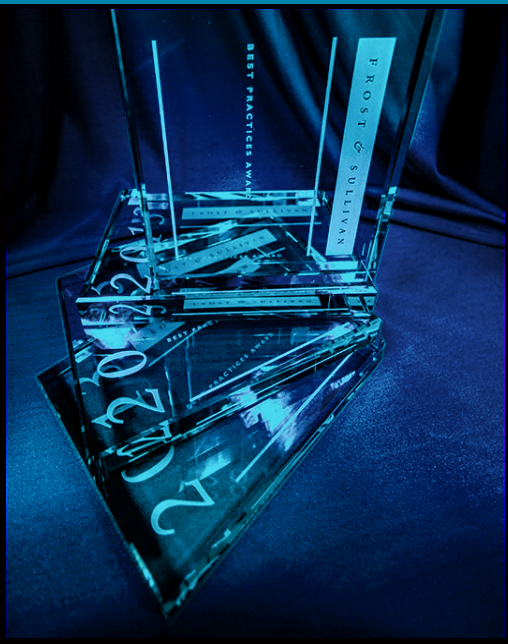FROST & SULLIVAN

TOYO Corporation
Quest for Precision

2016 North American
Packet Capture in High Speed Ethernet Networks
Customer Value Leadership Award

FROST & SULLIVAN

2016 BEST PRACTICES AWARD

NORTH AMERICAN PACKET CAPTURE
IN HIGH SPEED ETHERNET NETWORKS
CUSTOMER VALUE LEADERSHIP AWARD

2016
BEST PRACTICES
AWARDS

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The demand for connectivity is not limited to phone calls and texts anymore. High-quality phone calls (both voice and video), high-speed Internet accessibility, usage of mobile devices as smooth and secure payment gateways, and the Internet of Things (IoT) are some of the most frequently used applications that are witnessing a huge rise in IP traffic. To manage such exponential traffic growth, as well as the increasing demand for more bandwidth, network service providers and telecommunication companies are compelled to transition from low to high-capacity heterogeneous networks (from 1GbE to 10GbE and then to 40GbE). However, the current trend suggests that by 2018, IP traffic will increase up to almost 23%. To support this massive growth in IP traffic within this short succession of time, service providers and telecommunication companies are required to shift from 40GbE to 100GbE network capacity. Considering the absence of reliable packet capture systems in high-speed Ethernet networks, however, most of these companies in the North American market are not yet ready for the transition. In fact, they are under the impression that data that passes through at such high speed is difficult to capture, process, and present with the traditional all-in-one network analyzers.

Therefore, companies looking to acquire more business in the North American packet capture sector should develop specialized packet capture and analyzer systems to replace traditional network analyzers. They should combine state-of-the-art parallel computer processing technology with cutting-edge data archiving techniques to capture high volumes of data moving through high-speed (100GbE) networks. The development of such advanced solutions would assist network service providers and telecommunication companies in storing high-quality data and multimedia content, which can be used for research and development (R&D) purposes, such as issues barring network optimization, network security, and sophisticated cyber-attacks. These developments, in turn, would enable companies to effectively overcome the aforementioned challenges and stay competitive in the North American space.

Customer Impact and Business Impact

Price/Performance Value

Founded in 2015, California-based TOYOTech LLC (TOYOTech) is an extension of its parent entity, TOYO Corporation, and is focused on leveraging the latter's technological expertise for developing packet capture systems for high-speed Ethernet networks in order to cater to the needs of the North American market. In an effort to offer customers the best value for the money they invest in TOYOTech's solutions, the parent company has developed a packet capture and network analyzer system, known as Synesis, that boasts data storage capability even for the highest 100GbE networks. The traditional network security or

performance monitoring tools can either capture packets or perform network troubleshooting, yet they are not reliable in terms of capturing, processing, and presenting high-speed data due to either design limitations or operating software issues. On the contrary, TOYO Corporation and TOYOTech's proprietary Synesis solution, introduced in February 2016, is a dedicated 'appliance or portable-type large-capacity packet capture/analysis system' that has been engineered to collect high-speed packet data, which can be analyzed for understanding network performance or even the attempts made by hackers to breach network security.

The traditional solutions present in the North American market also cause data loss in huge amounts, due to which network administrators and engineers often miss out on the trace file. Backed by its 'network stream-to-disk' feature, Synesis eliminates the risk of trace file loss. In addition, the Open Design Box architecture of Synesis adds to the system's unique flexibility in terms of allowing it to function as both a stand-alone packet capture and an analyzer platform. It can also be integrated easily with customers' legacy tools for either network performance monitoring or security detection purposes. This means customers can, on the one hand, use the open application program interface (API) of Synesis to transform its functioning as a dedicated analysis engine, signal analyzer, or security detector, as per their needs. On the other hand, customers can simply integrate it with the existing network analyzer. This way, customers can enjoy best-in-class network packet capture performance at a 100Gbps rate without missing a single packet. It has real-time index information of packets generated from a single IP address, and shortest packet analysis time in the industry to determine network performance. Synesis comes with a Web-based graphical user interface (GUI), which allows customers' engineers and technical assistance teams to analyze local area networks (LANs) with the highest degree of convenience.

Customer Purchase Experience

Driven by its commitment to empower customers in making well-informed purchase decisions, TOYOTech works in partnership with North American network carriers and eCommerce companies that have high-end network performance analysis engines but lack the capability of packet data storage. Through these partnerships, the company demonstrates, in a real-world environment, how its Synesis 'packet capture/analysis system' can be deployed for various applications, such as investigating anomalous activities within the network; offering users a top-class usability experience by constantly

optimizing Web sites, applications, or servers in real-time; and handing over network administrators and vendors 'PCAP tracefiles' to help them understand the actual reason behind the malfunctioning of network devices. In fact, TOYOTech has already started working in partnership with two major carriers in the North American market to help them with packet capturing and to use the results of analysis for network troubleshooting. Concerning its eCommerce customers, TOYOTech understands that they are always under the risk of cyber security attack and payment misappropriation. In case of such an occurrence, these customers are under the obligation to investigate the issue that has caused the problem. TOYOTech's solution stores data packets and processes them through customers' in-house analysis engines to be able to pinpoint any act of security breach. Based on the analytical insights, the company's customers are able to select the right packet analyzer befitting of their specific needs.

Customer Ownership Experience

In its bid to offer customers a fulfilling ownership experience, TOYOTech relies on a strong customer feedback mechanism. Working closely with its partners, it builds a strong understanding of their needs and adds new features to its Synesis platform based on such inputs. Its strong customer feedback mechanism, for instance, helped the company identify that its potential customers are searching for a powerful analysis engine that can efficiently capture and process data on 100GbE heterogeneous networks. Based on this finding and in collaboration with its partners, TOYOTech took to developing a solution that would address this unmet customer need. By combining its technological understanding with partners' resources, the company offers a packet capture and analysis system more robust than any other competing network analyzer in the market.

The company's acquisition of PolyVirtual Corporation (PolyVirtual) (Feb 2016) also strongly demonstrates its commitment to ensure the best value for the money to its customers in North America. PolyVirtual's proprietary BIG DATA AGGREGATOR (BDA), which served as the basis for TOYO Corporation's SYNESIS, is the industry's first '100 Gigabit Ethernet (GbE) network stream-to-disk and analytics appliance.' By combining PolyVirtual's technological expertise with its own, TOYO Corporation and TOYOTech demonstrate their ability to integrate the customers' ownership role in the product development phase. This partnership has helped improve 'parallel compute processors', make the system GUI more user-friendly, and create novel data archiving strategies. These improvements have translated into more efficient packet capturing, data processing, and data visualization. As it stands today, SYNESIS is the only solution that can capture and stream packets to disk at 100G wire speed without any packet loss. In an effort to add more flexibility to the customers' product selection process, the Synesis platform has been made available in 8 different models, with different hardware, operating system, GUI, and internal storage specifications. Such variety in the product line has simplified the process for customers to find the right solution that perfectly matches their budgetary.

Brand Equity

As part of its brand development strategy, TOYOTech is working in partnership with a number of technology companies. Being a part of a larger entity, TOYO Corp, the company's strategy is to strengthen its brand equity and expand its market and strengthen its presence in the North American region, based on investment and acquisition of technology companies. In pursuit of this objective, TOYOTech, therefore, aims at building a joint solution in collaboration with several network test vendors and eCommerce companies in North America. Upon launching its joint solution with additional features as per customers' feedback by July 2016, the company looks to expand its footprint and strengthen its brand reputation across North America.

Customer Acquisition

TOYOTech's strategic approach to amplifying its customer base in the North American packet capture in high-speed Ethernet networks market rests on its ability to identify the needs of potential customers, such as network carriers and eCommerce companies, and equip them with the unique capability to store, process, and present network performance data even from high-speed (100GbE) networks. The company has rightly identified that the shift from a 10GbE to 100GbE network, though slowly, has already begun owing to the huge increase in IP traffic. By introducing the Synesis platform, the company has clearly exhibited its superior competence level, alongside offering customers the assurance of storing every single communication on a network. No other company in the North American packet capture market has been able to offer such capabilities to network carriers and service providers for enhancing their security measures as well as application performance. Furthermore, using the Mobile World Congress (February 2016) as a platform, the company attempted to reach out to a broad base of potential customers with the launch as well as demonstration of capabilities afforded by Synesis. The live demonstrations as well as examples of real-world deployment exhibited the unmatched efficacy of its Synesis offering.

Human Capital

In its nascent stage of growth, TOYOTech's North American team comprises only 5 employees. The company's extensive plan to increase its share of the North American market depends on the effective leverage of the highly-qualified, professional expertise of its personnel. In addition, the North American team receives constant support from its parent corporation fortified by over 500 employees. The company ensures that both TOYO Corp and TOYOTech LLC work mutually to generate the maximum productivity from its workforce and stay ahead of its competitors in North America in terms of growth.

Conclusion

TOYOTech's proprietary Synesis 'packet capture and analysis system' is a dedicated platform for network performance data collection, which can also be integrated easily with customers' legacy analysis engines to create visualizations and generate insights on network performance, ensure real-time network performance optimization, and investigate any event related to network security breach. Apart from guaranteeing the successful reporting of every communication event in 100GbE networks, the Open Design Box architecture of its Synesis platform allows customers to make necessary changes in the system and deploy it as per their respective needs, such as signal or network analysis and security verification, to generate best-in-class performance without having to undergo any major, costly transformation in the existing platform. The company has carefully understood the changing needs of customers for data capturing without missing out on any communication while shifting from a 10GbE or 40GbE network to a 100GbE network. Accordingly, it has developed the Synesis solution such that the performance of carrier networks does not slow down or miss recording every communication in order to guarantee cutting-edge protection against imminent security threats.

Because of its strong overall performance, TOYOTech is recognized with Frost & Sullivan's 2016 Customer Value Leadership Award.

Significance of Customer Value Leadership

Ultimately, growth in any organization depends upon customers purchasing from your company, and then making the decision to return time and again. Delighting customers is therefore the cornerstone of any successful growth strategy. To achieve these dual goals (growth and customer delight), an organization must be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.

Understanding Customer Value Leadership

Customer Value Leadership is defined and measured by two macro-level categories: customer impact and business impact. These two sides work together to make customers feel valued, and confident in their products' quality and long shelf life. This dual satisfaction translates into repeat purchases and a high lifetime customer value.

Key Benchmarking Criteria

For the Customer Value Leadership Award, Frost & Sullivan analysts independently evaluated two key factors—Customer Impact and Business Impact—according to the criteria identified below.

Customer Impact

Criterion 1: Price/Performance Value
Criterion 2: Customer Purchase Experience
Criterion 3: Customer Ownership Experience
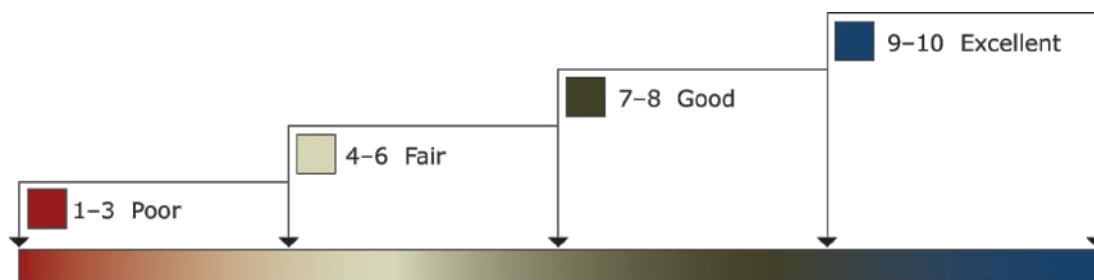Criterion 4: Customer Service Experience
Criterion 5: Brand Equity

Business Impact

Criterion 1: Financial Performance
Criterion 2: Customer Acquisition
Criterion 3: Operational Efficiency
Criterion 4: Growth Potential
Criterion 5: Human Capital

Best Practice Award Analysis for TOYOTech
Decision Support Scorecard

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard. This tool allows our research and consulting teams to objectively analyze performance, according to the key benchmarking criteria listed in the previous section, and to assign ratings on that basis. The tool follows a 10-point scale that allows for nuances in performance evaluation; ratings guidelines are illustrated below.

RATINGS GUIDELINES

The Decision Support Scorecard is organized by Customer Impact and Business Impact(i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criteria are provided beneath the scorecard). The research team confirms the veracity of this weighted scorecard through sensitivity analysis, which confirms that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.

The results of this analysis are shown below. To remain unbiased and to protect the interests of all organizations reviewed, we have chosen to refer to the other key players as Competitor 2 and Competitor 3.

Measurement of 1–10 (1 = poor; 10 = excellent)			
Customer Value Leadership	Customer Impact	Business Impact	**Average Rating**
TOYOTech	**9.8**	**9.9**	**9.9**
Competitor 2	8.3	8.1	8.2
Competitor 3	7.1	7.3	7.2

Customer Impact

Criterion 1: Price/Performance Value
Requirement: Products or services offer the best value for the price, compared to similar offerings in the market

Criterion 2: Customer Purchase Experience
Requirement: Customers feel like they are buying the most optimal solution that addresses both their unique needs and their unique constraints

Criterion 3: Customer Ownership Experience
Requirement: Customers are proud to own the company's product or service, and have a positive experience throughout the life of the product or service

Criterion 4: Customer Service Experience
Requirement: Customer service is accessible, fast, stress-free, and of high quality

Criterion 5: Brand Equity
Requirement: Customers have a positive view of the brand and exhibit high brand loyalty

Business Impact

Criterion 1: Financial Performance
Requirement: Strong overall financial performance in terms of revenues, revenue growth, operating margin and other key financial metrics

Criterion 2: Customer Acquisition
Requirement: Customer facing processes support the efficient and consistent acquisition of new customers, even as it enhances retention of current customers

Criterion 3: Operational Efficiency
Requirement: Staff is able to perform assigned tasks productively, quickly, and to a high quality standard
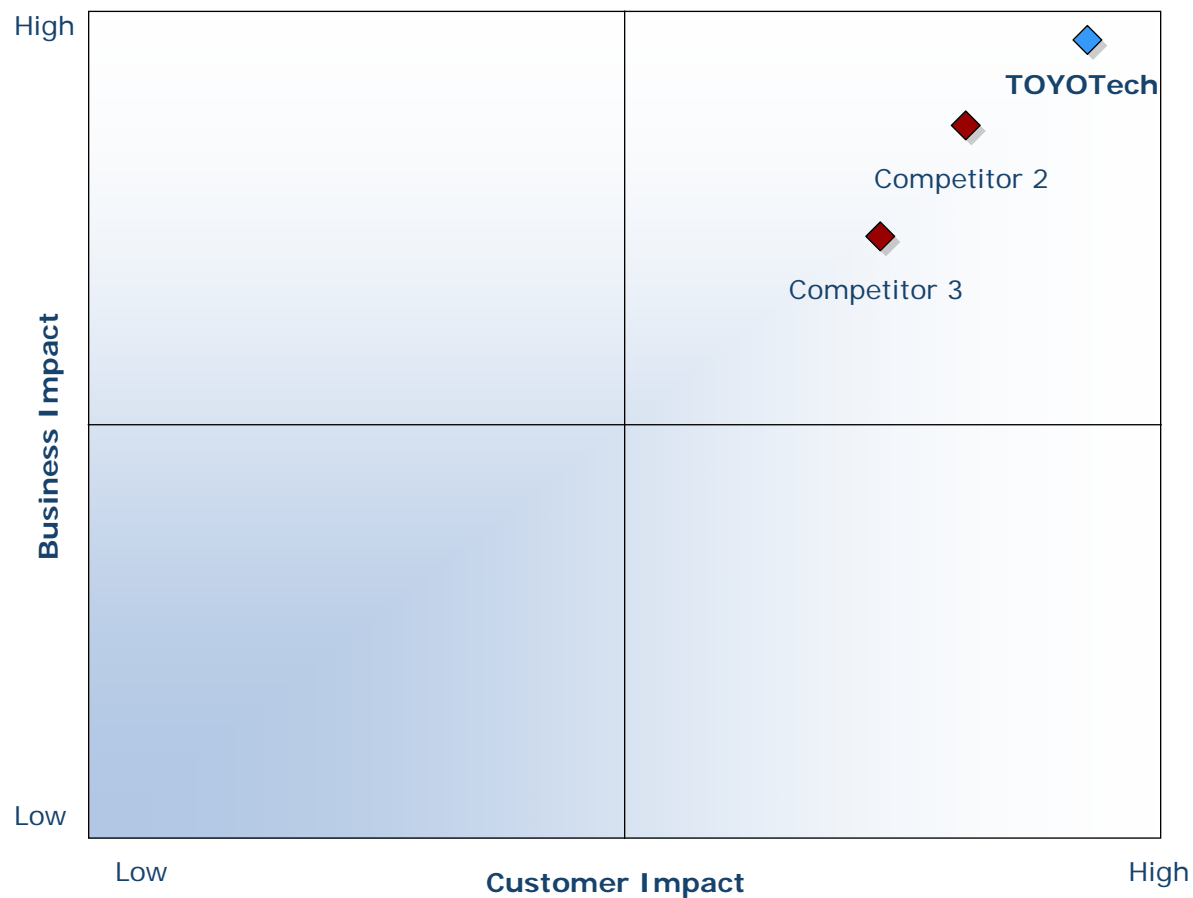
Criterion 4: Growth Potential
Requirements: Customer focus strengthens brand, reinforces customer loyalty and enhances growth potential

Criterion 5: Human Capital
Requirement: Company culture is characterized by a strong commitment to quality and customers, which in turn enhances employee morale and retention

Decision Support Matrix

Once all companies have been evaluated according to the Decision Support Scorecard, analysts can then position the candidates on the matrix shown below, enabling them to visualize which companies are truly breakthrough and which ones are not yet operating at best-in-class levels.

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree-view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often, companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry players and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan Awards follow a 10-step process to evaluate award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 **Monitor, target, and screen**	Identify award recipient candidates from around the globe	• Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies	Pipeline of candidates who potentially meet all best-practice criteria
2 **Perform 360-degree research**	Perform comprehensive, 360-degree research on all candidates in the pipeline	• Interview thought leaders and industry practitioners • Assess candidates' fit with best-practice criteria • Rank all candidates	Matrix positioning all candidates' performance relative to one another
3 **Invite thought leadership in best practices**	Perform in-depth examination of all candidates	• Confirm best-practice criteria • Examine eligibility of all candidates • Identify any information gaps	Detailed profiles of all ranked candidates
4 **Initiate research director review**	Conduct an unbiased evaluation of all candidate profiles	• Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles	Final prioritization of all eligible candidates and companion best-practice positioning paper
5 **Assemble panel of industry experts**	Present findings to an expert panel of industry thought leaders	• Share findings • Strengthen cases for candidate eligibility • Prioritize candidates	Refined list of prioritized award candidates
6 **Conduct global industry review**	Build consensus on award candidates' eligibility	• Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates	Final list of eligible award candidates, representing success stories worldwide
7 **Perform quality check**	Develop official award consideration materials	• Perform final performance benchmarking activities • Write nominations • Perform quality review	High-quality, accurate, and creative presentation of nominees' successes
8 **Reconnect with panel of industry experts**	Finalize the selection of the best-practice award recipient	• Review analysis with panel • Build consensus • Select winner	Decision on which company performs best against all best-practice criteria
9 **Communicate recognition**	Inform award recipient of award recognition	• Present award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance	Announcement of award and plan for how recipient can use the award to enhance the brand
10 **Take strategic action**	Upon licensing, company may share award news with stakeholders and customers	• Coordinate media outreach • Design a marketing plan • Assess award's role in future strategic planning	Widespread awareness of recipient's award status among investors, media personnel, and employees

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best in class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages almost 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 31 offices on six continents. To join our Growth Partnership, please visit http://www.frost.com.