Emergent System-Level Properties & Problems

Due to the complexity of the device and the unintended coupling of components, multimedia devices may exhibit difficult to understand “emergent” properties. For example, the system may deadlock, overflow buffers, miss deadlines, or provide “bursty” output, etc. Mechanisms to deal with these problems are very desirable.

Quality of Service

Device operation must meet quality of service constraints (processing latency, throughput, jitter, etc). Ideally, the communications infrastructure should support this. Due to high performance requirements, parts of this infrastructure may be in hardware.

Security

Multimedia flows have a strong security requirement. It may be required to prevent access to decoded data (for example), even if the operating system(s) have been compromised.

7.4.1.3 Metrics

The following table summarizes some of the quantitative characteristics of the multimedia application domain.

Attribute	Value (ranges)	Notes
Communication code size footprint on accelerators	8 K bytes	Becoming less constrained in the future
Communication data size footprint	8 K bytes	Becoming less constrained in the future
Non-resident code size	millions of lines of code	Increasing in the future
Number of processors	order 10	
Hardware accelerators	under 10	Different accelerators in high-end systems
Communication sizes	1K to under 100 bytes	Trend to finer-grain
Communication latency	10 mSec to under 1 uSec	Trend to finer-grain in future

7.4.2 Key Functionality Requirements

Table 1 summarizes the key requirements of multimedia devices and comments upon the ability MCAPI to meet the requirement.