Rich content and digital applications in campuswide office environments combined with the proliferation of highly disparate mobile devices are placing new demands on enterprise network operations to optimize the user experience. Conventional network management and monitoring solutions typically focus on controlling certain aspects of the network infrastructure itself. While important, this type of management does not provide a full view of the user experience because these new wireless client devices access their applications and wired services using constantly evolving enterprise infrastructures. New network analytics technologies are evolving to place expanded focus on understanding and enhancing the user experience across the entire network stack. Developing such expanded views involves processing massive volumes of network, client, and application data, requiring the use of big data and analytics (BDA) technologies. This Technology Spotlight looks at these emerging capabilities and the role that Nyansa solutions play in meeting the previously described challenges.

Introduction: Beyond Traditional Network Management

Internet of Things (IoT) devices and mobile services change the design goal for increasingly mobile enterprise networks. Customer perceptions of value are increasingly rooted in the quality of the personal device experiences of customers from the time they connect to the network. As customers encounter technology through ever-expanding numbers and types of connected services using real-time applications, connectivity is only one part of the technology picture but is fundamental to all applications.

The rapid growth in network traffic from an increasingly mobile base of users armed with such a diverse set of client devices represents one of the greatest challenges to IT and network operations staff trying to ensure a reliable and consistent user experience. Traditional network management tools haven't been designed with these big data challenges in mind and often fail to deliver a comprehensive understanding of or actionable insights into actual user experience from client to cloud.

Cloud as a technology and applications for enterprise infrastructure rely on connectivity services to deliver the value of the infrastructure. For network operations, the dynamic and agile approach to sourcing some cloud platforms and applications has disrupted the planning that was aligned with onsite mission-critical applications.

Ethernet and IP services and equipment used to access cloud resources are also evolving. Software-defined networks, virtualization, and programmability are emerging to improve the way that networks fit into overall infrastructure evolution. While supporting mission-critical applications remains essential to network operations, increased infrastructure complexity, traffic volumes, and mobile connectivity now require an updated set of priorities for corporations that need to focus on customer satisfaction.

Consequently, big data network analytics is becoming a major factor in addressing these issues.
When a user connects to a network, countless wired and wireless transactions take place across all layers, each of which can affect the user experience. Proper configuration and performance at each layer and every transaction are crucial to reliable application delivery and network operations as well as optimal user performance. As problems occur, network operations staff have become inundated with volumes of uncorrelated network, client, and application data that must be methodically analyzed before anything useful can be accomplished.

**The Digital Workplace Environment: Enabling the Mobile Workforce**

Because client mobility is now the norm in today's enterprise, the myriad client devices and user applications have caused an exponential increase in potential problems for IT operations. Troubleshooting these devices has become an increasingly frustrating task. Being able to quickly discover and diagnose these types of problems to proactively address user experience is the holy grail for IT operations.

- Today's business environment is becoming ever more technology dependent, and maintaining competitive differentiation often requires employees to have fast, reliable access to a wide variety of IT systems and services from a wide range of diverse device types running on disparate network architectures. As the lines between corporate-owned devices and personally owned devices continue to blur, mobile workers expect to have access to corporate data on multiple devices anywhere at any time. This shift, along with persistent consumerization, is driving IT executives to continually address the changing technology needs of their organizations.

- Employees are often frustrated that the mobile technology advancements taking place in their personal lives don't match up with the mobile technology advancements in the workplace.

- IT must provide a more consistent and seamless client experience to the rapidly expanding population of employees who seek to use multiple devices to conduct business transactions throughout the enterprise.

**Client-Centric Views Support the Mobile Workforce**

- Business leaders are increasingly looking to IT to deliver a mobile experience that allows employees to efficiently access corporate data and applications on their devices of choice.

- Network operations management must be able to provide clear views of the experience being delivered to users across diverse client devices and networks. This capability has a direct impact on business productivity and ultimately the success of mobile workplace initiatives.

**Key Implementation Benefits**

**Benefits for Network Operations**

- Client-centric views allow network administrators and network operations to get close-up pictures of the performance and availability being experienced at devices accessing wired and wireless networks.

- Client-centric views add a new dimension to network operations that goes beyond simple infrastructure health. There are a number of circumstances where the network is performing well but some end users are being impacted by issues related to their particular client devices.

- The ability to identify and analyze client-related issues helps network operations staff better understand the end-to-end user experience and improve user service levels.
Benefits for the Service Desk

- Help desk staff are often challenged to meet service-level agreements (SLAs), remediate issues quickly, and not depend on manual processes and/or disaggregated management tools for incident mitigation, root cause, and/or remediation.

- Traditional approaches to IT service, network, and operations management don't provide the tools necessary to respond quickly, are not comprehensive, and don't scale sufficiently to keep pace with the demands of today's complex IT environments.

- Service desk operations can benefit from technologies that can clearly identify incidents with associated exception conditions and probable root causes. Big data and analytics is specifically highlighted as an enabling technology for reducing the number of incidents submitted to the service desk as well as accelerating ticket resolution.

- Big data and analytics can now enable IT departments to optimize their services in support of business imperatives. Service management and network optimization are crucial elements in enabling IT to meet, or exceed, service-level requirements, particularly in environments where different vendor systems are being used.

Benefits for the IT Director/CIO

- The persistent consumerization of the user experience from client devices is driving IT executives to continually address the changing technology needs of their organizations. Failure to do so often results in employees circumventing the IT department's procurement policies and procedures, commonly referred to as “shadow IT.”

- IT executives are being driven to empower users with modern technologies while still ensuring the appropriate levels of performance, availability, and optimization of their organizations' IT assets.

- Decision makers need the ability to holistically visualize and assess the performance of their organizations' client devices and network assets in order to properly size hardware and software requirements as well as to understand adoption trends and the effectiveness of implementing new technologies.

Key Trends

- The acceptance and rapid proliferation of virtual, mobile, and cloud computing in the enterprise are driving the need for business users to create, access, and share information across multiple device types (including smartphones, tablets, and thin/zero client terminals) in real time, regardless of location.

- Cloud-sourced analytics systems are now providing cross-company correlation of network analytics to help IT executives better understand key performance indicators and operational trends essential for better planning and improving operational efficiency.

- As organizations plan their future digital platforms, business leaders are increasingly looking to IT to deliver technologies that allow employees to access and utilize corporate data, applications, and communication resources across multiple device types (e.g., tablets and smartphones), fostering new mobile worker use cases.
Emerging solutions with advanced analytic capabilities enable IT to leverage more efficient and purpose-built automated processes, specifically related to how automation is leveraged in support of event management and IT service management processes. This includes intelligent and simplified classification or escalation of incidents, problems, and changes as well as having access to trending information that helps determine the real value of infrastructure changes.

Additionally, a key benefit of operations analytics is streamlining how operational knowledge is gathered and managed, letting IT organizations improve the delivery of their services to an increasingly mobile workforce.

**Considering Nyansa: Cloud-Sourced Network Analytics**

Nyansa is a new Silicon Valley–based software innovator providing an IT network analytics solution called Voyance. Voyance tracks, analyzes, and correlates both wired and wireless data related to every client's network experience from initial connection to application access across the entire network applications stack. This data — both real time and historical — is summarized into simple root cause issues, remediation recommendations, and infrastructure trending information that provide valuable insights into the quality of the experience for each user or user group.

Voyance is a software solution that also has the ability to compare a number of network metrics anonymously among companies within similar vertical markets, arming organizations with the ability to learn how other organizations are leveraging similar technology and services — a capability the company calls *cloud sourcing*.

Nyansa's Voyance solution extracts, inspects, and correlates all wired traffic from a mirrored or span port on as the traffic passes through network switches, fusing this traffic with wireless metrics gathered from WLAN controllers at a customer's site. Voyance currently supports Cisco, Aruba, and Ruckus WLAN controlled environments. An out-of-line software extractor captures and processes all traffic, sending only summary metrics to its cloud analytics engine hosted within AWS' virtual private cloud. Data packets are stored and all correlated traffic is encrypted and transmitted over an SSL connection to Nyansa's patented cloud engine, ensuring high levels of security.

The user interface to the Voyance solution is configured through a simple and intuitive Web-based dashboard that provides a number of different and detailed views to CIOs, IT network directors, and help desk support staff. The Voyance interface provides a detailed timeline of each user's network experience, along with network operational performance trends, availability, and status. It also provides rich customizable reports, trending information, and occurrence of incidents. Specific incident details can be compared against those of other similar organizations.

Machine learning is used to automatically establish baselines for a variety of different metrics such as application, network infrastructure, Web, and WiFi performance measures. Voyance detects and prioritizes incidents that deviate from baselines and are impacting performance experienced at client devices. It also detects and automatically prioritizes availability issues that deviate from baselines such as the percentage of clients impacted by poor WiFi or Web performance or failures to connect because of DHCP or other network infrastructure services. For each type of incident, the solution provides a summary of symptoms, probable root cause, percentage of client devices affected versus baseline, and suggested next steps for remediation.

**Challenges**

Given the huge growth in network traffic, network management is critically important to a wide variety of organizations. The need is reflected by an increasing number of players in this space. As a new IT network analytics company, Nyansa must clearly identify itself in terms of product capabilities, unique differentiators, and defensible position in what is becoming a very competitive market.
With many organizations wishing to reduce or simplify management and monitoring tools, Nyansa will need to carefully position its offering against a variety of established solutions that can perform a small subset of network analytics capabilities. The company will also need to closely partner with or position itself as a complement to existing network infrastructure providers.

While Nyansa has incorporated a number of advanced technology elements, including network analytics, into the Voyance solution, the company needs to maintain the simplicity of its user interface approach, which makes the product usable by and attractive to a broad class of IT operations staff.

**Conclusion**

Today’s IT organizations must provide rapid and reliable wired and wireless network access to a broad and constantly expanding set of ecommerce, digital, self-service, and other related applications. Users expect to use handheld and mobile client devices to access these resources with consumer-grade performance and reliability. Managing networks to support these objectives requires visibility into the health of the network infrastructure and support for detecting and resolving issues before they affect users.

Issues can occur affecting client devices accessing the network so that even though the network infrastructure is healthy, users are not able to effectively use their devices. Expanding the context of network analytics to become more client centric and include client-specific error detection and resolution will benefit the user, the network administrator, the service desk staff, and the IT executives responsible for service quality. Client-centric network analytics will enhance the end-user experience. Nyansa offers a solution set that addresses many of these needs. To the extent that Nyansa can address the challenges described in this paper, IDC believes that the company is well positioned for success.