

### 7.8.66 LE Extended Create Connection command

Command	OCF	Command Parameters	Return Parameters
HCI_LE_Extended_Create_Connection	0x0043	Initiator_Filter_Policy, Own_Address_Type, Peer_Address_Type, Peer_Address, Initiating_PHYs, Scan_Interval[i], Scan_Window[i], Connection_Interval_Min[i], Connection_Interval_Max[i], Max_Latency[i], Supervision_Timeout[i], Min_CE_Length[i], Max_CE_Length[i]	

#### Description:

The HCI\_Extended\_Create\_Connection command is used to create an ACL connection, with the local device in the Central role, to a connectable advertiser.

If a connection is created with the local device in the Peripheral role while this command is pending, then this command remains pending.

The Initiator\_Filter\_Policy parameter is used to determine whether the Filter Accept List is used. If the Filter Accept List is not used, the Peer\_Address\_Type and the Peer\_Address parameters specify the address type and address of the advertising device to connect to.

The Own\_Address\_Type parameter indicates the type of address being used in the connection request packets.

The Peer\_Address\_Type parameter indicates the type of address used in the connectable advertisement sent by the peer.

The Peer\_Address parameter indicates the Peer's Public Device Address, Random (static) Device Address, Non-Resolvable Private Address, or Resolvable Private Address depending on the Peer\_Address\_Type parameter.

The Initiating\_PHYs parameter indicates the PHY(s) on which the advertising packets should be received on the primary advertising physical channel and the PHYs for which connection parameters have been specified. The Host may

enable one or more initiating PHYs. If the Host specifies a PHY that is not supported by the Controller, including a bit that is reserved for future use, the latter should return the error code *Unsupported Feature or Parameter Value* (0x11). The array elements of the arrayed parameters are ordered in the same order as the set bits in the Initiating\_PHYs parameter, starting from bit 0. The number of array elements is determined by the number of bits set in the Initiating\_PHYs parameter. When a connectable advertisement is received and a connection request is sent on one PHY, scanning on any other PHYs is terminated.

The Scan\_Interval[i] and Scan\_Window[i] parameters are recommendations from the Host on how long (Scan\_Window[i]) and how frequently (Scan\_Interval[i]) the Controller should scan (see [\[Vol 6\] Part B, Section 4.5.3](#)); however the frequency and length of the scan is implementation specific. If the requested scan cannot be supported by the implementation, the Controller shall return the error code *Invalid HCI Command Parameters* (0x12). If bit 1 is set in Initiating\_PHYs, the values for the LE 2M PHY shall be ignored.

The Connection\_Interval\_Min[i] and Connection\_Interval\_Max[i] parameters define the minimum and maximum allowed connection interval. The Connection\_Interval\_Min[i] parameter shall not be greater than the Connection\_Interval\_Max[i] parameter.

The Max\_Latency[i] parameter defines the maximum allowed Peripheral latency (see [\[Vol 6\] Part B, Section 4.5.1](#)).

The Supervision\_Timeout[i] parameter defines the link supervision timeout for the connection. The Supervision\_Timeout[i] in milliseconds shall be larger than  $(1 + \text{Max_Latency}[i]) * \text{Connection_Interval_Max}[i] * 2$ , where Connection\_Interval\_Max[i] is given in milliseconds (see [\[Vol 6\] Part B, Section 4.5.2](#)).

The Min\_CE\_Length[i] and Max\_CE\_Length[i] parameters provide the Controller with the expected minimum and maximum length of the connection events. The Min\_CE\_Length[i] parameter shall be less than or equal to the Max\_CE\_Length[i] parameter. The Controller is not required to use these values.

Where the connection is made on a PHY whose bit is not set in the Initiating\_PHYs parameter, the Controller shall use the Connection\_Interval\_Min[i], Connection\_Interval\_Max[i], Max\_Latency[i], Supervision\_Timeout[i], Min\_CE\_Length[i], and Max\_CE\_Length[i] parameters for an implementation-chosen PHY whose bit is set in the Initiating\_PHYs parameter.

If the Host issues this command when another HCI\_LE\_Extended\_Create\_Connection command is pending in the Controller, the Controller shall return the error code *Command Disallowed* (0x0C).

If the Own\_Address\_Type parameter is set to 0x00 and the device does not have a public address, the Controller should return an error code which should be *Invalid HCI Command Parameters* (0x12).

If the Own\_Address\_Type parameter is set to 0x01 and the random address for the device has not been initialized using the HCI\_LE\_Set\_Random\_Address command, the Controller shall return the error code *Invalid HCI Command Parameters* (0x12).

If the Own\_Address\_Type parameter is set to 0x02, the Initiator\_Filter\_Policy parameter is set to 0x00, the Controller's resolving list did not contain a matching entry, and the device does not have a public address, the Controller should return an error code which should be *Invalid HCI Command Parameters* (0x12).

If the Own\_Address\_Type parameter is set to 0x02, the Initiator\_Filter\_Policy parameter is set to 0x01, and the device does not have a public address, the Controller should return an error code which should be *Invalid HCI Command Parameters* (0x12).

If the Own\_Address\_Type parameter is set to 0x03, the Initiator\_Filter\_Policy parameter is set to 0x00, the controller's resolving list did not contain a matching entry, and the random address for the device has not been initialized using the HCI\_LE\_Set\_Random\_Address command, the Controller shall return the error code *Invalid HCI Command Parameters* (0x12).

If the Own\_Address\_Type parameter is set to 0x03, the Initiator\_Filter\_Policy parameter is set to 0x01, and the random address for the device has not been initialized using the HCI\_LE\_Set\_Random\_Address command, the Controller shall return the error code *Invalid HCI Command Parameters* (0x12).

If the Initiating\_PHYs parameter does not have at least one bit set for a PHY allowed for scanning on the primary advertising physical channel, the Controller shall return the error code *Invalid HCI Command Parameters* (0x12).

### **Command parameters:**

#### *Initiator\_Filter\_Policy:*

*Size: 1 octet*

<b>Value</b>	<b>Parameter Description</b>
0x00	Filter Accept List is not used to determine which advertiser to connect to. Peer_Address_Type and Peer_Address shall be used.
0x01	Filter Accept List is used to determine which advertiser to connect to. Peer_Address_Type and Peer_Address shall be ignored.
All other values	Reserved for future use

***Own\_Address\_Type:***

Size: 1 octet

Value	Parameter Description
0x00	Public Device Address
0x01	Random Device Address
0x02	Controller generates the Resolvable Private Address based on the local IRK from the resolving list. If the resolving list contains no matching entry, then use the public address.
0x03	Controller generates the Resolvable Private Address based on the local IRK from the resolving list. If the resolving list contains no matching entry, then use the random address from the most recent successful HCI_LE_Set_Random_Address command.
All other values	Reserved for future use

***Peer\_Address\_Type:***

Size: 1 octet

Value	Parameter Description
0x00	Public Device Address or Public Identity Address
0x01	Random Device Address or Random (static) Identity Address
All other values	Reserved for future use

***Peer\_Address:***

Size: 6 octets

Value	Parameter Description
0xXXXXXXXXXX XX	Public Device Address, Random Device Address, Public Identity Address, or Random (static) Identity Address of the device to be connected.

***Initiating\_PHYs:***

Size: 1 octet

Bit number	Parameter Description
0	Scan connectable advertisements on the LE 1M PHY. Connection parameters for the LE 1M PHY are provided.
1	Connection parameters for the LE 2M PHY are provided.
2	Scan connectable advertisements on the LE Coded PHY. Connection parameters for the LE Coded PHY are provided.
All other bits	Reserved for future use

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**Scan\_Interval[i]:** *Size: Bits set in Initiating\_PHYs × 2 octets*

Value	Parameter Description
N = 0XXXX	<p>Time interval from when the Controller started its last scan until it begins the subsequent scan on the primary advertising physical channel.</p> <p>Range: 0x0004 to 0xFFFF</p> <p>Time = N * 0.625 ms</p> <p>Time Range: 2.5 ms to 40.959375 s</p>

**Scan\_Window[i]:** *Size: Bits set in Initiating\_PHYs × 2 octets*

Value	Parameter Description
N = 0XXXX	<p>Duration of the scan on the primary advertising physical channel.</p> <p>Range: 0x0004 to 0xFFFF</p> <p>Time = N * 0.625 ms</p> <p>Time Range: 2.5 ms to 40.959375 s</p>

**Connection\_Interval\_Min[i]:** *Size: Bits set in Initiating\_PHYs × 2 octets*

Value	Parameter Description
N = 0XXXX	<p>Minimum value for the connection interval. This shall be less than or equal to Connection_Interval_Max[i].</p> <p>Range: 0x0006 to 0x0C80</p> <p>Time = N * 1.25 ms</p> <p>Time Range: 7.5 ms to 4 s</p>
All other values	Reserved for future use

**Connection\_Interval\_Max[i]:** *Size: Bits set in Initiating\_PHYs × 2 octets*

Value	Parameter Description
N = 0XXXX	<p>Maximum value for the connection interval. This shall be greater than or equal to Connection_Interval_Min[i].</p> <p>Range: 0x0006 to 0x0C80</p> <p>Time = N * 1.25 ms</p> <p>Time Range: 7.5 ms to 4 s</p>
All other values	Reserved for future use

**Max\_Latency[i]:** *Size: Bits set in Initiating\_PHYs × 2 octets*

Value	Parameter Description
0XXXX	<p>Maximum Peripheral latency for the connection in number of connection events.</p> <p>Range: 0x0000 to 0x01F3</p>
All other values	Reserved for future use

**Supervision\_Timeout[i]:** *Size: Bits set in Initiating\_PHYs × 2 octets*

Value	Parameter Description
N = 0xFFFF	Supervision timeout for the LE Link. (See [Vol 6] Part B, Section 4.5.2) Range: 0x000A to 0x0C80 Time = N * 10 ms Time Range: 100 ms to 32 s
All other values	Reserved for future use

**Min\_CE\_Length[i]:** *Size: Bits set in Initiating\_PHYs × 2 octets*

Value	Parameter Description
N = 0xFFFF	The minimum length of connection event recommended for this LE connection. Range: 0x0000 to 0xFFFF Time = N * 0.625 ms

**Max\_CE\_Length[i]:** *Size: Bits set in Initiating\_PHYs × 2 octets*

Value	Parameter Description
N = 0xFFFF	The maximum length of connection event recommended for this LE connection. Range: 0x0000 to 0xFFFF Time = N * 0.625 ms

### Return parameters:

None.

### Event(s) generated (unless masked away):

When the Controller receives the HCI\_LE\_Extended\_Create\_Connection command, the Controller sends the HCI\_Command\_Status event to the Host. An HCI\_LE\_Enhanced\_Connection\_Complete event shall be generated when a connection is created because of this command or the connection creation procedure is cancelled; until the event is generated, the command is considered pending. If a connection is created, this event shall be immediately followed by an HCI\_LE\_Channel\_Selection\_Algorithm event.