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BCM20729	CYW20729
BCM20719	CYW20719
BCM20735	CYW20735
BCM920735WCDEVAL	CYW920735WCDEVAL
BCM20739	CYW20739
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Software User Manual

WICED BT SDK

Developing Custom Applications with BT Designer



PRELIMINARY

Revision History

<i>Revision</i>	<i>Date</i>	<i>Change Description</i>
WICED-BT-SDK-SWUM200-R	07/21/16	Initial release

PRELIMINARY

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PRELIMINARY

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PRELIMINARY

About This Document

Purpose

This document provides information on the WICED Bluetooth (BT) Designer. The WICED BT Designer is executed as an Eclipse IDE plug-in and helps software developers create applications for Bluetooth devices that will execute on Broadcom® Bluetooth devices.



Note: The WICED BT SDK IDE uses its WICED BT Designer to help users create a new application. The WICED BT Designer, although not explicitly labeled in the WICED BT SDK IDE, can be initiated by clicking **File > New > Wiced Bluetooth Designer** in the WICED BT SDK IDE.

Scope

This document applies to **WICED BT SDK 3.7.x**, which provides software development support for products that use the Broadcom BCM2070x, BCM20735, or BCM20739 Bluetooth devices.

Audience

This document is for software developers who are using the WICED BT SDK Development System to create applications for Broadcom Bluetooth devices.

Acronyms and Abbreviations

In most cases, acronyms and abbreviations are defined on first use. For a comprehensive list of acronyms and other terms used in Broadcom documents, go to:

<http://www.broadcom.com/press/glossary.php>.

Document Conventions

The following conventions may be used in this document:

Convention	Description
Bold	Buttons, tabs, lists and other GUI items: click Next , select the Startup tab.
Monospace	Command lines and application outputs: <code>hello_sensor-BCM920737TAG_Q32 download</code>
< >	Placeholders for <i>required</i> elements: <WICED-BT-SDK>
''	Application Names, Configuration Parameters: 'heart_rate_monitor'

References

The references in this section may be used with this document.



Note: Broadcom provides customer access to technical documentation and software through its Broadcom Support Community website (community.broadcom.com). Additional restricted material may be provided through the Customer Support Portal (CSP) (support.broadcom.com).

For Broadcom documents, replace the "xx" in the document number with the largest number available to ensure you have the most current version of this document.

Document (or Item) Name	Number	Source
[1] WICED BT SDK Quick Start Guide	WICED-BT-SDK-QSG10x-R	WICED BT SDK or community.broadcom.com
[2] BCM20707 Hardware Interfaces	20707-UM10x-R	WICED BT SDK or community.broadcom.com
[3] Bluetooth Core Specification 4.1	–	www.bluetooth.org
[4] Assigned Numbers	–	www.bluetooth.org

Technical Support

Broadcom provides customer access to a wide range of information, including technical documentation, schematic diagrams, product bill of materials, PCB layout information, and software updates through its customer support portal. For a CSP account, contact your Broadcom Sales or Engineering support representative.

General WICED support is available to registered users in the Broadcom Support Community forum:

<http://community.broadcom.com/welcome>

Introduction

The BT Designer feature of the WICED BT SDK IDE helps software developers generate the Bluetooth Generic Attribute Profile (GATT) and/or Service Discovery Profile (SDP) databases and initial code for their Bluetooth WICED applications.



Note: WICED applications are created to work with Broadcom BCM2070x, BCM20735, and BCM20739 devices. They can be run and debugged on a Broadcom WICED Eval board. See [“References” on page 7](#) to get more information on WICED Bluetooth device usage and the interfaces supported.

The GATT and SDP databases may contain the following types of service records, services and characteristics:

- BT Special Interest Group (SIG) approved service records, services and characteristics.
- Vendor-specific service records, services and characteristics.

The initial application code generated by the BT Designer indicates to developers where they'll need to make additions and modifications.



Note: The BT Designer is initiated by clicking **File > New > WICED Bluetooth Designer** in the WICED BT SDK IDE.

Application development with the BT Designer takes place in three phases:

1. Phase 1: Device functionality, SDP and/or GATT database information is entered via the WICED BT Designer.
At the end of this phase, a WIC file, which is an XML representation of the device, is produced.
2. Phase 2: Initial code is automatically generated.
Code generation is initiated by a button click, and the BT Designer generates GATT and/or SDP databases and initial application code.
3. Phase 3: Users fill-in application-specific code.
The initial code produced by the BT Designer contains “To do” comments for application developers to act on.

The following high-level process, which covers the first two phases of application development, can be used to create a new WICED BT Designer application:

1. Create a device name (see [“Creating an Application for a New Device” on page 9](#)).
2. Fill in new device configuration information by:
 - a. Entering device settings (see [“Entering Device Settings Information” on page 12](#)).
 - b. Adding services and characteristics (see [“Adding Services and Characteristics” on page 14](#)).
3. Generate the initial code for the GATT and/or SDP databases and the WICED application (see [“Viewing Files” on page 22](#)).

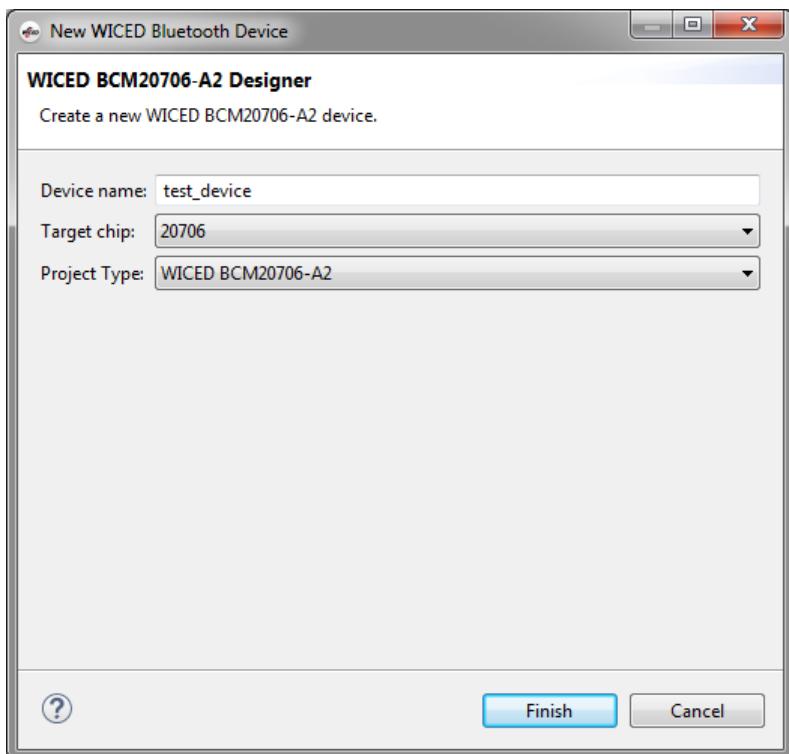


Note: Throughout the document, fields that are grayed-out in the various BT Designer windows and tabs are mandatory per *Bluetooth Core Specification 4.1* and cannot be edited.

Creating an Application for a New Device

To create an application for a new device:

1. Click **File > New > WICED Bluetooth Designer**.
2. In the New WICED Device window, enter a device name.

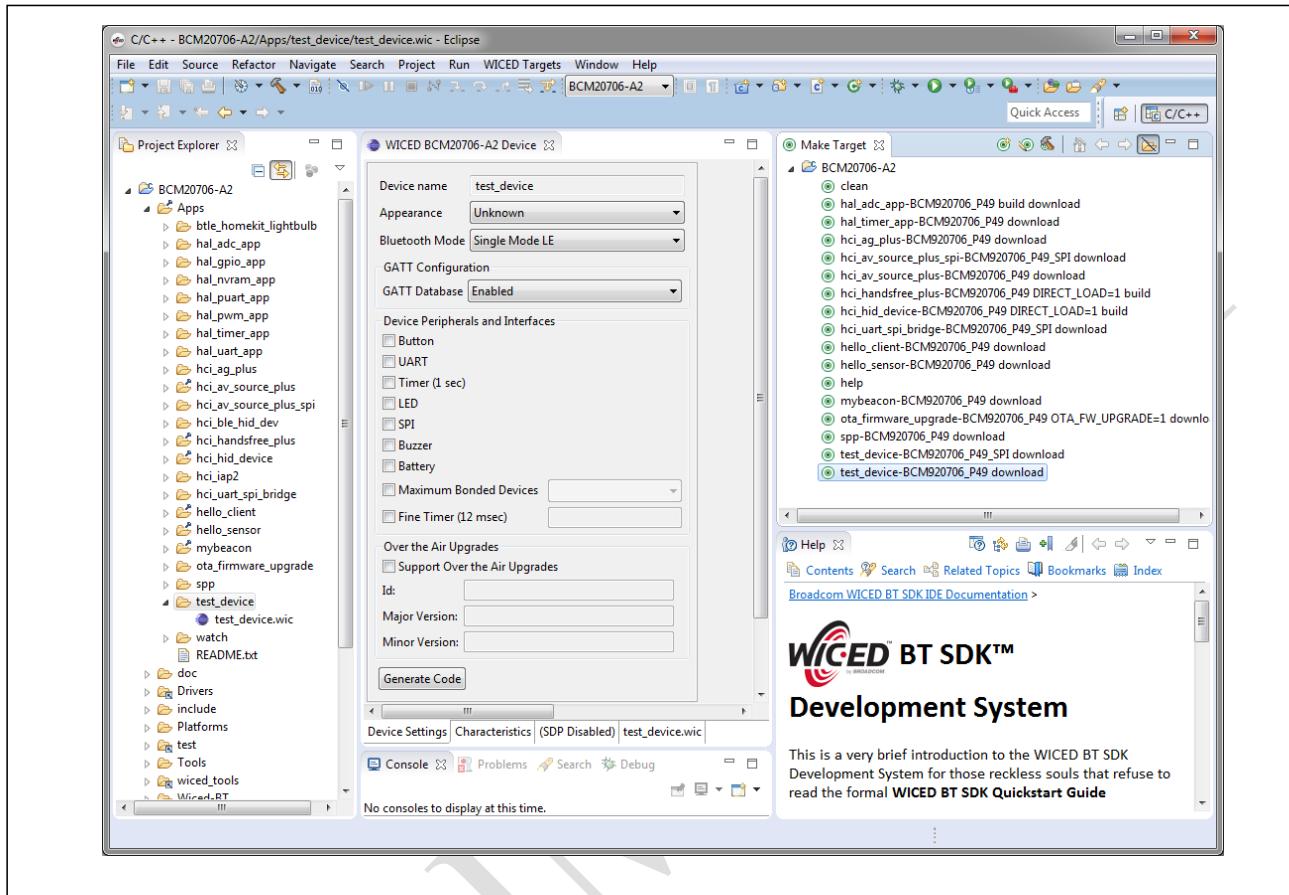


Note: In the above example, test_device is used as the device name. Users should select a device name that is relevant to their new application. For example, smart_lock, light, thermometer, etc. The particular Bluetooth device shown will depend on the currently targeted device – see the [Quick Start Guide \[1\]](#) for information on device target selection.

3. In the New WICED Device window, click **Finish**.

By clicking finish, a test_device folder is added as a subdirectory under the Apps directory in the Project Explorer and a test_device target is added to the Make Target pane (see [Figure 1 on page 10](#)).

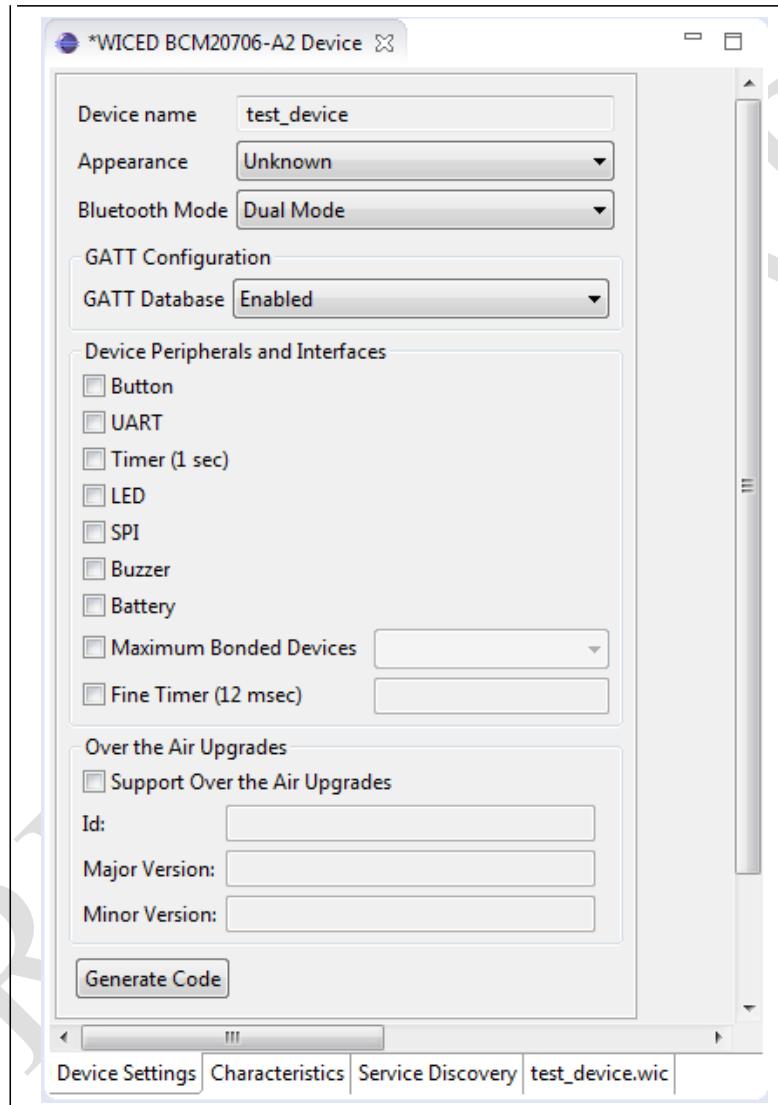
Figure 1: WICED BT SDK IDE After Creating a New Application Device Name



Filling in Configuration Information for a New Device

After [Creating an Application for a New Device](#), add the new device configuration information in the WICED Device window (which is initially located in the center of the WICED BT SDK IDE). [Figure 2](#) shows the WICED Device window.

Figure 2: WICED BT SDK IDE—WICED Device Window



As shown in [Figure 2](#), the WICED Device window has up to the following four tabs: Device Settings, Characteristics, Service Discovery, and test_device.wic. Depending on the Bluetooth Mode selected and the capabilities of the chip, the Service Discovery or Characteristics tabs may be disabled. See [Entering Device Settings Information](#) for more information.

The Device Settings, Characteristics, and Service Discovery tabs are used to enter information and generate source code. The test_device.wic tab is an XML file that will ultimately describe device settings and the services and characteristics supported by the device.

Entering Device Settings Information

Perform the following steps to enter the device settings:

1. In the lower-left corner of the WICED Device window, click on the **Device Settings** tab if it is not already selected.
2. In the **Appearance** menu, select an appropriate appearance. The WICED BT Designer presents the list of the appearance characteristic values approved by the Bluetooth SIG. See the assigned numbers on the Bluetooth SIG website (www.bluetooth.org).



Note: At the time of document publication, the generic access profile assigned numbers were located at www.bluetooth.org/en-us/specification/assigned-numbers/generic-access-profile.

3. In the **Bluetooth Mode** menu, select the target device Bluetooth capabilities. This will default to match the known chip capabilities, for example, the 20706 is a Dual Mode device (supports both BR/EDR or “classic” Bluetooth, as well as Low Energy or LE functionality). The selection of Bluetooth Mode controls whether the application will support the GATT service and characteristic database, the SDP service discovery record database, or both. If a device supports Dual Mode, either of the Single Modes (BR/EDR and LE) can be selected instead if only 1 mode is needed for the application.
4. In the **Device Peripherals and Interfaces** pane, select the pertinent peripherals and interfaces.

Table 1 provides the user actions for each peripheral and interface.

Table 1: Device Peripherals and Interfaces

Peripheral or Interface	User Action
Button	Select if the application uses a button.
UART ^a	Select if the application uses a peripheral UART.
Timer (1 sec)	Select if the application uses a one-second timer.
LED	Select if the application uses an LED.
SPI ^a	Select if the application uses a SPI interface.
Buzzer	Select if the application uses a buzzer.
Battery	Select if the application supports coin-cell battery operation.
Maximum Bonded Devices	Select if the application supports bonded devices. If it does, then select the maximum number of supported paired devices from the associated pull-down menu. Note: The Maximum Bonded Devices default value is 5.
Fine Timer (12 msec)	Select if the application supports a fine timer. Note: The default fine timer is 12 msec. The set of possible values is 12 msec to 1000 msec. To change the value from the default, enter a decimal value. Enter values in milliseconds. For example: to change to 100 milliseconds, enter 100 (not 0.1).

- a. A typical application may use the peripheral UART interface and/or one or both of the SPI interfaces to connect with a microcontroller unit (MCU) or a sensor. For a better understanding of how to configure UART and SPI interfaces, as well as other interfaces, see [Reference \[2\] on page 7](#).

5. To support over-the-air upgrades, perform the following steps in the **Over the Air Upgrades** pane:
 - a. Click **Support Over the Air Upgrades**.
 - b. In the **Id** field, use the pseudo unique value generated by BT Designer or enter a globally unique value of your choosing that does not conflict with any other applications.
 - c. In the **Major Version** field, enter the major version.



Note: The initial major version is 1. Users should increment the major version for an application update that fixes a security vulnerability.

- d. In the **Minor Version** field, enter the minor version.



Note: The initial minor version is 0. Users should increment the minor version each time a new version of the application gets generated.



Note: Although the Generate Code button is provided in the Device Settings tab, there is no reason to generate code until after entering all pertinent services and characteristics (see “[Entering Device Settings Information](#)” on page 12).

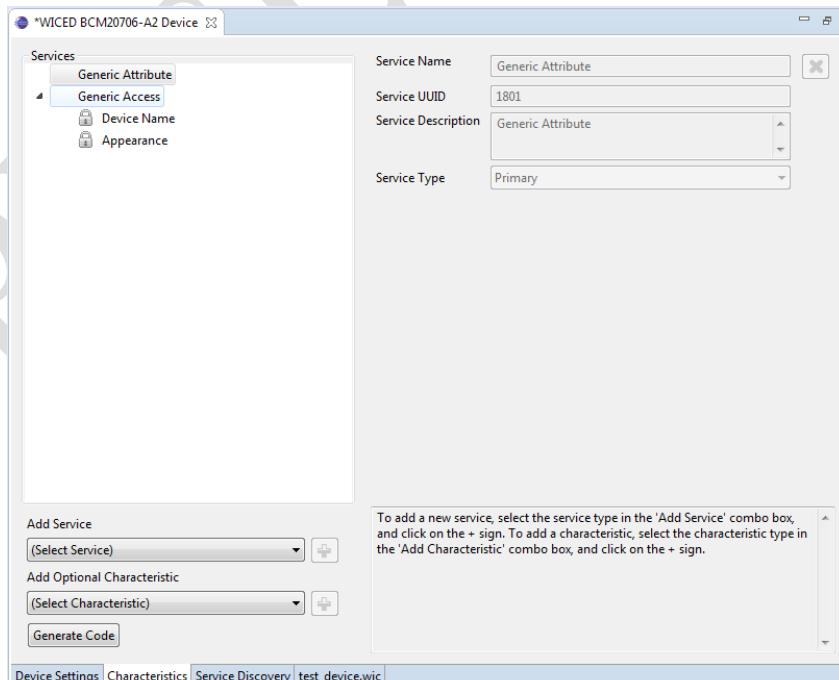
Adding Services and Characteristics

Depending on the **Bluetooth Mode** selection, the application may support the LE GATT database, the BR/EDR SDP database, or both.

GATT Database

Perform the following steps to add GATT services and characteristics:

1. In order to be able to see all content in the WICED Device window, maximize it.
2. In the lower-left corner of the WICED Device window, click on the **Characteristics** tab.



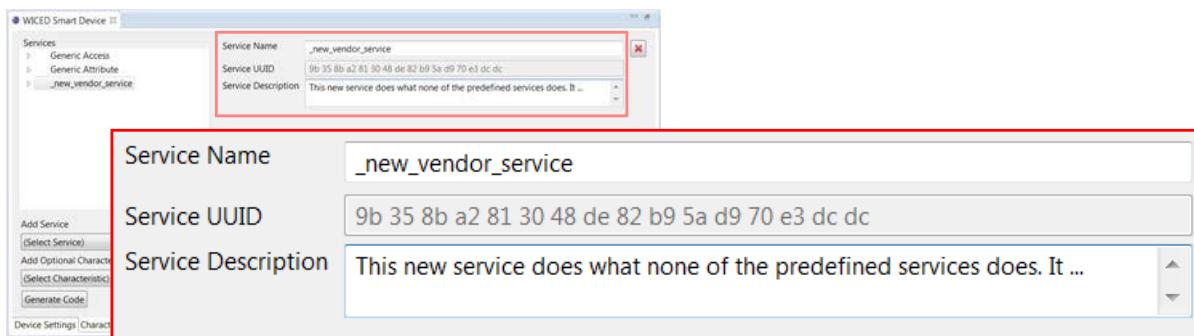


Note: The above screenshot shows the default state of the Characteristics tab before any services and associated characteristics have been added. The Generic Access and Generic Attribute services are automatically included by default to comply with *Bluetooth Core Specification 4.1*. The characteristics associated with the Generic Access service can be viewed by clicking on the arrow (►) to the left of Generic Access and then selecting the characteristic to view.

3. To add a new service, such as a vendor-specific service, select **Vendor Specific Service** from the **Add Service** drop-down menu and then click the sign.

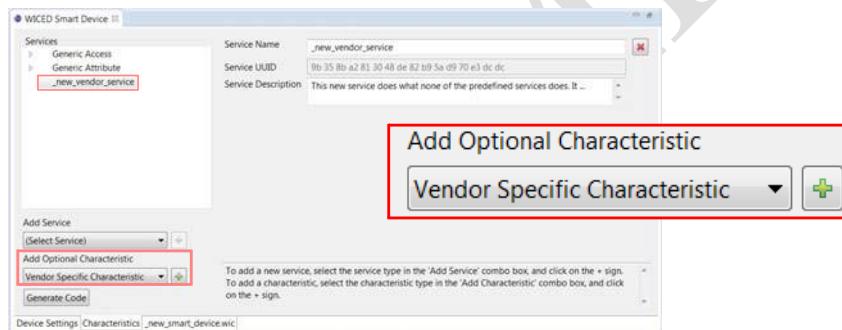


4. To rename the service and alter the service description, edit the **Service Name** and **Service Description** fields accordingly.

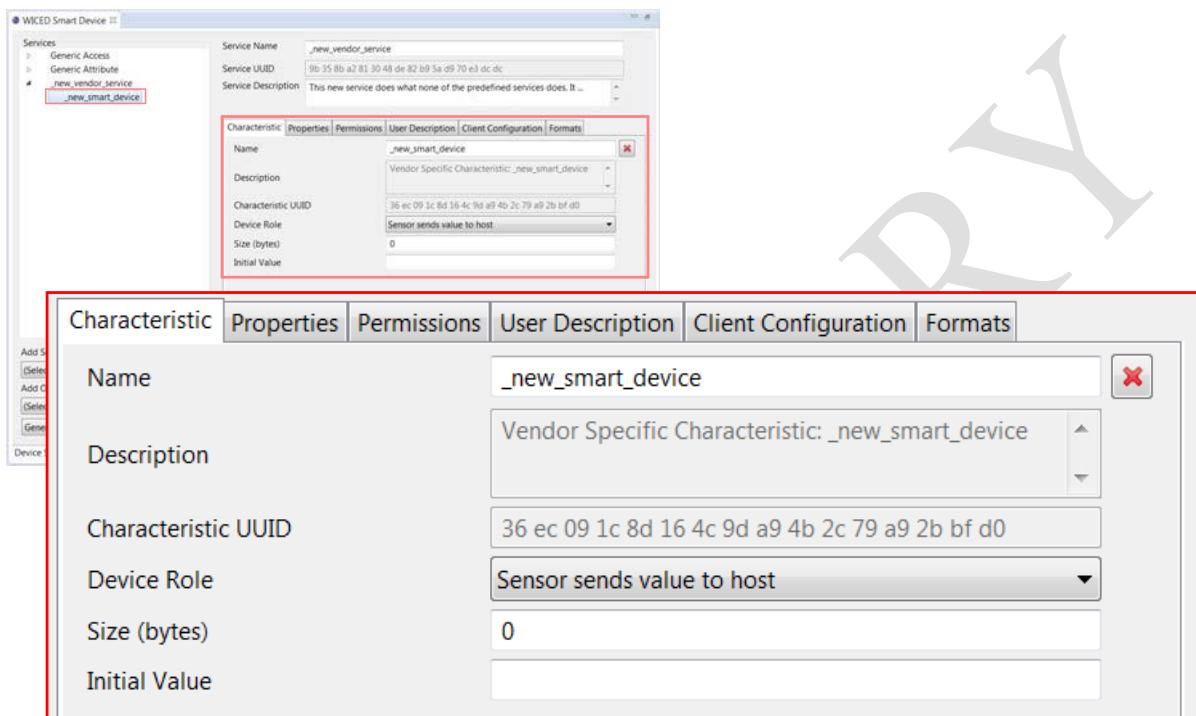


Note: For a newly created vendor-specific service, the BT Designer generates a new, random 128-bit number as the Service UUID. The Service UUID of each predefined service is 16 bits. The Service UUID is represented in the IDE as a hexadecimal number.

5. To add a characteristic to the newly added service:
- In the **Services** pane, click on the new service if it is not already selected.
 - In the **Add Optional Characteristic** menu, select **Vendor Specific Characteristic**.
 - Click the plus sign next to **Vendor Specific Characteristic**.



6. To update the data associated with the newly added characteristic:
 - a. In the **Services** pane, click on the new characteristic if it is not selected.
 - b. Fill out the information in the Characteristic, Properties, Permissions, User Description, Client Configuration, and Formats panes.

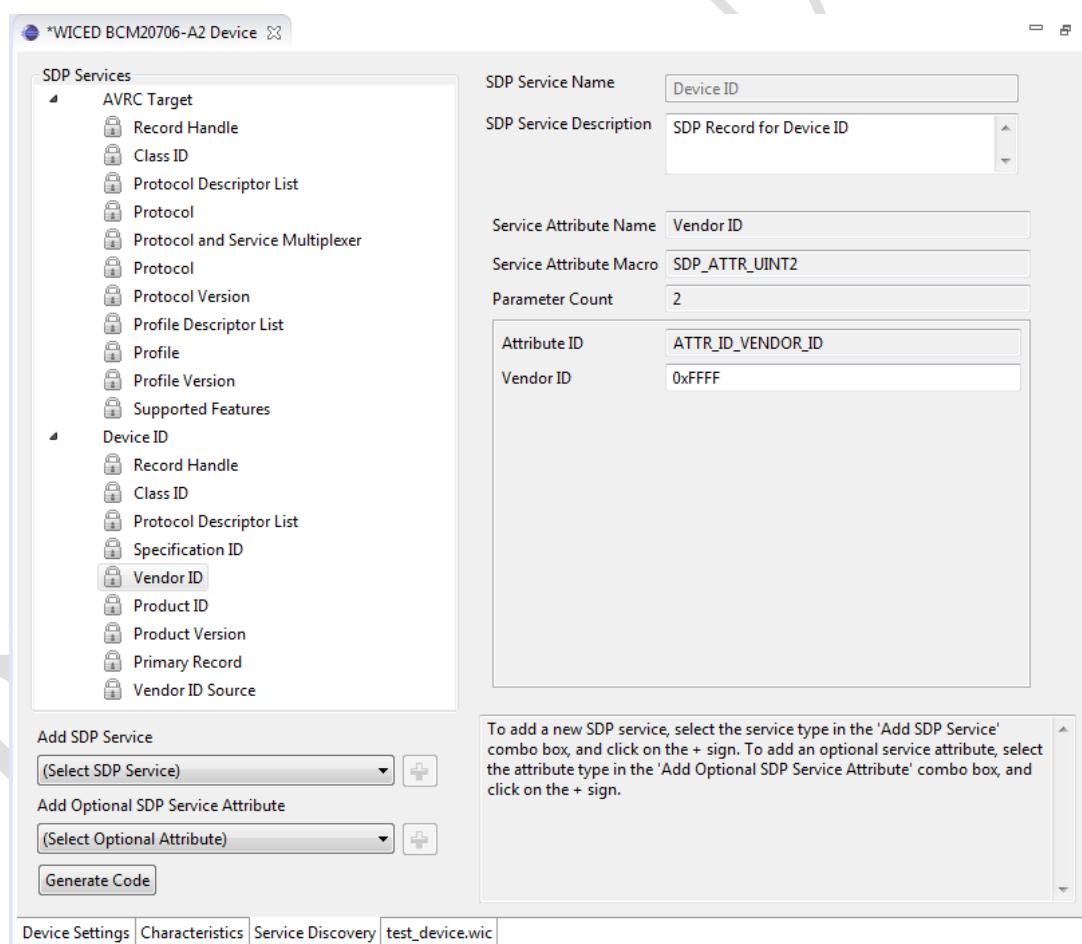


For help understanding and filling out the above panes, see “[Viewing and Understanding Services and Characteristics](#)” on page 18.

SDP Database

Perform the following steps to add BR/EDR SDP service records:

1. In order to be able to see all content in the WICED Device window, maximize it.
2. In the lower-left corner of the WICED Device window, click on the **Service Discovery** tab.
3. To add a new service record, choose from the list of supported SDP services from the **Add SDP Service** drop-down menu and then click the plus sign.
4. Each service added will appear in the **SDP Services Pane**, and any associated SDP Service Attributes will appear in a tree. Service Attribute values are mainly hard-coded (and thus editing is disabled) to supply the required values according to the Bluetooth Core Specification, but if any **Optional SDP Service Attributes** are desired, they may be clicking on the service name listed in the **SDP Services Pane**, and then added with the **Select Optional Attribute** drop down menu.
5. Click through each attribute under each service to see which may be configured with custom values, and perform any additional configuration needed.



Generating Code

The *.wic file, *db.h file, and *db.c files associated with an application can be automatically generated after entering all device settings information (see “[Entering Device Settings Information](#)” on page 12) and adding all services and characteristics (see “[Adding Services and Characteristics](#)” on page 14).

To generate code:

Click **Generate Code** in either of the Device Settings, Characteristics, or Service Discovery tabs.



Note: The *db.h and *db.c files are often collectively referred to as the GATT database. Neither of these files should be edited manually.

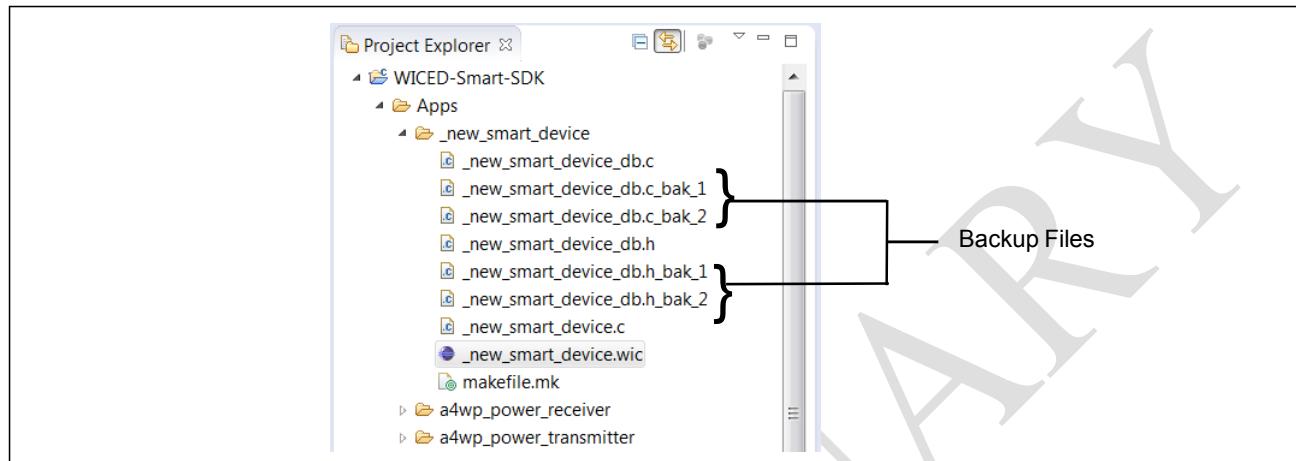
[Table 2](#) briefly describes the files added to the new Apps subdirectory.

Table 2: New Device Application Files

File	Description
*db.c	GATT and SDP database files. The code in these files gets automatically generated from the device settings, services, and characteristics defined by the user.
*.c	This is the application code. The initial file is automatically generated. It contains some initial code that users will have to modify and add to in order to make their application work.
*.wic	An XML configuration file that will contain device settings, services, and characteristics supplied by users. Users supply the device settings, services, and characteristics information by filling in the WICED Device window (see “ Filling in Configuration Information for a New Device ” on page 11). This file is essentially a human-readable version of the GATT and SDP databases. It can be viewed from the BT Designer <name>.wic tab. Note: This file should not be edited.
makefile.mk	A make file for building an application target.

Each time code is generated (by clicking **Generate Code**), new GATT database files get created. New files get created even if the device settings, services, and characteristics have not changed. Previous GATT database files are retained as backups (see [Figure 3](#)).

Figure 3: Project Explorer Showing GATT Database Backup Files



See [Appendix A: “Sample Application Files,” on page 23](#) to see some excerpts from some sample *.wic, *.db.c, and *.c files.

When code for a new application gets generated:

- The *.db.c, *.db.h, and *.c files get populated with some initial code.
- The *.db.h file gets included in the *.c file. For example, the test_device.c file has the following line in it:
#include "test_device_db.h".
- Constants in the *.c file get updated with:
 - The user-supplied device name and appearance.
 - The main service UUID.
 - The characteristic UUID.
 - To do comments (indicated as // ToDo:) for developers to take action on.

Viewing and Understanding Services and Characteristics

Viewing the Services and Characteristics of an Application

To view the GATT services associated with an application being developed:

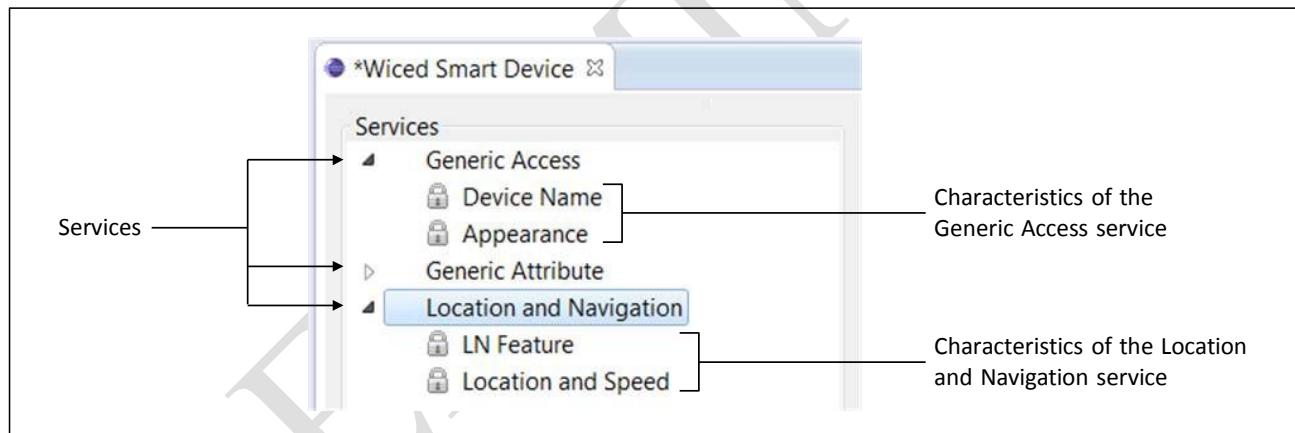
1. In the Project Explorer, navigate to the *.wic file of the relevant application.
2. Double click the *.wic file to open the WICED Device window.
3. Click on the Characteristics tab at the bottom left of the WICED Device window.



Note: The services are displayed in the Services pane. The content displayed in the Services pane is displayed similarly to a file directory tree. The first-level items in the tree structure are the services. The second-level items in the tree structure are the characteristics.

[Figure 4](#) shows a Services pane example for an application.

Figure 4: Services Pane Example



Note: A lock symbol to the left of a characteristic indicates that the characteristic is mandatory for its associated service. For example, according to *Bluetooth Core Specification 4.1*, the Device Name characteristic is mandatory for the Generic Access service.

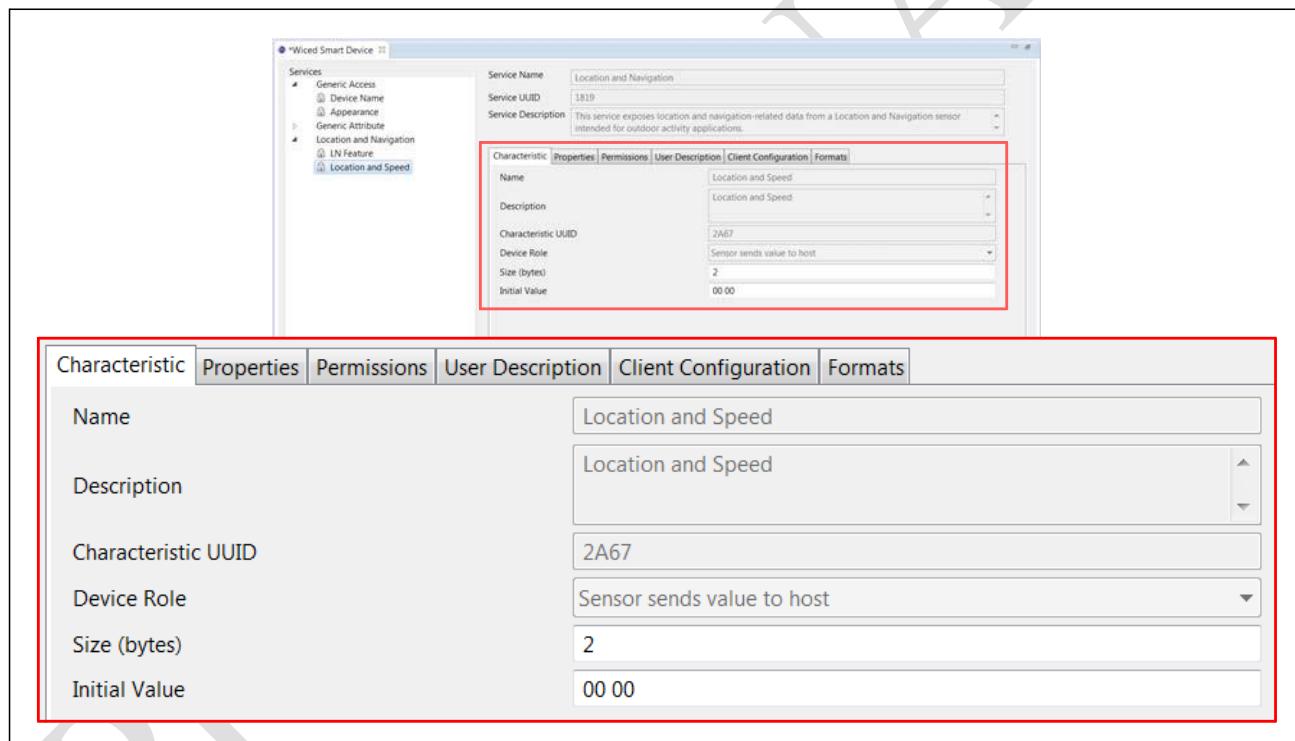
Viewing and Editing the Fields and Settings of a Service Characteristic

To view and/or edit the fields and settings of a service characteristic:

1. Click on a service characteristic in the Services pane. If necessary, see “[Viewing the Services and Characteristics of an Application](#)” on page 18 for help viewing the Services pane.
2. Navigate through the various service-characteristic panes and, if necessary, change the non-grayed-out content to suit the behavior of your application.

Figure 5 shows an example of the panes associated with the Location and Speed characteristic of the Location and Navigation service. The information in all of the panes shown (Characteristic, Properties, Permissions, User Description, Client Configuration, and Formats) collectively defines the attributes and behaviors of the Location and Speed characteristic.

Figure 5: Service-Characteristic Panes Example



[Table 3](#) describes the attributes and fields associated with each of the service-characteristic panes.

Table 3: Service-Characteristic Pane Descriptions^a

Pane	Description
Characteristic	<p>This pane provides the name, a description, and the characteristic UUID (a hexadecimal value) of the characteristic.</p> <p>In addition, the role, size, and initial value are shown and in some cases can be edited. The role of the characteristic (indicated as <i>Device Role</i>) is defined as either coming from a remote sensor in an unsolicited fashion (indicated as <i>Sensor sends value to host</i>) or as being read from or written to by a host (indicated as <i>Host writes to or reads from sensor</i>).</p> <p>Note: The description in this pane is only for the application developer. It appears in the BT Designer as well as in comments of the code that the BT Designer generates. It is unrelated to the user description defined later in this table.</p>
Properties ^a	This pane provides the properties of a characteristic. In the case of vendor-specific services and characteristics, users can set the properties. A set of default properties are assigned as a function of the <i>Device Role</i> set in the Characteristic tab.

Permissions	This pane provides the characteristic's peer-access permissions. A set of default permissions are assigned as a function of the <i>Device Role</i> set in the Characteristic tab, but users can change these permissions.
User Description	This pane provides users with a place to include a Characteristic User Description descriptor for a characteristic value if such a descriptor is supported by the characteristic. If <i>Include User Description</i> is selected, then a Characteristic User Description descriptor will be added. If this is done, the default behavior lets a peer device do unauthenticated reads of the descriptor over-the-air (OTA). Peer read and write permissions of the descriptor can be expanded by selecting one or more of the <i>Permissions</i> options provided.
Client Configuration	This pane is visible when the Notify and/or Indicate properties are set in the Properties pane. It allows users to set whether the initial notification or indication settings are true or false.
Formats	This pane provides users with the ability to define the format of the characteristic's value if the characteristic supports use of the Format descriptor.

- a. For more information on characteristic properties, attribute permissions, and characteristic value formats, see *Bluetooth Core Specification 4.1*.

Deleting a Service

To delete a service:

1. In the **Services** pane, select the service to delete.
2. Click on the  located to the right of the service name field.



Note: When deleting a service, all characteristics associated with the service are also deleted. To delete only a characteristic see "["Deleting a Characteristic" on page 21](#)".



Note: The Generic Access and Generic Attribute services cannot be deleted because they are required per the Bluetooth specification.

Editing a Service

To edit a service:

1. In the **Services** pane, select the service to be edited.
2. Edit the content of the **Service Name** and **Service Description** fields as required.



Note: The Generic Access and Generic Attribute services cannot be edited.

Deleting a Characteristic

To delete a characteristic associated with a service:

1. In the **Services** pane, expand the set of characteristics associated with a service by clicking on the arrow (▷) to the left of the service name if necessary.
2. In the **Services** pane, select the characteristic to delete.
3. Click on the  located to the right of the characteristic name field.



Note: In the BT Designer, a lock symbol to the left of a characteristic indicates that the characteristic is mandatory for its associated service. A mandatory characteristic cannot be deleted. For example, the Device Name and Appearance characteristics associated with the Generic Access service cannot be deleted (see [Figure 4 on page 18](#)).

Editing a Characteristic

To edit a characteristic:

1. In the **Services** pane, expand the set of characteristics associated with a service by clicking on the arrow (▷) to the left of the service name if necessary.
2. In the **Services** pane, select the characteristic to edit.
3. Edit any of the non-grayed-out or selectable fields in the Characteristic, Properties, Permissions, User Description, Client Configuration, and Formats panes.

Viewing Files

To view any of the files in the project explorer:

Double-click the file to open it in the center window of the WICED BT SDK IDE.

Appendix A: Sample Application Files

Configuration File (*.wic)

Figure 6 shows an excerpt from a *.wic XML configuration file.

Note: It is preferable to use the BT Designer to make changes to the WIC file. Users can manually edit the file, for example, to change the ordering of services and/or characteristics, but they should do so very carefully so that the BT Designer, when loading the edited WIC file, does not encounter any formatting problems.

Figure 6: Sample Excerpt from a WIC Configuration File

```

<Permissions>
  <Read>true</Read>
  <Write>false</Write>
  <WriteWithoutResponse>false</WriteWithoutResponse>
  <AuthenticatedRead>false</AuthenticatedRead>
  <AuthenticatedWrite>false</AuthenticatedWrite>
</Permissions>
</Characteristic>
</Service>
<Service predefined="true">
  <Name>Generic Attribute</Name>
  <Uuid>1801</Uuid>
  <Description>Generic Attribute</Description>
</Service>
<Service predefined="true">
  <Name>Location and Navigation</Name>
  <Uuid>1819</Uuid>
  <Description>This service exposes location and navigation-related data from a
  <Characteristic mandatory="true" predefined="true">
    <Name>LN Feature</Name>
    <Uuid>2A6A</Uuid>
    <Description>LN Feature</Description>
    <DataType>org.bluetooth.characteristic.ln_feature</DataType>
    <Size>4</Size>
    <InitialValue>00 00 00 00</InitialValue>
    <Properties>
      <Read type="Mandatory">true</Read>
      <Write type="Excluded">false</Write>
      <WriteWithoutResponse type="Excluded">false</WriteWithoutResponse>
      <SignedWrite type="Excluded">false</SignedWrite>
      <ReliableWrite type="Excluded">false</ReliableWrite>
      <Notify type="Excluded">false</Notify>
      <Indicate type="Excluded">false</Indicate>
      <WritableAuxiliaries type="Excluded">false</WritableAuxiliaries>
      <Broadcast type="Excluded">false</Broadcast>
    </Properties>
    <Permissions>
      <Read>true</Read>
      <Write>false</Write>
    </Permissions>
  </Characteristic>
</Service>

```

GATT Database File (*db.c)

Figure 7 shows an excerpt from a sample *db.c GATT database file.

Figure 7: Sample Excerpt from a GATT Database File

```

// ***** Primary service 'Generic Attribute'
//<Name>Generic_Attribute</Name>
//<Uuid>1801</Uuid>
//Service handle: HDLS_GENERIC_ATTRIBUTE
//Service UUID: UUID_SERVICE_GATT
PRIMARY_SERVICE_UUID16 (HDLS_GENERIC_ATTRIBUTE, UUID_SERVICE_GATT),
```

Generic Attribute
Service UUID is 1801.


```

// ***** Primary service 'Location and Navigation'
//<Name>Location_and_Navigation</Name>
//<Uuid>1819</Uuid>
//Service handle: HDLS_LOCATION_AND_NAVIGATION
//Service UUID: __UUID_LOCATION_AND_NAVIGATION
PRIMARY_SERVICE_UUID16 (HDLS_LOCATION_AND_NAVIGATION, __UUID_LOCATION_AND_NAVIGATION),
```

Location and Navigation
Service UUID is 1819 and the
UUID16 has been populated.


```

//<Name>LN Feature</Name>
//<Uuid>2A6A</Uuid>
CHARACTERISTIC_UUID16 (HDLC_LOCATION_AND_NAVIGATION_LN_FEATURE,
    HDLC_LOCATION_AND_NAVIGATION_LN_FEATURE_VALUE,
    __UUID_LOCATION_AND_NAVIGATION_LN_FEATURE,
    LEGATTDB_CHAR_PROP_READ,
    LEGATTDB_PERM_READABLE,
    4),
0x00,0x00,0x00,0x00,
```



```

//<Name>Location_and_Speed</Name>
//<Uuid>2A67</Uuid>
CHARACTERISTIC_UUID16 (HDLC_LOCATION_AND_NAVIGATION_LOCATION_AND_SPEED,
    HDLC_LOCATION_AND_NAVIGATION_LOCATION_AND_SPEED_VALUE,
    __UUID_LOCATION_AND_NAVIGATION_LOCATION_AND_SPEED,
    [LEGATTDB_CHAR_PROP_NOTIFY],
    LEGATTDB_PERM_NONE,
    2),
0x00,0x00,
```

Location and Speed characteristic
UUID is 2A67, the characteristic
has been populated, and the
notification property is listed as a
parameter.

The Notification box in the Client
Configuration pane was not
checked and, therefore,
notification is initialized as false.


```

//<ClientConfiguration>
//<Notification>false</Notification>
//<Indication>false</Indication>
CHAR_DESCRIPTOR_UUID16_Writable (HDLD_LOCATION_AND_NAVIGATION_LOCATION_AND_SPEED_CLIENT_CONFIGURATION,
    __UUID_DESCRIPTOR_CLIENT_CHARACTERISTIC_CONFIGURATION,
    LEGATTDB_PERM_READABLE | LEGATTDB_PERM_WRITE_CMD | LEGATTDB_PERM_WRITE_REQ | LEGATTDB_PERM_RELIABLE_WRITE | LEGATTDB_PERM_AUTH_WRITABLE,
    2),
BIT16_TO_8 (CCC_NONE),
```

Application File

Figure 8 shows an excerpt from a *.c application file.

Figure 8: Sample Excerpt from an Application File

```
/** @file
*
* This file has been automatically generated by the WICED Smart Designer.
* Device configuration and functions required for the BLE device.
*
*/

```

```
#include "bleprofile.h"
#include "bleapp.h"
#include "gpiodriver.h"
#include "string.h"
#include "stdio.h"
#include "platform.h"
```

```
#include "_new_smart_device_db.h"
```

```
*****
*          Constants
*****
```

```
#define _NEW_SMART_DEVICE_FINE_TIMER          0
#define _NEW_SMART_DEVICE_DEVICE_NAME          " new_smart_device"
#define _NEW_SMART_DEVICE_DEVICE_APPEARANCE    APPEARANCE_GENERIC_RUNNING_WALKING_SENSOR
#define _NEW_SMART_DEVICE_MAIN_SERVICE_UUID     __UUID_LOCATION_AND_NAVIGATION
#define _NEW_SMART_DEVICE_MAIN_CHAR_UUID       __UUID_LOCATION_AND_NAVIGATION_LN_FEATURE
#define _NEW_SMART_DEVICE_MAIN_CHAR_HANDLE     HDLC_LOCATION_AND_NAVIGATION_LN_FEATURE_VALUE
```

The GATT database header file has been included.

```
*****
*          Structures
*****
```

```
#pragma pack(1)
//host information for NVRAM
typedef PACKED struct
{
    //part of HOSTINFO generated by wizard
    HOSTINFO generated;
    // ToDo: add your variables here which need to be saved in the NVRAM
} HOSTINFO;
#pragma pack()
```

The _new_smart_device has been added as the device name, the appearance has been set, the main service UUID has been created, and the main characteristic UUID has been created.

```
*****
*          Function Prototypes
*****
```

User to-do items are indicated as comments in the code.

Sample Eliminatory

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