



Fig. 1. Power domains supported by RAPL.

RAPL supports multiple power domains. The RAPL power domain is a physically meaningful domain (e.g., Processor Package, DRAM, etc.) for power management. Each power domain informs the energy consumption of the domain, allows us to limit the power consumption of that domain over a specified time window, monitors the performance impact of the power limit, and provides other useful information, that is, energy measurement units, minimum or maximum power supported by the domain [20].

Figure 1 shows the hierarchy of the power domains graphically. RAPL provides the following power domains for both measuring and limiting energy consumption:

- **Package:** Package (PKG) domain measures the energy consumption of the entire socket. It includes the consumption of all the cores, integrated graphics and also the uncore components (last level caches, memory controller).
- **Power Plane 0:** Power Plane 0 (PP0) domain measures the energy consumption of all processor cores on the socket.
- **Power Plane 1:** Power Plane 1 (PP1) domain measures the energy consumption of processor graphics (GPU) on the socket (desktop models only).
- **DRAM:** DRAM domain measures the energy consumption of random access memory (RAM) attached to the integrated memory controller.
- **PSys:** Intel Skylake has introduced a new RAPL Domain named PSys. It monitors and controls the thermal and power specifications of the entire SoC and it is useful especially when the source of the power consumption is neither the CPU nor the GPU. As Figure 1 suggests, PSys includes the power consumption of the package domain, System Agent, PCH, eDRAM, and a few more domains on a single-socket SoC.

For multi-socket server systems, each socket reports its own RAPL values (for example, a two-socket computing system has two separate PKG readings for both the packages, two separate PP0 readings, etc.).