# F5 RESPONSES TO LNE DISCUSSION DOCUMENT

In the definitions section c) **Preliminary List of Definitions**,

**Sub-bullet 3 (Network Equipment**), section-i, Large Network Equipment (LNE) is defined as "…or contains more than eleven (11) wired Physical Network Ports." This definition is too constraining for certain types of networking equipment. For example, firewalls and load balancers are devices that see all network traffic, but do not necessarily connect to lots of systems. Consequently, they typically have few (sometimes only one or two) high-bandwidth ports whose total aggregate bandwidth is greater than eleven wired physical ports.

**Sub-bullet 4 (Product Types):** How will a hybrid product be classified—one which doesn't exactly fit as a Switch, Router, Security Appliance or Access Point? For example, a load balancer sits in front of a large server farm and directs traffic based on high-level rules and policies like http sessions, applications, authentication, etc. After a traffic flow decision is made the traffic is sent via layer-2 or laryer-3 (switching or routing) header manipulation. From an untrained eye, the box may be classified as a router, but because of where it sits in a network, it is generally utilized as a security appliance, too.

**Sub-bullet 5 (Product Characteristics), section-iii, 1:** Why would redundant power supplies establish whether or not equipment is "managed?" Managed Network Equipment exists which has only one power supply.

**Sub-bullet 6 (Operational States and Modes):** needs more clarification and/or more states. For example, without more distinction between state 1 and state 2 (Active and Idle), there is really no point of trying to separate them. Because, as is, it reads as though a piece of equipment is considered in idle due to lack of data flowing, whereas that can be due to other equipment not sending. In other words, by this definition, equipment would be constantly transitioning between Active/Idle based on the burstiness of traffic- whereas the actual mode of the equipment has not really changed (therefore the power consumption has not changed significantly enough to warrant calling it idle). Idle should require a substantial power reduction, like the sleep state of modern computers… which leads me to my 2nd point.

There needs to be more states than just On/Off, especially, as NFV (Network Functions Virtualization) becomes ubiquitous. There is a growing trend to replace switch/routers/firewalls/etc. with generic servers running software to mimic the aforementioned devices. Servers are PCs and support many sleep states or various levels of potential power savings, so to lump everything into just on/off is short-sighted and too limiting. Also, even for implementations that don't move towards NFV, many network appliances are architecturally like PCs and, therefore, could support sleep-state levels. Traditional L2 and L3 devices (switches and routers) are generally built from custom ASICs, but more intelligent devices require more complex hardware and are typically a combination of custom ASICs coupled with commercially available microcontrollers and CPUs. As such, they support various sleep states and power levels (at least for the non-custom chips).