format	Description	1. Range: [start_byte]-[end_byte]	Get file from [start_byte] to [end_byte]	2. Range: [start_byte]	Get file from [start_byte] to end of file	Rules	1. First byte of file is from 0 to [size of file – 1]. e.g. size 1200Byte file is from 0 to 1199.	2. First byte must be 0 or positive integer value.	3. First byte can't greater than the [size of file – 1]	4. start_byte can't be greater than the end_byte	5. end_byte can be absent.	6. end_byte must be presented in positive integer.	7. end_byte can be greater than the actual size of file. If exceeds, Aspen will assume end_byte equal to[size of file – 1]	Supported Range Format	Description	1. 0-10000	Get file from first byte 0 byte 10000 (total 10000 bytes)	2. 1000-8000	Get file from byte 1000 to byte 8001 (total 7001 bytes)	3. 1000-2000000	2000000 is greater than actual file size so the file will be get from byte 1000 to byte 12000. Not 2000000.	4. 1000-100	Cause 416 error
Range Format	Description																										
1. Range: [start_byte]-[end_byte]	Get file from [start_byte] to [end_byte]																										
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Supported Range Format	Description																										
1. 0-10000	Get file from first byte 0 byte 10000 (total 10000 bytes)																										
2. 1000-8000	Get file from byte 1000 to byte 8001 (total 7001 bytes)																										
3. 1000-2000000	2000000 is greater than actual file size so the file will be get from byte 1000 to byte 12000. Not 2000000.																										
4. 1000-100	Cause 416 error																										

25. File web service – get_file (ID : 2.4) (continued)

Web Service Name	get_file (ID : 2.4)	REST http method	GET	
More on Conditional Headers	Http Headers	Description	Example	Status Code
	If-Match	Get file if the passing ETag (MD5 of file) is same to the existing file ETag. This header can't be used with other conditional headers except of <i>If-Unmodified-Since</i> .	If-Match: adsfjkfjhjhj234 h3jkhk	412
	If-None-Match	Get file if the passing ETag is NOT same to the existing file ETag. This header can't be used with other conditional headers except of <i>If-Modified-Since</i> .	If-None-Match : fdklsfjkjki4545 j3	304
	If-Modified-Since	Get file if the file was modified since the specified date This header can't be used with other conditional headers except of <i>If-None-Match</i> .	If-Modified-Since: Thu, 23 Oct 2008 19:00:39 GMT	304
	If-Unmodified-Since	Get file if the file was NOT modified since the specified date. This header can't be used with other conditional headers except of <i>If-Match</i> .	If-Unmodified-Since: Thu, 23 Oct 2008 19:00:39 GMT	412

25. File web service – get_file (ID : 2.4) (continued)

Web Service Name	get_file (ID : 2.4)	REST http method	GET
REST Respond Header if success	HTTP/1.1 200 OK Date: Wed, 01 Mar 2006 12:00:00 GMT Last-Modified: Sun, 1 Jan 2008 12:00:00 GMT ETag: "82dsdfsdfs8dfsdfsf9ac7f" Content-Type: text/plain <i>(It was defined via http header once file was uploaded)</i> Content-Disposition: attachment; filename="downloaded.pdf" <i>(This header is optional displayed based on whether user defined during upload)</i> Content-Length: 50012 Connection: close Expires: Thu, 01 Dec 1994 16:00:00 GMT <i>(Optional display header. Depends on upload header)</i> Content-Range: bytes 0-50011/50012 <i>(Partial Download. It also show the total size of file)</i>		

26. File web service – get_file_acl (ID : 2.5)

Web Service Name	get_file_acl (ID : 2.5)	REST http method	GET																																							
Description	Get access control list (ACL) of the specified file																																									
REST example	http://food.s.mygrid.asia/fruit/apple.jpg?extra=access																																									
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26. File web service – get_file_acl (ID : 2.5) (continued)

Web Service Name	get_file_acl (ID : 2.5)	REST http method	GET
REST Request Header	GET /fruit/apple.jpg?extra=access HTTP/1.1 Host: food.s.mygrid.asia Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 624206fasdf23214e:fdjskfjdsklfjsdkslfjsdklfjkljsdfjkljsdfjkljsdf		
REST Respond Header if success	HTTP/1.1 200 OK Date: Wed, 01 Mar 2006 12:00:00 GMT Content-Length: 112 Connection: close Content-Type: application/xml		
REST XML Expected Result	<pre> <?xml version="1.0" encoding="UTF-8" ?> <AccessControlList> <Owner> <OwnerAccessID>12122324324324dafdsf</OwnerAccessID> <OwnerName>Peter Pan</OwnerName> </Owner> <ObjectAttribute> <ObjectType>FILE</ObjectType> <BoxUID>49328490348902384</BoxUID> <ObjectName>Fruit</ObjectName> <FileUID>f98908908989fdd</FileUID> <PCode>fjsdfkljfdkjsfkdsfj</PCode> </ObjectAttribute> <ACL> <AccessList> <GrantedRight>PUBLIC-READ</GrantedRight> </AccessList> <AccessList> <GrantedRight>PUBLIC-FULL</GrantedRight> </AccessList> </ACL> </AccessControlList> </pre>		

27. File web service – set_file_acl (ID : 2.6)

Web Service Name	set_file_acl (ID : 2.6)	REST http method	PUT																																													
Description	Set access control list (ACL) for specified file.																																															
REST example	http://food.s.mygrid.asia/fruit/apple.jpg?extra=access																																															
Extra Parameter	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>?extra=access</td> <td>Set the ACL of specified file in XML</td> <td>http://food.s.mygrid.asia/fruit/apple.jpg?extra=access</td> </tr> </tbody> </table>			Parameter	Description	Example	?extra=access	Set the ACL of specified file in XML	http://food.s.mygrid.asia/fruit/apple.jpg?extra=access																																							
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?extra=access	Set the ACL of specified file in XML	http://food.s.mygrid.asia/fruit/apple.jpg?extra=access																																														
Http Code if success	201 (Created)																																															
Request Signature	Yes																																															
Anonymous access	No. Only owner of file can set ACL.																																															
Possible Error	<p>Common errors</p> <table border="1"> <thead> <tr> <th>Error Description</th> <th>Error Code</th> <th>Http Status Code</th> </tr> </thead> <tbody> <tr> <td>1. Invalid Header format (not accepted format in this request. Format is different due to situation)</td> <td>InvalidHeader</td> <td>400 Bad Request</td> </tr> <tr> <td>2. Expired signature</td> <td>ExpiredSig</td> <td>400 Bad Request</td> </tr> <tr> <td>3. Fail Authentication</td> <td>FailAuth</td> <td>403 Forbidden</td> </tr> <tr> <td>4. Account problem or suspended</td> <td>ACPrb</td> <td>403 Forbidden</td> </tr> <tr> <td>5. Access deny. Problem encountered in the owner account of box or file.</td> <td>OwnerACPrb</td> <td>403 Forbidden</td> </tr> <tr> <td>6. No access right</td> <td>AccessDeny</td> <td>403 Forbidden</td> </tr> <tr> <td>7. Unsupported REST action e.g. HEAD not in BOX</td> <td>NoRestMethod</td> <td>405 Not allowed method</td> </tr> <tr> <td>8. Server unexpected error</td> <td>UnexpectedError</td> <td>500 Server error</td> </tr> <tr> <td>9. Service unavailable</td> <td>UnavailableService</td> <td>503 Service Unavailable</td> </tr> </tbody> </table> <p>Conditional errors</p> <table border="1"> <thead> <tr> <th>Error Description</th> <th>Error Code</th> <th>Http Status Code</th> </tr> </thead> <tbody> <tr> <td>1. No Such Box</td> <td>NoSuchBox</td> <td>404</td> </tr> <tr> <td>2. No Such File</td> <td>NoSuchFile</td> <td>404</td> </tr> <tr> <td>3. Incorrect box ACL format</td> <td>IncorrectBoxACL</td> <td>400 Bad Request</td> </tr> <tr> <td>4. Incorrect box ACL content</td> <td>IncorrectBoxACLContent</td> <td>400 Bad Request</td> </tr> </tbody> </table>			Error Description	Error Code	Http Status Code	1. Invalid Header format (not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request	2. Expired signature	ExpiredSig	400 Bad Request	3. Fail Authentication	FailAuth	403 Forbidden	4. Account problem or suspended	ACPrb	403 Forbidden	5. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden	6. No access right	AccessDeny	403 Forbidden	7. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method	8. Server unexpected error	UnexpectedError	500 Server error	9. Service unavailable	UnavailableService	503 Service Unavailable	Error Description	Error Code	Http Status Code	1. No Such Box	NoSuchBox	404	2. No Such File	NoSuchFile	404	3. Incorrect box ACL format	IncorrectBoxACL	400 Bad Request	4. Incorrect box ACL content	IncorrectBoxACLContent	400 Bad Request
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4. Incorrect box ACL content	IncorrectBoxACLContent	400 Bad Request																																														

27. File web service – set_file_acl (ID : 2.6) (continued)

Web Service Name	set_file_acl (ID : 2.6)	REST http method	PUT
REST Request Header	PUT fruit/apple.jpg?extra=access HTTP/1.1 Host: food.s.mygrid.asia Content-Length: 40 Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 624206fasdf23214e:fkjfkfjgfklsdfjgkfsdkgfjsdklfjsdklfjsdkfjkl		
ACL Content	<pre> <?xml version="1.0" encoding="UTF-8" ?> <AccessControllist> <ACL> <AccessList> <GrantedRight>OWNER-ONLY</GrantedRight> </AccessList> <AccessList> <GrantedRight>PUBLIC-READ</GrantedRight> </AccessList> <AccessList> <GrantedRight>PUBLIC-FULL</GrantedRight> </AccessList> <AccessList> <GrantedRight>PUBLIC-FULL</GrantedRight> </AccessList> </ACL> </AccessControllist> </pre> <p>Explanation :</p> <p>OWNER-ONLY is optional in the XML. If user not set it, it will be added automatically in Aspen Cloud Storage side because OWNER-ONLY is the compulsory access right in box and file.</p> <p>The access right such as OWNER-ONLY, PUBLIC-FULL, are case insensitive. User can pass with lower case.</p> <p>In above example, PUBLIC-FULL is duplicated entered. In server side, they are regarded as 1 record only.</p>		

27. File web service – set_file_acl (ID : 2.6) (continued)

Web Service Name	set_file_acl (ID : 2.6)	REST http method	PUT
REST Respond Header if success	HTTP/1.1 200 OK Date: Wed, 01 Mar 2006 12:00:00 GMT Content-Type: application/xml Content-Length: 112 Connection: close		
REST XML Expected Result	<pre><?xml version="1.0" encoding="UTF-8" ?> <SetFileACL> <HttpStatusCode>201</HttpStatusCode> </SetFileACL></pre>		

28. File web service – rename_file (ID : 2.7)

Web Service Name	rename_file (ID : 2.7)	REST http method	PUT
Description	Rename a file in specified box		
REST example	http://food.s.mygrid.asia/fruit/apple.jpg		
Http Code if success	201 (Created)		
Request Signature	Optional. Depends on File ACL.		
Anonymous access	Accept if file ACL is PUBLIC-FULL.		
Possible Error	Common errors		
	Error Description	Error Code	Http Status Code
	1. Invalid Header format (not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request
	2. Expired signature	ExpiredSig	400 Bad Request
	3. Fail Authentication	FailAuth	403 Forbidden
	4. Account problem or suspended	ACPrb	403 Forbidden
	5. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden
	6. No access right	AccessDeny	403 Forbidden
	7. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method
	8. Server unexpected error	UnexpectedError	500 Server error
9. Service unavailable	UnavailableService	503 Service Unavailable	

28. File web service – rename_file (ID : 2.7) (continued)

Web Service Name	rename_file (ID : 2.7)	REST http method	PUT
Possible Error	Conditional errors		
	Error Description	Error Code	Http Status Code
	1. File not modified. (If-None-Match and If-Modified-Since headers)	FileNotModified	304 Not Modified
	2. Too long file name	TooLongFilename	400 Bad Request
	3. Invalid file name	InvalidFile	400 Bad Request
	4. File name has too many slash character.	TooManySlashFileName	400 Bad Request
	5. No Such Box	NoSuchBox	404
	6. The source file not exists	NoSourceFile	404
	7. Both ETag are not same. (If-Match)	FilesEtagNotMatch	412 Precondition Failed
	8. Conflict headers (for all Conditional headers)	ConflictHeaders	412 Precondition Failed
	9. Incorrect time format (If-Modified-Since and If-Unmodified-Since headers)	IncorrectTimeFormat	412 Precondition Failed
	10. File modified (If-Unmodified-Since headers)	FileModified	412 Precondition Failed
11. The target file name exists.	DuplicateTargetFilename	412 Precondition Failed	

28. File web service – rename_file (ID : 2.7) (continued)

Supported Conditional Headers	Http Headers	Description	Example	Status Code
	1.If-Match	File rename will be done if the passing ETag (MD5 of file) is same to the existing file ETag. This header can't be used with other conditional headers except of <i>If-Unmodified-Since</i> .	If-Match: adsfjkfjhjhj234h 3jkhk	412
	2.If-None-Match	File rename will be done if the passing ETag is NOT same to the existing file ETag. This header can't be used with other conditional headers except of <i>If-Modified-Since</i> .	If-None-Match: fdklsfjkjkj4545j3	304
	3.If-Modified-Since	File rename will be done if the file was modified since the specified date This header can't be used with other conditional headers except of <i>If-None-Match</i> .	If-Modified-Since: Thu, 23 Oct 2008 19:00:39 GMT	304
	4.If-Unmodified-Since	File rename will be done if the file was NOT modified since the specified date. This header can't be used with other conditional headers except of <i>If-Match</i> .	If-Unmodified-Since: Thu, 23 Oct 2008 19:00:39 GMT	412

28. File web service – rename_file (ID : 2.7) (continued)

Web Service Name	rename_file (ID : 2.7)	REST http method	PUT
Target file name header (x-pan-target-filename)	<p><i>x-pan-target-filename</i> is header for target file name which you want rename to. The filename should be MIME base64 encoded before passing.</p> <p>e.g. The target file name is <i>apple.dat</i>. After base64 encoded, the file name should be <i>YXBwbGUuZGF0</i>.</p> <p>i.e. x-pan-target-filename: YXBwbGUuZGF0</p>		
REST Request Header	<p>PUT /orange.jpg HTTP/1.1</p> <p>Host: fruit.domain.com</p> <p>Date: Wed, 01 Mar 2006 12:00:00 GMT</p> <p>Authorization: 624206fasdf23214e</p> <p>x-pan-target-filename: YXBwbGUuZGF0</p> <p>(file name should be encoded in MIME base64)</p> <p>Conditional headers (Following are optional conditional headers)</p> <p>If-Match: dskfjdsklfjsdklfj243rdfsksjdfkdsjf</p> <p>If-None-Match: jfkldsfjkdlsfjksdlfjksdlfjkdlsfjksdffj</p> <p>If-Modified-Since: Thu, 23 Oct 2008 19:00:39 GMT</p> <p>If-Unmodified-Since: Thu, 23 Oct 2008 19:00:39 GMT</p>		
REST Respond Header if success	<p>Date: Wed, 01 Mar 2006 12:00:00 GMT</p> <p>Server: PAN-Storage-Server</p> <p>Content-Length: 103</p> <p>Connection: close</p> <p>Content-Type: application/xml</p>		
REST XML Expected Result	<pre><?xml version="1.0" encoding="UTF-8" ?> <RenameFile> <HttpStatusCode>201</HttpStatusCode> </RenameFile></pre>		

29. Web Services List (Other Service)

Other functions

Function Name	Description	Example	http Method
3.1 get_all_grids	Get all available grids in Aspen Cloud worldwide	http://s.mygrid.asia/?extra=grid	GET

30. Other web service – get_all_grids (ID : 3.1)

Web Service Name	get_all_grids (ID : 3.1)	REST http method	GET																								
Description	Get all available grids in Aspen Cloud worldwide.																										
REST example	http://s.mygrid.asia/?extra=grid																										
Extra Parameter	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>?extra=grid</td> <td>Get available grids in XML format.</td> <td>http://s.mygrid.asia/?extra=access</td> </tr> </tbody> </table>			Parameter	Description	Example	?extra=grid	Get available grids in XML format.	http://s.mygrid.asia/?extra=access																		
Parameter	Description	Example																									
?extra=grid	Get available grids in XML format.	http://s.mygrid.asia/?extra=access																									
Http Code if success	200 (OK)																										
Request Signature	Yes																										
Anonymous access	No																										
Possible Error	<p>Common errors</p> <table border="1"> <thead> <tr> <th>Error Description</th> <th>Error Code</th> <th>Http Status Code</th> </tr> </thead> <tbody> <tr> <td>1. Invalid Header format (not accepted format in this request. Format is different due to situation)</td> <td>InvalidHeader</td> <td>400 Bad Request</td> </tr> <tr> <td>2. Expired signature</td> <td>ExpiredSig</td> <td>400 Bad Request</td> </tr> <tr> <td>3. Fail Authentication</td> <td>FailAuth</td> <td>403 Forbidden</td> </tr> <tr> <td>4. Account problem or suspended</td> <td>ACPrb</td> <td>403 Forbidden</td> </tr> <tr> <td>5. Unsupported REST action e.g. HEAD not in BOX</td> <td>NoRestMethod</td> <td>405 Not allowed method</td> </tr> <tr> <td>6. Server unexpected error</td> <td>UnexpectedError</td> <td>500 Server error</td> </tr> <tr> <td>7. Service unavailable</td> <td>UnavailableService</td> <td>503 Service Unavailable</td> </tr> </tbody> </table>			Error Description	Error Code	Http Status Code	1. Invalid Header format (not accepted format in this request. Format is different due to situation)	InvalidHeader	400 Bad Request	2. Expired signature	ExpiredSig	400 Bad Request	3. Fail Authentication	FailAuth	403 Forbidden	4. Account problem or suspended	ACPrb	403 Forbidden	5. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method	6. Server unexpected error	UnexpectedError	500 Server error	7. Service unavailable	UnavailableService	503 Service Unavailable
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6. Server unexpected error	UnexpectedError	500 Server error																									
7. Service unavailable	UnavailableService	503 Service Unavailable																									
REST Request Header	GET ?extra=grid HTTP/1.1 Host: s.mygrid.asia Date: Wed, 01 Mar 2006 12:00:00 +0800 <i>(or passing x-pan-date instead of Date)</i> Authorization: 624206fasdf23214e:fkjfkfjgfklsdfjgkfsdgsdglfjsdklfjsdklfjkl																										

30. Other web service – get_all_grids (ID : 3.1) (continued)

Web Service Name	get_all_grids (ID : 3.1)	REST http method	GET
REST Respond Header if success	HTTP/1.1 200 OK Date: Wed, 01 Mar 2006 12:00:00 GMT Content-Type: application/xml Content-Length: 112 Connection: close		
REST XML Expected Result	<pre data-bbox="486 712 949 1220"> <?xml version="1.0" encoding="UTF-8" ?> <GridList> <AvailableGrid> <LocationID>HK00001</LocationID> <LocDesc>Hong Kong</LocDesc> </AvailableGrid> <AvailableGrid> <LocationID>CN00001</LocationID> <LocDesc>China</LocDesc> </AvailableGrid> </GridList> </pre> <p data-bbox="486 1288 1380 1512"> Explanation : LocationID is very important field to all developers for box creation. If you want to create a box in Hong Kong. You should assign HK0001 once create box. If you want to create box in China. You should assign CN00001 once create box. LocDesc is the English description of the location ID. </p>		

31. Error Handling

In Aspen Cloud Storage, it returns the error in XML format and takes advantages of http status code.

By http status code is a well known method to understand the return status after calling service. e.g. Return 201 if success creation of box. The advantage of status code is simple. Developer only take care the return status code and know success or not.

Besides, Aspen Cloud Storage also returns the error in XML format. If you require more details about your failure call, you can refer to the XML content.

The XML error message is English.

Following are the sample returned XML format.

http header sample :

```
Date: Mon, 03 Mar 2008 06:08:42 GMT
Content-Type: application/xml
Content-Length: 112
Connection: close
```

XML Body sample :

```
<Error>
  <ErrorCode>InvalidBoxName</ErrorCode>
  <ErrorMessage>Invalid box name</ErrorMessage>
  <AccessResource>food</AccessResource>
  <HttpStatusCode>400</HttpStatusCode>
  (The http status code also be shown in XML)
</Error>
```

In general case, the responded http header and body are similar to above sample. Under special condition, more http header and content will be returned.

31. Error Handling (continued)

Error Description	Error Code	Http Status Code	Related Functions
1. Invalid Header format (not accepted format in this request. Format is different due to situation)	vnvalidHeader	400 Bad Request	All APIs
2. Expired signature	ExpiredSig	400 Bad Request	All APIs
3. Invalid box name (not acceptable box name)	InvalidBoxName	400 Bad Request	1.1
4. Exceed maximum no. of box created	ExceedBox	400 Bad Request	1.1
5. Invalid file name (not acceptable file name)	InvalidFile	400 Bad Request	2.1
6. Too long file name.	TooLongFilename	400 Bad Request	2.1
7. Upload file error once check the message digest	FailMD	400 Bad Request	2.1
8. File too big	FileTooBig	400 Bad Request	2.1
9. Uploaded file size not match to contet-length http header	IncorrectFileSize	400 Bad Request	2.1
10. Incorrect box/file ACL format	IncorrectACL	400 Bad Request	1.7, 2.6
11. Incorrect box/file ACL content	IncorrectACLContent	400 Bad Request	1.7, 2.6
12. Incorrect box/file name (The passing ACL box/file name not same to the host)	IncorrectACLContentObjectName	400 Bad Request	1.7, 2.6
13. Invalid ACL header	InvalidHeaderACL	400 Bad Request	1.1
14. Invalid Box location in header	InvalidBoxGridID	400 Bad Request	1.1
15. Only 1 file can be uploaded in 1 POST form.	OnlyOneInPost	400 Bad Request	POST upload
16. Upload file size is too big	PostFileTooBig	400 Bad Request	POST upload
17. File name has too many slash	TooManySlashFileName	400 Bad Request	2.1, 2.7
18. Fail Authentication	FailAuth	403 Forbidden	All APIs
19. Account problem or suspended	ACPrb	403 Forbidden	All APIs
20. Access deny. Problem encountered in the owner account of box or file.	OwnerACPrb	403 Forbidden	All APIs

31. Error Handling (continued)

Following is the error code summary table.

Error Description	Error Code	Http Status Code	Related Functions
21. No access right	AccessDeny	403 Forbidden	All APIs
22. No Such Box	NoSuchBox	404	All APIs
23. No Such File	NoSuchFile	404	2.2, 2.3, 2.4, 2.5, 2.6
24. The source file not exists	NoSourceFile	404	2.7
25. Unsupported REST action e.g. HEAD not in BOX	NoRestMethod	405 Not allowed method	All APIs
26. Duplicated file	DuplicateFile	409 Conflict	2.1
27. Duplicate box	DuplicateBox	409 Conflict	1.1
28. Not empty box	NotEmptyBox	409 Conflict	1.2
29. Both ETag are not same. (If-Match)	FilesEtagNotMatch	412 Precondition Failed	2.4, 2.7
30. Conflict headers (for all Conditional headers)	ConflictHeaders	412 Precondition Failed	2.4, 2.7
31. Incorrect time format (If-Modified-Since and If-Unmodified-Since headers)	IncorrectTimeFormat	412 Precondition Failed	2.4, 2.7
32. File modified (If-Unmodified-Since headers)	FileModified	412 Precondition Failed	2.4, 2.7
33. The target file name exists.	DuplicateTargetFilename	412 Precondition Failed	2.7
34. Missed "Content-Length"	NoContentLen	411 length required	2.1
35. Incorrect assign Range value for partial download	IncorrectRange	416 Requested Range Not Satisfiable	2.4
36. Server unexpected error	UnexpectedError	500 Server error	All APIs
37. Server service unavailable	UnavailableService	503 Service Unavailable	All APIs

32. File Upload by HTTP Form Post

Introduction

Except HTTP PUT method, Aspen Cloud storage also supports HTTP form POST method.

HTTP POST method is simple and efficient way for file transfer. It reduces the upload file time and cost.

Difference between PUT and POST method

PUT method	POST method
Not a direct upload method.	Direct upload method.
File should upload to your web server and then further upload from your web server to Aspen Cloud Server.	File is uploaded from client to Aspen Cloud Server directly.

Regulation of POST method.

	Description
1	Maximum upload size by POST method is 300MB. Not Same to PUT method.
2	Length of file name is same to PUT method.
3	Should assign a box name for upload.
4	Only 1 file can be uploaded in same time. i.e. one file is submitted in POST form.

How To Setup HTTP Form

For using HTTP form POST, developer must follow Aspen Cloud Storage reserved field name. e.g. access_id, signature, and request_expiration_datetime.

Example :

```

<html>
  <head>
    <title>Test</title>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
  </head>
  <body>
    <form name="frm" enctype="multipart/form-data" action="http://boxhk.s.mygrid.asia/myfile.dat" method="post">
      Optional Fields<BR>
      ACL : <input type="text" name="acl_list"><BR>
      MD5 : <input type="text" name="md5"><BR>
      Content-Type : <input type="text" name="content_type"><BR>
      Content-Disposition : <input type="text" name="content_disposition"><BR>
      File Expiry Date Time : <input type="text" name="file_expiry_datetime"><BR>
      Success redirect URL : <input type="text" name="success_redirect_url"><BR>
      Failure redirect URL : <input type="text" name="fail_redirect_url"><BR>
      Access ID : <input type="text" name="access_id" value="dfjdsklfsdkf23k2kj4hkik"><BR>
      Signature : <input type="text" name="signature" value="fjksdfjsdkfj23k23kj3=="><BR>
      Form Expiry : <input type="text" name="request_expiration_datetime" value="Thu, 11 Jun 2009 20:22:03 +0800"><BR>
      File Path : <input type="file" size="40" name="uploadpath"><BR>
      <input type="submit" value="Upload File">
    </form>
  </body>
</html>

```

URL is the aspen cloud storage path. File name is your uploaded file name.

Optional field

Compulsory field

Compulsory Field List

	Compulsory Field	Description
1	request_expiration_datetime	Each upload form has an expiry date. Aspen Cloud Storage side will check whether this date field expired or not. If expired, the upload will turn down.
2	uploadpath	Your file upload body.

Optional Field List

	Optional Field	Description
1	acl_list	The access right of upload file. i.e. PUBLIC-READ, PUBLIC-FULL
2	md5	User provided MD5 of the upload file.
3	content_type	Assign http header, Content-Type
4	content_disposition	Assign http header, Content-Disposition
5	file_expiry_datetime	Assign http header, Expires
6	success_redirect_url	If file upload success, redirect to specified URL
7	fail_redirect_url	If file upload in failure, redirect to specified URL
8	access_id	User access ID. If target upload box is not set in PUBLIC-FULL, then access right is required. So, must provide access_id and signature for authentication.
9	signature	Signature is generated by request_expiration_datetime, access_id and box name.

Form Action

You should assign the target upload box name and also the file name which you name it for the new uploaded file body.

e.g. <http://boxhk.s.mygrid.asia/myfile.dat>

Submit to box, "boxhk" and name it "myfile.dat". Same to other API, Aspen will return the XML output even success or failure upload.

Error Return

Most errors are same to file_upload (put method). You can refer to it. Following are extra error return in POST file upload method.

Error Description	Error Code	Http Status Code
Only 1 file can be uploaded in 1 POST form.	OnlyOneInPost	400 Bad Request
Uploaded file size is too big. (The upload size for PUT and POST are different.)	PostFileTooBig	400 Bad Request

33. Sample Coding – Signature Generation

In the following samples, we show you how to create box, delete box, upload file and so on. Then you can understand how to use your favorite programming language to call Aspen Cloud Storage.

Now we can only provide PHP sample. Later we will further add other language sample such as Java and .Net.

Prerequisite of PHP

There are many methods to make http request to Aspen Cloud Storage. We adopt *Zend Framework* (<http://framework.zend.com>) version 1.5.0 or above. It is because it is easy to setup compare to setup modules in php such as Crypt_HMAC and HTTP_Request.

- Zend Framework v1.5.0 or above
- PHP v5.0 or above

Signature Generation (PHP)

```
$request_string = "<" . $http_action . ">";  
$request_string .= "<" . $current_datetime . ">";  
$request_string .= "<" . $ content_type . ">";  
$request_string .= "<" . $ box_name . ">";  
$request_string .= "<" . $ file_name . ">";  
  
$signature = base64_encode(hash_hmac('sha1', $request_string, $user_secret_key));  
$AuthHeader = "Authorization: $access_id:$signature"
```

34. Sample Coding – Create Box

PHP Version

```
$url = "http://[box name].s.mygrid.asia/";  
$client = new Zend_Http_Client();  
$client->setUri($url);  
$client->setHeaders($Headers);  
$client->setMethod('PUT');  
$response = $client->request();  
  
if (($response->getStatus())==201)  
    // box created successfully  
else  
    // Fail to create box
```

35. Sample Coding – Delete Box

PHP Version

```
$url = http://[box name].s.mygrid.asia/;
$client = new Zend_Http_Client();
$client->setUri($url);
$client->setHeaders($Headers);
$client->setMethod('DELETE');
$response = $client->request();

if (($response->getStatus())==204)
    // box deleted successfully
else
    // Fail to delete box
```

36. Sample Coding – Show owned boxes

PHP Version

```
$url = "http://s.mygrid.asia/";
$client = new Zend_Http_Client();
$client->setUri($url);
$client->setHeaders($headers);
$client->setMethod('GET');
$response = $client->request();

if (($response->getStatus())==200)
    return $response->getBody();    // return the XML value
else
    // Fail to get information
```

37. Sample Coding – Set Access Control List for box

PHP Version

```
$url = "http://[box name].s.mygrid.asia/";
$client = new Zend_Http_Client();
$client->setUri($url);
$client->setHeaders($headers);
$client->setMethod('PUT');
$client->setRawData($acl_content, 'text/xml');
$response = $client->request();

if (($response->getStatus())==201)
    // Set ACL successfully
else
    // Fail to set ACL
```

38. Sample Coding – Upload File

PHP Version

```
$url = "http://[box name].s.mygrid.asia/[file name]";
$client = new Zend_Http_Client();
$client->setUri($url);
$client->setHeaders($headers);
$client->setMethod('PUT');
$client->setRawData($file_body, $content_type);
$response = $client->request();

if (($response->getStatus())==201)
    // File is uploaded successfully
else
    // Fail to upload
```

39. Sample Coding – Delete File

PHP Version

```
$url = "http://[box name].s.mygrid.asia/[file name]";
$client = new Zend_Http_Client();
$client->setUri($url);
$client->setHeaders($headers);
$client->setMethod('DELETE');
$response = $client->request();

if (($response->getStatus())==204)
    // File is deleted successfully
else
    // Fail to delete file.
```

40. Sample Coding – Get File attribute

PHP Version

```
$url = "http://[box name].s.mygrid.asia/[file name]?extra=show";
$client = new Zend_Http_Client();
$client->setUri($url);
$client->setHeaders($headers);
$client->setMethod('GET');
$response = $client->request();

if (($response->getStatus())==200)
    return $response->getBody();// Get the returned file attribute in XML format.
else
    // Fail to get attribute.
```