

ESP8266 Fatal Exceptions

- [Reading Exception Information](#)
- [Simulating Fatal Exceptions](#)
- [Exceptions](#)
- [Beerfridge Exception](#)
- [Reference](#)

Reading Exception Information

ESP.getResetReason()

ESP.getResetInfo()

ESP.getFreeSketchSpace()

ESP.getFreeHeap()

ESP.getHeapFragmentation()

ESP.getMaxFreeBlockSize()

Simulating Fatal Exceptions

The following code will generate an exception:

```
void setup()
{
  Serial.begin(115200);
  Serial.println();
  Serial.println("Let's provoke the s/w wdt firing...");
  //
  // provoke an OOM, will be recorded as the last occurred one
  char* out_of_memory_failure = (char*)malloc(1000000);
  //
  // wait for s/w wdt in infinite loop below
  while(true);
  //
  Serial.println("This line will not ever print out");
}

void loop(){}
```

Exceptions

EXC-CAUSE CODE	CAUSE NAME	CAUSE DESCRIPTION	REQUIRED OPTION	EXC-VADDR LOADED
0	IllegalInstructionCause	Illegal instruction	Exception	No
1	SyscallCause	SYSCALL instruction	Exception	No
2	InstructionFetchErrorCause	Processor internal physical address or data error during instruction fetch	Exception	Yes
3	LoadStoreErrorCause	Processor internal physical address or data error during load or store	Exception	Yes
4	Level1InterruptCause	Level-1 interrupt as indicated by set level-1 bits in the INTERRUPT register	Interrupt	No
5	AllocaCause	MOVSP instruction, if callers registers are not in the register file	Windowed Register	No
6	IntegerDivideByZeroCause	QUOS, QUOU, REMS, or REMU divisor operand is zero	32-bit Integer Divide	No

7	Reserved for Tensilica			
8	PrivilegedCause	Attempt to execute a privileged operation when CRING ? 0	MMU	No
9	LoadStoreAlignmentCause	Load or store to an unaligned address	Unaligned Exception	Yes
10..11	Reserved for Tensilica			
12	InstrPIFDataErrorCause	PIF data error during instruction fetch	Processor Interface	Yes
13	LoadStorePIFDataErrorCause	Synchronous PIF data error during LoadStore access	Processor Interface	Yes
14	InstrPIFAddrErrorCause	PIF address error during instruction fetch	Processor Interface	Yes
15	LoadStorePIFAddrErrorCause	Synchronous PIF address error during LoadStore access	Processor Interface	Yes
16	InstTLBMissCause	Error during Instruction TLB refill	MMU	Yes
17	InstTLBMultiHitCause	Multiple instruction TLB entries matched	MMU	Yes
18	InstFetchPrivilegeCause	An instruction fetch referenced a virtual address at a ring level less than CRING	MMU	Yes
19	Reserved for Tensilica			
20	InstFetchProhibitedCause	An instruction fetch referenced a page mapped with an attribute that does not permit instruction fetch	Region Protection or MMU	Yes
21..23	Reserved for Tensilica			
24	LoadStoreTLBMissCause	Error during TLB refill for a load or store	MMU	Yes
25	LoadStoreTLBMultiHitCause	Multiple TLB entries matched for a load or store	MMU	Yes
26	LoadStorePrivilegeCause	A load or store referenced a virtual address at a ring level less than CRING	MMU	Yes
27	Reserved for Tensilica			
28	LoadProhibitedCause	A load referenced a page mapped with an attribute that does not permit loads	Region Protection or MMU	Yes
29	StoreProhibitedCause	A store referenced a page mapped with an attribute that does not permit stores	Region Protection or MMU	Yes
30..31	Reserved for Tensilica			
32..39	Coprocessor n Disabled	Coprocessor n instruction when cpn disabled. n varies 0..7 as the cause varies 32..39	Coprocessor	No
40..63	Reserved			

Beerfridge Exception

resetInfo	Fatal exception:4 flag:3 (SOFT_WDT) epc1:0x4000dd11 epc2:0x00000000 epc3:0x00000000 excvaddr:0x00000000 depc:0x00000000
resetReason	Software Watchdog

```
updateWebVars -complete
performTimeSync - start
```

Soft WDT reset

```
>>>stack>>>
```

```
ctx: cont
sp: 3ffffd40 end: 3fffffc0 offset: 01b0
3ffffef0: 00000050 00000017 3fff1ebc 4021358c
3fffff00: 8ebaaba0 00418937 2a3f724a 3fff2000
3fffff10: 8ebaaba0 00000000 00418937 00000000
3fffff20: 3ffea226 3fff2000 40100e9a 8ebaaba0
3fffff30: 00000007 00000064 00000064 40216c37
3fffff40: 01ef43a4 3fff6acc 3fff6ad4 40206b32
3fffff50: 00000007 00000014 00000007 01ef2f84
3fffff60: 3fffdad0 3fff19c4 3fff6acc 40206c54
3fffff70: 3fffdad0 00000000 3fff18c4 402039fe
3fffff80: 3fffdad0 00000000 3fff18c4 40205240
3fffff90: 00000000 00000000 3fff1fd0 40202a71
3fffffa0: 3fffdad0 00000000 3fff1fd0 40215ec4
3fffffb0: feeefeffe feeefeffe 3ffe8594 40101475
<<<stack<<<
```

ets Jan 8 2013,rst cause:1, boot mode:(3,7)

```
load 0x4010f000, len 1384, room 16
tail 8
chksum 0x2d
csum 0x2d
v8b899c12
~ld
```

Reference

Reference	URL
ESP8266 Fatal exception and Wdt Reset	https://circuits4you.com/2017/12/19/esp8266-fatal-exception-wdt-reset/
ESP8266 Reset Causes and Common Fatal Exception Causes	https://www.espressif.com/sites/default/files/documentation/esp8266_reset_causes_and_common_fatal_exception_causes_en.pdf
My ESP crashes running some code. How to troubleshoot it?	https://arduino-esp8266.readthedocs.io/en/latest/faq/a02-my-esp-crashes.html
Arduino ESP8266/ESP32 Exception Stack Trace Decoder	https://github.com/me-no-dev/EspExceptionDecoder#installation
ESP8266 Watchdogs in Arduino ***	https://www.sigmdel.ca/michel/program/esp8266/arduino/watchdogs_en.html#ESP8266_HW_WDT