Pre-OS Display Switching With UEFI GOP

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Agenda

• When is a display switch needed in pre-OS time?
• Example: choose boot-up display(s) using GOP driver
• Additional Notes
• Q & A
When is a display switch needed in pre-OS time?
When is a display switch needed in pre-OS time?

When some mobile system events like lid open/close or docking/undocking occur during pre-OS boot, a platform may choose to switch display(s) as the designated or active display(s) become unavailable.

Or when pre-OS applications or test suites need to test multiple displays.
When is a display switch needed in pre-OS time?

Such a display switch was supported through different proprietary interfaces in the legacy VGA BIOS provided by various graphic vendors.

Such a display switch can also be achieved through standard UEFI interfaces and a same or similar sequence supported by GOP drivers provided by various graphic vendors!
Pre-OS Display Switching With UEFI GOP

Example: choose boot-up display(s) using GOP driver
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Boxes in light green shows a generic sequence when switching from display set A to set B
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Additional Notes
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* A GOP driver is a “bus” driver, since a GPU usually has child video output devices.

What happens when `RemainingDevicePath` is set to `NULL` in `Start()`?

- A GOP driver will likely create child handles for each physically connected video output device.
- `GraphicsOutputProtocol` will be installed to one child handle, the “active” display selected by the GOP driver in `SetMode()`.
- Faster boot time if GOP driver uses a single display.

*Note: Platforms may use settings to change the logic used by the GOP driver to pick the primary display.*
** Additional Notes **

** The LCD child handle will still be present if it’s a supported display device (connected but not available when the lid is closed).

*** A set of video output devices is described in several ACPI _ADRs.

– Unfortunately, the ACPI _ADR definition is not standard across GOP driver providers.

– Platform vendors may need to use different ACPI _ADRs for different graphic vendors.

*Final Solution is TBD.*
**** If the RemainingDevicePath assignment changes in Start() and the function returns successfully, the ModeList from GraphicsOutputProtocol will be changed accordingly to reflect the new modes supported by newly assigned video output devices.
The actual switch to a new display set happens in `SetMode()` , not after the call to `Start` (new display devices).

– Display timing, resolution and display surface will stay the same after `Start` (new display devices).
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Questions?
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Understanding Platform Requirements for UEFI HII – Brian Richardson, Intel Corporation

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