

Objectivity Case History – Glen Finston

Customer: Com21
Industry: Telecommunications
Application Domain: Network Element Management System
Status: Deployed
Platform: Solaris 2.5
Compiler: Sun
Objectivity Version: 3.8.19, Objectivity/C++

Buying Criteria

- Quality of product
- Technical support
- Distributed architecture
- Concurrency support
- Ability to embed database completely inside product, transparently
- Performance scales linearly with database size
- Schema Migration ability
- Ease of programming, elegance of binding

Overview

Com21 developed their NMAPS (Network Management and Provisioning System) using Objectivity/DB. Their system maintains information about a network of cable modems (STUs) and their hub controllers (HCXs).

Their Object Model is an abstraction/mapping of the actual physical hardware involved in the cable network. Classes include such real-world abstractions as HCX (the cable hub), HCX-slot (slot for card within the hub), HCX-card (card that fits within slot), STU (the modem attached to the hub), Subscriber (individual subscriber to the service), QosGroup (quality of service group for set of subscribers – different levels of quality of service are available.) An object-database is a natural fit to such real world constructs.

Objects are divided into databases as a function of their usage. The topology database is the primary database and represents the physical state of the network (i.e. which modems are connected to which hub). Polled statistical data lives in its own database, and a database also exists for recent alarm data.

The NMAPS databases are accessed simultaneously by any number of GUI network management applications, which display information and support queries. The GUI application is in Motif and presents a meaningful view of the information stored in the databases to the human observer. Using Objectivity dictionaries greatly improves the performance of named lookup queries from the GUI.

The polled statistical data grows quite rapidly, generating up to a gig of polling data per day. These objects are created by background daemon processes. The daemons also populate the polled data database.

Why Objectivity

* **Quality** of the product - reference Bill Alexander. Other OODBMS systems Com21 experimented with did not have the same level of quality and reliability as Objectivity. (Initial deployment on version 3.x).

* Distributed Architecture - Com21's application is a natural fit to Objectivity/DB distributed architecture which allows the NMAPS databases to be spread across several file systems.

* MROW read feature on read transactions provides the highest possible level of concurrency. When two applications update the container simultaneously, only one has to retry.

* Natural fit of containers to HCX Objects. Recall the HCX is the hub and is attached to multiple modems (STUs). Modems are placed within the HCX container corresponding to the HCX hub to which they are attached. Their HCX object actually derives from the Objectivity container class and the STUs it contains represent the modems connected to the hub.

* Support for dynamic moving of STU to different HCX

* Multiple containers within the polling database allow daemons to concurrently update information in the database.

* Support for mapping and indexing for fast lookup, examples -- all Subscriber objects are indexed by name and account number and Com21 also maps from account number to Subscriber object. This allows fast generation of billing information.

* Ease of development with Objectivity allowed Com21 to develop their own custom event notification system fine tuned to their application needs.

* DBMS is completely transparent – embedded inside the product.

* Scalability – Distribution. Com21 cable networks are growing rapidly. Their cable modem networks have encountered no performance problems despite rapid growth.

Potential Hot Buttons – Schema Migration problems prevented Com21 from using version 4.x . The intention is to provide the schema fixes in version 5.x or use version 4.0.10 build 4.

Contact Information

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