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administration.

(5) Section 6 provides guidelines for creating profiles that address various application domains. This is a brief description of how the reference model and services are applied to a variety of existing types of systems. Section 7 describes current POSIX profiles and profiling activities.

The text emphasizes the concept of service requirements (rather than services) to emphasize that the POSIX OSE only includes requirements, not solutions which satisfy those requirements. It is the standards and profiles listed in the subclauses of Sections 4 and 5 that will satisfy these requirements.

Definition of the service requirements is not constrained by the availability of standards. Services requirements that are not currently satisfied via standards are discussed in either the Emerging Standards subclause, or under Gaps.

3.1 POSIX Open System Environment — General Requirements

The POSIX Open System Environment should satisfy the requirements in the following list:

(1) Application Portability at the Source Code Level

The POSIX OSE shall enable application software portability at the source code level.

Rationale: Comprehensive and consistent source code level service specifications allow porting of applications among processors (ideally without modification). Binary portability requires too tight a coupling with the processor implementation.

(2) System Interoperability

The POSIX OSE shall enable application software and system service interoperability.

Rationale: Communications services and format specifications allow two entities participating in a distributed system to exchange and make mutual use of data, including: D

— Homogeneous systems

— Heterogeneous systems (i.e., a wide variety of hardware/software platforms)

— POSIX -OSE -based and non- OSE -based systems

(3) User Portability

The POSIX OSE shall enable human users to operate on a wide range of systems without retraining.

Rationale: Standard methods and services for supporting human/computer interaction are a key aspect of the definition of an open system (see Section 2). Elimination of gratuitous differences in the interface that the application platform presents to the user via standards is a significant aspect of this task.

(4) Accommodation of Standards

The POSIX OSE shall accommodate existing, imminent, and new information technology standards.

Rationale: If the POSIX OSE were constrained to current technology, it would quickly become obsolete. It would also not be capable of providing a complete set of applicable standards and profiles, as efforts to-date have not yet provided a full suite of applicable standards. The POSIX OSE must evolve as standards emerge and technology changes.

An inevitable tension exists between establishing fixed standards and providing for technology enhancement. Therefore, the POSIX OSE must be sufficiently general to allow for technology growth and yet specific enough to act as a guide for standards development.

(5) Accommodation of New Information System Technology

The POSIX OSE shall accommodate new Information System Technology.

Rationale: The POSIX OSE must strive to satisfy the full range of the users' functional requirements. This is undoubtedly a requirement that will only be fully realized over time, but it reflects the goal of the POSIX OSE.

(6) Application Platform Scalability

The POSIX OSE shall be scalable to platforms of varying power and implementation complexity.

Rationale: This reflects the realities of the potential users of the POSIX OSE. This requirement affects individual standards as well as the conditions under which various of the standards can or should be combined into profiles.

For example, where similar services are provided by both workstation type application platforms and supercomputers, the same standards should be applied to each if possible. This would enable a greater degree of portability across these specialized implementations of the application platform.

(7) Distributed System Scalability

The POSIX OSE shall provide for distributed system scalability.

Rationale: The number of distributed system components connected should not be limited by any structural aspects of the POSIX OSE.

For example, in the area of network services, the OSE standards should be such that it is possible to construct profiles (and therefore systems) in which remote and local operation and utilization of information system resources are indistinguishable, with the exception of unavoidable message transit delay. In other words, it should be possible for applications to be unaware of whether the application platform on which they are executing is local or distributed and that lack of awareness should not affect their proper operation.

(8) Implementation Transparency

The POSIX OSE shall provide implementation technology transparency.

Rationale: The mechanism for implementation of services is not visible to the service user; i.e., only the service is visible to the service user.

(9) User's Functional Requirements

The POSIX OSE shall reflect the full scope of the user's functional requirements, within the context of the other requirements above.

Rationale: The POSIX OSE will provide the context within which application software portability can be addressed and it is the set of user's functional requirements that defines the scope of transportable service needs.

3.2 POSIX Open System Environment Reference Model

The POSIX OSE is based on a reference model with the full information system as its scope. As such, it spans the gap between requirement specification and the design of any specific information system. The reference model provides a set of conventions and concepts, mutually agreed upon between the information system user and provider communities. This common understanding is key to achieving application software portability, system interoperability, and may encourage software reuse. It will certainly allow for more compact and correct procurement specifications.

The definition of this reference model is an engineering and management task and not a scientific one. There are many possible models and, while it might be interesting to contemplate an optimal one, a reference model that satisfies the requirements is all that is necessary.

An information system reference model must satisfy conflicting requirements similar to those encountered in traditional architectural disciplines. The reference model must be structured enough to encourage the generation and use of standards and standard components. Yet it must also be flexible enough to accommodate tailored and special purpose components necessary to meet realworld needs.

The POSIX OSE Reference Model is a set of concepts, interfaces, entities, and diagrams that provides a basis for specification of standards. The POSIX OSE Reference Model will provide guidance and direction for future standardization and integration efforts. In order for the POSIX OSE to evolve and mature, it will be necessary for the reference model to provide insights into those services and capabilities for which standards do not currently exist and for which appropriate standardization activities cannot be identified.