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METHOD AND SYSTEM FOR MANAGING RESOURCES IN A PRINTER

HP INC

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Method and System for managing resources in a printer

Introduction

Printers are used to run embedded solutions, which enables partners to build and deploy their solutions on the device. The partner applications are basically considered untrusted code, and therefore, there is a very stringent validation and verification process (V&V) for ensuring sanity of the device. The solutions need resources and these resources are provided by firmware running on the printer. The current invention describes a resource profile manager which can use a profile for each solution, and manage the resource allocation dynamically.
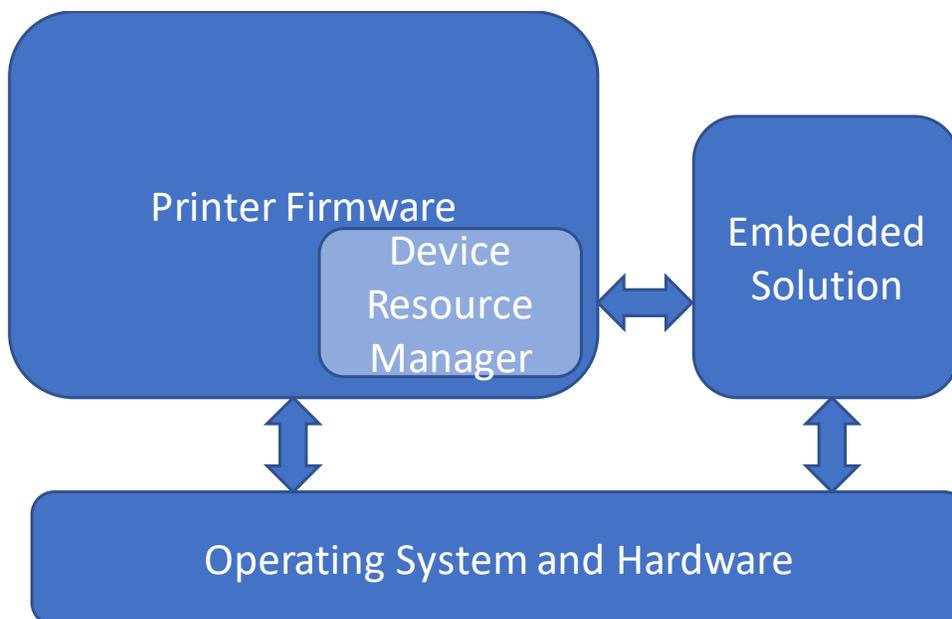
Solution

Printers run embedded solutions on devices. These solutions need memory, CPU and other resources for their execution. The resources could be hardware related like memory, CPU, etc or they could be shared objects (like Embedded Web Server, CPU, etc). Assume that every resource has a profile (which describes how the resource can be allocated). Then each solution would request for the resources it needs by making a request to the resource manager. The resource manager allocates the resource using certain rules and dynamically re-configures the solution to use the newly allocated resources.

How it works

The solution is installed on the device, and when run it requests for resources from the resource manager. The RM then considers the various resources requests, and makes allocations.

Please refer to the architecture diagram below:

We create a resource profile for the solution. This resource profile contains various resources and an allocation to the solution, and possible rules for allocation. For ex,

Sl.no	Resource	Solution	Allocation
1	Memory	Partner solution #2	40MB (or 10%)
2	CPU	partner solution #1	2 (or 10% of time)
3	Network	CPAC	100MB
4	ABCD	Control Panel	10%

The resource manager accepts requests for resources from various solutions (and possibly the other firmware components as well), and manages the overall allocation of resources. When it receives requests from multiple requestors for the same resource, it then allocates based on priority of the requestor. The priority of firmware is assumed to be highest, and then comes the solution, and so on.

Related work

There is no such dynamic resource allocation being supported on printers today.

Advantages

Following are the list of advantages:

1) The solutions are allocated a fixed amount of resources today, and this can be avoided.
2) Dynamic allocation improves the resource utilization, and ensures better performance.
3) As the resource manager runs as part of firmware, the performance is not impacted.

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