KBA-170815073838

How to enable BTM in XBL(UFEI)

Applicable platform:

MSM8998, SDM660, SDM670, SDM845…..

Issue/problem description:

BTM ensures temperature is in a valid operating range before allowing device to boot. From each chipet thermal overview, you could see BTM configuration hardcoded as below:

boot_images/core/hwengines/tsens/config/xxxx/BootTempCheckBsp.c

nLowerThresholdDegC and nUpperThresholdDegC are set to -150/150 °C by default and BTM is virtually disabled.

If OEMs define nLowerThresholdDegC with the correct temperature threshold, boot can be deferred if the current temperature is higher than the threshold and retries. However, boot can fail if the predefined number of retries is exceeded.

For XBL(UFEI), default BTM is disable more than above, please refer to below method for example(MSM8998) BTM enabling:

Issue Analysis:

1. sbl hw init to enable.

boot_images\QcomPkg\Msm8998Pkg\Library\XBLLoaderLib\sbl1_hw.c

```
void sbl1_hw_init()
{
  TsensResultType status;
   ……
  /* Initialize temperature sensor */
  status = boot_Tsens_Init();
  BL_VERIFY(status == TSENS_SUCCESS,(uint16)status|BL_ERROR_GROUP_TSENS);
```

/* Check the temperature */

//plc boot_check_device_temp();

2. modify in boot_images\QcomPkg\Msm8998Pkg\Settings\TSENS\ folder.
    a. tsens_props.xml

```
<driver name="NULL">
 <global_def>
  <var_seq name="TsensStructIncFile" type=DALPROP_DATA_TYPE_STRUCT_INC_FILE>
   ./../TSENS/TsensBsp.c
  </var_seq>
 </global_def>
 <device id="/core/hwengines/tsens">
  <props name="TSENS_BSP" type=DALPROP_ATTR_TYPE_STRUCT_PTR>
   TsensBsp
  </props>
  <props name="TSENS_BSP_8997" type=DALPROP_ATTR_TYPE_STRUCT_PTR>
   TsensBsp8997
  </props>
 </device>
 <device id="/core/power/boot_temp_check">
  <props name="BOOT_TEMP_CHECK_BSP" type=DALPROP_ATTR_TYPE_STRUCT_PTR>
   BootTempCheckBsp
  </props>
 </device>
</driver>
```

    b. TsensBsp.c add threshold/tsens id definition as usual.

```
/*----------------------------------------------------------------------------
 * Static Variable Definitions
 * ----------------------------------------------------------------------------*/
```

```
const BootTempCheckBspType BootTempCheckBsp[] = {
  {
    /* .nUpperThresholdDegC */ 150,
    /* .nLowerThresholdDegC */ -150,
    /* .uBootSensorIdx      */ 0
  }
};
```

Logic check path: boot_images\QcomPkg\Library\BootTempCheckLib\BootTempCheck.c

API: BootTempCheckStatusType BootTempCheck(void)

[**Example log, boot up fail by BTM check**]

```
S - Core 0 Frequency, 1305 MHz
S - PBL Patch Ver: 1
B -        0 - PBL, Start
B -     9445 - bootable_media_detect_entry, Start
B -    55525 - bootable_media_detect_success, Start
B -    55532 - elf_loader_entry, Start
B -    56827 - auth_hash_seg_entry, Start
B -    57140 - auth_hash_seg_exit, Start
B -   106226 - elf_segs_hash_verify_entry, Start
B -   135821 - elf_segs_hash_verify_exit, Start
B -   135839 - auth_xbl_sec_hash_seg_entry, Start
B -   159710 - auth_xbl_sec_hash_seg_exit, Start
B -   159713 - xbl_sec_segs_hash_verify_entry, Start
B -   165110 - xbl_sec_segs_hash_verify_exit, Start
B -   165175 - PBL, End
B -   198128 - SBL1, Start  //boot up fail
```

Format: Log Type - Time(microsec) - Message - Optional Info

Log Type: B - Since Boot(Power On Reset), D - Delta, S - Statistic

S - QC_IMAGE_VERSION_STRING=BOOT.XF.1.2.2.c1-00018-M8998LZB-1

S - IMAGE_VARIANT_STRING=Msm8998LA

S - OEM_IMAGE_VERSION_STRING=ljunshen-HP-Z240-SFF-Workstation