Nokia Deepfield portfolio overview

IP network intelligence, analytics and DDoS security

Solution sheet

Today's internet is complex, and cloud-based apps and services dominate the traffic. Customers demand a high quality of experience (QoE) with ubiquitous connectivity and seamless access to internet applications, content and services— across all devices, mobile or fixed. In the era of multiple over-the-top (OTT) subscriptions and on-demand video streaming replacing traditional video broadcasting, customers also demand an uninterrupted, optimal experience for all video services, whether they originate from a service provider's network or the internet.

The need for precise, real-time, analytical insights about the network, services and consumption patterns is greater than ever. Partial network views, segmented by technology (e.g., wireline/wireless access, optical/IP) provide limited visibility into how internet services today are delivered and consumed.

Legacy IP network analytics tools that employ dedicated hardware probes and deep packet inspection (DPI) techniques cannot provide the insights required for enhanced network performance and security; the traditional approaches were not designed for the scale required in the era of the cloud, IoT and 5G. In addition, most of today's internet traffic is encrypted, requiring a new, innovative approach to provide a holistic view of end-to-end traffic flows.

How do you obtain full insight into all internet services and cloud applications flowing into and across your network? How do you ensure the QoE required for optimal customer experience? And how do you protect your network and customers in the era of sophisticated, terabit-scale distributed denial of service (DDoS) attacks?

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The Nokia Deepfield approach

Whether you're a service provider (cable provider, multiple system operator (MSO), telecommunications services provider, internet access provider or cloud provider), a webscale company or a large digital enterprise, Nokia can help. The Deepfield portfolio of software applications enables you to obtain unique, real-time network and service insights to improve your network performance and security, and optimize the customer experience.

How the Nokia Deepfield approach works

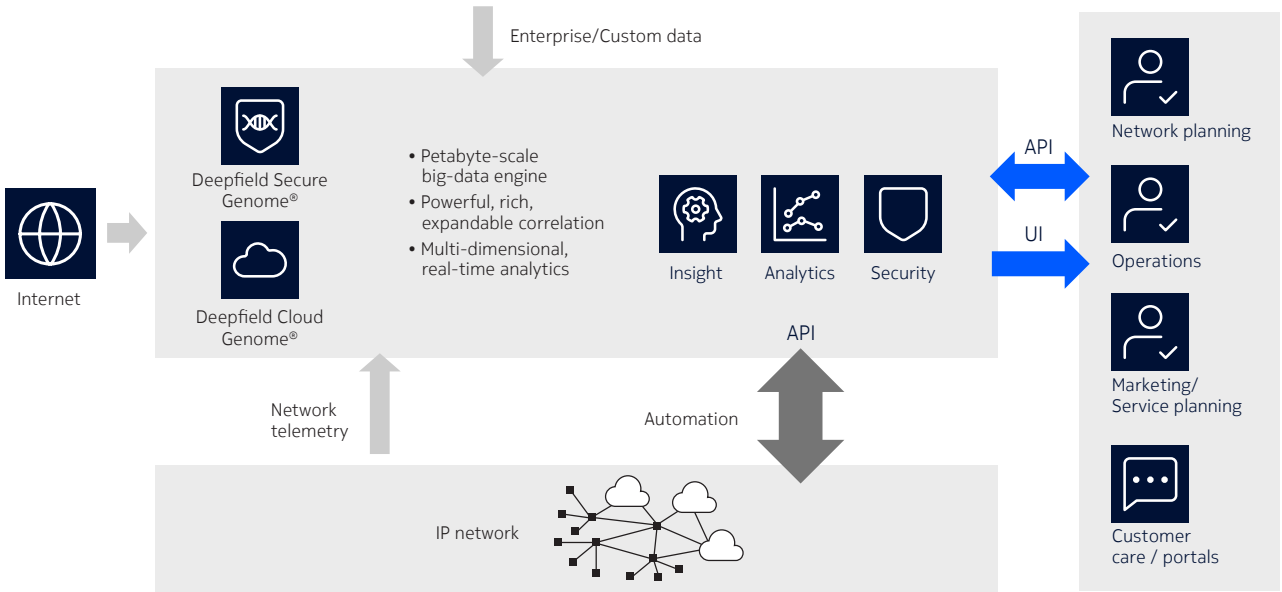
All Deepfield applications use a common software platform for data processing. Individual applications can be deployed on-premises, within your network on dedicated servers, or you can deploy them as cloud-based (using the software-as-a-service model).

The Deepfield platform ingests data from many different sources within your network, starting with essential IP flow-based protocol information (such as sFlow, CFlow, J-Flow, and IPFIX) (see Figure 1). This information can be further enhanced with BGP and SNMP information, as well as with other router-, network- and telemetry-related data such as RADIUS/AAA, IPFIX and gRPC.

The Deepfield platform can also ingest custom data from other network and operational domains, including network management, software-defined networking (SDN) control, operations support systems/ business support systems (OSSs/BSSs), customer care, support and billing[1].

The Deepfield applications process and correlate this information to provide a real-time, multidimensional, un-siloed view of your network, services and IP flows to many different organizational teams.

Figure 1. The Nokia Deepfield approach



1 May require custom development. Please discuss your requirements with your Nokia sales representative.

Nokia Deepfield applications complement the information about your network infrastructure, services and subscribers with the intelligence we collect continuously from the internet. This intelligence is maintained in the Deepfield Cloud Genome® and Deepfield Secure Genome® data feeds. The Deepfield Genome data feeds contain up-to-date information about billions of internet (IPv4 and IPv6) endpoints and IP flows, categorized by application type to create dynamic supply and security maps of the internet.

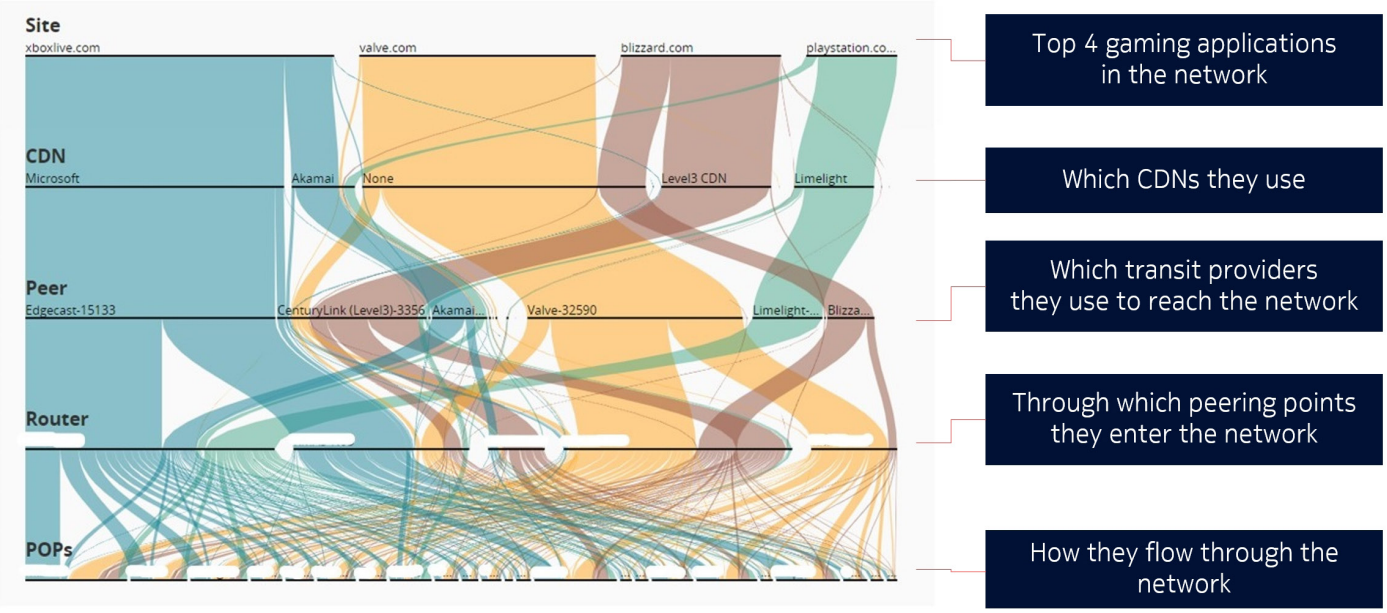
By correlating the information from your network with the Genome data feeds, Nokia Deepfield allows you to obtain unique and deep insight into your network, peering and transit, services and the ways in which the content is consumed.

The output from the Deepfield applications can be in many formats:

- Real-time and historical reports
- Data that can further be integrated into other systems via APIs (e.g., data science organizations, data lakes) for automated retrieval and processing
- Highly visual representations of multidimensional correlations via GUI
- Real-time notifications and triggers.

The Deepfield processing capabilities extend well into the petabyte range, giving you the scalability and robustness you need for the era of the cloud, IoT and 5G.

Figure 2. An example of a multi-dimensional view of gaming traffic flowing through a service provider network

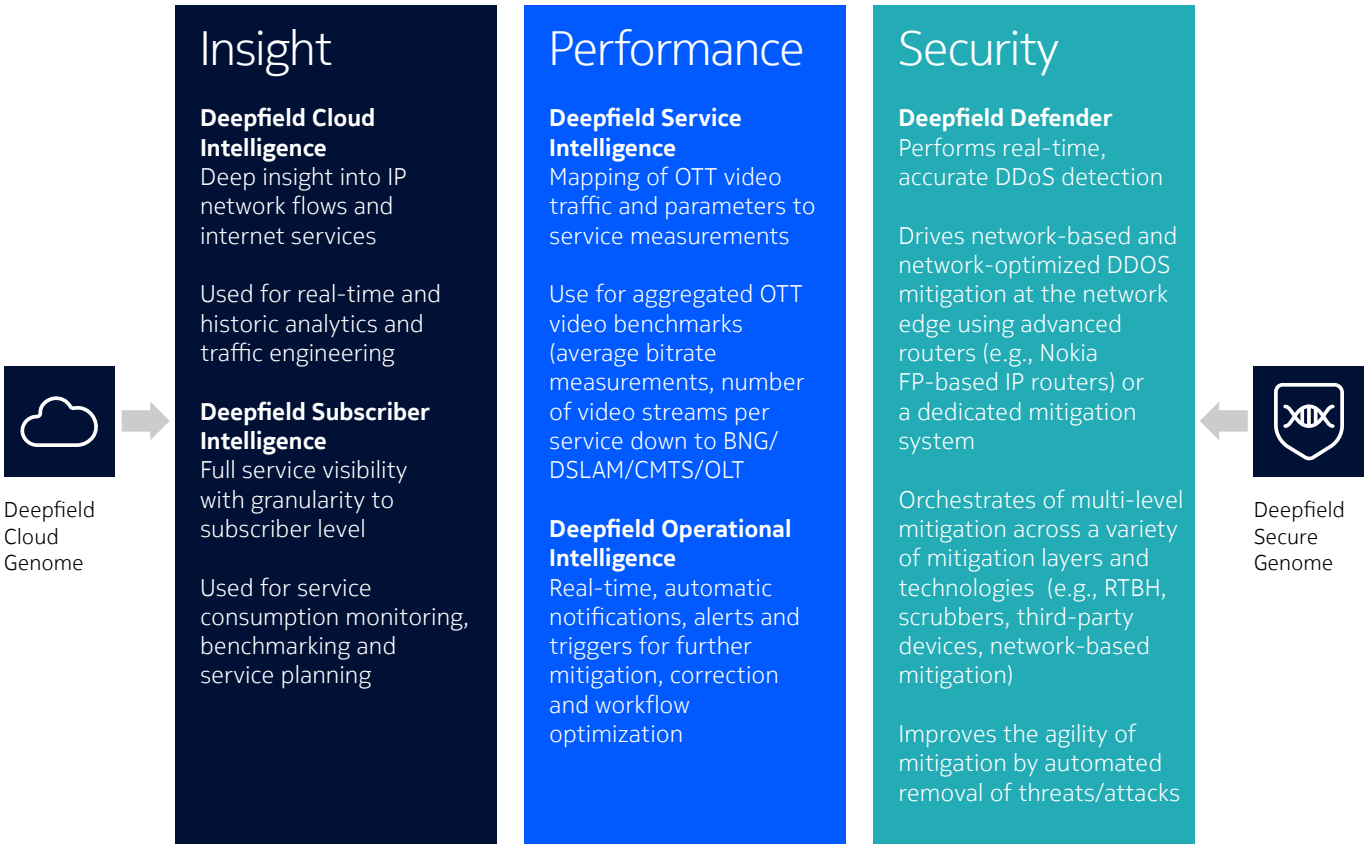


Deepfield applications

The Deepfield applications address three major areas: insight, performance and security. Figure 3 provides a brief overview of each application.

For more detail, please consult the individual datasheets for these applications.

Figure 3. The Deepfield applications portfolio



Deepfield Cloud Genome® and Deepfield Secure Genome®

The Deepfield applications are enhanced by two proprietary data feeds, Deepfield Cloud Genome and Deepfield Secure Genome, based on Nokia patented technology.

The Deepfield Genome data sets provide complete and continuously updated maps of the internet endpoint IPs and flows. They give you full visibility of internet traffic and security threats that may exist or appear in your network.

Deepfield Cloud Genome tracks, maps and analyzes billions of internet endpoints to provide a dynamic supply map of the internet. It provides full visibility into how applications and content are delivered from all the sources across the internet to your network and across your network to your subscribers.

Deepfield Secure Genome complements Deepfield Cloud Genome by maintaining a similar map with up-to-date DDoS security-related information.

Use cases

The Nokia Deepfield portfolio enables many use cases, including:

- Peering analytics and optimization
- Backbone engineering
- Traffic engineering and capacity planning
- Content delivery network analytics
- Traffic analysis by access type
- OTT video insights for improved customer QoE
- Per-service plan/subscriber traffic analytics and content consumption insight
- Improving the efficiency of marketing campaigns through more precise profiling of subscribers' online preferences and behavior
- Customer care.

For examples of the solution in action, see the Deepfield use cases.

Solution features

Feature	Description
A software-only solution	Replaces costly legacy-based approaches that use network appliances and hardware probes or DPI with next-generation analytics, saving time and money
A common, multipurpose platform	Can be leveraged for various use cases and across diverse organizational teams
A scalable solution	Scales to support petabytes of data
Multidimensional insight	Processes, correlates, analyzes and visualizes super-large sets of network and service data, providing insights that legacy traffic analytics solutions cannot
Real-time visibility	Performs data ingestion, correlation and processing in real time, giving you immediate visibility and enabling fast responses
DDoS security	Protects against the latest (such as botnet-driven DDoS) and next-generation DDoS threats and attacks: volumetric, multi-vector, inbound/outbound
Automation	Integrates output from Deepfield applications into OSSs/BSSs and automates your operational workflows

Benefits

Deploying Deepfield applications brings the following benefits:

- End-to-end visibility into cloud apps and IP services that flow into and across your network
- Cost-effective scaling for the era of the cloud, IoT and 5G
- Optimized use of network resources through improved peering, transit and caching
- Enhanced user experience—and reduced churn
- Streamlined operations and improved troubleshooting through automated reports, notifications and triggers
- Improved network security through next-generation DDoS detection and mitigation.

The Nokia Deepfield advantage

Nokia Deepfield is a software suite of network analytics and DDoS security applications for large-scale IP networks. These applications optimize networks and services, enhance customer experience, improve network security and increase operational agility.

Deepfield applications are deployed globally in many networks, including fixed and mobile service providers, cable companies, cloud companies, and digital enterprises.

Deepfield's approach uses big data IP analytics, combining network data (telemetry, DNS, BGP etc.) with Nokia's patented Deepfield Genome technology (live feed that tracks internet content, applications and services and provides DDoS security context). As a result, the Deepfield applications offer multi-dimensional, real-time insights about IP-based services and applications running across the entire IP network - from content-originating domains and CDNs, across the peering and backbone to the customer edge.

Regarding DDoS security, Deepfield Defender represents a foundation for a next-generation DDoS detection and mitigation solution, leveraging rich telemetry and programmability of the IP network itself. Deepfield Defender offers significant benefits over legacy (appliance-based or DPI-based) approaches: better scalability, improved accuracy of DDoS detection (with lower false positives) and more efficient and rapid mitigation in the most cost-efficient manner, delivering holistic, 360-degree DDoS security required for 5G, cloud, and IoT era.

The real-time cloud and network context provided by the Nokia Deepfield applications enables service providers to extract the actionable intelligence needed to design their networks better, react to performance anomalies and changing traffic patterns, manage security threats, and better package their product offerings to attract and retain subscribers.

The Nokia Deepfield portfolio enables service providers to understand, in real time, the service delivery path from the internet/cloud through the peering edge and at the customer edge—a path that can span multiple clouds, data centers, CDNs and networks.

This visibility is the critical first step to intelligent network automation to enable networks to respond immediately to changing conditions with minimal manual or physical intervention, lowering costs and improving performance.

To learn more about the Deepfield solution, visit the Deepfield web page.

About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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