

# EFI\_ACCEPT\_ALL\_UNACCEPTED\_MEMORY \_ACCEPTANCE\_PROTOCOL

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## Summary of the change

Specifies expected UEFI memory acceptance behavior to accept all memory eagerly before ExitBootServices returns. Also adds a new ~~Adds a new~~ protocol to disable the eager acceptance ~~UEFI's behavior of accepting all memory eagerly before ExitBootServices returns. to~~ “allow” unaccepted memory to pass through to the loaded image.

## Benefits of the change

We solve the following problem:

The memory type introduced in UEFI specification v2.9, EfiUnacceptedMemory, does not have a specified way for operating systems to safely upgrade from not supporting the type to supporting the type. The UEFI can choose to either pose a memory map including the type or not. There is no way for an OS loader to inform the UEFI that it supports the type or not.

Memory acceptance for the entire virtual RAM space is not required for booting a system. Support for a Confidential compute (CC) technology does not require supporting unaccepted memory, so the UEFI cannot simply choose to use the unaccepted memory type when it detects that it is running on a CC technology that requires memory acceptance.

The behavior of the UEFI for CC technologies before supporting the unaccepted memory type is to eagerly accept all memory. This behavior is required since otherwise there was no way to indicate down the boot chain which regions of memory have not yet been accepted. We take eager acceptance as the expected and correct behavior for the UEFI when booting the next boot stage without being told otherwise.

Operating systems that support the EfiUnacceptedMemory memory type are able to dynamically accept memory that was not pre-accepted by the UEFI. Without the EfiUnacceptedMemory support in the guest OS kernel, the boot time will take longer due to:

1. UEFI must accept the whole memory allocated for the guest images before transferring control to the guest OS kernel

2. While accepting the pages, because of confidential computing requirements, the host has to allocate the backing pages and pin them to prevent guest memory to be migrated to new host physical addresses.

Currently UEFI cannot know if `EfiUnacceptedMemory` is supported in the guest OS. This document proposes a protocol to tell the UEFI not to accept all memory when `EfiUnacceptedMemory` is supported in the guest OS kernel.

## Impact of the change

This is an optional protocol for OS loaders to opt into getting the unaccepted memory type in their memory map.

## Code first

The latest version of this proposal is at

[https://github.com/deeglaze/edk2/tree/enabl\\_e\\_umv7](https://github.com/deeglaze/edk2/tree/enabl_e_umv7)[https://github.com/deeglaze/edk2/tree/enabl\\_e\\_umv8](https://github.com/deeglaze/edk2/tree/enabl_e_umv8). Following code-first policy, the names are prefixed with the bugzilla issue number for discussing the specification change, [Bz3987](#).

## Detailed description of the change

**Changes to section 8.5.4:** Exchanging information between the OS and Firmware

*The firmware and an Operating System may exchange information through the `OsIndicationsSupported` and the `OSIndications` variables as follows:*

to become

The firmware and an Operating System may exchange information through protocols defined in [Protocols - OS to Firmware Communication](#chapter21) and the `OsIndicationsSupported` and the `OSIndications` variables. The `OsIndicationsSupported` and `OSIndications` variable usage is as follows:

**Addition of chapter between  
Chapter 20 Protocols - ACPI Protocols and  
Chapter 21 String Services**  
Text follows

## Chapter 21 Protocols - OS to Firmware communication

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There are situations such as a multi-boot system where a single system-wide bit in `OsIndications` is not suitable, and persistence is not necessary. In those cases, we specify protocols to communicate support for UEFI features that cannot be known ahead of time.

## Section 21.1 -

### EFI\_~~ACCEPT\_ALL\_UNACCEPTED~~\_MEMORY\_ACCEPTANCE\_PROTOCOL

#### Summary

~~A protocol to change the UEFI's overall memory acceptance behavior. In order to safely support OSes that don't interpret the new `EfiUnacceptedMemory` type and those that do, the UEFI may conservatively accept all unaccepted memory before `ExitBootServices` returns. This protocol allows the OS loader to change that behavior.~~ The UEFI shall accept all memory any time before `ExitBootServices` returns if it does not provide this protocol. The UEFI shall not accept all memory until `ExitBootServices` is called if the protocol is provided.

This protocol and acceptance behavior ensures that the UEFI safely supports OSes that don't interpret the new `EfiUnacceptedMemory` type and those that do.

#### GUID

```
#define EFI_ACCEPT_ALL_UNACCEPTED_MEMORY_ACCEPTANCE_PROTOCOL_GUID \
    {0xc5a010fe,0x38a7,0x4531, \
     {0x8a,0x4a,0x05,0x00,0xd2,0xfd,0x16,0x49}}
```

#### Protocol Interface Structure

```
typedef struct _EFI_ACCEPT_ALL_UNACCEPTED_MEMORY_ACCEPTANCE_PROTOCOL {
    EFI_DISABLE_ACCEPT_ALLALLOW_UNACCEPTED_MEMORY
DisableAllowUnacceptedMemory;
} EFI_ACCEPT_ALL_UNACCEPTED_MEMORY_ACCEPTANCE_PROTOCOL;
```

#### Parameters

~~*DisableAllowUnacceptedMemory*~~ Disables behavior of accepting all memory before `ExitBootServices` returns. See the `EFI_ACCEPT_ALL_UNACCEPTED_MEMORY_ACCEPTANCE_PROTOCOL.Disable()`(#section 21.1.1) function description.

## Description

This interface does not provide any way to re-enable the ~~AcceptAllUnacceptedMemory~~ behavior of accepting all memory.

Section 21.1.1

EFI\_~~ACCEPT\_ALL\_UNACCEPTED\_MEMORY\_ACCEPTANCE\_PROTOCOL~~.~~DisableAllUnacceptedMemory~~()

## Summary

Disables behavior of accepting all memory before ExitBootServices returns.

## Prototype

```
typedef
EFI_STATUS
(EFIAPI *EFI_DISABLE_ACCEPT_ALLALLOW_UNACCEPTED_MEMORY)(
    IN EFI_ACCEPT_ALL_UNACCEPTED_MEMORY_ACCEPTANCE_PROTOCOL *This
);
```

## Parameters

*This* A pointer to EFI\_~~ACCEPT\_ALL\_MEMORY\_ACCEPTANCE\_PROTOCOL~~ instance.  
Type EFI\_~~ACCEPT\_ALL\_MEMORY\_ACCEPTANCE\_PROTOCOL~~ is defined in  
[EFI\_~~ACCEPT\_ALL\_MEMORY\_ACCEPTANCE\_PROTOCOL~~](#section21.1)

## Description

Meant to be called by OS loader ~~before ExitBootServices~~ if the OS supports EfiUnacceptedMemoryType and means to assume the role of accepting memory before its use. ~~The UEFI is permitted to create unaccepted memory for the memory map whether or not this function is called. The intent is for the UEFI to default to the safe behavior of accepting all memory for the OS unless requests otherwise, but that is not required behavior.~~