Undefined Behavior

Not what you expected

Oded Shimon

Log output

```
2017-01-25 00:33:48.091 INFO: Connection failed - remainingAttempts=4
```

Log output

```
2017-01-25 00:33:48.091 INFO: Connection failed - remainingAttempts=4
2017-01-25 00:33:48.092 INFO: Connection failed - remainingAttempts=3
2017-01-25 00:33:48.093 INFO: Connection failed - remainingAttempts=2
2017-01-25 00:33:48.095 INFO: Connection failed - remainingAttempts=1
2017-01-25 00:33:48.096 INFO: Connection failed - remainingAttempts=0
```

Log output

```
2017-01-25 00:33:48.091 INFO: Connection failed - remainingAttempts=4
2017-01-25 00:33:48.092 INFO: Connection failed - remainingAttempts=3
2017-01-25 00:33:48.093 INFO: Connection failed - remainingAttempts=2
2017-01-25 00:33:48.095 INFO: Connection failed - remainingAttempts=1
2017-01-25 00:33:48.096 INFO: Connection failed - remainingAttempts=0
2017-01-25 00:33:48.101 INFO: Connection failed - remainingAttempts=4294967295
```

Log output

```
2017-01-25 00:33:48.091 INFO: Connection failed - remainingAttempts=4
2017-01-25 00:33:48.092 INFO: Connection failed - remainingAttempts=3
2017-01-25 00:33:48.093 INFO: Connection failed - remainingAttempts=2
2017-01-25 00:33:48.095 INFO: Connection failed - remainingAttempts=1
2017-01-25 00:33:48.096 INFO: Connection failed - remainingAttempts=0
2017-01-25 00:33:48.101 INFO: Connection failed - remainingAttempts=4294967295
2017-01-25 00:33:48.109 INFO: Connection failed - remainingAttempts=4294967294
2017-01-25 00:33:48.112 INFO: Connection failed - remainingAttempts=4294967293
...
...
...
```

The code

```
unsigned int attempts = 5;
while (!m_pConn && (attempts--) > 0) {
    attemptConnect();
    if (!m_pConn || m_pConn->failed()) {
        LOG("Connection failed - remainingAttempts=", attempts);
        close();
    }
}
```

The code

```cpp
unsigned int attempts = 5;
while (!m_pConn && (attempts--) > 0) {
    attemptConnect();
    if (!m_pConn || m_pConn->failed()) {
        LOG("Connection failed - remainingAttempts=", attempts);
        close();
    }
}
```

The bug

```cpp
unsigned int attempts = 5;
while (!m_pConn && (attempts--) > 0) {
    attemptConnect();
    if (!m_pConn || m_pConn->failed()) {
        LOG("Connection failed - remainingAttempts=", attempts);
        close();
    }
}

ASSERT(!m_pConn->failed(), "Failed to connect");
```

The bug

```cpp
unsigned int attempts = 5;
while (!m_pConn && (attempts--) > 0) {
    attemptConnect();
    if (!m_pConn || m_pConn->failed()) {
        LOG("Connection failed - remainingAttempts=", attempts);
        close();
    }
}

ASSERT(!m_pConn->failed(), "Failed to connect");
```

The Assembly

```cpp
void connect() {

    close();

    unsigned int attempts = 5;
    while (!m_pConn && (attempts--) > 0) {
        attemptConnect();
        if (!m_pConn || m_pConn->failed()) {
            LOG("Connection failed - remainingAttempts=
            close();
        }
    }

    ASSERT(!m_pConn->failed(), "Failed to connect");
}
```

```asm
 2          pushq    %rbx
 3          movq     %rdi, %rbx
 4  .LBB0_1:
 5          movq     $0, (%rbx)
 6          movq     %rbx, %rdi
 7          callq    SomeClass::attemptConnec
 8          movq     (%rbx), %rax
 9          testq    %rax, %rax
10          je       .LBB0_1
11          cmpl     $0, (%rax)
12          je       .LBB0_1
13          popq     %rbx
14          retq
```