s115 release notes

Introduction to the s115 release notes

About the document

These release notes describe the changes in the s115 from version to version.

The release notes are intended to list all relevant changes in a given version. They are kept brief to make it easy to get an overview of the changes. More details regarding changes and new features may be found in the s115 migration document (normally available for major releases only).

This document may be updated for an already released version of SoftDevice. The changes will be tagged with "Update X", where X is a number incremented each time the document has been revised.

Issue numbers in parentheses are for internal use and should be disregarded by the customer.

Contents

s115_9.0.0-4.prototype

This version is a major release, providing support for nRF54L series devices.

Notes:

- This release has changed the API. This requires changes to applications.
- The release notes list changes since s115_9.0.0-3.prototype.

SoftDevice properties

- This SoftDevice variant is compatible with nRF54L05, nRF54L10, and nRF54L15.
- The SoftDevice memory requirements for this version are as follows:
  - NVM: **107.0 kB** (0x1AC00 bytes).
  - RAM: **4.9 kB** (0x1380 bytes). This is the minimum required memory. The actual requirements depend on the configuration chosen at `sd_ble_enable()` time.
  - Call stack: The SoftDevice uses a call stack combined with the application. The worst-case stack usage for the SoftDevice is **1.8 kB** (0x700 bytes). Application writers should ensure that enough stack space is reserved to cover the worst-case SoftDevice call stack usage combined with the worst-case application call stack usage.
- SoftDevice base address:
  - nRF54L05: 0x062000 (`s115_nrf54l05_9.0.0-4.prototype_softdevice.hex`).
  - nRF54L10: 0x0E2000 (`s115_nrf54l10_9.0.0-4.prototype_softdevice.hex`).
  - nRF54L15: 0x162000 (`s115_nrf54l15_9.0.0-4.prototype_softdevice.hex`).
- The Firmware ID of this SoftDevice is 0x309B.

New Features

Changes

- GAP
  - The SoftDevice no longer enforces the spec-required 1 second interval between channel map updates (`ble_gap_opt_ch_map_t`) (DRGN-26253).

Limitations

- SoftDevice
  - If Radio Notifications are enabled, flash write and flash erase operations initiated through the SoftDevice API will be notified to the application as Radio Events (DRGN-5197).
  - Synthesized low frequency clock source is not tested or intended for use with the Bluetooth LE stack.
  - Applications must not modify the SEVONPEND flag in the SCR register when running in priority levels higher than 6 (priority level numerical values lower than 6) as this can lead to undefined behavior.

    - The SoftDevice may generate several events when connected, based on peer actions, meaning without previous action from the application. The `BLE_GAP_EVT_PHY_UPDATE_REQUEST` event, for instance, is generated when a connected peer sends a Phy Update Request, even when an application does not include logic to change PHY. There are several such events that may require action from an application if they are received. For more information, see the `sd_ble_enable()` API in SoftDevice.
    - Configuring multiple connection configurations (see `ble_conn_cfg_t::conn_cfg_tag`) is not supported (DRGN-23839).
- GATT
    - To conform to the Bluetooth Core Specification, there shall be no secondary service that is not referenced somehow by a primary service. The SoftDevice does not enforce this (DRGN-906).

Known Issues

- SoftDevice
- LL
    - If the application adds an all zeroes IRK with the `sd_ble_gap_device_identities_set()`, it will be treated as a valid entry in the device identity list. An all zeroes IRK is invalid and must not be added (DRGN-9083).

s115_9.0.0-3.prototype

This version is a major release, providing support for nRF54L series devices.

Notes:

- This release has changed the API. This requires changes to applications.
- The release notes list changes since s115_9.0.0-2.prototype.

SoftDevice properties

- This SoftDevice variant is compatible with nRF54L05, nRF54L10, and nRF54L15.
- The SoftDevice memory requirements for this version are as follows:
  - NVM: **107.0 kB** (0x1AC00 bytes).
  - RAM: **4.9 kB** (0x1380 bytes). This is the minimum required memory. The actual requirements depend on the configuration chosen at `sd_ble_enable()` time.
  - Call stack: The SoftDevice uses a call stack combined with the application. The worst-case stack usage for the SoftDevice is **1.8 kB** (0x700 bytes). Application writers should ensure that enough stack space is reserved to cover the worst-case SoftDevice call stack usage combined with the worst-case application call stack usage.
- SoftDevice base address:
  - nRF54L05: 0x062000 (`s115_9.0.0-3.prototype_nrf54l05_softdevice.hex`).
  - nRF54L10: 0x0E2000 (`s115_9.0.0-3.prototype_nrf54l10_softdevice.hex`).
  - nRF54L15: 0x162000 (`s115_9.0.0-3.prototype_nrf54l15_softdevice.hex`).
- The Firmware ID of this SoftDevice is 0x3072.

New Features

- GAP
  - Added support for LE Data Packet Length Extension (DLE).

Changes

- SoftDevice
  - Support for PA/LNA (`BLE_COMMON_OPT_PA_LNA`) has been removed (DRGN-23876).
  - A new API for seeding the random number generator `sd_rand_seed_set` has been added (DRGN-25550).
  - The `sd_radio_notification_cfg_set` now accepts an uint16_t distance_us parameter instead of enum. The valid range is [50, 5500] µs. The enums can still be used for backwards compatibility. The active notification distance is now from when the SoftDevice prepares to use the radio, and not the actual radio activity (DRGN-25879).
- GAP
  - The Device IRK is no longer used as a fallback to generate Resolvable Private Addresses (RPA). Applications that want to use RPA need to populate the device identity list

(sd_ble_gap_device_identities_set). Otherwise the identity address will be used (sd_ble_gap_addr_set) (DRGN-23358).

- When privacy is enabled (sd_ble_gap_privacy_set) the advertiser will refresh private addresses whenever the advertising data or scan response data is changed (sd_ble_gap_adv_set_configure) (DRGN-23358).

Limitations

- SoftDevice
  - If Radio Notifications are enabled, flash write and flash erase operations initiated through the SoftDevice API will be notified to the application as Radio Events (DRGN-5197).
  - Synthesized low frequency clock source is not tested or intended for use with the Bluetooth LE stack.
  - Applications must not modify the SEVONPEND flag in the SCR register when running in priority levels higher than 6 (priority level numerical values lower than 6) as this can lead to undefined behavior.
  - The SoftDevice may generate several events when connected, based on peer actions, meaning without previous action from the application. The BLE_GAP_EVT_PHY_UPDATE_REQUEST event, for instance, is generated when a connected peer sends a Phy Update Request, even when an application does not include logic to change PHY. There are several such events that may require action from an application if they are received. For more information, see the sd_ble_enable() API in SoftDevice.
  - Configuring multiple connection configurations (see ble_conn_cfg_t::conn_cfg_tag) is not supported (DRGN-23839).
- GATT
  - To conform to the Bluetooth Core Specification, there shall be no secondary service that is not referenced somehow by a primary service. The SoftDevice does not enforce this (DRGN-906).

Known Issues

- SoftDevice
- GAP
  - If the Peer Preferred Connection Parameters Characteristic (PPCP) contains "No specific values indication (0xFFFF)", application should not perform a peripheral initiated connection parameter update using PPCP. Otherwise invalid values will be used in L2CAP_CONNECTION_PARAMETER_UPDATE_REQ. A workaround is to always specify the connection parameters in the sd_ble_gap_conn_param_update call (DRGN-15111).
  - The BLE_GAP_EVT_SEC_INFO_REQUEST event will not report the identity address of the peer to the application. A workaround is to do a mapping of the connection handle to the peer's identity address (DRGN-10340).
- GATTC
  - The ble_gattc_service_t::uuid field is incorrectly populated in the BLE_GATTC_EVT_PRIM_SRVC_DISC_RSP event if sd_ble_gattc_primary_services_discover() or sd_ble_gattc_read() is called when a Primary Service Discovery by Service UUID is already ongoing. When the application has called sd_ble_gattc_primary_services_discover(), it should wait for the BLE_GATTC_EVT_PRIM_SRVC_DISC_RSP event before calling

`sd_ble_gattc_primary_services_discover()` or `sd_ble_gattc_read()` (DRGN-11300).

- LL
  - If the application adds an all zeroes IRK with the `sd_ble_gap_device_identities_set()`, it will be treated as a valid entry in the device identity list. An all zeroes IRK is invalid and must not be added (DRGN-9083).

s115_9.0.0-2.prototype

This version is a major release, providing support for nRF54L series devices.

Notes:

- This release has changed the API. This requires changes to applications.
- The release notes list changes since s115_9.0.0-1.prototype.

SoftDevice properties

- This SoftDevice variant is compatible with nRF54L05, nRF54L10, and nRF54L15.
- The SoftDevice memory requirements for this version are as follows:
  - NVM: **128.0 kB** (0x20000 bytes).
  - RAM: **4.9 kB** (0x1380 bytes). This is the minimum required memory. The actual requirements depend on the configuration chosen at `sd_ble_enable()` time.
  - Call stack: The SoftDevice uses a call stack combined with the application. The worst-case stack usage for the SoftDevice is **1.8 kB** (0x700 bytes). Application writers should ensure that enough stack space is reserved to cover the worst-case SoftDevice call stack usage combined with the worst-case application call stack usage.
- SoftDevice base address:
  - nRF54L05: 0x05D000 (`s115_9.0.0-2.prototype+offset-0x05D000_softdevice.hex`).
  - nRF54L10: 0x0DF800 (`s115_9.0.0-2.prototype+offset-0x0DF800_softdevice.hex`).
  - nRF54L15: 0x15D000 (`s115_9.0.0-2.prototype+offset-0x15D000_softdevice.hex`).
- The Firmware ID of this SoftDevice is 0x3106.

Changes

- Application needs to do relevant ISR forwarding to SoftDevice. See `nrf_sd_isr.h`. (DRGN-25185)
- Connection handles generated by the SoftDevice are no longer restricted to the range [0..<max_connections-1>], and must not be used as array indices.
- The functions `sd_nvic_EnableIRQ`, `sd_nvic_DisableIRQ`, `sd_nvic_GetPendingIRQ`, `sd_nvic_SetPendingIRQ`, `sd_nvic_ClearPendingIRQ`, `sd_nvic_SetPriority`, `sd_nvic_GetPriority`, `sd_nvic_SystemReset`, `sd_nvic_critical_region_enter`, `sd_nvic_critical_region_exit` have been removed. An application must use the CMSIS `NVIC_*` functions instead. Make sure that the application does not use the interrupts and interrupt priorities owned by the SoftDevice.
- Setting of RAM retention for the first memory blocks has been removed.

Limitations

- SoftDevice
  - If Radio Notifications are enabled, flash write and flash erase operations initiated through the SoftDevice API will be notified to the application as Radio Events (DRGN-5197).

    - Synthesized low frequency clock source is not tested or intended for use with the Bluetooth LE stack.
    - Applications must not modify the SEVONPEND flag in the SCR register when running in priority levels higher than 6 (priority level numerical values lower than 6) as this can lead to undefined behavior.
    - The SoftDevice may generate several events when connected, based on peer actions, meaning without previous action from the application. The `BLE_GAP_EVT_PHY_UPDATE_REQUEST` event, for instance, is generated when a connected peer sends a Phy Update Request, even when an application does not include logic to change PHY. There are several such events that may require action from an application if they are received. For more information, see the `sd_ble_enable()` API in SoftDevice.
    - Configuring multiple connection configurations (see `ble_conn_cfg_t::conn_cfg_tag`) is not supported (DRGN-23839).
- GATT
    - To conform to the Bluetooth Core Specification, there shall be no secondary service that is not referenced somehow by a primary service. The SoftDevice does not enforce this (DRGN-906).

Known Issues

- SoftDevice
    - The Radio Notification signal is not yet supported. The function `sd_radio_notification_cfg_set` must not be used (DRGN-24324).
- GAP
    - Privacy feature is not yet supported. (DRGN-23358)
    - If the Peer Preferred Connection Parameters Characteristic (PPCP) contains "No specific values indication (0xFFFF)", application should not perform a peripheral initiated connection parameter update using PPCP. Otherwise invalid values will be used in `L2CAP_CONNECTION_PARAMETER_UPDATE_REQ`. A workaround is to always specify the connection parameters in the `sd_ble_gap_conn_param_update` call (DRGN-15111).
    - The `BLE_GAP_EVT_SEC_INFO_REQUEST` event will not report the identity address of the peer to the application. A workaround is to do a mapping of the connection handle to the peer's identity address (DRGN-10340).
- GATTS
    - Queued Writes are not yet supported. Receiving the `ATT_PREPARE_WRITE_REQ` PDU will lead to assert (DRGN-23848).
- GATTC
    - The `ble_gattc_service_t::uuid` field is incorrectly populated in the `BLE_GATTC_EVT_PRIM_SRVC_DISC_RSP` event if `sd_ble_gattc_primary_services_discover()` or `sd_ble_gattc_read()` is called when a Primary Service Discovery by Service UUID is already ongoing. When the application has called `sd_ble_gattc_primary_services_discover()`, it should wait for the `BLE_GATTC_EVT_PRIM_SRVC_DISC_RSP` event before calling `sd_ble_gattc_primary_services_discover()` or `sd_ble_gattc_read()` (DRGN-11300).
- LL

- If the application adds an all zeroes IRK with the `sd_ble_gap_device_identities_set()`, it will be treated as a valid entry in the device identity list. An all zeroes IRK is invalid and must not be added (DRGN-9083).

s115_9.0.0-1.prototype

This version is a major release, providing support for nRF54L series devices.

Notes:

- This release has changed the API. This requires changes to applications.
- The release notes list changes since s112_nrf52_7.2.0.

SoftDevice properties

- This SoftDevice variant is compatible with nRF54L15.
- The SoftDevice memory requirements for this version are as follows:
  - NVM: **100.0 kB** (0x19000 bytes).
  - RAM: **4.9 kB** (0x1380 bytes). This is the minimum required memory. The actual requirements depend on the configuration chosen at `sd_ble_enable()` time.
  - Call stack: The SoftDevice uses a call stack combined with the application. The worst-case stack usage for the SoftDevice is **1.8 kB** (0x700 bytes). Application writers should ensure that enough stack space is reserved to cover the worst-case SoftDevice call stack usage combined with the worst-case application call stack usage.
- The Firmware ID of this SoftDevice is 0x30D2.

Changes

- SoftDevice
  - The function `sd_flash_page_erase` has been removed for devices that do not require page erase before write.
  - The function `sd_flash_protect` has been removed.
  - The function `sd_protected_register_write` has been removed.
  - The function `sd_power_pof_thresholdvddh_set` has been removed.
  - The functions `sd_power_ram_power_set`, `sd_power_ram_power_clr`, and `sd_power_ram_power_get` have been removed.
  - The functions `sd_power_dcdc_mode_set` and `sd_power_dcdc_mode_get` have been removed.
  - The functions `sd_power_reset_reason_get` and `sd_power_reset_reason_clr` have been removed.
  - The function `sd_power_system_off` has been removed.
  - The functions `sd_ppi_channel_enable_get`, `sd_ppi_channel_enable_set`, `sd_ppi_channel_enable_clr`, `sd_ppi_channel_assign`, `sd_ppi_group_task_enable`, `sd_ppi_group_task_disable`, `sd_ppi_group_assign` and `sd_ppi_group_get` have been removed.

Limitations

- SoftDevice

    - If Radio Notifications are enabled, flash write and flash erase operations initiated through the SoftDevice API will be notified to the application as Radio Events (DRGN-5197).
    - Synthesized low frequency clock source is not tested or intended for use with the Bluetooth LE stack.
    - Applications must not modify the SEVONPEND flag in the SCR register when running in priority levels higher than 6 (priority level numerical values lower than 6) as this can lead to undefined behavior.
    - The SoftDevice may generate several events when connected, based on peer actions, meaning without previous action from the application. The `BLE_GAP_EVT_PHY_UPDATE_REQUEST` event, for instance, is generated when a connected peer sends a Phy Update Request, even when an application does not include logic to change PHY. There are several such events that may require action from an application if they are received. For more information, see the `sd_ble_enable()` API in SoftDevice.
    - Configuring multiple connection configurations (see `ble_conn_cfg_t::conn_cfg_tag`) is not supported (DRGN-23839).
- GATT
    - To conform to the Bluetooth Core Specification, there shall be no secondary service that is not referenced somehow by a primary service. The SoftDevice does not enforce this (DRGN-906).

Known Issues

- SoftDevice
    - The Radio Notification signal is not yet supported. The function `sd_radio_notification_cfg_set` must not be used (DRGN-24324).
    - The API functions in `nrf_nvic.h` that operate on interrupts are not yet supported. This includes the functions `sd_nvic_critical_region_enter` and `sd_nvic_critical_region_exit` (DRGN-23477).
- L2CAP
    - Receiving fragmented L2CAP packets is not yet supported (DRGN-23305).
- GAP
    - If the Peer Preferred Connection Parameters Characteristic (PPCP) contains "No specific values indication (0xFFFF)", application should not perform a peripheral initiated connection parameter update using PPCP. Otherwise invalid values will be used in `L2CAP_CONNECTION_PARAMETER_UPDATE_REQ`. A workaround is to always specify the connection parameters in the `sd_ble_gap_conn_param_update` call (DRGN-15111).
    - The `BLE_GAP_EVT_SEC_INFO_REQUEST` event will not report the identity address of the peer to the application. A workaround is to do a mapping of the connection handle to the peer's identity address (DRGN-10340).
    - LE Secure Connections are not yet supported (DRGN-23305).
- GATT
    - ATT MTU size greater than 23 octets is not yet supported (DRGN-23305).
- GATTS
    - Queued Writes are not yet supported. Receiving the `ATT_PREPARE_WRITE_REQ` PDU will lead to assert (DRGN-23848).

- GATTC
  - The `ble_gattc_service_t::uuid` field is incorrectly populated in the `BLE_GATTC_EVT_PRIM_SRVC_DISC_RSP` event if `sd_ble_gattc_primary_services_discover()` or `sd_ble_gattc_read()` is called when a Primary Service Discovery by Service UUID is already ongoing. When the application has called `sd_ble_gattc_primary_services_discover()`, it should wait for the `BLE_GATTC_EVT_PRIM_SRVC_DISC_RSP` event before calling `sd_ble_gattc_primary_services_discover()` or `sd_ble_gattc_read()` (DRGN-11300).
- LL
  - If the application adds an all zeroes IRK with the `sd_ble_gap_device_identities_set()`, it will be treated as a valid entry in the device identity list. An all zeroes IRK is invalid and must not be added (DRGN-9083).