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The following are Dell's comments in regards to the Draft 2 of the Version 1.0 ENERGY STAR Data Center Storage Specification.

#### SECTION 1.1 – Product Family Definition

Dell supports the definition of a product family given by the EPA. However, the idea of testing a family with three separate tests (Minimum, Maximum, and Typical) is troublesome. With configurations stretching up to 1000 drives – per the SNIA Online-4 definition – the logistics of testing these large configurations is prohibitive.

Dell would like to propose an alternative approach: Testing of the controller, and one of each type of storage enclosures. The advantage of this approach is that it comprehensively shows the power consumption of all of the components within the solution. Additionally, the Ready-Idle GB/Watt metric would be maximized due to the low amortization of the controller power across storage capacity.

#### SECTION 2.1 – Included Products:

In Section 2.1.iv, the specification states that included products “be characterized within the SNIA-defined Online 2, 3, or 4 storage taxonomy categories.” The SNIA taxonomy is applicable to block-based and not to file-based (NAS) or object-based storage, and Dell believes that other storage technologies should be included. If the ENERGY STAR program were to proceed to qualify only block-based storage, it would give the appearance that other storage technologies are not as energy efficient. These other technologies are a fast growing market segment, and should be included in the ENERGY STAR program.

#### SECTION 3.2 – Power Supply Requirements:

Dell supports the inclusion minimum efficiency standards for power supplies within the ENERGY STAR specification. However, Dell recommends that the ENERGY STAR program should follow the 80PLUS standard for efficiency. Specifically, Dell recommends that the ENERGY STAR Data Center Storage Specification drop the power supply requirements specified at the 10% load point. The configurations and characteristics of storage systems make it very likely that the power supply loading will be at or above 20% of the rated power.

#### SECTION 3.5.2 – Power Modeling Presale tool:

Dell supports the inclusion of power modeling/calculating tools for storage. However, Dell recommends the removal of the requirement for the partner to warrant the hardware to draw equal or less power than that predicted by the tool. The unintended consequences of this requirement would be for the modeling tool to over-estimate the power usage of the

equipment so that the actual power consumption would be less than the predicted consumption. Data skewed toward this requirement would not be useful to the Data Center architect, who is the consumer of the data. It is better to just provide a modeling tool that provides a best estimate of the power consumed by the product, as the data is more meaningful.

### SECTION 3.6 – Energy Efficiency Feature Requirements

Dell supports the ability to *optionally* ship with Configurable Energy Efficiency Features, but does not support that the product must be shipped with a number enabled. Many of the features listed in Table 4 are based on proprietary intellectual property, and are considered as up-sell points from a base configuration. Additionally, having these features enabled may actually provide no energy benefit to the end user. The unintended consequences of this requirement would be to raise the price of ENERGY STAR configurations, and forcing the end user, in some cases, to take on some un-needed features.

### SECTION 3.7 – Standard Information Reporting Requirements

In Section 3.7.3.iv, it states that performance data shall be reported. Although Dell does not mind reporting the data to the EPA, we are concerned with the information being available to the general public. Storage solutions are generally architected to the specific customer requirements, and each solution is unique and would have its own specific performance parameters. If a customer were to use the performance as reported to the EPA, they may not see the full picture of what is available to them in terms of performance within the family offering. Dell would request that performance data not be published, or published with the manufacturer and model masked to the public.

### SECTION 3.8 – Standard Performance Data Measurement and Output Requirements

In general, the requirements of this section are not well defined for Storage solutions. When a Data Center Storage solution consists of several units located in several racks, how do you then define “Inlet Air Temperature” for the entire solution?

Additionally, these features are not generally available for storage platforms. The inclusion of these reporting requirements would require extensive changes to shipping products. These changes would require long lead-times for both hardware and software, and would incur significant incremental costs. The cost impact would be especially challenging for the smaller solutions of the Online-2 and Online-3 products, where the additional cost would be a higher percentage of the overall solution cost. Dell would propose that these requirements be removed from the specification.