Advancing Your Analytics with Webtrends Infinity™
A new approach to digital intelligence in a big data world
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WHAT IS THE IOT?
The Internet of Things (IoT) is a rapidly expanding network of internet-connected sensors attached to ‘things,’ which can be any object with an on and off switch to the internet. Cellphones, wearable devices, refrigerators and even components of machines are examples of things in the IoT.

Advancing Your Analytics with Webtrends Infinity™

Our connected world is producing data at an unprecedented scale and velocity. According to Gartner, by 2020 there will be more than 26 billion connected devices. For businesses, the implications are many, but of particular interest is how to understand and leverage this data successfully.

To seize new opportunities, we believe a new and better method of digital analytics is required. The old ways of capturing, processing and reporting on customer data are no longer sufficient as three significant developments are forcing us to look at analytics in a very different way.

1. The need for highly relevant and contextual customer experiences
   With greater access to quality content and information, consumers are well informed and demand top-notch, relevant experiences with brands. This has challenged brands to better understand the discreet needs of individuals along their cross-channel journeys and to use that intelligence to deliver the most personalized experiences possible.

2. Channel proliferation and the Internet of Things (IoT)
   The number of marketing channels and the complexity of consumer touchpoints continue to grow. The path to a purchase or conversion almost always involves a variety of different channels – and often is a combination of digital and non-digital. Additionally, the IoT expands the definition of a digital touchpoint beyond a human to any network-enabled object. We must rethink both how we process data and how we make real-time decisions within the business intelligence systems that rely on that data.

3. Concerns about data security
   A data breach can destroy a brand’s reputation. As software is increasingly delivered as a service and volumes of data measuring online behaviors continue to grow, data security rises to the top of the buying criteria for any new tool or technology. There is a clear recognition that the data chain is only as strong as its weakest link and a break can be devastating.
Our approach to analytics is designed to:

- Unify all analytics functions by bringing together aggregate and visitor-level data from all digital channels in an easy-to-use interface
- Be ready for the massive scale and flexibility of collecting and processing behaviors across the IoT
- Provide fast access, making all data and intelligence available in real time for immediate decision making
- Enable end-to-end data security via encryption of individual data in transit and at rest
- Deliver data accuracy at scale, including unique visitor data and analysis with absolutely no sampling
- Make all the data interoperable and support the highest level of data openness with the broader marketing ecosystem for personalization and deeper analysis

Webtrends Infinity makes this new approach possible

A highly scalable platform for the collection, processing and storage of data, Infinity was built from the ground up to meet the needs of today’s demanding environment. It embraces integration, security, scale, customizability, data freshness and performance. Leveraging big data technologies, it solves both current and future data challenges that the IoT will create.

This white paper highlights some of that innovation and illustrates how Infinity Analytics™, an application built on top of the Infinity platform, can help analysts, marketers, technologists and digital executives build data-driven organizations in a big data world.

WHAT IS BIG DATA ANALYTICS?

The collection, processing, analysis and reporting of large datasets containing various types of data – both structured and unstructured – to uncover patterns, correlations, market trends, customer preferences and other useful business information.
Real Time, All the Time

To satisfy the agile needs of the business, all data must be available in real time by default.

Today’s Challenges

In today’s agile marketing world, you need timely feedback and measurement so that adjustments can be made before an opportunity is lost. Some analytics solutions provide real-time reports, but without an end-to-end data streaming pipeline, there’s no way for 100 percent of the data to actually be real time.

The default latency for reports within enterprise analytics solutions today is typically 24 or more hours. This delay is the reason there are two classes of reports: standard reports and real-time reports. You must pre-determine and pre-configure which reports you want to see in real time. And, because not all data is available in real time, only specific metrics and reports can be selected. Turning on those real-time reports is an administration task that adds upfront planning, implementation complexity and ongoing maintenance overhead for administrators.

Real-time insights come from real-time interrogation of the data – a traffic spike, an online anomaly or an unexpected behavior in a segment of your customers. What is important is the ability to interrogate the data in real time, rather than look at a static report that you had to define as real time in advance.

QUESTIONS TO ASK WHEN RESEARCHING AN ANALYTICS VENDOR:

1. Is there a distinction between “standard” and “real-time” reports?
2. Do I have to pre-define or pre-configure my real-time reports?
3. Can I only get a subset of my data in real time?

Real Time in Action

“As an ecommerce manager, I spend a lot of time working to ensure that visitors have no problems making purchases on our sites. But, mistakes happen. Just the other week, our marketing department launched a new ad campaign for color printers, driving consumers to our site. Within two days, it was out of stock and visitors were exiting the site deep within the online purchase funnel. I need to be able to see this behavior immediately so I can respond and make inventory adjustments or swap out the out-of-stock product with another one.

Supply and stock mishaps cause serious headaches for our customers and lose revenue for the business. I need real-time analytics so I can quickly respond and make adjustments immediately.”
How Infinity Analytics Provides Real Time, All the Time

Providing real-time data, all the time, fundamentally requires a new way of collecting, story and interrogating data. The Infinity platform applies open source technologies with our own patent-pending algorithms to create a real-time streaming data pipeline that supports the massive scale of the IoT. Data flows through an analytics processing engine that is able to handle tens of billions of transactions per day.

With Infinity Analytics, you do not need to know in advance which reports you want in real time because all data is available in real time by default. There is no concept of standard reports vs. real-time reports. All data is readily available for analysis so that when an anomaly is observed, you can simply use any report as an entry point for further interrogation. All collected data, whether a measure or dimension, is available, and any segment can be applied to any report in real-time to hone in on the question or problem and get answers at the moment you need them.

Benefits of Real Time, All the Time

For the digital analyst
Timely and accurate analytical insights available to business stakeholders

For the digital marketer
Immediate visibility into the performance of marketing programs

For the marketing technologist
Data and insights available at the moment the business needs them

For the digital executive
An agile marketing organization that can respond faster to market demands
I am a marketer for a global bank and standard campaign performance reports are important tools that I use to determine the success of my marketing efforts. Recently, we launched a new credit card promotion and I wanted to understand how it was performing by country, but the standard report I get raised more questions than answers. For example, I see that the clicks on the offer link peaked on the 23rd of the month, but because I’m responsible for justifying our mobile channel, I would like to know how much of that traffic came from mobile and which countries had highest conversion rates for mobile traffic. I need to be able to drill into this report on the 23rd and segment the report on mobile devices and geography. I also want a view of mobile’s global performance, irrespective of country. For those who have logged in on their mobile app, I want a list of user names so I can send them a personalized email.

I need to be able to ask questions of the data when they arise and not have to always rely on my analysts to generate the right reports for me. They do a great job of setting up my standard reports, but there are always additional questions that are unique to me. I want to be more self-sufficient so that even though I may start with aggregated reports, I can drill into the individual-level data to get exactly what I need, when I need it.”
How Infinity Analytics Provides a Unified and Intuitive Experience

Infinity Analytics provides a unified and intuitive user experience to support completely different tasks, roles and people – making it both easy to learn and manage. Built on a single data platform, there is no movement of data between data stores and no need for extra data processing or transformations.

All data within the Infinity platform is stored at the individual level and maintains visitor session and event data next to each other in the same data store. You benefit from access to a single application that provides trend reports along with powerful ad hoc data exploration and segmentation.

Also of importance, the Infinity platform was built to reduce administrative overhead. This is achieved by eliminating the pre-processing of data and providing support for granular data permissions. Granular and flexible data permissions are particularly important when different departments or agencies require different levels of access.

With Infinity, users have all the capabilities they need without going to different products or feeling like each unique question has a completely different experience. No more analytics data here, optimization data over there, ad hoc analysis data in a different application and segmenting visitor lists elsewhere. You can select a webpage in your report, drill down to look at visitor-level activity and apply and compare segments of visitors on the fly – all in the same place. The result is an analytics application that is easy to learn with higher adoption across the organization.
Today’s Challenges

According to a report published by the United Nations, there are 3.2 billion people globally who are using the Internet. Gartner forecasts that 6.4 billion connected things will be in use worldwide in 2016, up 30 percent from 2015, and will reach 20.8 billion by 2020. This means more digital touchpoints to monitor, more behaviors to cross-analyze and more interactions to optimize. The implications are far reaching when it comes to relying on data to gain a clear picture of your customers and to ultimately use that picture to provide a relevant and impactful experience.

There are many challenges that stand in the way of gaining a clear picture of customer interactions with your brand, including:

1. Data collection

Today, there are often limitations in the volume of data points that can be collected with a given analytics solution. This is typically due to the limitations inherent in traditional relational data models – i.e., there are only so many ‘slots’ in which to put data. With these solutions, when you run out of parameters, you need to figure out which data to no longer collect to make room for the new data point. Limits on parameters can greatly increase implementation and ongoing maintenance costs – issues you don’t hear about until later!

QUESTIONS TO ASK WHEN RESEARCHING AN ANALYTICS VENDOR:

1. Do you have limits to the number of parameters that can be collected?

2. Do you sample at collection, during processing or in your reports?

3. Can you apply custom measures and segments to historical data?

Unlimited Scale and Flexibility in Action

“I am a data scientist at a national online retailer and my job is to use data to predict online behaviors. A single visit by a person to my website can generate hundreds of pieces of data associated with what he is looking at, what he puts in his cart, his geographic information and the physical attributes of the device he is using. I am both excited and concerned about the data overload that the world of IoT is going to bring. Since it is not restricted to just human interactions, but the interaction of ‘things,’ the number of data points that need to be collected and processed will be staggering.

The challenge I face are limits with my analytics vendor. Only capturing a subset of data means I am not getting the complete picture of the interactions with my brand, which will impact the experience we can ultimately provide customers.”
Sampling at collection is another technique that some solutions use to sidestep technology limitations. Sampling can be effective if you simply want to roughly measure trends. But as soon as you want to use data about an individual to take action, sampled data is unacceptable, as it will miss certain online behaviors, resulting in missed opportunities for marketers and brands.

Any limits that exist at the time of data collection may result in increased implementation time and costs due to the complexity and additional planning that is needed. It is important to look closely at the total cost of ownership, not just the upfront costs. There may be unexpected maintenance costs down the road when you run out of parameters or variables.

2. Data processing

How data is processed and stored can limit the depth and flexibility of the analysis that can be done. It is extremely limiting to have pre-defined parameter types and to limit which parameters can be correlated to others. This limits the questions that can be asked of the data. The need to pre-process reports greatly impacts the speed at which that data can be made available. Report processing can take 24 or more hours to complete in some solutions, meaning you cannot see the results of a campaign until the next day. The requirement to differentiate between standard and real-time reports adds planning complexity and administrative overhead.

3. Data exploration

As the volume and variety of data grow, so will the questions you want to ask. Due to scale limitations, analytics solutions today often restrict the ways in which the data can be interrogated. Common techniques used to restrict the data you have to work with include:

- Switching to sampled data when asking a non-standard question
- Use of time buckets to limit data in order to increase processing speeds
- Inability to apply custom measures to historical data (going back in time)
- Static ordering of dimension values in reports forcing the need for duplicate reports with a different dimension order
- Limited report dimensionality and depth to which you can drill into a report
- Inability to dynamically segment reports on the fly
- Limiting the number of queries that can be run on the data
- Inability to get accurate unique user counts in every report

All of these data exploration restrictions and limitations reduce a marketer’s ability to be more self-sufficient and an analyst’s ability to answer ad hoc questions quickly and to perform dynamic data exploration at the right moment. Limits to scale and flexibility make it impossible to gain a complete picture of your customers.
The limitations of many analytics solutions lead to an incomplete picture of your customers, but not with Infinity Analytics, where there are no limits from the point of data collection through to data exploration.

**THE INTERNET OF THINGS**

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**TRADITIONAL ANALYTICS SOLUTIONS**

**Data Collection is Limited By:**

1. Variable limits
2. Server call volume limits
3. Data collection sampling options

- Results in complex implementation and tagging as well as higher costs

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**Data Processing is Limited By:**

1. Pre-processing of reports
2. Standard time buckets
3. Different data stores for visitor vs aggregate data
4. Restrictions on variable correlations

- Results in delays due to batch processing and data freshness

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**Data Exploration is Limited By:**

1. Data sampling in custom reports
2. Applying custom measures to historical data
3. Limited report drilldown & dimensionality
4. Limited real-time data

- Results in an inability to be self sufficient and answer ad hoc questions

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**MISSED OPPORTUNITY**

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**INCOMPLETE PICTURE OF YOUR CUSTOMERS**

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**WEBTRENDS INFINITY ANALYTICS**

**Data Collection**

- Unlimited volume of behavioral attributes that can be collected

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**Data Processing**

- No restrictions to how data is correlated to each other and processed

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**Data Exploration**

- Unlimited flexibility to the depth of questions you can ask of the data

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**A COMPLETE PICTURE OF YOUR CUSTOMERS**

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**THE INTERNET OF THINGS**

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How Infinity Analytics Provides Unlimited Scale and Flexibility

Infinity Analytics places no restrictions on the types and quantity of collection parameters. With Infinity, you will never run out of parameters because its parameters are ‘self-describing’ as opposed to having a limited number of ‘named slots’ to put parameters in. And, once collected, Infinity Analytics enables any collected parameter to be used in any report and be correlated with any other parameter. A parameter can become a measure or a dimension, or both at the same time.

At no point from collection to consumption are there limitations and at no point through the data pipeline does Infinity sample or lose a raw event. With data collection technologies for almost any digital property, you can collect everything you need on any digital property without the risk of running out as your business grows.

Benefits of Unlimited Scale and Flexibility

For the digital analyst
Greater flexibility and lower cost to deliver analytics across all digital properties

For the digital marketer
Opportunity to provide customers with the most relevant experience regardless of channel

For the marketing technologist
Scale with flexibility to support the evolving demands of the business today and into the future

For the digital executive
A complete picture of customers across all digital touchpoints
Connectivity and Openness in Action

“I am the VP of marketing for a large retail bank that manages millions of online interactions per day. I need to understand my customers so I can provide them with the most relevant experience possible. Behavioral data from the website is critical, but is only one part of the complete customer view.

To really understand my customers, I need to be able to connect their web behaviors with their transactional and product holdings data. The challenge is that this information comes from many different sources and getting a consolidated view is both difficult and takes time. And as the data volumes grow, my IT department has pointed out that the integration of this data will become slower and less reliable.”

QUESTIONS TO ASK WHEN RESEARCHING AN ANALYTICS VENDOR:

1. Are visitor-level behaviors collected by your analytics solution?
2. Do you have the ability to extract and deliver a complete set of visitor records in real time?
3. Do you have an intelligent streaming capability that is not simply a data firehose?

Today’s Challenges

The need to extract data out of analytics applications has been top of mind for analysts for many years and most enterprise solutions have the ability to extract aggregate report data. But this is not enough. The practical business uses for analytics data include:

- Analysis, data visualization and BI – Further analysis of aggregate and disparate data sources within a common BI tool, such as Tableau, PowerBI or Excel.
- Personalization – Using discreet in-session behaviors to tailor the customer experience based upon next best action or offer. Typically done using a content testing and personalization application or a remarking solution.
- 360° customer view – Consolidating online and offline data into a comprehensive view of the customer for the purposes of segmentation, customer service, product development, etc. Typically done within an on premise customer warehouse or big data initiative.
Even though aggregate report data can be extracted to satisfy the analysis, data visualization and BI uses, limitations in today’s analytics solutions make it challenging to satisfy the personalization and 360° customer view use cases because:

- Visitor-level data is often not available within the analytics application
- Processing delays inhibit the ability to make the data available in real time
- The ability to deliver visitor-level details in a secure and reliable way is limited and error prone

As data volumes grow and the need for access to discreet visitor behaviors increases, traditional analytics solutions will struggle to deliver at the speed and granularity that today’s businesses need.

### How Infinity Analytics Provides Connectivity and Openness

Analytics data is a critical source of customer behavior that – when connected with other data sources – can be used to transform the way a brand interacts with its customers. Data connectivity and openness is a core design principle for the Infinity data platform.

Infinity Analytics collects and stores all behaviors at the visitor level, for real-time data exploration and for connecting that data to the marketing ecosystem. The visitor behaviors across different sessions and channels can be stitched together leveraging a user graph that ties multiple user IDs. This approach, coupled with our end-to-end data streaming pipeline, can extract the most detailed information in the shortest amount of time possible. All visitor records are available for extraction from Infinity Analytics. No sampling or aggregation is done.

For advanced analysis, data visualization and BI

Infinity Analytics enables aggregate reports to be extracted via REST and delivered in JSON, XML, CSV formats for consumption by 3rd party BI tools such as Tableau, PowerBI and Qlik.

For personalization

Infinity Analytics enables enriched visitor-level records to be streamed in JSON as the events happen for the consumption by marketing automation and personalization applications. The stream of data is user configurable and can be segmented down to any discreet dataset needed. Visitor-level behaviors are available immediately to influence in-session content and next-best-action decisions.

For 360° customer view

Infinity Analytics enables all the enriched visitor-level records to be extracted in several formats (e.g. ORC, JSON, XML, CSV) and securely delivered to your on premise customer intelligence warehouse. Data is encrypted using PGP with ability to connect to systems such as Amazon S3, Microsoft Azure, Kafka, HDFS, Teradata file systems, etc.
Accuracy at Scale

“As an analyst, I get a lot of questions from my marketing team as to why my analytics reports differ so much from the reports in their marketing automation system. My marketers need to know more than just trend information when it comes to how their campaigns are performing. They ask me questions like, ‘How many distinct users visited my landing page in the last 55 days?’ And, ‘What were the top product pages that had the most unique users?’ If the answers differ from what the marketers see elsewhere, this leads to a lack of credibility and ultimately incorrect conclusions and actions that may not lead to the expected outcomes.”
Sampling does not provide consistent results unless the data distribution is predictable. Pre-aggregation is storage intensive and does not lend itself to ad hoc data exploration. Both of these methods don’t cut it in the new world of big data.

This is generally why counts of unique users are not available in all reports across arbitrary time boundaries in most enterprise analytics tools today. As long as the dataset is limited or time-bounded, an accurate unique user count is possible. But, as soon as you need to cross time boundaries, the results are no longer reliable.

Analytics and BI professionals are very aware of the problem of high cardinality data or the “long tail.” The most common examples are page titles or URLs. Finding the top pages that had the most unique users is quite a complex problem and one that analytics solutions that use the sampling or pre-aggregation methods fail to produce accurate or consistent results. Answering this question using sampling will produce wildly different answers at different times with potentially large bounds on error rates. Those results are inconsistent and therefore not reliable.

How Infinity Analytics Provides Accuracy at Scale

The query engine within Infinity is built to ensure the most accurate results possible. It leverages massively parallel processing capabilities coupled with a version of an advanced counting algorithm, called HyperLogLog. HyperLogLog estimates the number of distinct values in a very large set of data with a high degree of accuracy. It does not do this by sampling, but inspects all of the data in the desired time range. The results are consistent, meaning that the same question asked at different times will produce the same answer.

This is in contrast to analytics solutions that rely on sampling. Sampling uses a randomly-generated subset of the input data each time the question is asked producing inconsistent answers. Pre-aggregation is also not needed within Infinity due to the massively parallel processing architecture and its ability to handle large volumes of data in real time.

Benefits of Accuracy at Scale

For the digital analyst
Analytical insights that are trusted by the business stakeholders

For the digital marketer
Visibility into marketing program performance that is accurate and consistent

For the marketing technologist
Marketing technology that delivers real value to the business

For the digital executive
Confidence that your marketing team can create customer value and improved ROI
Data Privacy and Security in Action

“As the data security officer for an insurance company, a data breach is my worst nightmare and the impact that would have to our clients’ trust in us is unthinkable. But, I am constantly challenged with striking the optimal balance between my marketing team’s desire to provide the best customer experience and the need to minimize the risk of a data breach. An optimal customer experience requires collecting the right information about customers, including device and geographic information. However, the more you collect, the greater the risk from a data breach.”

Today’s Challenges

It is no longer just businesses in regulated industries such as finance and health care that agonize over data privacy and security concerns. The challenge with many of today’s enterprise analytics solutions is that they are assembled via acquisitions and/or have different technology footprints across the different products within a suite. This results in a fragmented architecture with multiple points of data collection, processing and storage, making it much more costly to ensure end-to-end data security.

It is clear that organizations must be careful if security and encryption features are an add-on to the solution architecture rather than built into it from the ground up. The more layers, the greater the risk to customer data and the organization, where fragmented customer data collection and storage means each piece is a potential single point of failure. Security can no longer be a bolted-on afterthought as fragmented, stitched-together solutions open the door to vulnerabilities and increase operational costs.

QUESTIONS TO ASK WHEN RESEARCHING AN ANALYTICS VENDOR:

1. Do you have one point of data collection, processing and storage or multiple?

2. How do you secure data to support compliance with EU GDPR, or industry-specific regulations, such as HIPAA?

3. Is data security built into the core of any SaaS solutions, or implemented and maintained separately?
How Infinity Analytics Ensures Data Privacy and Security

Data is a valuable asset and our approach is that all our client data should be treated as highly confidential. We’ve embraced the concepts of security by design with the architecture for the Infinity platform, which provides the foundation for end-to-end encryption. This will ensure security from data collection through to storage – where only our clients can access their data.

The Infinity platform design allows the strengthening of logical data segregation with client-provided encryption keys for data at rest. Encryption and key management are critical factors to ensure sensitive data is protected and organizations maintain compliance with security and privacy.

We support a concentric view of data privacy moving from less to more sensitive. First is the collection of anonymous technical web traffic data. The next level is pseudonymous data, which maintains individuals’ uniqueness without direct identification. After that comes personally identifiable information (PII), such as the email addresses marketers need. Then there is sensitive or regulated data, such as approved elements of personal health information (PHI) or business revenue information, allowing businesses in retail, finance and healthcare to gain deeper insight. And last, there is prohibited data, including financial details such as credit card numbers and taxpayer identification, which Webtrends doesn’t permit clients to collect.

We addressed these various needs by building on the scalability of Hadoop, the security of Hortonworks, our patent-pending persona service and our 20-year history in analytics.
Webtrends Infinity Analytics

A new standard of digital analytics to help brands succeed in an increasingly data-saturated world that is real time, easy to use, scalable, open, accurate and secure.

So what does this mean for you?

• For the digital analyst, Infinity provides the ability to deliver a flexible analytics program that is trusted across the organization providing rich insights that help identify opportunities to drive the business forward. You can enable greater self-sufficiency for marketers and reduce the overhead associated with managing your analytics program.

• For the marketing technologist, Infinity provides an analytics solution that supports your company’s marketing technology strategy, integrates well with existing marketing technology investments and satisfies the corporate data security needs of your global organization while maintaining brand reputation and ensuring individual privacy.

• For the digital marketer, Infinity provides the data you need to understand the customer journey no matter where or how they interact with your brand in order to provide the most relevant and contextual experience for each and every one.

• For the digital executive, Infinity will give you greater confidence as you develop an agile marketing organization that continues to strive for and deliver the optimal customer experience while being able to respond faster than the competition.

We believe that technology needs to solve real problems and push the limits of what is possible. The Infinity platform provides a fundamentally new way to do analytics and solves the data challenges of today while providing a solid foundation for the future as the IoT grows even more vast.