

Local Recording Service Requirements
v.1.00

Revision History

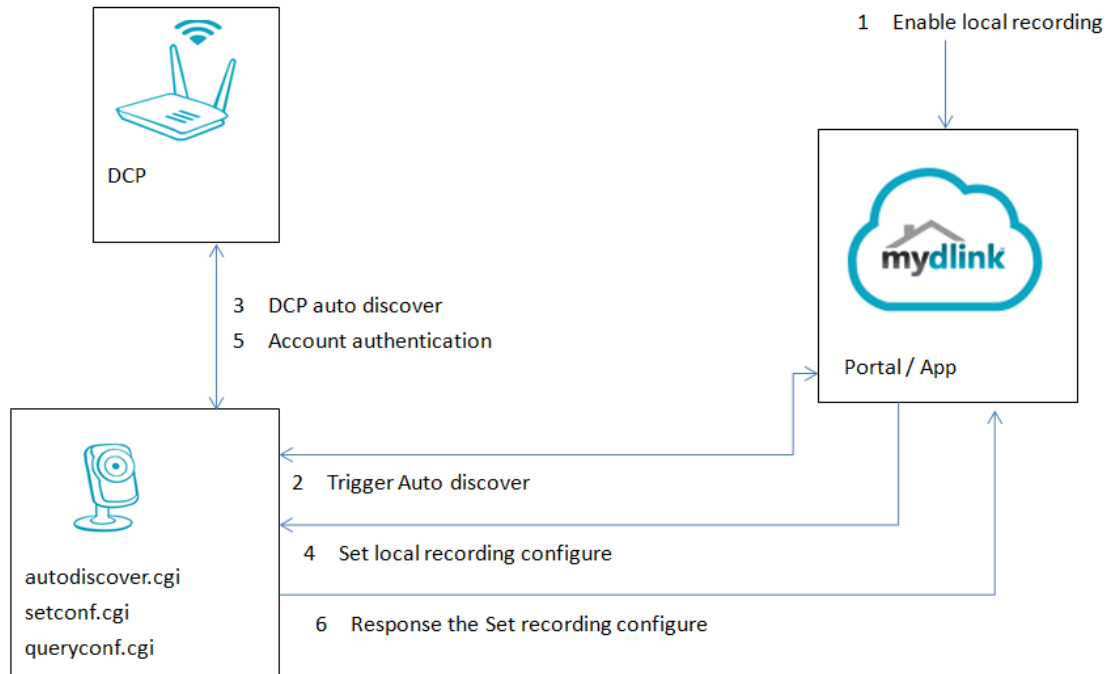
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1. Local recording overview

Components of local recording function



1.1 Prerequisites of local recording integration

1. Device web server shall support HTTPS. All the CGIs shall be accessed via http or https.
2. The additional CGIs for local recording functions go same http authentication approach and devices password.
3. All http header for response about CGIs shall carry "<Access-Control-Allow-Origin:*/>"
4. The cross domain policy file "crossdomain.xml" shall be placed in root directory of web server. About content of this file, please refer to APPENDIX A.
5. Execution hooks for local recording Web API refer to APPENDIX E.

1.2 Setup flow

1. Enable local recording
User enables local recording feature via mydlink clients (portal or apps).
2. Trigger auto discover
If the selected camera is local recording enabled, client launches

autodiscover.cgi of camera to search local recording enabled router in LAN.

3. Device discovery

autodiscover.cgi will broadcast DCP request to all devices in LAN.
mydlink enabled devices bound to same account will respond the discover request.

4. Configure local recording function

Client launches setconf.cgi to apply local recording settings to camera. For more details, refer to “Set local recording config” on **Local recording Web API (Camera)**

5. Account authentication

setconf.cgi will launch initmapping (refer to 2.2.15) to router for account authentication and create storage mapping relationship. If everything's ok, the setconf.cgi stores all local recording configurations.

6. Response the set recording configure

Return the result of settings and account authentication.

2. Router (Storage Manager)

2.1 System Requirements

1. Volumes listing of attached USB storage
 - i. Mount point for external USB storage volume information shall be written in “/var/volume.conf”. For more details please APPENDIX B.
 - ii. Support “mount” command for providing all external storage volume information
2. Builtin ffmpeg libs with h264 decoder and jpeg encoder functions, including the following in system lib.
 - i. libavcodec.so
 - ii. libavutil.so
 - iii. libswscale.so

For more details refer the APPENDIX C.

3. Device web server shall support APIs defined in chapter 2.2.
4. Use NTP for time synchronization instead of modifying UTC time directly when user changes time zone.
5. Support “df” command with options -p/k/m/n.
6. Add md5 command “lrmapping”. Please refer APPENDIX G.
7. Implementation of local recording Web API.

Those Web APIs shall be implemented by execution hook. Web API shall parse and pass parameters to “localrec” program once received local recording APIs, and handle the response from “localrec” then returns the result to the clients. Please refer chapter 2, chapter 3 and APPENDIX E.
8. Execute “localrec -f 0” to initialize local recording volume mapping relationship when system boot up.
9. Add symbolic link “videostorage” in root directory of device web server points to /tmp/device.

2.2 Local recording Web API for router

All response shall return with json header except the response description of Web API indicates that it should adopt other type of header. Refer to APPENDIX D for json header and APPENDIX E for execution hook.

2.2.1 Get HLS playlist for video clip

Request:

GET /localrecording/getplaylist.m3u8

Parameters:

Key Name	Value	Description
no	Integer	mydlink no.
trigger	Integer	Timestamp of this request, in millisecond.
target	Integer	Timestamp of target time of video, in millisecond. If trigger-time is equal to target-time, live view mode will be enabled.

Example:

https://192.168.1.100/localrecording/getplaylist.m3u8?no=11111111&trigger=1407654400004&target=1407654400004

Response:

Response example	Description
#EXTM3U #EXT-X-TARGETDURATION:12 #EXT-X-MEDIA-SEQUENCE:0 #EXTINF:6, no desc 11111111/20141007/14/30/0058.ts #EXTINF:6, no desc 11111111/20141007/14/30/0104.ts	Success with mpeg header. Follow m3u8 file format.
{ "result" : "Fail", "error_code" : 500 }	Fail 500 : Unavailable mydlink no. 501 : Timestamp format error

2.2.2 Query start time of HLS playlist**Request:**

GET /localrecording/querystarttime

Parameters:

Key Name	Value	Description
----------	-------	-------------

no	Integer	mydlink no.
trigger	Integer	Timestamp in millisecond of this request

Example:

https://192.168.1.100/localrecording/querystarttime?no=11111111&trigger=1407654400004

Response:

Response example	Description
{ "result" : "Success", "start_time" : 1401966022000 }	Success
{ "result" : "Fail", "error_code" : 500 }	Fail 500 : Expired start-time

2.2.3 Query event list in specified range

Request:

GET /localrecording/queryevent

Parameters:

Key Name	Value	Description
no	Integer	mydlink no.
time-from	Integer	Unix Timestamp of start time of target range
time-to	Integer	Unix Timestamp of end time of target range

Example:

https://192.168.1.100/localrecording/queryevent?no=11111111&time-from=1407654400&time-to=1407654900

Response:

Event list with JSON object. Unix timestamp as key and event type as value.

Response example	Description
------------------	-------------

<pre>{ "result" : "Success", "data" : [{"1378438335": 256}, {"1378438345": 512}, {"1378438355": 512}] }</pre>	Success 256 : Motion Event 512 : Sound Event
<pre>{ "result" : "Fail", "error_code" : 500 }</pre>	Fail 500 : Invalid mydlink no. 501 : Timestamp format error 502 : time-to less than time-from

2.2.4 Query recorded time range data of playback video

Request:

GET /localrecording/querytimerange

Parameters:

Key Name	Value	Description
no	Integer	mydlink no.
time-from	Integer	Unix Timestamp of start time of target range
time-to	Integer	Unix Timestamp of end time of target range

Example:

<https://192.168.1.100/localrecording/querytimerange?no=11111111&time-from=1407654400&time-to=1407654900>

Response:

Time range list with JSON object, Unix timestamp of start as key and Unix timestamp of end time as value.

Response example	Description
<pre>{ "result" : "Success", "data" : [{ "time-from" : 1378438235, "time-to" : 1378438435 }] }</pre>	Success

<pre> }, { "time-from" : 1378438277, "time-to" : 1378438435 }] } </pre>	
<pre> { "result" : "Fail", "error_code" : 500 } </pre>	Fail 500 : Unavailable mydlink no. 501 : Timestamp format error 502 : time-to less than time-from

2.2.5 Download preview image of recorded video of specified time

Request:

GET /localrecording/preimage

Parameters:

Key Name	Value	Description
no	Integer	mydlink no.
time	Integer	UNIX Timestamp of preview image.

Example:

https://192.168.1.100/localrecording/preimage?no=11111111&time=1407654400

Response:

Response example	Description
302 redirect to image URL	Success with text header.
<pre> { "result" : "Fail", "error_code" : 500 } </pre>	Fail 500 : Unavailable mydlink no. 501 : Timestamp format error 502 : Preview image not found

2.2.6 Query list of video clip (cropped by user)

Request:

GET /localrecording/querylist

Parameters:

Key Name	Value	Description
no	Integer	mydlink no.

Example:

https://192.168.1.100/localrecording/querylist?no=11111111

Response:

JSON array contains clip information as elements

Index	Type	Description
id:	Integer	Clip ID
starttime:	Integer	Unix timestamp of start time
endtime:	Integer	Unix timestamp of end time
title:	String	Title
read:	Boolean	Already read ?

Response example	Description
<pre>{ "result" : "Success", "data" : [{ "id" : 1378111223000, "starttime" : 1378111220, "endtime" : 1378111316, "title" : "2013092_164020", "read" : "true" }, { "id" : 1378111226000, "starttime" : 1378111300, "endtime" : 1378111316, "title" : "2013092_164021", "read" : "true" }] }</pre>	Success

<pre>] } </pre>	
<pre> { "result" : "Fail", "error_code" : 500 } </pre>	Fail 500 : Unavailable mydlink no.

2.2.7 Query used time of video clip

Request:

GET /localrecording/queryusedtime

Parameters:

Name	Value	Description
no	Integer	mydlink no.

Example:

<https://192.168.1.100/localrecording/queryusedtime?no=11111111>

Response:

Response example	Description
<pre> { "time" : 50000 } </pre>	Success Estimated used time in second of video clip
<pre> { "result" : "Fail", "error_code" : 500 } </pre>	Fail 500 : Unavailable mydlink no.

2.2.8 Create video clip of specified time range

Request:

POST /localrecording/createclip

Parameters (Url-encoded POST Form Data):

Key Name	Value	Description
----------	-------	-------------

no	Integer	mydlink no.
time-from	Integer	Unix Timestamp of start time of target range
time-to	Integer	Unix Timestamp of end time of target range
name	String	Specified name Maximum length is 256.

Example:

no=11111111&time-from=1400000000&time-to=1401000000&name=
mydlink%2B

Response:

Response example	Description
{ "result" : "Success" }	Success
{ "result" : "Fail", "error_code" : 500 }	Fail 500 : Unavailable mydlink no. 501 : Timestamp format error 502 : time-to less than time-from

2.2.9 Delete a video clip

Request:

POST /localrecording/deleteclip

Parameters (Url-encoded POST Form Data) :

Key Name	Value	Description
no	Integer	mydlink no.
clip-id	Integer	Video clip ID number

Example:

no=11111111&clip-id=1378111223000

Response:

Response example	Description
{ "result" : "Success" }	Success

{ "result" : "Fail", "error_code" : 500 }	Fail 500 : Unavailable mydlink no. 501 : Unavailable clip-id 502 : Write protect
--	---

2.2.10 Rename a video clip

Request:

POST /localrecording/renameclip

Parameters (Url-encoded POST Form Data):

Key Name	Value	Description
no	Integer	mydlink no.
clip-id	Integer	Video clip ID number.
new-name	String	New name about the video clip in http body

Example:

no=11111111&clip-id=1378111223000&new-name=mydlink%2B

Response:

Response example	Description
{ "result" : "Success" }	Success
{ "result" : "Fail", "error_code" : 500 }	Fail 500 : Unavailable mydlink no. 501 : Unavailable clip-id 502 : Write protect

2.2.11 Update read status of a video clip

Request:

GET /localrecording/clipstatus

Parameters:

Key Name	Value	Description
----------	-------	-------------

no	Integer	mydlink no.
clip-id	String	Clip-id
status	Integer	1 : read 0 : unread

Example:

<https://192.168.1.100/localrecording/clipstatus?no=11111111&clip-id=1401000000&status=1>

Response:

Response example	Description
{ "result" : "Success" }	Success
{ "result" : "Fail", "error_code" : 500 }	Fail 500 : Unavailable mydlink no. 501 : Unavailable clip-id

2.2.12 Query list of story boarding

Request:

GET /localrecording/qsboarding

Parameters:

Key Name	Value	Description
no	Integer	mydlink no.
time-from	Integer	Unix Timestamp of start time of target range
time-to	Integer	Unix Timestamp of end time of target range
gap	Integer	The time gap between each preview image in second.

Example:

<https://192.168.1.100/localrecording/qsboarding?no=11111111&time-from=1401230000&time-to=1401240000&gap=6>

Response:

Response example	Description
<pre>{ "result" : "Success", "data" : [{ "timestamp": 1411111111, "value": "YXNkZmFkZmFkZmFzZGZhc1Q=" }, { "timestamp": 1411111117, "value": "YXNkZmFkZmFkZmFzZGZhc2Q=" }] }</pre>	<p>Success.</p> <p>Entry format {Timestamp},{preview-image in based-64 format}</p> <p>Entries are separated with new line.</p>
<pre>{ "result" : "Fail", "error_code" : 500 }</pre>	<p>Fail</p> <p>500 : Unavailable mydlink no</p> <p>501 : Unavailable clip-id</p> <p>502 : Timestamp format error</p> <p>503 : time-to less than time-from</p>

2.2.13 Upload clip**Request:**

POST /localrecording/uploadclip

Upload clip in a form using multipart/form-data. The form should contain below Content-Disposition.

Content-Disposition

Name	Value	Description
no	Integer	mydlink no
timestamp	Integer	Unix Timestamp of this file

file-name	String	File name of clip
duration	Integer	Clip's length in seconds

Remake:

1. Refer APPENDIX F for more details.

Response:

Response example	Description
{ "result" : "Success" }	Success
{ "result" : "Fail", "error_code" : 500 }	Fail 500 : Unavailable mydlink no. 501 : Timestamp format error

2.2.14 Event notify

Request:

POST /localrecording/eventnotify

Parameters (Url-encoded POST Form Data):

Key Name	Value	Description
no	Integer	mydlink no.
event-type	Integer	Unix Timestamp of start time of target range
timestamp	Integer	Unix Timestamp of end time of target range

Exampe:

no=11111111&event-type=512×tamp=1401240000

Response:

Response example	Description
{ "result" : "Success" }	Success
{	Fail

<pre>"result" : "Fail", "error_code" : 500 }</pre>	500 : Unavailable mydlink no 501 : Timestamp format error 501 : Event format error
--	--

2.2.15 Initialize mapping

Request:

POST /localrecording/initmapping

Parameters (Url-encoded POST Form Data):

Key Name	Value	Description
no	Integer	mydlink no.
volume-path	String	Volume's full path

Example:

no=11111111&volume-path=%2Ftmp%2Fstorage%2FUFD_Silicon_02780

Response:

Response example	Description
<pre>{ "result" : "Success" }</pre>	Success
<pre>{ "result" : "Fail", "error_code" : 500 }</pre>	Fail 500 : auth fail. 501 : invalid volume path.

3. Camera (Video Streamer)

3.1 System Requirement

1. Device web server shall support all APIs defined in 3.2.
2. Use NTP for time synchronization instead of modifying UTC time directly when user changes time zone.

3.2 Local recording Web API for camera

3.2.1 Auto discover

Request:

GET /localrecording/autodiscover.cgi

Parameters: none

Remake:

The API shall be implemented by execution hook. Refer to APPENDIX E for more details.

Response:

Response the storage information of router resides in LAN.

Response example	Description
{ "result" : "Success", "data" : [{ "mydlinkno": "11111111", "UID": "Verbatim_110E6", "Free":1475, "Total":145252, "ip": "192.168.0.15" }, { "mydlinkno": "11111111", "UID": "Verbatim_220F7", "Free":14750, 	Success. Found two volumes, Verbatim_110E6 at 192.168.0.15 with 1475KB free space/145252KB total space and Verbatim_220F7 at 192.168.0.150 with 14750KB free space/1452520KB total space.

<pre> "Total":1452520, "ip":"192.168.0.150" }] } </pre>	
<pre> { "result" : "Fail", "error_code" : 500 } </pre>	Fail 500 : Internal Error

3.2.2 Set local recording config

Request:

POST /localrecording/setconf.cgi

Remark:

setconf.cgi will launch initmapping (refer to 2.2.15) to router for account authentication.

Parameters (Url-encoded POST Form Data):

Key Name	Value	Description
enable	Integer in 0 , 1	0= Disable 1= Enable
policy	Integer in 0,1 or 2	0 = Always 1 = Schedule recording 2 = Event triggered
day	String	Day of the week for schedule recording. Represent day of week in bit string start with Monday. For example, 0101010 represent Tuesday, Thursday, Saturday.
period	String	Period for schedule recording. For example, 14301730 represent the period from 14:30 to 17:30.
UID	String	Storage volume description. It might be volume name or HW description.
overwrite	Integer in 0 and 1	0 = Overwrite the oldest part 1 = Stop the recording when storage device is full.

account	String	Router's account
password	String	Router's password
no	Integer	Router's mydlink no.
ip	String	Router's ip.

Example:

enable=1&policy=1&day=0101010&period=14301730&UID=Verbatim_220F7&overwrite=1&account=admin&password=mydlink%2B&no=11111111&ip=192.168.0.150

Response:

Response example	Description
{ "result" : "Success" }	Success
{ "result" : "Fail", "error_code" : 500 }	Fail 500 : Format error 505 : Auth failed

3.2.3 Query local recording config

Request:

GET /localrecording/queryconf.cgi

Parameters: none

Response:

Response example	Description
{ "enable": 1, "policy": 1, "day": "0101010", "period" : "14301730", "UID" : "Verbatim_220F7", "overwrite" : 1, "account" : "admin", "password" : "mydlink+", }	The local recording setting is Schedule recording, recording from 14:30 to 17:30 at Tuesday, Thursday and Saturday, target storage device is "Verbatim_220F7" with the policy to overwrite the oldest part when space is full. The target router storage account/password is admin/mydlink+ at 192.168.0.150.

<pre>"no" : 11111111, "ip" : "192.168.0.150" }</pre>	
<pre>{ "result" : "Fail", "error_code" : 500 }</pre>	<pre>Fail 500 : Internal error</pre>

APPNEDIX A CROSSDOMAIN.XML

The content of crossdomain.xml

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
  <allow-access-from domain="*" secure="true" />
</cross-domain-policy>
```

APPENDIX B VOLUME INFORMATION

System shall maintain volumes information attached to system in /tmp/volume.conf, information below.

```
</path/to/the/mount-point>
```

For example:

1.

```
/var/tmp/storage/volume-name
```

2.

```
/var/tmp/storage/volume-name0
```

```
/var/tmp/storage/volume-name1
```

APPENDIX C FFMEPG LIBRARY

How to generate libavcodec.so, libavutil.so and libswscale.so

1. Download ffmpeg 0.65.

2. Configure ffmpeg with suitable parameters. For example

```
./configure --enable-cross-compile --cc=arm-linux-gcc --arch=arm --target-os=linux
--enable-shared --enable-gpl --disable-everything --enable-shared --
enable-decoder=h264 --enable-encode=mjpeg
```


APPENDIX D HTTP HEADER

mpeg header:

"Content-Type: application/vnd.apple.mpegurl"

Access-Control-Allow-Origin: *

Cache-Control: no-cache

Pragma: no-cache

json header:

Content-Type: application/json

Access-Control-Allow-Origin: *

Cache-Control: no-cache

Pragma: no-cache

text header:

Content-Type: text/plain; charset=utf-8

APPENDIX E EXECUTION HOOK COMMAND MAPPING

1. All the parameter value must be URL-encoded.

For example:

no=11111111&time-from=1400000000&time-to=1401000000&name=mydlink%2B

mydlink%2B is the url-encoded format of mydlink+.

2. "localrec" will return result in json format as the response body defined in each API.

Web APIs	Execution hook command example
2.2.1 Get HLS playlist for video clip	Input getplaylist.m3u8?no=11111111&trigger=1407654400004&target=1407654400004 Execute localrec -f 11 -n 11111111 -t 1407654400004 -r 1407654400004
2.2.2 Query start time of HLS	Input querystarttime?no=11111111&trigger=1407654400004

playlist	Execute localrec -f 12 -n 11111111 -t 1407654400004
2.2.3 Query event list in specified range	Input queryevent?no=11111111&time-from=1407654400&time-to=1407654900 Execute localrec -f 13 -n 11111111 -r 1407654400 -t 1407654900
2.2.4 Query recorded time range data of playback video	Input querytimerange?no=11111111&time-from=1407654400&time-to=1407654900 Execute localrec -f 14 -n 11111111 -r 1407654400 -t 1407654900
2.2.5 Download preview image of recorded video of specified time	Input preimage?no=11111111&time=1407654400 Execute localrec -f 15 -n 11111111 -t 1407654400
2.2.6 Query list of video clip	Input querylist?no=11111111 Execute localrec -f 16 -n 11111111
2.2.7 Query used time of video clip	Input queryusedtime?no=11111111 Execute localrec -f 17 -n 11111111
2.2.8 Create video clip of specified time range	Input no=11111111&time-from=1400000000&time-to=1401000000&name= mydlink%2B Execute localrec -f 18 -n 11111111 -r 1400000000 -t 1401000000 -m mydlink%2B
2.2.9 Delete a video clip	Input no=11111111&clip-id=1378111223000 Execute localrec -f 19 -n 11111111 -i 1378111223000
2.2.10 Rename a video clip	Input no=11111111&clip-id=1378111223000&new-name=mydlink%2B Execute

	localrec -f 20 -n 11111111 -i 1378111223000 -e mydlink%2B
2.2.11 Update read status of a video clip	Input clipstatus?no=11111111&clip-id=1401000000&status=1 Execute localrec -f 21 -n 11111111 -i 1401000000 -s 1
2.2.12 Query list of story boarding	Input qsboarding?no=11111111&time-from=1401230000&time-to=1401240000&gap=6 Execute localrec -f 22 -n 11111111 -r 1401230000 -t 1401240000 -g 6
2.2.13 Upload clip	Input no=11111111×tamp=1411110223 &file-name=1411110223.ts Execute localrec -f 23 -n 11111111 -t 141110223 -a 141110223.ts -p <i>file-path</i> . Remark This CGI shall launch “localrec” with the parameter “-p” about full path of the uploaded file.
2.2.14 Event notify	Input eventnotify?no=11111111&event-type=512×tamp=1401240000 Execute localrec -f 24 -n 11111111 -e 512 -t 1401240000
2.2.15 Initialize mapping	Input no=11111111&volume-path=%2Ftmp%2Fstorage%2FUFD_Silicon_02780 Execute localrec -f 25 -n 11111111 -v /tmp/storage/UFD_Silicon_02780
3.2.1 Auto discover	Execute /path_of_agent/dcp -a

APPENDIX F HTTP MULTIPART POST

POST /camera_upload.php HTTP/1.1

Host: 192.168.0.1

Content-Length: 25035

Authorization: Basic QWxhZGRpbjpvYVUHNlc2FtZQ==

Content-Type: multipart/form-data; boundary=----WebKitFormBoundaryfYeskH534ISMqbtP

-----WebKitFormBoundaryfYeskH534ISMqbtP

Content-Disposition: form-data; name="no"

88888888

-----WebKitFormBoundaryfYeskH534ISMqbtP

Content-Disposition: form-data; name="timestamp"

1413275553

-----WebKitFormBoundaryfYeskH534ISMqbtP

Content-Disposition: form-data; name="file-name"; filename="0856.ts"

Content-Type: video/vnd.dlna.mpeg-tts

<File content>

-----WebKitFormBoundaryfYeskH534ISMqbtP--

APPENDIX G MDB COMMAND

mdb set lrmapping command format:

mydlink_no:volume_path&mydlink_no:volume_path&.....

All the value of each entry must be "URL encoded"

For example:

1.

mdb set lrmapping

11111111%3A%2Ftmp%2Fstorage%2FUFD_Silicon_02780%2622222222%3A%2Ftmp%2Fstorage%2FUFD_Silicon_02781

2.

mdb get lrmapping

Response:

11111111%3A%2Ftmp%2Fstorage%2FUFD_Silicon_02780%2622222222%3A%2Ftmp%2Fstorage%2FUFD_Silicon_02781