

# Application Quality/Resource Management

.... *Ensuring Certainty in Service Delivery*....

## A Call to Action

### Summary

The IT industry is starting a major technology shift to modular computing and component-based, web services application architectures. In addition, businesses are driving toward the real-time enterprise model.

Taken together, these driving forces represent a fundamental change in the way systems will be implemented and, even more importantly, managed, thus requiring a new management paradigm.

If the IT industry is to respond to these changes, we will need an appropriate set of Application Quality/Resource Management (AquaReuM) standards, to allow the integration of applications and management systems, but at present there is no single, cohesive industry standards effort focused on addressing these two issues.

This represents a strategic opportunity to form an influential standards initiative that will:

- establish industry acceptance of an open architecture for managing such environments
- accelerate the availability of application and infrastructure instrumentation
- provide a vehicle for all relevant constituencies of the IT industry to cooperate
- solve the applications management problem today and tomorrow

The key challenges to making this happen are to recruit a critical mass of key players in a timely fashion, and to commit sufficient resources to lead the group and accomplish the technical work.

## **Current Situation**

The IT industry movement towards modular computing and component-based application architectures will be accompanied by an equally significant evolution in the way data center applications, and even the data centers themselves, are designed in the coming years.

This data center evolution is driven by the removal of constraints and bottlenecks being designed out of modular equipment. This results in scalability and flexibility of both the applications and the equipment on which they run. The computing, network and storage resources required to deliver applications to users are following the trend towards modularity, enabling increasing levels of disaggregation – i.e., partitioning functionality onto modular, granular systems components which are then re-aggregated to provide high density, low power, and high performance scalable systems.

We can already see this trend unfolding in the server space, where modular blade servers are rapidly being deployed as replacements to large, monolithic standalone servers. The next-generation data center management solution needs to support diverse, highly distributed applications on dense, modular systems.

The storage networking industry is years ahead of server and software industries in management/virtualization technologies and standards convergence. However, their solutions do not provide a complete, end-to-end, application-oriented, solution for the data center. They will contribute components the complete solution that needs to be developed.

The convergence of cluster/modular/blade architecture with autonomic/self-managing/utility computing requires a new management paradigm.

The new management paradigm must define and embrace certain critical standards to span all aspects of the data center, including networks, servers, storage platforms, and distributed applications software. As no single company rules the data center, the achievement of this ambitious goal will require a cross-industry effort.

There are currently no standards activities that are addressing the totality of this problem. There are some components available that can be used to form part of the solution, but there is a need for both major integration work and the creation of new solutions in order to achieve a comprehensive and practical solution.

## **The Solution**

In order to deliver suitable interoperable, plug-and-play solutions, there is a need for an industry standard architectural framework, together with a set of appropriate standards profiles, which will incorporate both existing standards and any additional ones that are required to be developed.

It is the purpose of this document to outline a standards effort, involving membership across all relevant industry sectors, that respond to this need.

The AQuaReuM standards will help manage the behavior of the new applications and legacy applications as they share the infrastructure within the data centers and the networks connecting them. The AQuaReuM standards will be designed to ultimately support all phases of the application life cycle. Furthermore, the AQuaReuM framework will ensure that each layer can evolve (and the vendors in each layer can innovate), while at the same time ensuring that the system can be managed as a whole, and that the individual pieces can interoperate.

## **Benefits**

With new equipment and management systems based on the AQuaReuM standards:

1. Application developers can develop software that interacts with the resources it uses, allowing better control over the resources needed to deliver the level and granularity of Quality of Service required by application users.
2. Data center managers can deploy new applications faster and run the ones they have more efficiently, increasing the ROI of their deployed systems.
3. Data center managers no longer need to use different, disparate, management systems for all the technologies in their environment, reducing the Total Cost of Ownership (TCO) associated with resource management.
4. The equipment vendors that support this transition will be part of a new way of managing the applications that run global commerce, ensuring participation in a rapid-growth market in years to come.

This means that as new applications are rolled out for the ever-hungry enterprises that run large data centers, vendors can look forward to enterprises purchasing a new generation of equipment to deploy. This is important because the annual spend on IT totals over \$1.7T annually. Of this amount, over \$850B is spent on equipment, software, facilities and communications and another \$800B spent on external services and staff.

## Potential Charter

The charter for this group will be developed along the following lines:

To develop an architectural framework, standards profile, and appropriate standards for an adaptive approach to managing existing and new applications across one or more modular, virtual, dynamic data centers within one or more real-time enterprises.

The objectives of the group will include:

1. Recognition/acceptance/endorsement of an adaptive approach to managing distributed applications.
2. Industry ratification of an architecture and standards profile for goal #1.
3. Identification of standards gaps and an action plan to close gaps and insure interoperability and plug-and-play integration.

Milestones for meeting these objectives will include:

1. Standard measures of Application Quality of Service
2. An Application Model-Based Management Architecture
3. Measure/Affect instrumentation (standards framework)

An important aspect of the work of the group will be that it will work cooperatively with other groups and will make use of existing or emerging standards wherever possible.

## Key Participation

In order to address this broad problem space, the group will need participation from companies working in the following areas:

Server Management  
Network Management  
Storage Management  
Application Management

Web Servers  
Application Servers  
Databases  
End Users

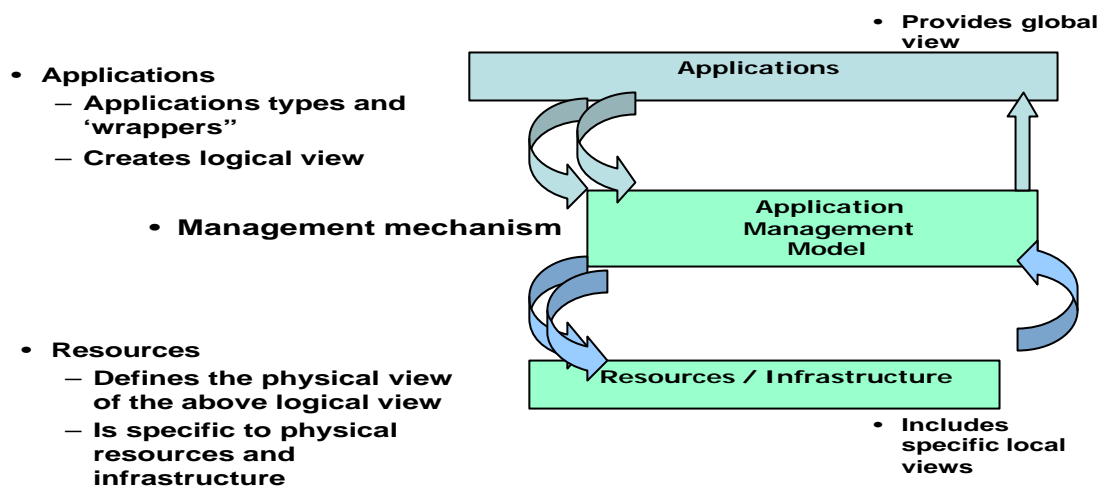
## Potential Timeline

An aggressive schedule has been established in order to meet the needs of the industry.

<b>Qtr</b>	<b>Goal</b>
Q1 '03	Recruit key companies
Q2 '03	Organize group Form Steering Committee Establish Working Groups
Q3 '03	Architecture Framework v0.5 Standards Profile v0.1
Q4 '03	Architecture Framework v1.0 Standards Profile v0.5 WG Standards v0.1
Q1 '04	Standards Profile v1.0 WG Standards v0.5
Q2 '04	WG Standards v1.0

## Potential Work Areas

The following high-level views illustrate the interactions that the AQuaReuM initiative will need to address.



There are many work areas which need to be addressed. The following is a suggestion for a prioritization (1 = highest):

1	Framework	Comprehensive architectural framework
2	Application	“Knobs and Gauges” (Instrumentation)
3	Application	AQoS specification standards
4	Application	Distributed application management
5	OS/Server	“Knobs and Gauges” (Instrumentation)
6	OS/Server	Distributed application services
7	Network	“Knobs and Gauges” (Instrumentation)
8	Database	“Knobs and Gauges” (Instrumentation)
9	Storage	“Knobs and Gauges” (Instrumentation)
10	Management	Standard behaviors
11	Management	Tool interaction processes/protocols
12	Management/Accounting	Interfaces with business systems
13	Human Interface	Policy template standards
14	Human Interface	Business dashboard standards

## **Organization**

The Open Group, a vendor-neutral, international, organization, has a long history of involvement in the area of management standardization. More recently it has developed activities in the area of Quality of Service, and has been the home of OpenPegasus, the leading open source implementation of the CIM/WBEM management standards.

The Open Group will host the AQuaReuM Initiative. It will be the primary activity of The Open Group's recently combined Enterprise Management and Quality of Service Forums.

The AQuaReuM Initiative will be led by a Steering Committee, and will consist of multiple working groups addressing specific activities working toward a uniform framework for highly distributed IT systems. Each of the working groups will address a specific domain and will work against a specific charter and may or may not be a joint project with other organizations. The Open Group will support all these activities with a full range of program and project management, quarterly conferences, interim conference calls and face-to-face meetings, and electronic services including electronic mail lists, collaborative web sites, and other online support tools. The Open Group is also able to support the development of standards, test suites, certification programs, etc, when this becomes appropriate.

Details on participation terms are currently being finalized and will be available by mid-April. The initial meeting of the group will be held at The Open Group Member Meeting in Austin on May 1<sup>st</sup>, 2003.

For further information, please contact Martin Kirk, [m.kirk@opengroup.org](mailto:m.kirk@opengroup.org).