USB Driver

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Driver Overview

- USB Driver Split into PC side and Device Side
- Device side matches PC side
- Current PC side driver is provided by SamSung
- Current Device side is developed by Marvell to cooperate with PC side driver.

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Drivers supported by Marvell MIFI

PID	Description	Driver type composition	Use case	Group Comparison (reason)	remark
0x6861	integrated driver(RNDIS(#0,1) + UMS(#2)	RNDIS+UMS+ dynamic composition	MS Composite		Samsung integrated driver
0x6864	integrated driver(RNDIS(#0,1))	RNDIS+dynamic composition	MS Composite		

PID	Description	Driver type composition	Use case	Group Comparison (reason)	remark
N/A	RNDIS Only	RNDIS			
N/A	ECM Only	ECM			
N/A	UMS Only	UMS			

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Dynamic composition

- Dynamic composition use the CDC-ACM Device Descriptor
- Enumerated as Modem in PC side
- 3 endpoints for one device: 1 for control, 2 for data(RX/TX)
- 2 Modems realized in current design: one for AT, one for Diag

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RNDIS

- Developed according to Microsoft RNDIS protocol
- 3 endpoints for one device: 1 for control, 2 for data(RX/TX)

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ECM

- Developed according to USB CDC-ECM protocol
- 3 endpoints for one device: 1 for control, 2 for data(RX/TX)

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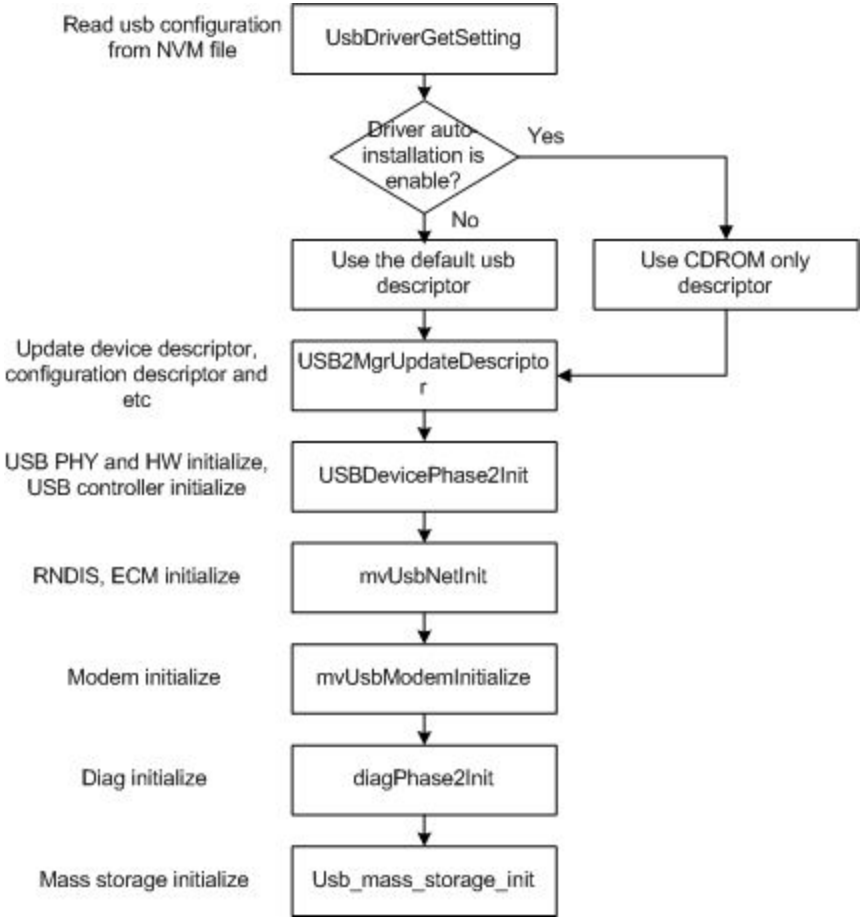
USB Initialization process



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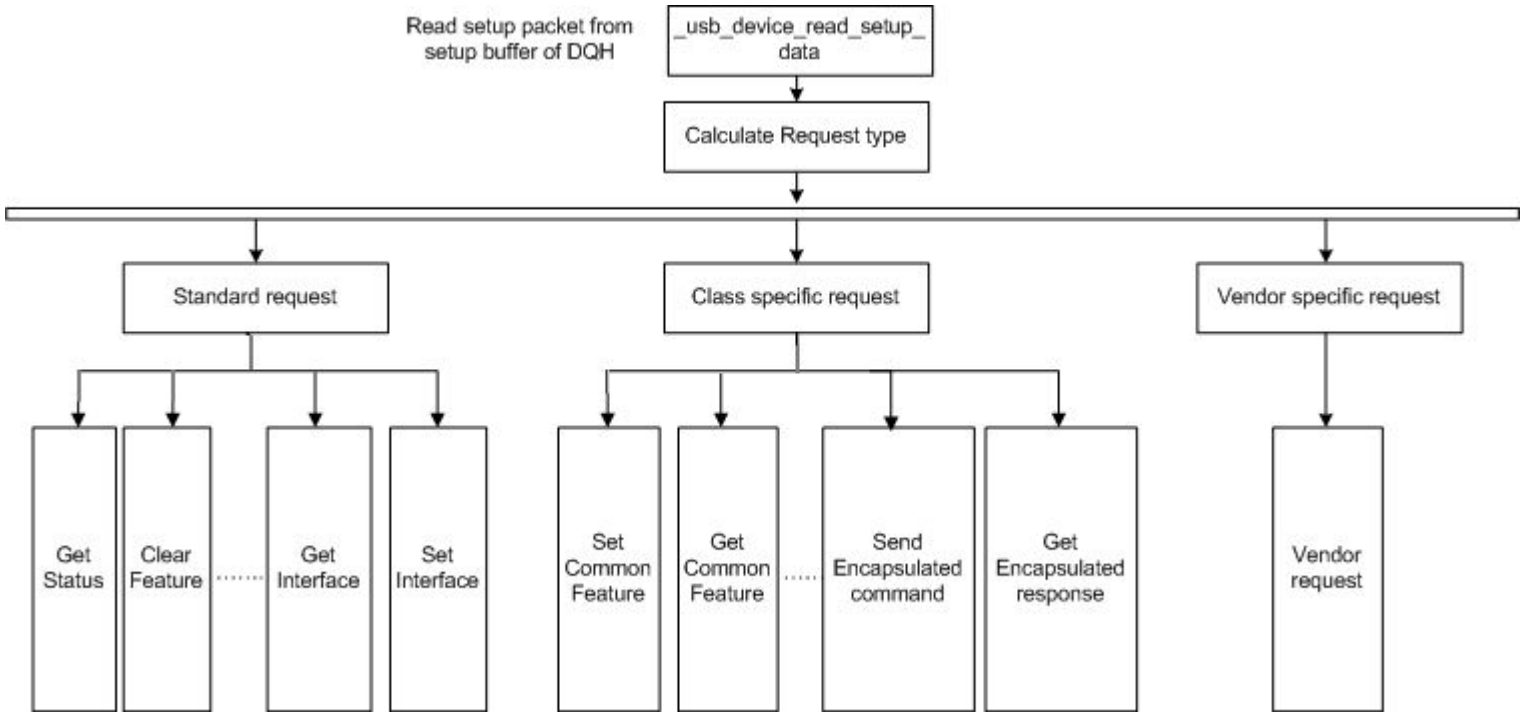
Setup packet process



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How to update USB descriptor

- **Modify or add new descriptor in USB2MgrUpdateDescriptor.**
  - Device descriptor.
  - Configuration descriptor.
  - String descriptor.

```
void USB2MgrUpdateDescriptor(PlatformUsbDescType desc)
{
    UINT16 dev_desc_length,config_desc_length, qualif_desc_length, other_speed_desc_length;
    UINT16 devDesc_num, configDesc_num;
    BOOL storage = FALSE;

    ..................................

    /* Get Mass storage enable flag. */
    storage = usbCfg.mass_storage;

    switch(desc)
    {
        ......................

        case USB_SSG_MIFI_DESCRIPTOR: //Samsung MIFI
        {
            devDesc_num=0;
            //Device Descriptor
            devDesc[devDesc_num++] = 0x12; //  bLength             - Descriptor length
            devDesc[devDesc_num++] = 0x01; //  bDescriptorType     - Descriptor  Type
            ..................................

            configDesc_num=0;
            //Configuration Descriptor
            configDesc[configDesc_num++]   = 0x09; // bLength              - Descriptor length
            configDesc[configDesc_num++]   = 0x02; // bDescriptorType      - Descriptor Type
            ..................................

            break;
        }

        ......................

    } ? end switch desc ?

    ......................

    switch(desc)
    {

        ......................

        case USB_SSG_MIFI_DESCRIPTOR:
        case USB_AZW_MIFI_DESCRIPTOR:
        {
            USBDeviceSetDescriptor( USB_DESCRIPTOR_TYPE_STRING , strDescManufacturer, sizeof(strDescManufacturer), 1);//iManu
            USBDeviceSetDescriptor( USB_DESCRIPTOR_TYPE_STRING , strMobileDevice, sizeof(strMobileDevice), 2);//iProduct
            USBDeviceSetDescriptor( USB_DESCRIPTOR_TYPE_STRING , strMobileNumber, sizeof(strMobileNumber), 3);//iSerialNumber
            ......................
```

Device descriptor

Configuration descriptor

Set string descriptor

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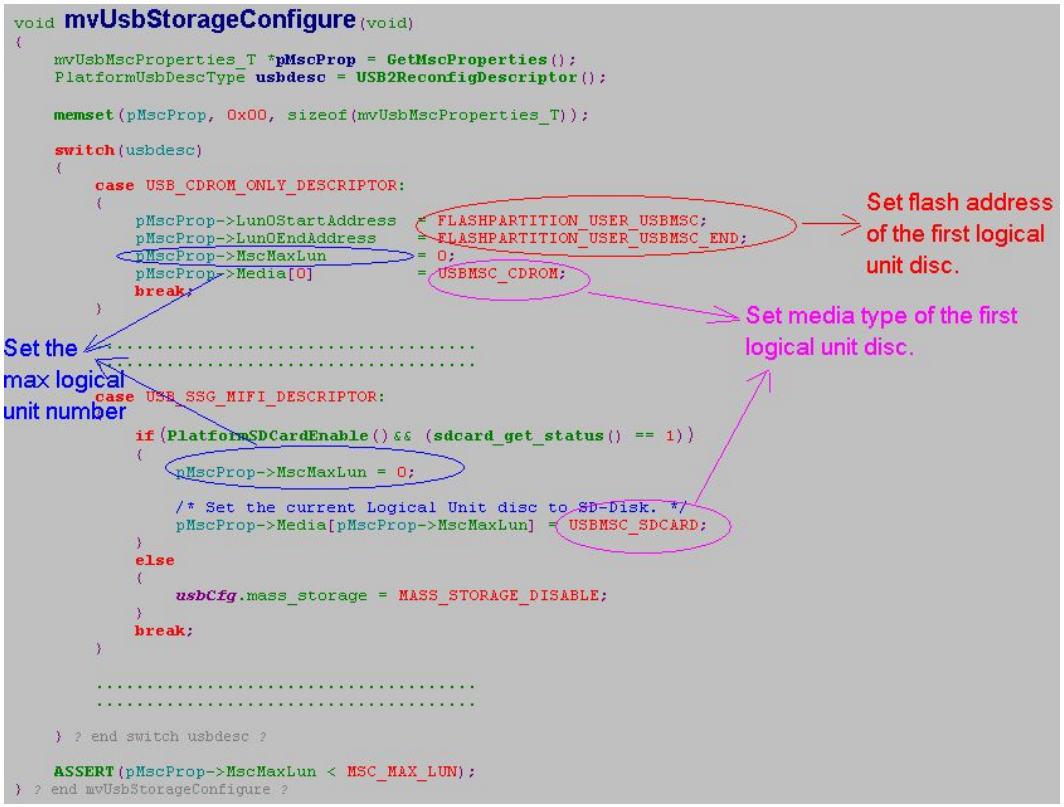
How to configure Mass Storage

Configure mass storage.

- The max logical unit number.
- The Start/End flash address.
- The media type of logical disc.
- Enable/Disable Mass storage.




```
void mvUsbStorageConfigure(void)
{
    mvUsbMscProperties_T *pMscProp = GetMscProperties();
    PlatformUsbDescType usbdesc = USB2ReconfigDescriptor();

    memset(pMscProp, 0x00, sizeof(mvUsbMscProperties_T));

    switch(usbdesc)
    {
        case USB_CDROM_ONLY_DESCRIPTOR:
        {
            pMscProp->Lun0StartAddress  = FLASHPARTITION_USER_USBMSC;
            pMscProp->Lun0EndAddress    = FLASHPARTITION_USER_USBMSC_END;
            pMscProp->MscMaxLun         = 0;
            pMscProp->Media[0]          = USBMSC_CDROM;
            break;
        }
        ..................................
        ..................................
        case USB_SSG_MIFI_DESCRIPTOR:
            if(PlatformSDCardEnable() && (sdcard_get_status() == 1))
            {
                pMscProp->MscMaxLun = 0;

                /* Set the current Logical Unit disc to SD-Disk. */
                pMscProp->Media[pMscProp->MscMaxLun] = USBMSC_SDCARD;
            }
            else
            {
                usbCfg.mass_storage = MASS_STORAGE_DISABLE;
            }
            break;
        }

        ..................................
        ..................................

    } ? end switch usbdesc ?

    ASSERT(pMscProp->MscMaxLun < MSC_MAX_LUN);
} ? end mvUsbStorageConfigure ?
```

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How to modify the flash address of mass storage

- **Modify the flash address of every logical unit disc in flashpartition.h**

```
/*********************************************/
/* FAT System/Mass Storage Nor flash Address */
/*********************************************/

#ifdef SPI_NOR_FLASH

#define FAT_SYS_MAP_TABLE_ADDRESS           0x960000
#define FAT_SYS_START_ADDRESS               (0x960000+0x30000)
#define FAT_SYS_END_ADDRESS                 (FAT_SYS_START_ADDRESS+0x210000-1)

#define FLASHPARTITION_USER_USBMSC          0xBA0000
#define FLASHPARTITION_USER_USBMSC_END      (0xDA0000-1)

/* USB Flash Disc one*/
#define FLASHPARTITION_USER_USBMSC1         (0xDA0000)
#define FLASHPARTITION_USER_USBMSC1_END     (0xEA0000-1)

/* USB Flash Disc two*/
#define FLASHPARTITION_USER_USBMSC2         (0xEA0000)
#define FLASHPARTITION_USER_USBMSC2_END     (0xFA0000-1)

#define FLASHPARTITION_PSM_ADDR             0xFA0000

#else /* Nand Flash layout*/
```

the first logical unit disc

the second logical unit disc

the third logical unit disc

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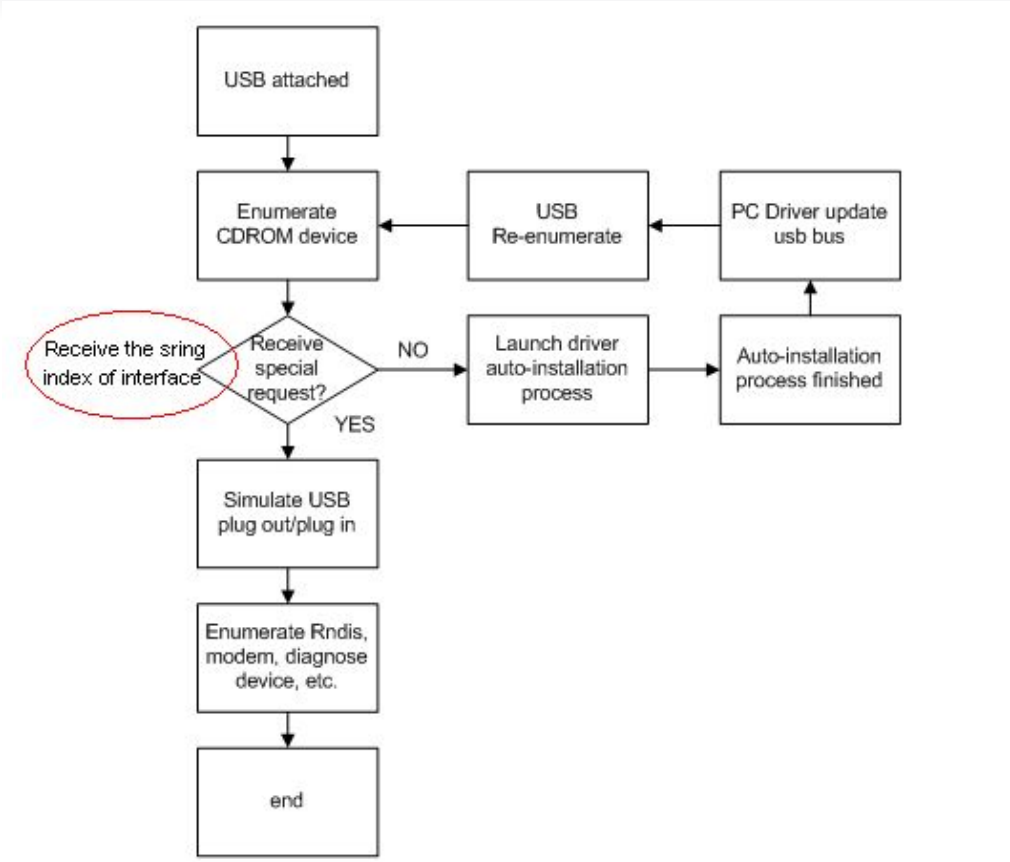
Driver Auto-installation



Driver auto-installation flow chart

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Debug With Bushound

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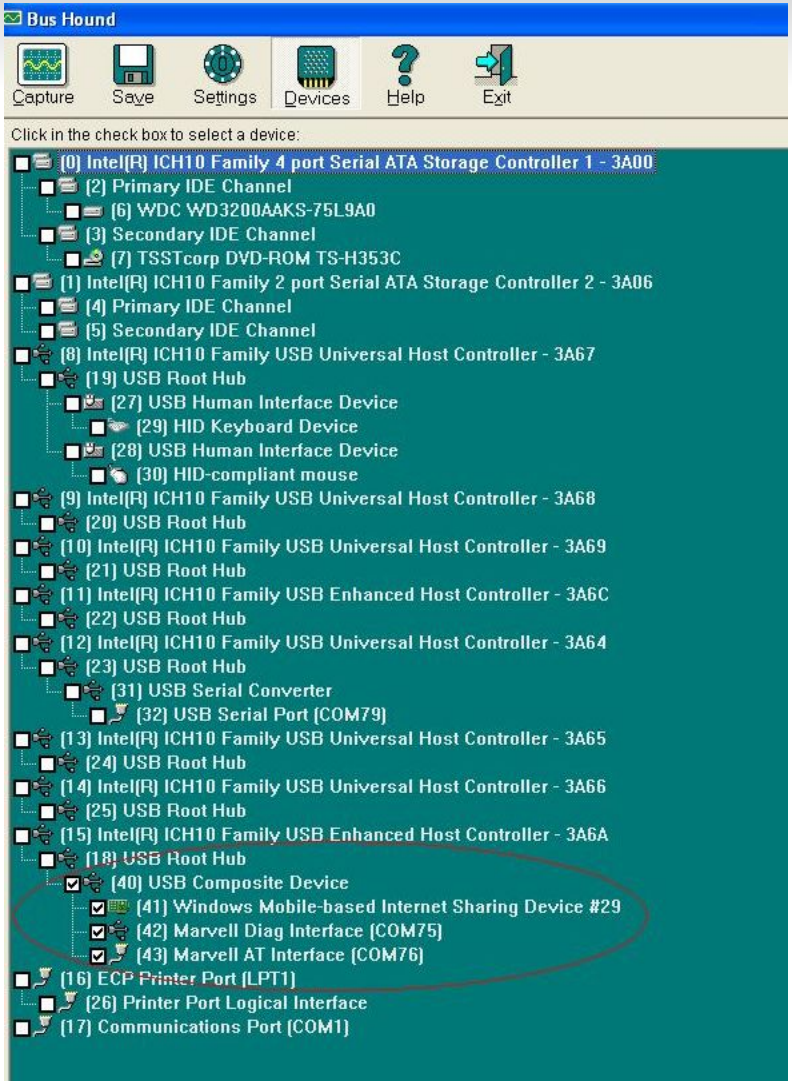
How to capture bushound log

- Select usb devices



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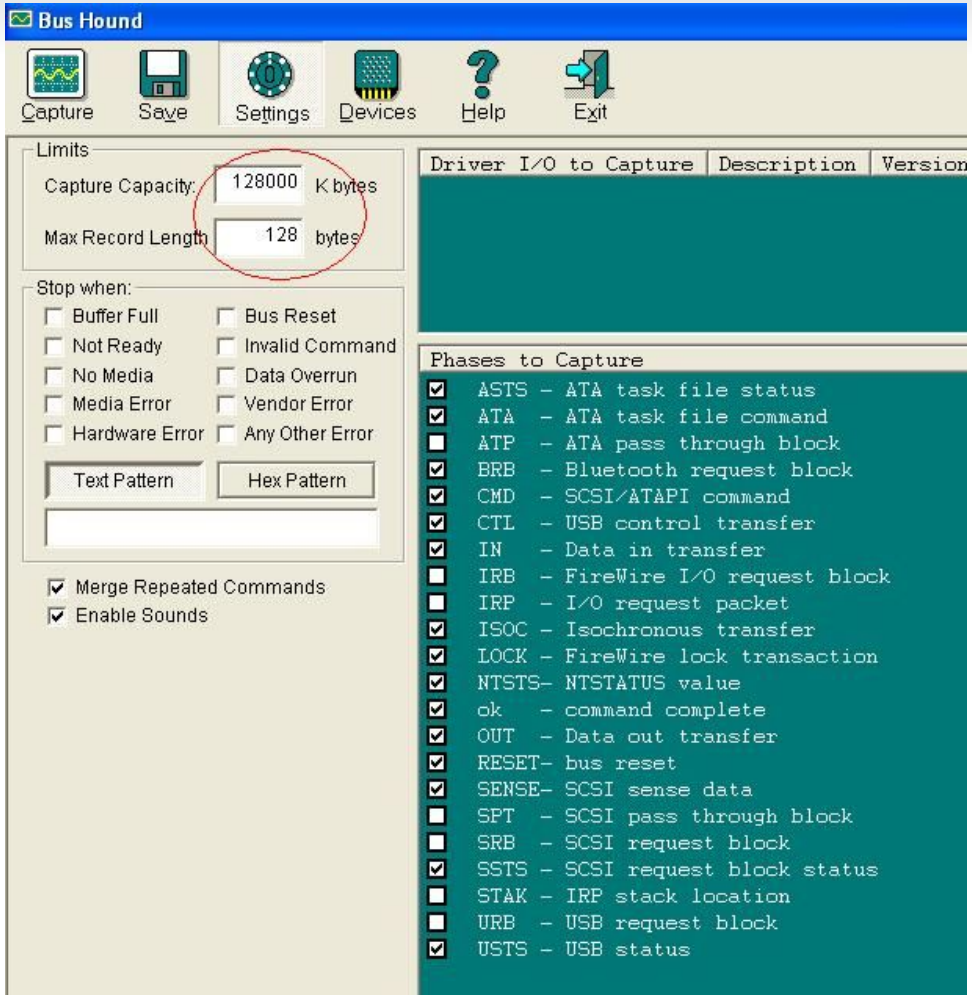
How to capture bushound log

- Set “Capture Capacity”.
- Set “Max Record Length”



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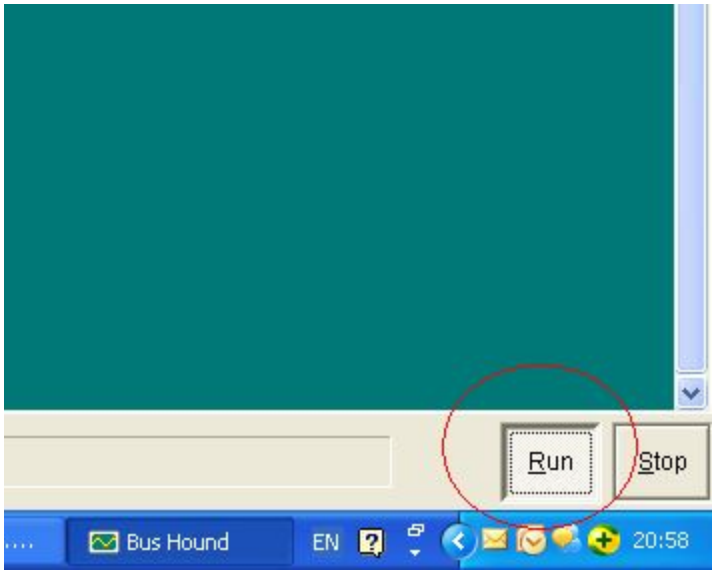
How to capture bushound log

- Click “run” button to start to capture log.



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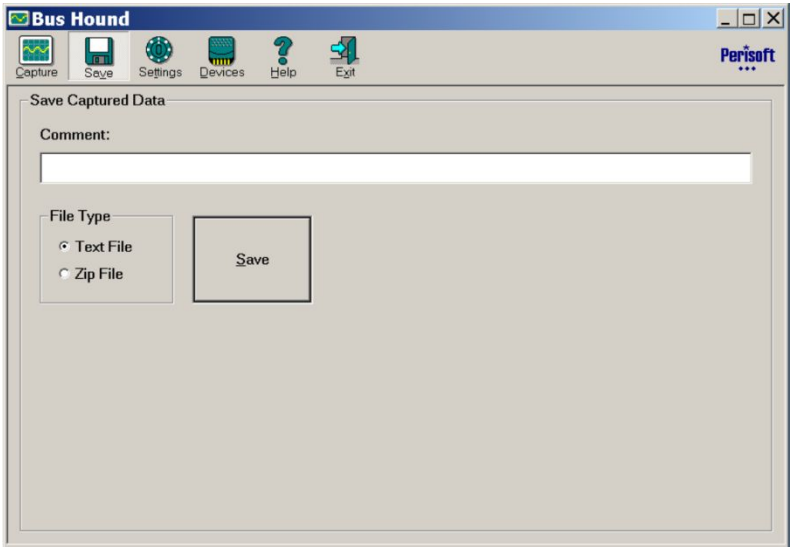
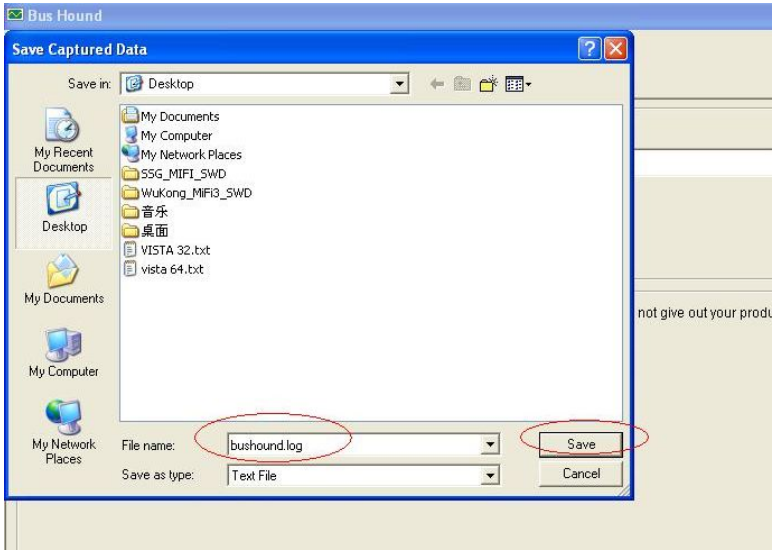
How to capture bushound log

Save log





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Thank You!

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