REDDING NETWORK COSTS WITHOUT SACRIFICING QUALITY

INTEGRATED ENVIRONMENT DELIVERS MEASUREMENT AND ANALYSIS OF DATA FOR BETTER SERVICE AND WASTE REDUCTION
EXECUTIVE SUMMARY

What if you could eliminate 15 percent of network costs while improving service quality? At first glance this may sound improbable. Carriers, after all, are seeing their margins shrink because customers are demanding more and higher-quality, higher-bandwidth services that require continual investment in expensive infrastructure. While connectivity and mobility have never been more important to both consumers and business users, customers aren’t willing to pay more for what they perceive is ubiquitous and unlimited access to the network for either voice or data. To make matters worse, over-the-top service providers are skimming potential revenue, customer acquisition costs are on the rise due to a fully penetrated market, and competition continues to intensify, driven by bundled converged service offerings.

What can carriers do? Measure and analyze. Unless you know exactly where cost inefficiencies and waste exist in the network, it’s impossible to understand how to improve them.

This paper explains how integrating data from multiple network sources, combining it with various forms of reference data (including inventory, vendor contracts, rate sheets, and other cost data points) can help you do the following:

- Reduce costs by improving inventory management and traffic routing policies.
- Improve quality from both network- and customer-experience perspectives by creating a more efficient networking environment.
- Perform continuous audits to verify vendor invoicing, identify billing errors, manage invoice disputes, and eliminate stranded assets.
- Enforce vendor service-level agreements (SLAs) by tracking key performance indicators (KPIs).

CHALLENGE: REDUCING COSTS WITHOUT REDUCING QUALITY

One of the greatest challenges carriers face is the constant need to reduce costs. This task is made more difficult because they don’t fully understand the cost structure of their operations, which are infinitely complex. How complex? With as many as 50,000 towers, multiple generations of technology, networks cobbled together through mergers and acquisitions, dozens of external vendors contributing to variable- and fixed-cost positions, and an ever changing backhaul capacity challenge, carriers have deployed a variety of standalone, siloed solutions to deal with each cost component, handled on an individual basis. Although it creates an appearance of control, it is almost impossible to obtain a holistic networkwide cost view in this type of environment.

Not all costs are created equal, of course. Your fixed costs, such as investments in infrastructure, are the same no matter how much traffic goes over the network, how many services are provided, or how much can be billed to a customer.

If, for example, you’re a wireless carrier leasing fiber link capacity from a local wireline provider, cable TV company, or other local utility on a monthly basis, that adds to the fixed costs of your network. In this type of environment you can reduce fixed costs in several ways:

- Eliminating underutilized or “stranded” assets
- Improving vendor management by negotiating better price points, eliminating penalties, and maximizing the use of SLAs
- “Grooming” existing circuit inventory into higher-bandwidth (and more efficient) networking options
- Evaluating local distribution options (colocation, shared networks, and alternative vendors) to improve fixed-cost positions

Variable costs are those costs that go up when services or products are consumed. The way to reduce variable costs is to reduce unit costs and minimize the amount of network resources necessary to provide service.
CREATING ONE VERSION OF THE TRUTH
ABOUT THE NETWORK

For example, in a voice network, least-cost routing (LCR) helps manage both fixed and variable costs. To achieve LCR, carriers have to understand where their calls are being terminated (e.g., within their own network, through a different carrier, or via a wholesale provider) and the costs associated with each traffic type. Only by understanding all the interconnect points, all the potential ways to terminate traffic, and the costs associated with each option can carriers achieve the lowest cost outcome.

To make matters even more challenging, carriers have to figure out how to reduce their costs without sacrificing service quality. They must provide the same or better quality of service (QoS) to customers if they have any hope of remaining competitive.

It’s important, then, to take a balanced approach to minimizing costs. Carriers that oversubscribe their networks by drastically cutting resources or infrastructure can end up offering degraded service that can include dropped calls and poor-quality data connections. In such cases, blind cost cutting ultimately results in poor customer satisfaction, higher churn, and higher unit costs.

It is not unusual for carriers to achieve cost savings of up to 20 percent in fixed and variable costs by deploying a fully integrated cost control management capability that delivers the following:

- **Network optimization**: More efficient routing combined with better interconnect management creates an optimized network environment capable of carrying more traffic within the same infrastructure. Not only are operating costs reduced but capital expenditures can often be delayed and in some cases completely eliminated.

- **Higher-quality network service**: By rigorously enforcing vendor SLAs, providers can improve overall service quality, reducing customer support traffic and creating a more efficient operating environment.

- **Improved customer experience**: Higher service quality is one of the key drivers for improved customer experience. It also reduces churn, lowers customer acquisition costs, and improves brand performance and awareness.

SOLUTION: CREATING ONE VERSION OF THE TRUTH

What is the solution to this cost-cutting versus QoS challenge? Just imagine how the situation changes if you have the ability to analyze all the elements in your network in an integrated fashion from a centralized environment. No longer would you have a siloed system of operational and financial data looking at different components of your network. Instead, you would bring together all the data that is being generated and forge the necessary linkages and relationships to create a single version of the truth. This approach improves data management by using data integration and reuse to understand the relationship between variable (traffic) and fixed (circuit) elements. Because every dollar taken out of cost is pure profit, this new approach can improve the bottom line by millions and sometimes billions of dollars annually.

To better understand this “single version of the truth,” let’s take the example of a single phone call. There’s a record of the number called, where the call originated, and the length of the call, as well as other factors. Then there are data points generated that pertain to the quality of the call; the resource utilization across the network for that call; the kind of network elements used; and any abnormal conditions encountered in terminating that call.
call. But this dataset can be meaningless unless you can integrate it with other data to understand, for example, why a specific customer keeps complaining about the quality of her international calls, or why a carrier carries traffic on its own network across the country just to pass it off to another carrier for termination.

All this is complicated by the fact that a carrier can easily handle billions of calls per day, and that a single call can easily have multiple call data records (CDRs) and may be ultimately routed to another carrier for completion to the terminating user. When another carrier has taken responsibility to terminate a call, it needs to be terminated within the quality attributes of the negotiated contract. These contracts have quality terms and pricing associated with them, including enforceable financial penalties if the terms are not met.

The problem is many of these datasets use unique formats. A robust cost management environment will aggregate data from a variety of different network systems and require input from an extensive list of reference data sources, including the following:

- **Transactional data**: This data type provides information on user activity and is commonly known as xDR data. This term covers a number of voice and data forms, including CDR, IPDR, FDR, SDR, and so on.

- **Performance data**: This data type provides deeper performance insights and is critical to developing a quality view of the network.

- **Packet-level information**: As networks move toward converged service offerings, the relatively easy-to-manage days of circuit-switched networks are coming to an end and are being replaced by IP-networking technologies that are capable of efficiently carrying any type of traffic (voice, data, video, text, application, Web, etc.).

- **Inventory data**: This form of reference data provides information on network inventory, including circuit details, capacity, and any pending service-order changes.

- **Vendor data**: This wide collection of reference data covers vendor contract terms, rate sheets, effective dates, and other pertinent details.

- **Forecast data**: This planning data details network changes due to expected customer growth, marketing offers, technology evolution, and merger/acquisition activity.

To gain a single version of the truth, this data needs to be loaded to a single data model, combined with reference data, and run through a series of algorithms in a data warehouse to create a timely output that can be easily understood and manipulated by network analysts.

This granular approach generates cost values at a transactional level (call, data session, application use, message, etc.), allowing the carrier to segment cost by location, time, network element, service, and even user (if required), providing a relatively easy way of detecting cost outliers. Looking for ways to reduce the unit cost of these outliers provides a relatively easy method to prioritize improvement opportunities.

The common alternative approach of allocating a common cost to all transactions may be a good high-level estimation tool, but that can’t be used for serious cost cutting because it eliminates the visibility required to find and address outlier cost positions.

For example, if you look at all your voice traffic using a top-down approach, you might find 10,000 errors or failure points on the network. Out of 10 billion calls, that’s not statistically significant. But if 70 percent of those errors occurred when terminating calls on Carrier A’s network, you have cost and quality issues that can be traced back to a specific root cause. Then you can exercise the penalties for poor QoS, shift business away from Carrier A, or otherwise take action that results in lower costs and delivers a higher-quality customer experience.

Traffic profiling comes into play here as well. You can optimize the behavior of the network by analyzing data packets based on source and destination IP addresses or destination TCP port. By doing this, you know when and how traffic enters and leaves the network. You gain a better understanding of the topology of your network and, more importantly, where your customers are generating revenue and where your interconnect points may be generating excessive costs. With traffic profiling, you can obtain a deeper understanding of traffic flow within a very complex ecosystem and then develop actionable plans to optimize the networking landscape.

As you seek places to cut costs, it is critically important that you maintain a level of quality that is acceptable to your customers. You don’t want to create customer-service issues and poor-quality brand-image problems. You must maintain your quality KPIs, which tell you how your vendors are performing. The vendor scorecard and failure analysis becomes an integral part of the cost-management solution.
CREATING ONE VERSION OF THE TRUTH ABOUT THE NETWORK

TERADATA SOLUTIONS FOR COST MANAGEMENT

Teradata provides the flexibility, scalability, and performance necessary to collect, integrate, and analyze the huge amounts of data generated in a carrier network environment.

Teradata applies a modular approach to building a sophisticated data warehousing environment capable of supporting any network organization analytics requirements. The basic building blocks of this approach include the following:

- **Business modeling:** To fully understand customer requirements, Teradata uses a consultative business modeling approach to integrate all applicable data sources, to find and address process gaps, and to design a solution to meet current and future business objectives.

- **Robust extract, transform, and load (ETL) capabilities:** Teradata makes use of a number of specialized ETL tools (both internal and third party) to rapidly load any network data and associated reference data into normalized data structures designed to efficiently support sophisticated analytics requirements, such as cost management.

- **Data model:** Over the past 30 years, Teradata has developed extensive logical data models (LDMs) specialized by industry. The Teradata communications logical data model contains more than 7,400 attributes, one of the most comprehensive in the industry.

- **Master data management:** This defines relationships between different data elements across multiple data sources to create an efficient integrated data environment capable of supporting multiple business needs.

- **Applications:** Teradata works closely with customers to ensure that the selected application (custom builds or off-the-shelf third-party applications and visualization tools) environment will meet all current business objectives.

Teradata promotes a data reuse strategy, a “load once, use many” approach, where the same data warehousing environment can support dozens of different applications, addressing a wide variety of business needs. This approach creates a single version of the truth that can vastly reduce the network data footprint, eliminate redundancy and standalone data silos, and even reduce third-party licensing requirements.

**Benefits**

Teradata solutions for cost management deliver a broad range of quantifiable benefits:

- **Networkwide visibility**
  - Distribution of fixed and variable costs
  - Granular understanding of service costs (voice, data, text, application, content)
  - Understanding of peak utilization periods by service
  - Understanding of quality KPIs by service
  - Improvement in vendor management
  - Optimization of federal and state reporting processes

- **Voice/text**
  - Identification of top international destinations for cost-saving opportunities
  - Visibility into wholesale termination arrangements
  - Improved identification of “buy targets”
  - Knowledge of how much traffic the network needs to support during busy hours and ability to select carriers to support that traffic for optimal cost routing
  - Factual representations of how vendors are performing against scorecards
  - Insight into profitability of a specific destination to optimize billing rates
  - Better roaming rates and input for pricing
CREATE ONE VERSION OF THE TRUTH ABOUT THE NETWORK

- Data/applications/content
  - Better management of public and private peering points
  - Improved traffic flow within the network
  - Better understanding of content distribution and associated costs
  - Understanding of applications usage trends
  - Knowledge of impact of over-the-top service providers on cost structure

It's important to note that achieving better cost management while controlling vendor quality also provides additional business benefits that include better customer relationships and reduced customer churn; better brand image; and improved profitability. In particular, the Teradata solution provides a jump-start to building a network data warehouse capable of supporting other network-planning and operational requirements.

Teradata has been supporting analytic innovation in the communications industry for more than 30 years and remains the leading solution provider for the world's top service providers. For more information, visit www.Teradata.com/communications.

CONCLUSION

What are the top ten international destinations based on volume or total cost for voice calls? What are the top destinations (IP addresses) for data traffic? How are vendors performing? Getting the answers to these and other questions is critical for controlling costs and improving profitability for carriers. Yet given the overwhelming amount of data generated by billions of transactions every day, and the fact that much of this data resides in disparate siloes, means that carriers struggle to get a handle on costs, both variable and fixed. By moving to an integrated data environment that maps out precise relationships of the data and makes it accessible in near real time, carriers can stay on top of both cost and quality issues.