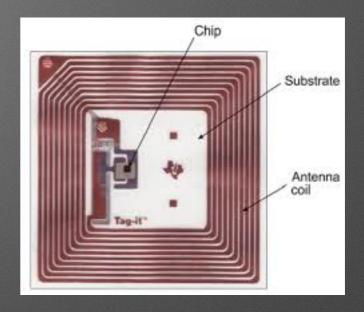
Designing a NFC Tag Reader with WebUSB support

基础篇





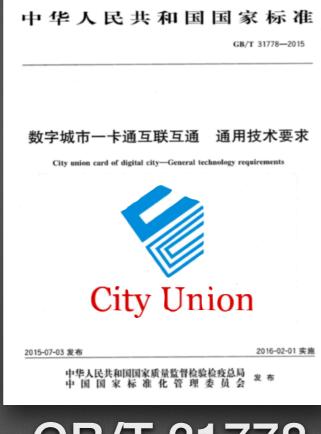


常见卡类型举例

频率	标准	ID/IC卡 (TAG)	CPU卡(智能卡)
125KHZ 134KHZ	ISO 11785		
	ISO 14443 TypeA	Mifare S50 (M1)	各地交通卡、护照、银行卡
10 FC MUZ	ISO 14443 TypeB	THR1064奥运会 门票	清华校园卡、身份证?
13.56 MHZ	ISO 18092 FeliCa	八達加 OCTOPUS	
	ISO 15693	文 车票 学生优惠卡。 他用时必能和 在字在证内员上, 他居住来 唯下	
860-960 MHZ	ISO 18000-6	ETC专用 20 ETC专用 Change of the change of th	



JT/T 978-2015



ICS 35.240.60 P 07

ICS 35.240.60 P 07

GJ

中华人民共和国城镇建设行业标准

建设事业集成电路(IC)卡应用技术条件

Technology specification for application of integrated circuit cards in construction cause

2014-04-22 发布

2014-11-01 实施



中华人民共和国住房和城乡建设部 发布

CJ/T 166

GB/T 31778

中国金融集成电路(IC)卡规范 第2部分: 电子钱包/电子存折应用规范

中华人民共和国金融行业标准

China financial integrated circuit card specifications-Part 2: Electronic purse/electronic deposit application specification

2010-04-30 发布

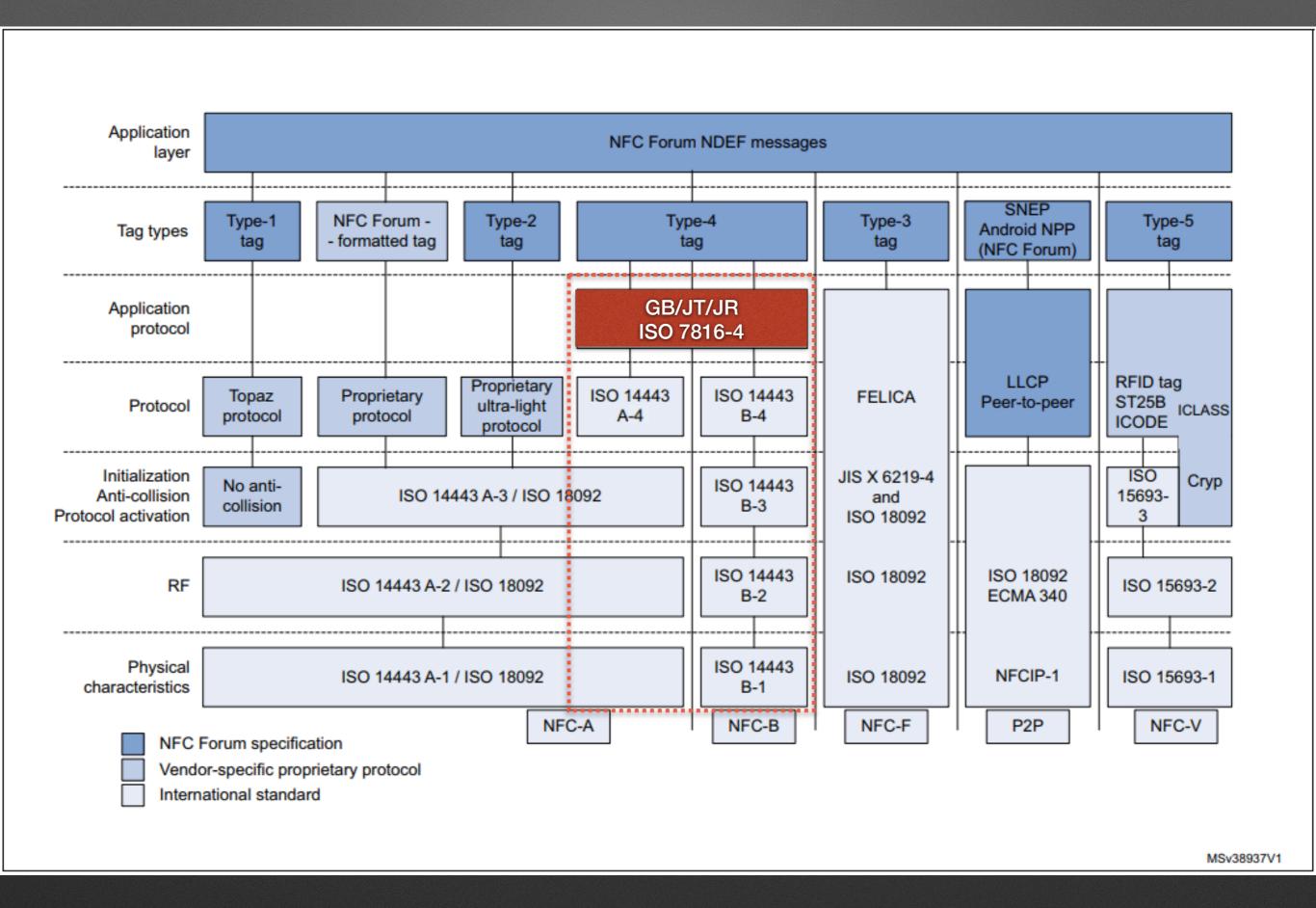
2010-04-30 实施

JR

JR/T 0025.2-2010 代替JR/T 0025, 2-2005

中国人民银行 发布

JR/T 0025.9-2010



文件结构 (CJ/T 166)

表11 公共应用基本信息文件

文件标识 (SFI)	0x15									
文件类型	二进制文件									
文件大小	00 1EH	00 1EH								
文件存取控制	读 = 自由		改写 = DAW	K线路保护						
字节	数据元	长度	£.	格式						
01~02	发卡方代码	2		BCD						
03~04	城市代码	2		HEX						
05~05	算法支持	1		BCD						
06~06	行业代码	1		BCD						
07~08	占位符 (0000)	2		HEX						
09~09	应用类型标识(启用标志)	1		BCD						
10~10	应用版本	1		BCD						
11~12	互通标识	2		HEX						
13~20	应用序列号	8		HEX						
21~24	应用启动日期 (YYYYMMDD)	4		BCD						
25~28	应用有效日期 (YYYYMMDD)	4		BCD						
29~30	預留	2		HEX						

注1: 互通标识为本城市的城市代码:

注2:应用类型标识(启用标志)00为未启用,非00为启用:预留部分不允许占用。

文件结构 (CJ/T 166)

表12 个人基本信息文件

文件标识符	00 16	SFI	16	文件长度	0040H (64)	文件结构	二进制文件	
读控	PIN 认证		写控		DAMK(明	文+MAC)		
字节	数据元		长度	格式	说明			
01-01	持卡人类型标i	Į.		1	BCD			
02-02	持卡人职工标i	Į.		1	BCD			
03-22	持卡人姓名			20	ASC			
23-54	持卡人证件号码	马		32	ASC			
55-55	持卡人证件类	型		1	BCD			
空间預留	9 字节							

文件结构 (CJ/T 166)

表17 本地消费交易明细文件

文件标识(SFI)	0x18
文件类型	循环记录文件

记录长度	0017H							
文件存取控制	读 = 自由 改写 = COS内部操作							
字节	数据元	长度	格式					
01~02	电子钱包消费	2	HEX					
03~05	預留	3	HEX					
06~09	交易金额	4	HEX					
10~10	交易类型	1	BCD					
11~16	交易终端编号	6	HEX					
17~20	交易日期 (YYYYMMDD)	4	BCD					
21~23	交易时间(HHMMSS)	3	BCD					

工具篇

TagInfo App







NFCard App



https://github.com/z4yx/nfcard



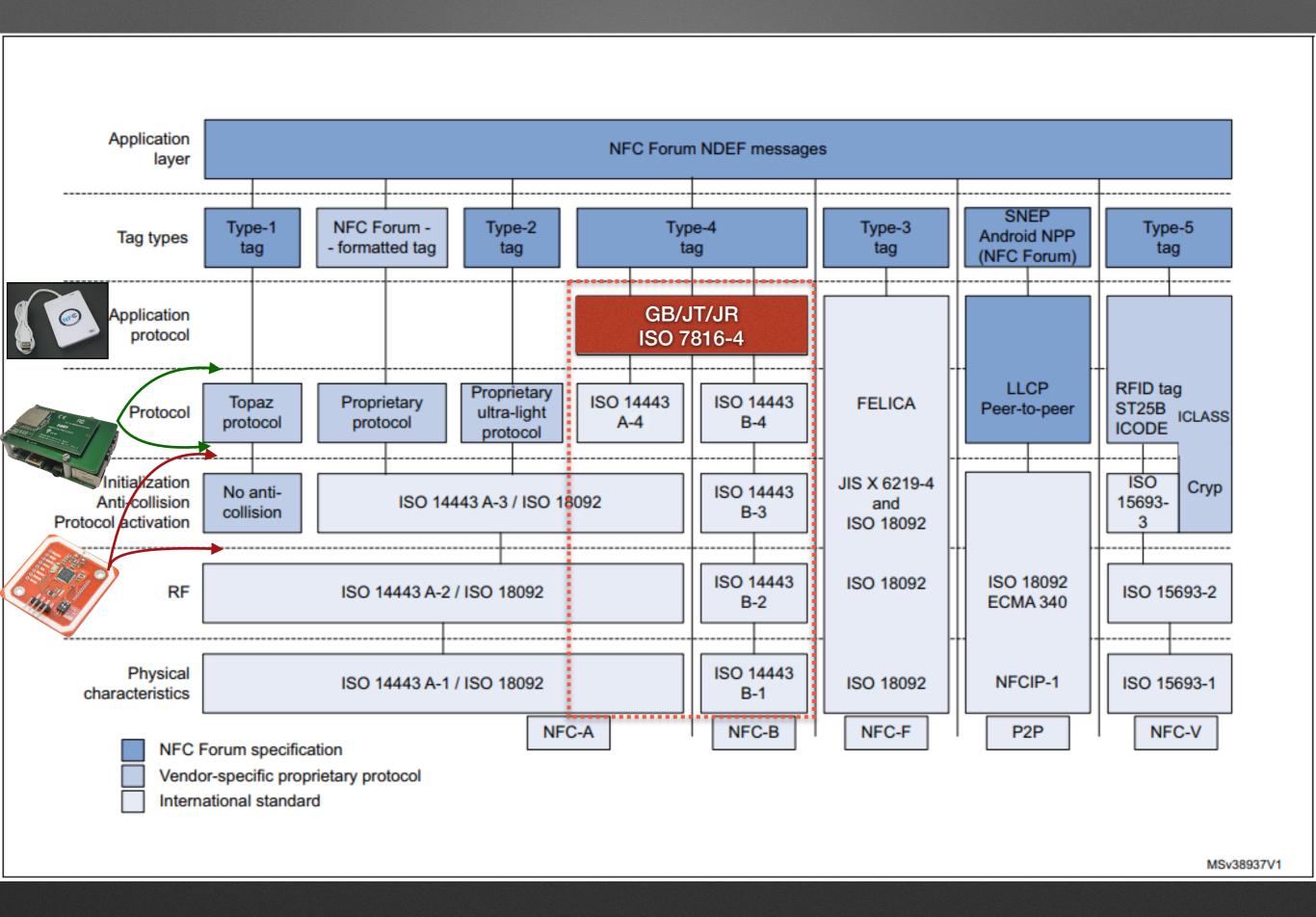
读卡器

PN532+Arduino



ACR122U+PC





编程篇

PC上的读卡应用

- 开发本地应用
 - 串口 / USB串口
 - USB-CCID
 - Bluetooth
- 跨平台问题
- 驱动问题

• 开发Web应用

ActiveX

WebUSB

WebBluetooth Chrome-Only

IE-Only

Chrome-Only

WebUSB 🖹 - UNOFF

Usage

% of all users

Global

60.94%

Allows communication with devices via USB (Universal Serial Bus).

Current align	ned Usage re	elative Date	relative	Apply filters	Show all	?									
IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini*	Android * Browser	Blackberry Browser	Opera Mobile	Chrome for Android	Firefox for Android	IE Mobile	UC Browser for Android	Samsı Interr
			4-53		10-40										
			54-60 ^F		41-47										
6-10	12-16	2-61	61-69	3.1 - 11.1	48-55	3.2-11.2		2.1 - 4.4.4	7	12-12.1			10		4-6
11	17	62	70	12	56	11.4	all	67	10	46	69	62	11	11.8	7.2
	18	63-64	71-73	TP		12									

Web Bluetooth ■ - UNOFF

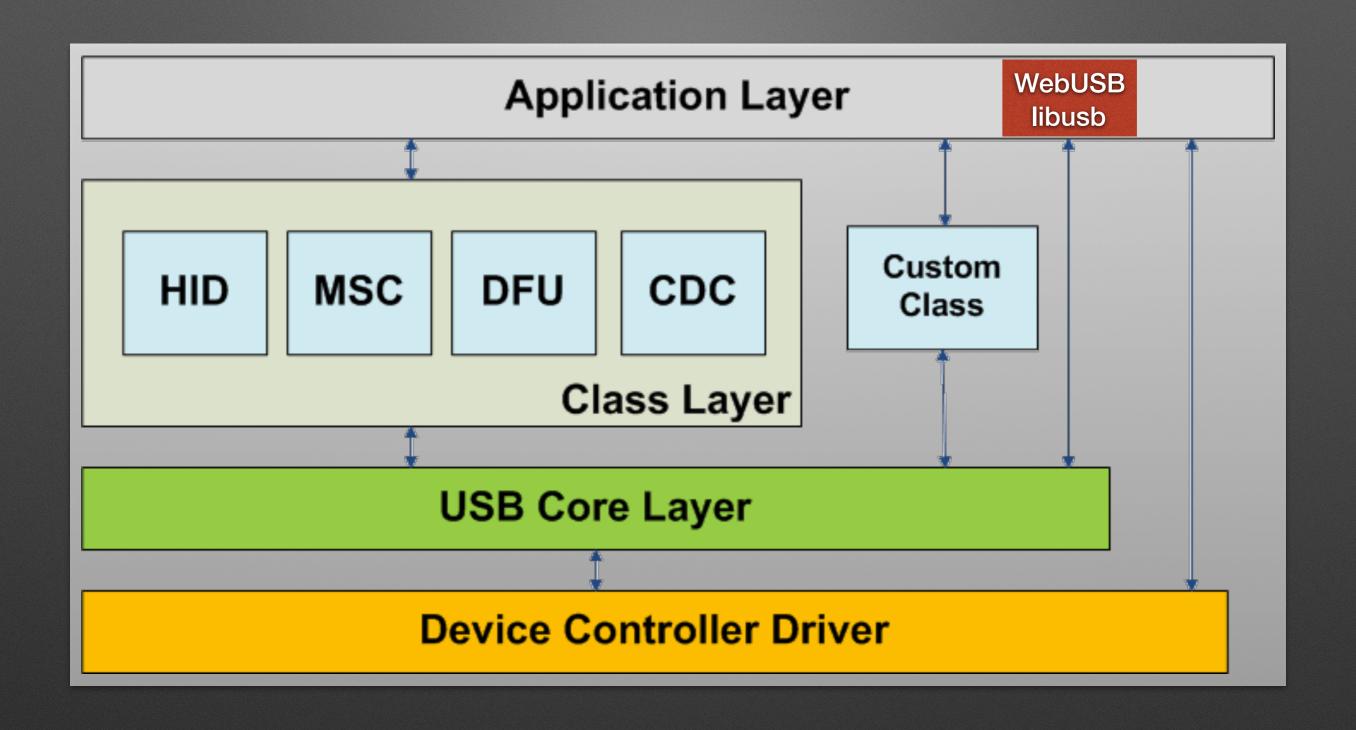
Usage % of all users

Global

61.48%

Allows web sites to communicate over GATT with nearby userselected Bluetooth devices in a secure and privacy-preserving way.

Current align	ned Usage re	elative Date	relative	Apply filters	Show all	?									
IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini*	Android * Browser	Blackberry Browser	Opera Mobile	Chrome for Android	Firefox for Android	IE Mobile	UC Browser for Android	Samsı Interr
			4-44		10-35										
			45-52 F		36-39										
			53-55		40-42										4-
6-10	12-16	2-61	⁴ 56-69	3.1-11.1	⁴ 43-55	3.2-11.2		2.1 - 4.4.4	7	12-12.1			10		6.2
11	17	62	70	12	⁴ 56	11.4	all	⁴ 67	10	46	⁴ 69	62	11	11.8	7.2
	18	63-64	⁴ 71-73	TP		12									



WebUSB API (Draft) - Device

Offset	Field	Size	Value	Description
0	bLength	1	Number	Size of this descriptor. Must be set to 24.
1	bDescriptorType	1	Constant	DEVICE CAPABILITY descriptor type ([USB31] Table 9-6).
2	bDevCapabilityType	1	Constant	PLATFORM capability type ([USB31] Table 9-14).
3	bReserved	1	Number	This field is reserved and shall be set to zero.
4	PlatformCapabilityUUID	16	UUID	Must be set to {3408b638-09a9-47a0-8bfd-a0768815b665}.
20	bcdVersion	2	BCD	Protocol version supported. Must be set to 0x0100.
22	bVendorCode	1	Number	bRequest value used for issuing WebUSB requests.
23	iLandingPage	1	Number	URL descriptor index of the device's landing page.

Platform Descriptor

Control Transfer

bmRequestType	bRequest	wValue	wIndex	wLength	Data
11000000B	bVendorCode	Descriptor Index	GET_URL	Descriptor Length	Descriptor

Offset	Field	Size	Value	Description	
0	bLength	1	at-	检测到Arduino Leonardo	×
1	bDescriptorType	1	l T	请前往 webusb.github.io 进行连接。	
2	bScheme	1	_		
3	URL	Variable	String	UTF-8 encoded URL (excluding the sc	heme prefix).

WebUSB API (Draft) - Host

```
serial.requestPort = function() {
  const filters = [
    { 'vendorId': 0x2341, 'productId': 0x8036 },
                                                         Secure https://webusb.github.io/arduino/demos/rgb/
    { 'vendorId': 0x2341, 'productId': 0x8037 },
                                                         webusb.github.io wants to connect
    { 'vendorId': 0x2341, 'productId': 0x804d },
    { 'vendorId': 0x2341, 'productId': 0x804e },
                                                           Arduino Micro
    { 'vendorId': 0x2341, 'productId': 0x804f },
    { 'vendorId': 0x2341, 'productId': 0x8050 },
  1;
  return navigator.usb.requestDevice({ 'filters': fi
    device => new serial.Port(device)
  );
                                                                                           Connect
                                                                                                      Cancel
                                                          Get help
```

WebUSB API (Draft) - Host

```
return this.device_.open()
    .then(() => {
     if (this.device_.configuration === null) {
        return this.device_.selectConfiguration(1);
    1)
    .then(() => this.device_.claimInterface(2))
    .then(() => this.device_.selectAlternateInterface(2, 0))
    .then(() => this.device_.controlTransferOut({
        'requestType': 'class',
        'recipient': 'interface',
        'request': 0x22,
        'value': 0x01,
        'index': 0x02}))
    .then(() => {
      readLoop();
    });
```

libusb_set_configuration

libusb_claim_interface libusb_set_interface_alt_setting libusb_control_transfer

WebUSB API (Draft) - Host

```
let readLoop = () => {
    this.device_.transferIn(5, 64).then(result => {
        this.onReceive(result.data);
        readLoop();
    }, error => {
        this.onReceiveError(error);
    });
};
```

```
serial.Port.prototype.send = function(data) {
   return this.device_.transferOut(4, data);
};
```

libusb_bulk_transfer



https://github.com/webusb/arduino

WebUSB W Arduino

This repository contains an Arduino library for WebUSB-enabling your sketches. Example sketches and JavaScript code are available in the demos directory.

The WebUSB object is a copy of the Arduino SDK's built-in USB serial library. It creates a WebUSB-compatible vendorspecific interface rather than one marked as USB CDC-ACM. This prevents operating system drivers from claiming the device and making it inaccessible to the browser. This library also implements:

- The WebUSB landing page descriptor, providing a hint to the browser about what page the user should navigate to to
 interact with the device. In Google Chrome the presence of this descriptor causes the browser to display a notification
 when the device is connected. The user can click on this notification to navigate directly to the provided URL.
- Microsoft OS 2.0 Descriptors which instruct the Windows operating system (8.1 and above) to automatically the WinUSB.sys driver so that the browser can connect to the device.

Compatible Hardware

WebUSB requires an Arduino model that gives the sketch complete control over the USB hardware. This library has been tested with the following models:

- Arduino Leonardo
- Arduino/Genuino Micro
- Arduino/Genuino Zero
- Arduino MKR1000
- Arduino MKRZero
- Arduino MKRFox1200
- Adafruit Feather 32u4

刷卡入会

- https://github.com/z4yx/ webusb-cardreader
- https://github.com/tuna/ registr/blob/master/ static/js/card-reader.js

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