



Business Case Analysis Services

Explosive traffic growth is stressing service provider's business cases. New services including video streaming, cloud services and mobile broadband are driving network traffic demand at annual rates of 35 percent to 85 percent. At the same time service providers' business models are changing so that there is no longer a simple linkage between traffic growth and revenue growth. This puts tremendous pressure on service providers' cost structures, service portfolios, and pricing policies. Service providers are looking to their systems vendors for solutions that are supported by rigorous business case analysis to help them control costs and develop differentiated and profitable new services. When selecting a systems vendor, service providers look beyond simple product by product price/performance analyses to business case analyses that extend across the market ecosystem.

Business cases can include CapEx and OpEx comparisons, service pricing, incremental revenue and churn analysis. Increasingly, service providers are engaging with systems vendors to provide turnkey solutions that include network design, construction and operation as well as sourcing of content and business planning services. Use cases, total cost of ownership (TCO), and fi-

Business Case Analysis Services

All business case analyses are customized to your specific needs.

Analysis Scope: Analysis for any market covered by ACG.

Analysis Uses: TCO comparisons; OpEx analysis; ROI for use cases, revenue opportunities, and service pricing policies.

Communications Vehicles: Whitepapers, webinars, videos, ghost written articles, interactive tools.

financial modeling support are integral to such comprehensive vendor offerings.

ACG can position you as a leader by providing independent and unbiased business case analyses that are well respected in the industry. Our financial models are driven by our rigorous and comprehensive projections of market trends, market share and traffic growth. Our CapEx estimates are detailed and reflect our in-depth understanding of next-gen infrastructure. Our OpEx models are based upon more than 10 years of cost analyses performed for the industry's leading systems vendors and service providers. Analyses of new revenue opportunities leverage ACG's large database of market intelligence embodied in its subscription service offerings.

Business Case Analysis Service Offerings

Business case analyses can be developed for any of the markets covered by ACG:

- Data Center/Cloud Computing
- Managed Services Cloud
- Carrier Infrastructure
- Packet Optical Transport
- Mobility Services
- Video Infrastructure

Business case analyses can address many issues and uses:

- TCO analyses to compare differing network architectures
- TCO comparisons in support of sales activities
- OpEx comparisons of network architectures and vendor solutions
- ROI analysis for turnkey solutions and use cases
- ROI analysis of incremental revenue opportunities
- ROI comparisons of service pricing policies

Business case models are constructed in modular form so that the analytical depth exactly meets specific requirements of each analysis project. ACG modeling capabilities include:

- Traffic, demand and revenue projections; analysis of churn and market penetration
- Traffic engineering: Erlang, Protection Schemes, OSPF,



Michael Kennedy
Principal Analyst

Why Business Case Analysis with ACG Research?

- Globally respected analysts dedicated to each service; ACG's analysts' collective experience is derived from leading firms across a broad spectrum of professional disciplines including management consulting, engineering, marketing, financial analysis, and IT management and operations. We combine advanced academic degrees with practical business experience.
- ACG has helped leading network systems vendors and innovative startups support their value propositions with rigorous business case analyses. Notable business case analyses range from recent analyses on cloud computing, Packet Optical Transport, and the IP mobile core through landmark studies that established the business case for IP VPN, MPLS, Carrier Ethernet and PON.
- ACG's main focus is on the service provider space, and because of this focus we provide penetrating value.
- ACG maintains the highest levels of professionalism, integrity, independence, objectivity, and discretion. By following these principles our client relationships are long standing and active based on commitment and trust.

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- multicast/unicast, content networking, SONET/SDH rings, video distribution
 - Automated equipment configuration algorithms
 - Detailed OpEx modeling
 - Cost of service modeling
 - Analysis of the ecosystem value chain
 - Financial metrics and analysis: TCO, ROI, cash flow, full financial statements (income statement, balance sheet, cash flow statement), shareholder value, value of a customer account, payback, breakeven, NPV

Communicating the Business Case

Business case results can be communicated by ACG as whitepapers, webinars, videos or ghost written articles. We also can create interactive tools to more fully engage sales prospects in the analysis and customize results to each service provider's specific situation and concerns. Interactive models include:

- Customized tools coded in Excel or STEM that automatically generate custom whitepapers or PowerPoint presentations
- Modeling tools with user friendly front-ends for use in one-on-one sales consultations
- Web-based tools for use on the Internet or on intranets
- Smartphone apps for simpler models

ACG Employs Industry Leading Network Modeling Methodologies

ACG's modeling methodologies are equal to those of the industry's large research laboratories and leading universities. Its innovative methods include:

- **Traffic engineering for IP and OTN networks:** ACG has developed a traffic engineering capability using the Dijkstra shortest path algorithm to calculate network flows and find the traffic capacity on each link. It accommodates Unprotected, 1+1 fast reroute, and mesh restoration protection schemes. It can be used on IP packets or OTN's ODU0 (1 Gbps) traffic flow increments.
- **Probability model for calculating the size of CDN caches and network link traffic capacities:** The probability model uses cumulative probability distribution and probability density functions together with mathematical formulas employing conditional probability statements to specify required network link and cache sizes to design content distribution networks. The results are used in highly realistic studies of the TCO and ROI of cloud-centric network applications.
- **Resource allocation algorithm to study the economic benefits of using cloud centric networking:** ACG has developed a resource allocation algorithm that is used to study the benefit of allocating data center resources across a cloud computing environment. The algorithm seeks the set of data center capacity allocations that most fully reduces individual data center peak capacities to that of the average capacity for the cloud. It is used to estimate TCO/ROI benefits of cloud computing.

- **Traffic forecasting algorithms:** ACG has highly detailed and realistic algorithms that are used to forecast traffic for voice, data, video, and mobile service offerings. The algorithms develop forecasts using demographic data on individual residential and enterprise subscribers. They combine this with traffic statistics such as packet size, average data rates, concurrency rates, and latency limits to predict the bandwidth required for individual network flows and network links.
- **Network transition optimizations:** Most new network technologies are introduced into large incumbent networks using Cap and Grow transition strategies. ACG has developed an optimization method that finds the optimal sequence of transition projects that minimizes the TCO for transition to a Next Gen network. This is used to demonstrate the ROI and payback for transition to new network technologies. This is a major business case issue for incumbent network operators.

Published Whitepapers

The following are recent published whitepaper. Many other business case analyses are used for one-on-one sales consultations and to shape systems vendors' go-to-market strategies.

- Economic Impact of Junosphere: Understanding Benefits of Cloud-Based Network Modeling
- A Business Case for Scaling the Next-Generation Network with the Cisco ASR 9000 System
- OpEx Benefits of Fujitsu Ethernet Tag Switching Implementation of Connection-Oriented Ethernet
- A Financial Analysis of the Operational Benefits of MPLS-TP Transport Networks
- Cloud-Based OTT Video Services: A Business Case Analysis
- The Business Case for the Brocade Carrier Ethernet IP Solution in a Metro Network
- Business Case for 10 GbE Ethernet-Based Triple Play for Rural Service Providers
- The Business Case for an Integrated Policy and Charging Control Solution in the Multimedia Core

For a more extensive list of business case analysis whitepapers see <http://www.nspllc.com/whitepapers.html>.

Business Case Analysis Case Studies

The following are recent business case analysis projects highlight ACG's experience, the value the engagements provided to ACG's clients, and the depth of the analysis.

1. TCO Tool for Core Router: Router Vendor

- **Problem to Solve:** To penetrate the core router market by demonstrating the TCO savings gained through transition to the vendor's router
- **ACG Research Retained:** Develop a TCO tool used in a consultative sales environment that compares the vendor's core routing solution to those of the two leading vendors
- **Result:** Create TCO tool and whitepaper that demonstrates 47% to 53% lower TCO over five years by capping the incumbent router and off-loading traffic to the vendor's router
- **What We Did:**

- Create modeling tool that compares TCO of incumbent vendor versus vendor for Cap and Grow and Greenfield capacity expansion scenarios for up to 50 core nodes
- Forecast traffic growth using highly realistic and detailed traffic models for residential broadband, enterprise, mobile and wholesale services markets
- Engineer traffic capacity requirements using Dijkstra shortest path first routing algorithm for three possible protection schemes
- Configure automatically each router down to individual ports and line cards
- Model OpEx for nine separate cost elements
- **Value:** The business case for introducing a new vendor into a core network must be compelling. An independently developed TCO tool that uses the service provider's own design principles helps build the required proof and trust.

2. ROI Calculator for OTT Video: Top Tier Manufacturer for Network Equipment

- **Problem to Solve:** To provide comprehensive solution sales to broadband service providers
- **ACG Research Retained:** Create a ROI calculator that analyses business cases for cloud-based OTT video service
- **Result:** Demonstrate the value of OTT video strategies that employ "two-sided" business models and the manufacturer's policy-based routing capabilities
- **What We Did:**
 - Develop ROI calculator that includes detailed modeling of video usage, churn, network traffic, service fees, demand response and advertizing revenue
 - Create six alternative business models for the delivery of WebTV services by broadband service providers
 - Support automatic generation of a custom whitepaper so that the manufacturer can work with individual service providers on their own business cases
- **Value:** OTT video is increasing broadband service providers' capacity requirements but not revenue. Service providers are looking to their network equipment vendors for ways to increase revenue through policy-based routing.

3. TCO for Cloud-Centric Networking: Top Tier Manufacturer for Network Equipment

- **Problem to Solve:** To demonstrate the value of cloud-centric networking for two use cases in marketing comprehensive solutions
- **ACG Research Retained:** Create TCO models for cloud-centric networking solutions for retail cloud computing services and video-on-demand service delivery
- **Result:** Calculated 47% to 53% TCO reduction by using cloud-centric networking to locate video assets closer to subscribers and 36% TCO reduction by using cloud-centric networking to reduce the peak capacity of cloud computing hosting centers
- **What We Did:**
 - Build a probability model to predict the reduction of network transport expenses by using cloud-centric networking to locate video assets closer to subscribers

- Develop a load-leveling algorithm to distribute retail cloud computing traffic among hosting centers and compute the TCO savings
- **Value:** Service providers expect their vendors to provide complete solutions. Use cases, TCO, and financial modeling support are integral to such comprehensive vendor offerings.

4. OpEx Calculator for Connected Ethernet: Manufacturer of Transport Systems

- **Problem to Solve:** Demonstrate the OpEx advantages of Ethernet Tag Switching for Connected Ethernet solutions as part of the sales process
- **ACG Research Retained:** Calculate the OpEx advantage of Connected Ethernet implementations that use Ethernet Tag Switching versus those that use MPLS-TP
- **Result:** Demonstrate a 32% OpEx savings over five years for Ethernet Tag Switching vs. MPLS-TP and provide a tool for use in one-on-one sales situations
- **What We Did:**
 - Interview network operations experts to refine existing OpEx modeling parameters
 - Assess the status and objectives of ongoing standards activities to estimate schedule for MPLS-TP standardization
 - Create interactive OpEx sales tool
 - Write whitepaper and deliver webinar on study results
- **Value:** OpEx carries at least five times the weight of CapEx in service provider purchasing decisions. ACG has an OpEx model that has been perfected over more than 100 engagements that can be used to support vendors' OpEx savings claims.

5. Mobile Multimedia Core TCO/ROI Tool: Top Tier Manufacturer of Network Equipment

- **Problem to Solve:** Show prospects the economic advantages of an integrated multimedia core platform versus multiple platforms
- **ACG Research Retained:** Create TCO tool that compares an integrated platform with a multi-chassis solution and calculates the ROI of incremental revenue opportunities enabled by the integrated platform
- **Result:** Equip the sales force with a TCO/ROI tool that demonstrates the economic advantages of an integrated platform versus multi-chassis solutions
- **What We Did:**
 - Automate the design and configuration of the multimedia core network elements so that they are functions of projected network usage
 - Build detailed TCO analysis that includes many OpEx cost components
 - Create incremental revenue analysis driven by variables such as the unit cost of overbilling, tiered pricing demand curve, ad insertion revenue
 - **Value:** Service differentiation and value-added service options are needed to profitably offer mobile data services. The sales force must be equipped with analytical tools that quantify the return produced by vendors' platforms.

6. TCO for OTN Core Network Offloading: Transmission Equipment Manufacturer

- **Problem to Solve:** Support consultative sales situations with a detailed TCO tool for analysis of OTN Core Network Offloading scenarios
- **ACG Research Retained:** Create tool that compares TCO of core network with switched OTN versus an IP router solution
- **Result:** Develop tool that provides detailed analysis of the sources of TCO savings through use of OTN switching in core network
- **What We Did:**
 - Create a traffic engineering model for a 15 node core network that develops port requirements for each node using the Dijkstra shortest path algorithm
 - Configure OTN multiplexing (OYU0, OTU2) and map MPLS LSPs to OTN tunnels to compute CapEx of OTN solution
 - Configure IP router present mode of operations using traffic flows
 - Compute CapEx at the port and line card level for all alternatives
 - Compute OpEx using model refined in over 100 TCO studies
- **Value:** Architectural changes to the core network can fundamentally alter a service provider's cost position. Such fundamental change must be analyzed in detail and leverage the best analytical and engineering minds.

7. TCO/ROI for RAN Backhaul: Top Tier Manufacturer for Network Equipment

- **Problem to Solve:** Quantify the TCO savings and ROI of a transition from TDM to pseudowire for RAN backhaul
- **ACG Research Retained:** Present the business case and calculate the TCO/ROI for an investment in pseudowire technology
- **Result:** Write a whitepaper that is used to differentiate the manufacturer's solution in a crowded market place and create a TCO/ROI tool that is used in one-on-one sales consultations
- **What We Did:**
 - Refine and present the manufacturer's value proposition for pseudowire backhaul
 - Build a tool that calculates the TCO benefit of transition to pseudowire and the ROI for the investment in pseudowire technology
 - Develop realistic model of a typical RAN backhaul network
- **Value:** The wireless backhaul equipment market is crowded with many competitors. ACG helps you stand out from the crowd with a well articulated value proposition supported by rigorous analysis.

8. TCO for Fiber to the Home (FTTH): Top Tier Manufacturer for Network Equipment

- **Problem to Solve:** Compare TCO of E-FTTH with GPON including all costs of the Optical Distribution Network (ODN)
- **ACG Research Retained:** Analyze the TCO trade-offs between E-FTTH and GPON with special emphasis on the costs of building, managing and changing the Optical Distribution Network (ODN)
- **Result:** Demonstrate the bandwidth and flexibility advantages of E-FTTH as compared to GPON in a whitepaper

- **What We Did:**
 - Create highly realistic models of urban, suburban, and rural wire-centers including the optical distribution frame, serving area interface, distribution terminal, ONT and associated cabling
 - Project several alternative broadband service development scenarios that are anticipated over the long expected life of the ODN
 - Present trade-off analyses that demonstrate the flexibility of E-FTTH
- **Value:** Construction of FTTH is a major public works project analogous to road or sewer construction. ACG provides the independent support and analysis needed to support these long-range commitments.

Michael Kennedy Ph.D., principal analyst, offers a comprehensive business case analysis program consisting of in-depth TCO/ROI models, whitepapers and other communications vehicles, and interactive modeling tools for one-on-one sales consultations and web-based use.

For more information about ACG Research's business case analysis service practice click here www.acgresearch.net or contact Michael Kennedy at mkenney@acgresearch.net.

ACG provides market analysis and consulting to help service providers and vendors monetize their existing infrastructures and increase operational efficiency and profitability. Through ROI and TCO analysis, product and service message testing, and business model review, reports and forecasts, ACG gives you strategic and tactical advice, services and products, and timely answers so that you can better understand market dynamics and grow your telecom.

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