

RD Client Integration Document

CURRENT VERSION DETAIL

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|------------------------|-----------------------------|
| Project Name | Windows RD service Solution |
| Project Version | 2.0.1.15 |

| Prepared By | Date Prepared |
|---------------|---------------------------|
| Manish Pandey | 25 th Jan 2018 |
| Approved By | Date Approved |
| Udita Singh | 25 th Jan 2018 |
| Comments | |
| | |

| References |
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| DOC Ver. | Description of Changes | Prepared By | Date Prepared | Reviewed By | Date Reviewed | Approved By | Date Approved |
|----------|---|----------------|----------------------------|-------------|----------------------------|-------------|----------------------------|
| 1.0 | 1 st Beta release | Tanuj Joshi | 23 May 2017 | Udita Singh | | | |
| 1.1 | 1 st Beta release | Tanuj Joshi | 24 May 2017 | Udita Singh | 24-May-17 | Udita Singh | 24-May-17 |
| 1.2 | Input and output data details added | Udita Singh | 30-May-17 | Udita Singh | 30-May-17 | Udita Singh | 30-May-17 |
| 1.3 | Integration with Mozilla Firefox and Google Chrome | Abhishek Gupta | 12 June 2017 | Udita Singh | 12 June 2017 | Udita Singh | 12 June 2017 |
| 1.5 | This release is tested successfully on Chrome Only | Manish Pandey | 4 th July 2017 | Udita Singh | 4 th July 2017 | Udita Singh | 4 th July 2017 |
| 1.6 | This release is tested successfully on Chrome Only | Manish Pandey | 5 th July 2017 | Udita Singh | 5 th July 2017 | Udita Singh | 5 th July 2017 |
| 1.7 | This release is tested successfully on Chrome Only | Abhishek Gupta | 13 th July 2017 | Udita Singh | 13 th July 2017 | Udita Singh | 13 th July 2017 |
| 1.8 | This release is tested successfully on Chrome Only | Abhishek Gupta | 22 nd July 2017 | Udita Singh | 22 nd July 2017 | Udita Singh | 22 nd July 2017 |
| 1.9 | This release is tested successfully on IE | Manish Pandey | 31 st July 2017 | Udita Singh | 31 st July 2017 | Udita Singh | 31 st July 2017 |
| 1.10 | White listed functionality has been added. Increase Response Timeout | Manish Pandey | 4 th Aug 2017 | Udita Singh | 4 th Aug 2017 | Udita Singh | 4 th Aug 2017 |
| 1.11 | Added Trouble shoot | Manish Pandey | 17-Aug-17 | Udita Singh | 17-Aug-17 | Udita Singh | 17-Aug-17 |
| 1.12 | 1. Proxy Configuration has been added. 2. Device Serial Number field has been added in Device Info Response. 3. Qscore field has been added in Capture Response. 4. Functionalities have been added includes – Otp+Bio, Otp+Demo, Otp(Proto and XML). 5. More logs have been added in Rd Service. 6. nmpoints field has been added for the possible combination of Biometric capture. | Manish Pandey | 23 rd Aug 2017 | Udita Singh | 23 rd Aug 2017 | Udita Singh | 23 rd Aug 2017 |
| 1.13 | 1. Fixed Issues for IE for Http Communication between Test Page and RD Service. | Manish Pandey | 5 th Sep 2017 | Udita Singh | 5 th Sep 2017 | Udita Singh | 5 th Sep 2017 |
| 1.14 | 1. Correction in the RD code includes storing of “ms” field(part of pfa) passing in XML as an input in the right structure. 2. “Validate Keystore function” is being called inside the thread. 3. Delay has been added during receiving/sending data to/from RD Service. | Manish Pandey | 18 th Sep 2017 | Udita Singh | 8 th Sep 2017 | Udita Singh | 8 th Sep 2017 |
| 1.15 | 1. Morpho RD service has been listed in windows startup 2. Minor change in Main Service Code includes more logs have been added, API calling. 3. Added logic to capture fingerprint from Secured Morpho Devices. 4. Added logic to handle Device Details of Repaired Morpho Devices. 5. Changed the low level API of SDK and removed the static memory allocation in threads to avoid excess Memory consumption. 6. Changed in handling of pre-flight request. | Manish Pandey | 28 th Dec 2017 | Udita Singh | 28 th Dec 2017 | Udita Singh | 28 th Dec 2017 |
| 1.16 | 1. Message boxes have been removed in case user intervention is not required and Instead Logs have been created at “C:\MORPHORDLOG\yearfolder\month_log.txt”. 2. New field “SrNoTag:1” has been added in | Manish Pandey | 11 th Jan 2018 | Udita Singh | 11 th Jan 2018 | Udita Singh | 11 th Jan 2018 |

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| | <p>ConfigSettings.ini only for NIC.</p> <p>3. In case of any issue during service upgrade while going for First time registration, it will bypass the issue and user will be able to register the device. This change has been made on a temporarily basis only for NIC. Once the testing is done successfully by NIC, the bypass action will be removed in case of first time registration.</p> <p>4. Dpsid, rdsid, rdsver, MI values are set as same in RD service across all the environment (Staging, Preprod, Prod).</p> | | | | | | |
| 1.17 | <p>1. Rd service start issue has been fixed while system shutdown by changing the install – uninstall script in RD drivers to fix the Rd service start issue while system shutdown.</p> <p>2. Rd service Crash Issue has been fixed while calling capture.</p> | Manish Pandey | 25 th Jan 2018 | Udita Singh | 25 th Jan 2018 | Udita Singh | 25 th Jan 2018 |

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1. Introduction

Purpose of this document is to help the developers to integrate the Windows RD service in their application.

2. Scope

Scope of this document is limited to the Windows RD, its installation, integration with the Client application.

3. Installation Steps of RD service

1. Run 'MorphoRdServiceLOSoftSetup.exe' as administrator to install the RD Service
2. Follow the instruction in setup wizard to complete the installation.

4. Un-Installation Steps

1. Run 'C:\MorphoRdServiceLOSoftSetup\unins000.exe' to uninstall the RD Service OR Uninstall "Morpho RD Service Version Driver" from Control Panel.
2. Follow the instruction in setup wizard to complete the installation.

5. Registration steps of Biometric Device

1. Plug-in the Morpho Biometric Device.
2. If the Morpho Biometric Device is white listed in Management Server, it will be registered without giving Activation Code manually, but if it is not then user will be prompted an Activation Code Window to enter Activation Code for registration.

[Activation Code will be shared by Smart Chip Pvt Ltd]

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6. Pre-Requisites for Https Communication from Web Browser after Installation

- 1) Set value 'CommunicationMode:0' in 'C:\MorphoRdServiceLOSoft\ConfigSettings.ini' file to enable Https communication in Morpho RD Service.
- 2) Keep the Bank/Merchant's server certificate file at 'C:\MorphoRdServiceLOSoft\' named as '**server.crt**'. Certificate must be in pem format.
- 3) Keep the Bank/Merchant's server private key file at 'C:\MorphoRdServiceLOSoft\' named as '**server.key**'. Private key must be in pem format.
- 4) Rename '127.0.0.1' as Bank/Merchant's URL to which certificate is issued, in the host file of the windows present at 'C:\Windows\System32\drivers\etc'. Update this URL in the calling JavaScript functions given in the MorphoRdServiceTestPage.html.
- 5) Restart the Morpho RD Service.

Please note:

*The **server.crt** is a CA signed certificate, in case of integration it can be a self signed certificate. But to avoid any browser issue please use signed certificate.*

To generate a self signed certificate please follow the below link:

https://www.ibm.com/support/knowledgecenter/en/SSWHYP_4.0.0/com.ibm.apimgmt.cmc.doc/task_apionprem_generate_self_signed_openSSL.html

or

<https://jamielinux.com/docs/openssl-certificate-authority/>

7. Configuration settings according to environment

7.1 Staging :

1. Change the RDEnviroment variable in ConfigSetting.ini file (file PATH : C:\MorphoRdServiceLOSoft\).
RDEnviroment:0

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2. Change the URLs:

Registration : <https://Stage-rdm.smartbioplus.com/rdm-device-app/registration>
Keyrotation : <https://Stage-rdm.smartbioplus.com/rdm-key-management-app/keyRotation>
Telemetry : <https://Stage-rdm.smartbioplus.com/rdm-telemetry-app/telemetry>

3. Change URL_IP : Stage-rdm.smartbioplus.com

4. Change URL_Port: 443

5. Save the changes in config file.

6. Restart the service to effect the changes.

7.2 Preproduction :

1. Change the RDEnviroment variable ConfigSetting.ini file (file PATH :
C:\MorphoRdServiceLOSoft\).

RDEnviroment:1

2. Change the URLs:

Registration : <https://pre-rdm.smartbioplus.com/rdm-device-app/registration>
Keyrotation : <https://pre-rdm.smartbioplus.com/rdm-key-management-app/keyRotation>
Telemetry : <https://pre-rdm.smartbioplus.com/rdm-telemetry-app/telemetry>

3. Change URL_IP : pre-rdm.smartbioplus.com

4. Change URL_Port: 443

5. Save the changes in config file.

6. Restart the service to effect the changes.

7.3 Production :

1. Change the RDEnviroment variable ConfigSetting.ini file (file PATH :
C:\MorphoRdServiceLOSoft\).

RDEnviroment:2

2. Change the URLs:

Registration : <https://rdm.smartbioplus.com/rdm-device-app/registration>

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Keyrotation : <https://rdm.smartbioplus.com/rdm-key-management-app/keyRotation>
Telemetry : <https://rdm.smartbioplus.com/rdm-telemetry-app/telemetry>

3. Change URL_IP : rdm.smartbioplus.com
4. Change URL_Port: 443
5. Save the changes in config file.
6. Restart the service to effect the changes.

8. RD Services API Calling

There are 3 actions in MorphoRDSERVICE.html, these actions are listed below:

- a. RDSERVICE
- b. DeviceInfo
- c. Capture

The sequence of calling the API is as follows:

1. RDSERVICE->DeviceInfo
2. RDSERVICE->Capture

8.1 RDSERVICE

To discover RD Service, please use the below Javascript code snippet:

```
Function
RDService()
{
    var url = "http://127.0.0.1:11100";

    var xhr;
    var ua = window.navigator.userAgent;
    var msie = ua.indexOf("MSIE ");

    if (msie > 0 || !navigator.userAgent.match(/Trident.*rv\:11\./)) // If Internet Explorer, return version number
    {
        //IE browser
        xhr = new ActiveXObject("Microsoft.XMLHTTP");
    } else {
```


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```
//other browser
xhr = new XMLHttpRequest();
}
xhr.open('RDSERVICE', url, true);
xhr.onreadystatechange = function () {

if (xhr.readyState == 4){
var status = xhr.status;
if (status == 200) {
alert(xhr.responseText);
console.log(xhr.response);
} else {
console.log(xhr.response);
}
}
};
/*setTimeout(function(){
xhr.send();},1000);*/
xhr.send();
}
```

8.2 DEVICEINFO

To get device info, please use the below Javascript code snippet:

```
function
DeviceInfo()

{
var url = "http://127.0.0.1:11100/getDeviceInfo";

var xhr;
var ua = window.navigator.userAgent;
var msie = ua.indexOf("MSIE ");

if (msie > 0 || !!navigator.userAgent.match(/Trident.*rv\:11\./)) // If Internet
Explorer, return version number
{
//IE browser
```

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```
xhr = new ActiveXObject("Microsoft.XMLHTTP");
} else {
//other browser
xhr = new XMLHttpRequest();
}

xhr.open('DEVICEINFO', url, true);
xhr.onreadystatechange = function () {

if (xhr.readyState == 4){
var status = xhr.status;
if (status == 200) {
alert(xhr.responseText);
console.log(xhr.response);
} else {
console.log(xhr.response);
}
}
};

xhr.send();
}
```

Response data:

```
<DeviceInfo dpld="" rdsId="" rdsVer="" dc="" mi="" mc="" >
<additional_info><Param name="serial_number" value=""/></additional_info></DeviceInfo>
```

dpId - (mandatory) Unique code assigned to registered device provider.
rdsId - (mandatory) Unique ID of the certified registered device service.
rdsVer - (mandatory) Registered devices service version.
dc - (mandatory) Unique Registered device code.
mi - (mandatory) Registered device model ID.
mc - (mandatory) This attribute holds registered device public key certificate. This is signed with device provider key.
 In additional info tag, value field is the device serial number connected.

8.3 CAPTURE

To use CAPTURE command, please use the below Javascript code snippet:

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```
function
Capture() {
    var url = "http://127.0.0.1:11100/capture";

    var PIDOPTS='<PidOptions ver=\"1.0\">'+<Opts fCount=\"1\" fType=\"0\"
iCount=\"\" iType=\"\" pCount=\"\" pType=\"\" format=\"0\" pidVer=\"2.0\"
timeout=\"10000\" otp=\"\" wadh=\"\" posh=\"\"/>'+</PidOptions>';

    /*
    format=\"0\" --> XML
    format=\"1\" --> Protobuf
    */
    var xhr;
    var ua = window.navigator.userAgent;
    var msie = ua.indexOf("MSIE ");

    if (msie > 0 || !navigator.userAgent.match(/Trident.*rv:11\./)) // If Internet
    Explorer, return version number
    {
        //IE browser
        xhr = new ActiveXObject("Microsoft.XMLHTTP");
    } else {
        //other browser
        xhr = new XMLHttpRequest();
    }

    xhr.open('CAPTURE', url, true);
    xhr.setRequestHeader("Content-Type","text/xml");
    xhr.setRequestHeader("Accept","text/xml");
    xhr.onreadystatechange = function () {

        if (xhr.readyState == 4){
            var status = xhr.status;
            if (status == 200) {
                alert(xhr.responseText);

            } else {
                console.log(xhr.response);
            }
        }
    }
}
```

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```

    }
  };
  xhr.send(PIDOPTS);
}

```

Input data detail need to send in the above request:

```

<PidOptions ver="">
<Opts fCount="" fType="" iCount="" iType="" pCount="" pType="" format="" pidVer="" timeout="" otp=""
wadh="" posh=""/>
<Demo></Demo>
<CustOpts>
<!-- no application should hard code these and should be configured on app or AUA servers. These
parameters can be used for any custom application authentication or for other configuration parameters.
Device providers can differentiate their service in the market by enabling advanced algorithms that
applications can take advantage of. -->
<Param name="" value="" />
</CustOpts>
</PidOptions>

```

It should send this input data in this key "PID_OPTIONS" using intent to RD Service

Where:

PidOptions:

ver: Version of the PidOptions spec. Currently it is "1.0". This is necessary to allow applications to gracefully upgrade even when RD service may be been upgraded. **RD Service must support current version and one previous version** to allow apps to upgrade at different points in time.

Opts:

Int **fCount** (optional) number of finger records to be captured (0 to 10)

Int **fType** (optional) ISO format (0 for FMR or 1 for FIR), 0 (FMR) is default

Int **iCount** (optional) number of iris records to be captured (0 to 2)

Int **iType** (optional) ISO format (0 for IIR), 0 (IIR) is default

Int **pCount** (optional) number of face photo records to be captured (0 to 1).

Currently face matching is not supported.

Int **pType** (optional) face format. Currently face matching is not supported.

Int **format** (mandatory) 0 for XML, 1 for Protobuf

String **pidVer** (mandatory) PID version

Int **timeout** capture timeout in milliseconds

String **otp** (optional) OTP value captured from user in case of 2-factor auth

String **wadh** (optional) If passed, RD Service should use this within PID block root element "as-is".

String **posh** (optional) if specific positions need to be captured, applications can pass a comma delimited position attributes. See "posh" attribute definition in Authentication Specification for valid values. RD Service (if showing preview) can indicate the finger using this. If passed, this should be passed back within PID block. Default is "UNKNOWN", meaning "any" finger/iris can be captured.

Demo:

Element allows demographic data to be passed to form PID block as per authentication specification

Response Data Format:

When it request to capture finger data using RD Service, It returns some xml data as output that would be further used to Authentication as well as eKYC.

```
<PidData>
<Resp errCode="" errInfo="" fCount="" fType="" iCount="" iType="" pCount="" pType="" nmPoints=""
qScore=""/>
<DeviceInfo />
<Skey ci="">encrypted and encoded session key</Skey>
<Hmac>SHA-256 Hash of Pid block, encrypted and then encoded</Hmac>
<Data type="X|P"> base-64 encoded encrypted pid block </pid>
</PidData>
```

Where:

Resp:

Int **errCode** (mandatory) 0 if no error, else standard error codes

String **errInfo** (optional) additional info message in case of error/warning

Int **fCount** (mandatory for FP) number of finger records actually captured

Int **fType** (mandatory for FP) actual format type – 0 (FMR) or 1 (FIR)

Int **iCount** (mandatory for Iris) number of iris records actually captured

Int **iType** (mandatory for Iris) actual Iris format (0 for IIR)

Int **pCount** (mandatory for Photo) number of face photo records actually captured. Currently face matching is not supported.

Int **pType** (mandatory for Photo) face format. Currently face matching is not supported.

Int **nmPoints** (mandatory for FMR capture) Number of minutiae points when FMR is captured.

Applications may use this for accepting or retrying the capture. If multiple fingers are captured, send comma delimited numbers.

Int **qScore** (optional) If quality check is done, send a normalized score that is between 0 and 100. Device providers may allow configuration within RD service to use specific quality check algorithms to be enabled. Either it can be configured within RD service or applications can pass those under

PidOptionsCustOptsParam.

Skey:

String **skey** (mandatory) encrypted session key as per auth spec

String **ci** (mandatory) UIDAI public key identifier as per auth spec

Hmac:

String **hmac** (mandatory) hmac value as per auth spec.

9. Error Codes from RD service

100 "Invalid PidOptions input. XML should strictly adhere to spec."

110 "Invalid value for fType"

120 "Invalid value for fCount"

130 "Invalid value for iType"

140 "Invalid value for iCount"

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150 "Invalid value for pidVer"
160 "Invalid value for timeout"
170 "Invalid value for posh"
180 "Face matching is not supported"
190 "Invalid value for format"
200 "Invalid Demo structure"
210 "Protobuf format not supported"
700 "Capture timed out"
710 "Being used by another application"
720 "Device not ready"
730 "Capture Failed"
740 "Device needs to be re-initialized"
750 "RD Service does not support fingerprints"
760 "RD Service does not support Iris"
770 "Invalid URL"
999 "Internal error"

10. Troubleshooting

| S.No. | Error Code | Error Info | Occurrence | Solution |
|-------|------------|---|---|--|
| 1. | 100 | Invalid PidOptions input. XML should strictly adhere to spec. | When RD Service calling application sends corrupt pidoption xml or may be incomplete pid option xml. | Before calling capture function check pidoption xml format properly. |
| 2. | 110 | Invalid value for fType | When RD Service calling application sends wrong value for finger type according to UIDAI registered device document. | Before calling capture function check fType attribute value properly. It should be according to UIDAI registered device document. |
| 3. | 120 | Invalid value for fCount | When RD Service calling application sends wrong value for finger count according to UIDAI registered device document. | Before calling capture function check fCount attribute value properly. It should be according to UIDAI registered device document. |
| 4. | 130 | Invalid value for iType | When RD Service calling application sends wrong value for iris type according to UIDAI registered device document. | Before calling capture function check iType attribute value properly. It should be according to UIDAI registered device document. |
| 5. | 140 | Invalid value for iCount | When RD Service calling application sends wrong | Before calling capture function check iCount |

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| | | | value for iris count according to UIDAI registered device document. | attribute value properly. It should be according to UIDAI registered device document. |
| 6. | 150 | Invalid value for pidVer | When RD Service calling application sends wrong value for pidblock version according to UIDAI registered device document. | Before calling capture function check pidVer attribute value properly. It should be according to UIDAI registered device document. |
| 7. | 160 | Invalid value for timeout | When RD Service calling application sends wrong value for timeout according to UIDAI registered device document. | Before calling capture function check timeout attribute value properly. It should be according to UIDAI registered device document. |
| 8. | 170 | Invalid value for posh | When RD Service calling application sends wrong value for posh according to UIDAI registered device document. | Before calling capture function check posh attribute value properly. It should be according to UIDAI registered device document. |
| 9. | 180 | Face matching is not supported | When RD Service calling application sends value for pCount and pType. | Morpho RD Service not supported face matching. So ignore/remove pCount and pType attributes. |
| 10. | 190 | Invalid value for format | When RD Service calling application sends wrong value for format according to UIDAI registered device document. | Before calling capture function check format attribute value properly. It should be according to UIDAI registered device document. |
| 11. | 200 | Invalid Demo structure | When RD Service calling application sends wrong Demo xml format according to UIDAI Aadhaar authentication document. | Before calling capture function check Demo xml format attribute value properly. It should be according to UIDAI Aadhaar authentication document. |
| 11. | 700 | Capture timed out. | If Customer not putting finger on sensor within giving timeout. | Make sure customer put their finger on sensor within giving timeout. |
| 12. | 710 | Being used by another application. | If Fingerprint sensor busy by another application | Make sure fingerprint sensor should be in ready state. So call device info and check rd service status before calling |

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| | | | | capture. If RD Service status is ready than capture should be perform. |
| 13. | 710 | Being used by another application. | If Fingerprint sensor busy by another application | Make sure fingerprint sensor should be in ready state. So call device info and check rd service status before calling capture. If RD Service status is ready than capture should be perform. |
| 14. | 720 | Device not ready. | If Fingerprint device haven't permission. During capture usb connection loose. Backward compatible issue | Make sure fingerprint sensor has permission and USB cable connection should be perfect. |
| 15. | 730 | Capture Failed | Some unknown issue | Retry process |
| 16. | 740 | Device needs to be re-initialized | When RD Service environment changed | Do Registration |
| 17. | 760 | RD Service does not support Iris | When RD Service calling application sends value for iCount and iType. | Morpho RD Service not supported eye matching. So ignore/remove iCount and iType attributes. |
| 18. | 999 | Internal error | <ul style="list-style-type: none"> • Problem Occur during PID generation • During Finger Capture • RD Service in different Environment • Device date time is not set to automatic. • Internal error | <ul style="list-style-type: none"> • Retry Capture • Retry Capture • Launch RD Service and click refresh button at right top corner. • Please ensure that value of env attribute in PID Option xml is correct(according to RD Service environment). • Host Machine date & time should be auto sync. • Please ensure that value of env attribute in PID Option xml is |

| | | | | |
|--|--|--|--|---|
| | | | | correct(according to RD Service environment). |
|--|--|--|--|---|

11. S/W and H/W Requirements for new release

- **Prerequisites for S/W**

OS - Windows 7

Web Browser - Chrome version 60 and IE 11

- **Prerequisites for H/W**

Morpho MSO1300 E, MSO1300 E2, MSO1300 E3 Biometric Sensor

- **Any other tool**

NA