

## GATT

笔记本： 蓝牙技术

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URL： <https://www.bluetooth.org/en-us/specification/assigned-numbers/generic-attribute-p...>

Attribute Type	UUID	Description
«Primary Service»	0x2800	Primary Service Declaration
«Secondary Service»	0x2801	Secondary Service Declaration
«Include»	0x2802	Include Declaration
«Characteristic»	0x2803	Characteristic Declaration
«Characteristic Extended Properties»	0x2900	Characteristic Extended Properties
«Characteristic User Description»	0x2901	Characteristic User Description Descriptor
«Client Characteristic Configuration»	0x2902	Client Characteristic Configuration Descriptor
«Server Characteristic Configuration»	0x2903	Server Characteristic Configuration Descriptor
«Characteristic Format»	0x2904	Characteristic Format Descriptor
«Characteristic Aggregate Format»	0x2905	Characteristic Aggregate Format Descriptor

Table 3.18: Summary of GATT Profile Attribute types

Handle	UUID	Value
0x0001	0x2800	0x1800
0x0002	0x2803	{0x0A, 0x0003, 0x2A00}
0x0003	0x2A00	“Example Device”
0x0010	0x2800	0x1801
0x0100	0x2800	0x180A
0x0101	0x2803	{0x02, 0x0102, 0x2A19}
0x0102	0x2A19	0x04
0x0200	0x2800	0x5AB20001-B355-4D8A-96EF-2963812DD0B8
0x0201	0x2803	{0x12, 0x0202, 0x5AB2FF01-B355-4D8A-96EF-2963812DD0B8}
0x0202	0x5AB2FF01-B355-4D8A-96EF-2963812DD0B8	0x028A
0x0203	0x2904	{0x0E, 0xFE, «Celsius», «Outside»}
0x0204	0x2901	“Outside Temperature”
0x0205	0x2902	0x0000
0x0210	0x2803	{0x12, 0x0211, 0x5AB2FF02-B355-4D8A-96EF-2963812DD0B8}
0x0211	0x5AB2FF02-B355-4D8A-96EF-2963812DD0B8	0x27
0x0212	0x2904	{0x04, 0x00, «Percent», «Outside»}
0x0213	0x2901	“Outside Relative Humidity”
0x0214	0x2902	0x0000

Handle	UUID (Type)	Value (Type)
0x0001	0x2800 (Service)	0x1800 (GAP Service)
0x0002	0x2803 (Characteristic)	{0x0A, 0x0003, 0x2A00}
0x0003	0x2A00 (Device Name)	"Example Device"
0x0010	0x2800 (Service)	0x1801 (GATT Service)
0x0100	0x2800 (Service)	0x180A (Battery State Service)
0x0101	0x2803 (Characteristic)	{0x02, 0x0102, 0x2A19}
0x0102	0x2A19 (Battery Level)	0x04
0x0200	0x2800 (Service)	0x5AB20001-B355-4D8A-96EF-2963812DD0B8 (Proprietary Thermometer Humidity Service)
0x0201	0x2803 (Characteristic)	{0x12, 0x0202, 0x5AB2FF01-B355-4D8A-96EF-2963812DD0B8}
0x0202	0x5AB2FF01-B355-4D8A-96EF-2963812DD0B8 (Proprietary Temperature Characteristic)	0x028A
0x0203	0x2904 (Characteristic Format)	{0x0E, 0xFE, «Celsius», «Outside»}
0x0204	0x2901 (Characteristic User Description)	"Outside Temperature"
0x0205	0x2902 (Client Characteristic Configuration Descriptor)	0x0000
0x0210	0x2803 (Characteristic)	{0x12, 0x0211, 0x5AB2FF02-B355-4D8A-96EF-2963812DD0B8}
0x0211	0x5AB2FF02-B355-4D8A-96EF-2963812DD0B8 (Proprietary Humidity Characteristic)	0x27
0x0212	0x2904 (Characteristic Format)	{0x04, 0x00, «Percent», «Outside»}
0x0213	0x2901 (Characteristic User Description)	"Outside Relative Humidity"
0x0214	0x2902 (Client Characteristic Configuration Descriptor)	0x0000

- A Service is a grouping of associated characteristics.
- Can see four services:
  - **GAP Service**
  - **GATT Service**
  - **Battery State Service**
  - **Thermometer Humidity Service**
- Each service has zero or more characteristics.

Handle	UUID (Type)	Value (Type)
0x0001	0x2800 (Service)	0x1800 (GAP Service)
0x0002	0x2803 (Characteristic)	{0x0A, 0x0003, 0x2A00}
0x0003	0x2A00 (Device Name)	"Example Device"
0x0010	0x2800 (Service)	0x1801 (GATT Service)
0x0100	0x2800 (Service)	0x180A (Battery State Service)
0x0101	0x2803 (Characteristic)	{0x02, 0x0102, 0x2A19}
0x0102	0x2A19 (Battery Level)	0x04
0x0200	0x2800 (Service)	0x5AB20001-B355-4D8A-96EF-2963812DD0B8 (Proprietary Thermometer Humidity Service)
0x0201	0x2803 (Characteristic)	{0x12, 0x0202, 0x5AB2FF01-B355-4D8A-96EF-2963812DD0B8}
0x0202	0x5AB2FF01-B355-4D8A-96EF-2963812DD0B8 (Proprietary Temperature Characteristic)	0x028A
0x0203	0x2904 (Characteristic Format)	{0x0E, 0xFE, «Celsius», «Outside»}
0x0204	0x2901 (Characteristic User Description)	"Outside Temperature"
0x0205	0x2902 (Client Characteristic Configuration Descriptor)	0x0000
0x0210	0x2803 (Characteristic)	{0x12, 0x0212, 0x5AB2FF02-B355-4D8A-96EF-2963812DD0B8}
0x0211	0x5AB2FF02-B355-4D8A-96EF-2963812DD0B8 (Proprietary Humidity Characteristic)	0x27
0x0212	0x2904 (Characteristic Format)	{0x04, 0x00, «Percent», «Outside»}
0x0213	0x2901 (Characteristic User Description)	"Outside Relative Humidity"
0x0214	0x2902 (Client Characteristic Configuration Descriptor)	0x0000

Attribute Handle	Attribute Types	Attribute Value			Attribute Permissions
0xNNNN	0x2803–UUID for «Characteristic»	Characteristic Properties	Characteristic Value Attribute Handle	Characteristic UUID	Read Only, No Authentication, No Authorization

Table 3.3: Characteristic declaration

The *Attribute Value* of a characteristic declaration is read only.

Attribute Value	Size	Description
<b>Characteristic Properties</b>	1 octets	Bit field of characteristic properties
<b>Characteristic Value Handle</b>	2 octets	Handle of the Attribute containing the value of this characteristic
<b>Characteristic UUID</b>	2 or 16 octets	16-bit Bluetooth UUID or 128-bit UUID for Characteristic Value

Table 3.4: Attribute Value Field in characteristic declaration

Properties	Value	Description
Broadcast	0x01	If set, permits broadcasts of the Characteristic Value using Characteristic Configuration Descriptor
Read	0x02	If set, permits reads of the Characteristic Value using procedures defined in <a href="#">Section 4.8</a>
Write Without Response	0x04	If set, permit writes of the Characteristic Value without response using procedures defined in <a href="#">Section 4.9.1</a> .
Write	0x08	If set, permits writes of the Characteristic Value with response using procedures defined in <a href="#">Section 4.9.3</a> or <a href="#">Section 4.9.4</a> .
Notify	0x10	If set, permits notifications of a Characteristic Value without acknowledgement using the procedure defined in <a href="#">Section 4.10</a> .
Indicate	0x20	If set, permits indications of a Characteristic Value with acknowledgement using the procedure defined in <a href="#">Section 4.11</a> .
Authenticated Signed Writes	0x40	If set, permits signed writes to the Characteristic Value using the procedure defined in <a href="#">Section 4.9.2</a> .
Extended Properties	0x80	If set, additional characteristic properties are defined in the Characteristic Extended Properties Descriptor defined in <a href="#">Section 3.3.3.1</a> .

Table 3.5: Characteristic Properties bit field

Generic Attribute Profile (GATT)

Generic Attribute Profile (GATT)

## GATT Services

Mnemonic	UUID Size	UUID	Referenced Specification
<<Generic Access Profile>>	uuid16	0x1800	Bluetooth® Core Specification Volume 3, Part C, Section 12
<<Generic Attribute Profile>>	uuid16	0x1801	Bluetooth Core Specification Volume 3, Part G, Section 7
		(Max value 0xFFFF)	

Table 1: GATT Services

## GATT Attribute Types

Mnemonic	UUID Size	UUID	Referenced Specification
<<Primary Service>>	uuid16	0x2800	Bluetooth Core Specification Volume 3, Part G, Section 3.1
<<Secondary Service>>	uuid16	0x2801	Bluetooth Core Specification Volume 3, Part G, Section 3.1
<<Include>>	uuid16	0x2802	Bluetooth Core Specification Volume 3, Part G, Section 3.2
<<Characteristic>>	uuid16	0x2803	Bluetooth Core Specification Volume 3, Part G, Section 3.3
		(Max value 0xFFFF)	

Table 2: GATT Attribute Types

## GATT Characteristic Descriptors

Mnemonic	UUID Size	UUID	Referenced Specification
<<Characteristic Extended Properties>>	uuid16	0x2900	Bluetooth Core Specification Volume 3, Part G, Section 3.3.3.1
<<Characteristic User Description>>	uuid16	0x2901	Bluetooth Core Specification Volume 3, Part G, Section 3.3.3.2
<<Client Characteristic Configuration>>	uuid16	0x2902	Bluetooth Core Specification Volume 3, Part G, Section 3.3.3.3
<<Server Characteristic Configuration>>	uuid16	0x2903	Bluetooth Core Specification Volume 3, Part G, Section 3.3.3.4
<<Characteristic Format>>	uuid16	0x2904	Bluetooth Core Specification Volume 3, Part G, Section 3.3.3.5
<<Characteristic Aggregate Format>>	uuid16	0x2905	Bluetooth Core Specification Volume 3, Part G, Section 3.3.3.6
		(Max value 0xFFFF)	

Table 3: GATT Characteristic Descriptors

# GATT Characteristic Types

Mnemonic	UUID Size	UUID	Referenced Specification
<<Device Name>>	uuid16	0x2A00	Bluetooth Core Specification Volume 3, Part C, Section 12.1
<<Appearance>>	uuid16	0x2A01	Bluetooth Core Specification Volume 3, Part C, Section 12.2
<<Peripheral Privacy Flag>>	uuid16	0x2A02	Bluetooth Core Specification Volume 3, Part C, Section 12.3
<<Reconnection Address>>	uuid16	0x2A03	Bluetooth Core Specification Volume 3, Part C, Section 12.4
<<Peripheral Preferred Connection Parameters>>	uuid16	0x2A04	Bluetooth Core Specification Volume 3, Part C, Section 12.5
<<Service Changed>>	uuid16	0x2A05	Bluetooth Core Specification Volume 3, Part G, Section 7.1
		(Max value 0xFFFF)	

Table 4: GATT Characteristic Type