Connecting the Caribbean

Archie Marshall <am146@umail.umd.edu>

Abstract

In 1991, the Organization of American States(OAS) approved the initiative ent "Hemisphere-Wide Inter-University Scientific and Technological Information Network"(RedHUCyT). Under this project the Caribbean Academic, Scientific and Technological Network(CUNet) was established to provide the basic infrastruct electronic information exchange and the development of Internet connectivity Caribbean region.

The growth of these networks since 1991 has prompted the development of more twenty- four (24) separate UUCP connected networks and thus, the need for the establishment of full Internet connected networks in the region. However, telecommunications cost is the main hindrance in the quest for full TCP/IP As a result, the effective usage of the Internet's wealth of information depe the ability of resource tools to scale well in this vast data arena, but also telecommunications cost associated with use of these tools over dial-up links presents an overview of the major principles and concepts of a distributed sy up in a third world environment such as the Caribbean.

I. Caribbean Connectivity

The Internet concept is not new to the Caribbean and the demand for connectiv Barbados, Belize, Jamaica, Trinidad, St Lucia and many of the other islands a advance in the concepts of integrating information technology into economic d Many of them already have professional information societies working in this developments however, are not limited to the research and academic arenas; in have extended deep into the private sector. Thus, a competitive force has sta towards the development of full Internet connectivity in some areas. So as no network development shadowed by commercial practices, the move towards mutual collaboration between the academic community and the private sector is being encouraged. This not only fosters the Internet culture, but provide for the f foundation that is need for sustainable development.

II. Telecommunications Infrastructure

Telecommunications technology has advance swiftly, and it is now an important in the infrastructure of modern economic and social activities. As the techno more influential role in our lives, users are demanding ever-greater diversit developed services. Privatization has allowed for the integration of new and telecommunications technologies into the communications infrastructure of mos thus allowing for the ease of developing links into the Internet. However, in infrastructure the cost of telecommunications is wreaking havoc on the develo Internet connectivity. In most of the island of the region widespread use and of Internet services like E-mail, Gopher, WAIS and WWW comes slowly and their deployment and trials must be limited and low-cost, as well as scalable and m The bottom line is that network operators must be able to offer the services reasonable cost. Therefore, effective usage of the Internet's wealth of infor not only on the ability of resource tools to scale well in this vast data are efficient usage of the low-bandwidth link.

The careful and systematic design of telecommunication services and managemen software is the key to success of these services. Such software will be compo components that execute in remote machines that cooperate to provide the serv users. Design of such distributed applications is intrinsically difficult. Is communication, concurrency, timeliness, and fault tolerance must be addressed design process.

Apart from these obstacles which are inherent in any heterogeneous distributi there are some problems that are unique to the application software. The soft structure must be modular enough so that new services can be rapidly introdu using as many existing software components as possible.

The complete framework required to deal with the complexity of software comes integrating the concerns and approaches being dealt with at the UUCP network of the network.

III. Application Requirements

Some of the architectural requirements imposed by the applications that deal telecommunication services and management is describe as an indication of the of requirements. Coupled with this is the significant cost of telecommunicati directly relate to the local PTTs tariffs.

- The architecture should enable a user to compose certain elements of the interactive session off-line like electronic mail, search models. The id the store forward concept of the UUCP networks that were developed in th to dial-up IP. Mail boxes and search objects can then be transferred bet machines and processing can be done locally. At the server level off-lin must be compiled into the appropriate object groups for the store-forwar mechanism to work.

- The distributed systems must enable the maintenance of active processes by a remote machine for the duration of its allowable idle time without telecommunication channel. As a result the system must implement the fol three components. 1) an object location algorithm 2) a replacement algor 3) a consistent update algorithm. Algorithms for User authentication and security issues becomes a function of an agreement between client and se during the transaction serialization process.

- The distributed application must be deployable in different computing en To cope with changes in these environments, changes in the interfaces of component should not require concurrent changes in other components as o the host is most likely to be on a dial-up basis. An agreed naming stand offset the need for updates on the off line-site which must simultaneous local host functions. Concepts of remote caching could enhanced function

- The architecture must enable the network to support a multiplicity of networking protocols, while allowing for different services to share net resource-management functions that are common to them.

- The information requirements for telecommunication services and user operation are intricate and often interdependent. Several applications may need to access the same data, possibly for different purposes. It is important that organization and management of such shared data be databased- technology and product independent. Data must be distributable and replicatable to meet specific performance need that is inherent to these dial-up networks.

- Application must be able to cope with the evolution of terminal equipment and presentation devices, and accommodate new presentation styles or, equipment with minimal changes to application software.

IV. Status of the Program

The program has two main goals: One is to develop a set of detailed specification that define the architecture outline in this article. The second goal is to focus on a set of experiments that serve to validate or improve the architectural specifications, this work is in progress. Many of the key principles have been highlighted in this paper based on the specification of user requests. Prototypes are being developed along with concurrent laboratory work to determine effects of such concurrent process over low-bandwidth networks and PC host systems.

Author Info

Archie Marshall is an independent network consultant, responsible for the development of information networks under the Caribbean Academic, Scientific and Technological networking project, formally referred to as the Caribbean University Network(CUNet). He is currently active in the field of design low-cost networking solution for developing countries. His E-mail address is Archie_Marshall@umail.umd.edu