

Why Digital Cable Needs Data Warehousing & Analytics

Frequently Asked Questions
By Charlie Lougheed
Everstream Chief Technology Officer

October 31, 2003

©1999-2003 Everstream, Inc.
Document version 1.0



TABLE OF CONTENTS

Introduction 3
What defines a data warehouse? 3
What can an iTV and VOD data warehouse provide? 4
**Why don't existing VOD vendors provide data warehousing or
analytics solutions?..... 4**
Why do off-the-shelf data warehouse and OLAP tools fall short? 5
**Why is Everstream uniquely positioned to provide products in this
area? 5**
What are the technical requirements for implementing S4 Oi 3.0? 6

INTRODUCTION

This document is intended to provide brief answers to commonly asked questions about the role of data warehousing and analytics in the digital cable industry, as well as Everstream's position on the subject. Although this document emphasizes video on demand (VOD), other emerging digital services are also addressed.

WHAT DEFINES A DATA WAREHOUSE?

The definition of a data warehouse varies depending on the industry practices and individual vendor strategies. However, most agree that the fundamental characteristics of a data warehouse include the following:

- The data warehouse is physically separate from the transaction systems, thus providing an environment for aggressive data analysis and reporting without performance impact to production transaction systems.
- The data warehouse is designed for online analytical processing (OLAP) versus online transaction processing (OLTP). The key point here being that an OLAP model provides an "information centric" platform as opposed to a "transaction centric" platform for business users.
- The data warehouse schema is typically reorganized to favor batch imports and exports, as well as high performance "reads" for data analysis, reporting, and decision support.
- Data in a data warehouse is often "denormalized" to an extent to provide less complex queries and faster query response time.
- Data is stored in a hierarchical fashion, characterized by large raw data tables and successive levels of correlated and summarized tables.
- Some form of ETL (extraction, transformation and loading) process occurs during the population of the data warehouse to provide cleansed and successive levels of data.
- The data warehouse is designed to store large date ranges of data to enable comparison and trending for business applications.
- The data warehouse is designed to store data in historical snapshots which provide insight into the state of time-volatile information such as account status or product pricing.

Although experts and vendors differ in opinion and implementation of OLAP models, three are commonly used in the industry

- Multidimensional OLAP (M-OLAP): Conversion of data to a "cube" architecture supporting well defined and high performance queries.
- Relational OLAP (R-OLAP): Leverages relational database architecture in a star, snowflake or other schema.
- Hybrid OLAP (H-OLAP): Combines elements of M-OLAP and R-OLAP.

WHAT CAN AN ITV AND VOD DATA WAREHOUSE PROVIDE?

Data warehousing provides the opportunity for massive amounts of data from multiple markets, systems, and vendors to be aggregated and correlated together into a single view. Data from platforms such as middleware, VOD, and high speed internet services can be combined with subscriber account data to provide a complete view of activity and customer lifecycle traits.

The VOD Example

The Everstream S4 Oi application utilizes the S4 Data Warehouse to provide an easy to understand and visually engaging view of VOD based business and technical metrics. It lets managers set and track targets, view subscriber trends, sessions and stream performance, and measure the effects of technical and marketing initiatives over time. S4 Oi provides a unified view of performance and goals so different groups within the organization can work from the same foundation of knowledge.

Data in the S4 Oi Data Warehouse lets product and marketing managers, as well as engineering teams, answer the critical questions that drive the success of their on-demand offerings such as:

- Is on-demand usage increasing?
- Is the number of our active on-demand subscribers growing?
- What portion of our subscribers is regularly active?
- What is our subscribers' average take rate and revenue?
- What level of quality are our subscribers experiencing?
- How does service quality impact churn?
- How did last months marketing plan impact this month's results?
- What is our on-demand churn rate and which subscribers are at risk of churn?

WHY DON'T EXISTING VOD VENDORS PROVIDE DATA WAREHOUSING OR ANALYTICS SOLUTIONS?

Video on demand systems are transaction oriented systems designed specifically for delivering high capacity video services to many thousands of subscribers within a cable environment. Like virtually all transactional systems, their data models are optimized for small queries and updates to support as many simultaneous subscriber sessions as possible. Also, to conserve disk space and referential integrity, these databases are designed with "normalized" schemas using relational database architectures.

Unfortunately, the trade-off for high transaction efficiency often results in limited real-time data query capabilities, especially over wide timeframes. Because data are stored in a highly normalized manner in the VOD system, performance intensive "joins" are required to provide a full picture of usage and system events. These factors, combined with the fact that many vendors suggest to purge certain transaction data after a short amount of time to conserve disk space, make a separate data warehouse strategy a necessity for operators.

Lastly, a key data warehouse trait missing in native VOD data structures is a long spanning state history of elements which tend to change over time such as subscriber account status, device status, and content metadata.

WHY DO OFF-THE-SHELF DATA WAREHOUSE AND OLAP TOOLS FALL SHORT?

Many products exist in the data warehouse and analytics market. Vendors range from the large multinational software corporations to small niche providers focusing on discrete industry segments. Some vendors provide comprehensive enterprise data warehouse solutions, while others provide only subsets of tools such as ETL functions, OLAP analysis, or data mining.

Although highly flexible, these products require a high degree of user sophistication and training for effective use. They also require that the source data they process be structured in a standard way and that the user has a deep understanding of the data stores and the interrelationships between the data. Given the proprietary nature of the digital cable and VOD market, no off-the-shelf vendor currently provides automated solutions in this area, forcing the users of their products to become experts in their vendors' data model, as well as their tools.

Given the complexity and proprietary nature of VOD and other service data, most cable operators struggle with the high costs associated with using large enterprise data warehouse and OLAP tools alone. The costs of outsourcing or in-sourcing experts to use or modify off-the-shelf tools quickly rise. Not to mention, that the rapid advancements in the digital cable and VOD industry require on-going adaptations to keep up with change. Many resort to manual data accumulation and analysis rather than attempt the battle.

However, it is important to note that we at Everstream do see a good fit for integration of our systems into enterprise data warehouses and OLAP tools at an enterprise corporate level within some cable operators. This is especially applicable in situations where integration initiatives with large scale Customer Relationship Management (CRM), marketing automation, and financial systems are underway.

Our primary point is that these solutions are most effective when combined with a tightly integrated middle tier data warehouse and analytics system such as Everstream's S4 Oi 3.0 product.

WHY IS EVERSTREAM UNIQUELY POSITIONED TO PROVIDE PRODUCTS IN THIS AREA?

Everstream is uniquely positioned to provide data warehousing and analytics products in the cable industry for the following combination of reasons:

1. **Domain knowledge:** Everstream has extensive experience in digital cable environments, as well as in-depth working knowledge of all major VOD vendors, subscriber management systems, digital cable equipment, and middleware platforms. In addition to Everstream's S4 product line, we have developed and licensed software for VOD SMS/billing system integration, as well as web based reporting.

2. **Data expertise:** Everstream has extensive experience with massive data sets containing subscriber, content, device, and usage data.
3. **Market leader in data warehouse and analytics:** Everstream was the first to develop and deploy an independent data warehousing and analytics product for VOD in the North American cable market. Our in-field experience in production environments has provided unique insight to build our 3rd generation of the product.
4. **Independence:** Since Everstream is an independent company, our S4 products provide cross-vendor support and a unified approach to key performance indicators.
5. **Vendor supported:** Everstream is a “VOD vendor friendly” company. Our spirit of cooperation in the industry has earned us tight partnerships and relationships with major VOD vendors for providing complementary data warehouse and analytics solutions.

WHAT ARE THE TECHNICAL REQUIREMENTS FOR IMPLEMENTING S4 OI 3.0?

The Everstream S4 Data Warehouse and S4 Oi analytics application require minimal integration effort from a cable headend staff. It was designed to operate as a non-invasive component of the headend systems.

Everstream provides a complete turn key setup, offering various integration options such as external network management system integration, email notification, remote monitoring, and digital cable device SNMP integration. Setup is normally completed within a half day. The complete system requires only 2 rack units of space per VOD system.

For a complete list of options, as well as a sample project plan, please contact your Everstream representative.