Greymatter.Io Use Case:
Service Based Architecture at Scale

Introduction

Greymatter.io is a secure, cloud-native core platform that provides massive/critical machine communication services with expanded service capabilities, scalability, agility and more. Greymatter.io features include routing control, resiliency, and observability. These factors enable elastic growth, unprecedented interoperability and the rapid introduction of new services and capabilities, while reducing cost and complexity. Designed based on basic cloud-native principles and open source technologies, the platform addresses the many challenges introduced by a Service Based Architecture (SBA). Greymatter.io is not only helpful, it is necessary.

Why Are Decentralized Networks Unique?

Applications, services, and cloud software delivery have changed how networks are designed, adapting and managing components that are disconnected and often dispersed across the enterprise. This drastically changes how services communicate with each other, announcing where they exist and providing critical functions which are consumed in composite for multichannel delivery. Greymatter.io allows for the rapid adoption of software technologies coupled with significant automation in a secure, repeatable, and controlled manner. Using the concept of a service mesh as it's core, Greymatter.io addresses challenges related to: congestion control, traffic prioritization, overloaded services, optimized routing, API management, explicit security enforcement, AI enabled networks, and IT operations intelligence.
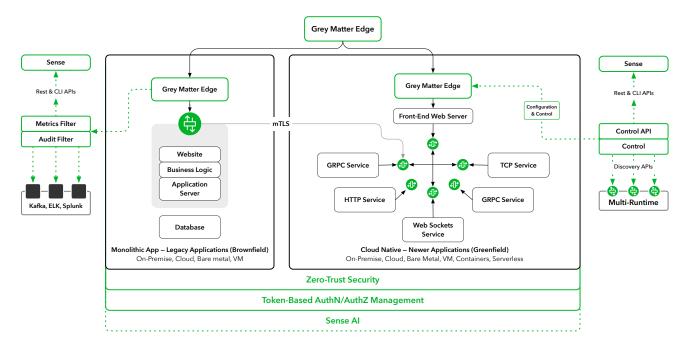
When dealing with an SBA core, service providers are implementing a necessary networking & infrastructure layer within the stack. While using open source software (OSS) may seem initially accomplishable, enterprise needs and solutions quickly outgrow OSS viability. The management and operation of an OSS layer becomes costly to maintain. It often requires the introduction of many pieces of OSS into the overall solution. Up keeping the latest security and software patches create consistent lost opportunity costs for the service providers business. Greymatter.io is a

trusted mesh networking platform simplifying applications, services, and network functions by decoupling the network functions while providing end-to-end security, load balancing, traffic splitting, and much more.

The Platform

Greymatter.io is a universal mesh networking platform - a decentralized solution that provides control, management, and surveillance to any multi-cloud, hybrid core network. It is composed of proxy control planes, micro-edge gateways, and proxy data planes, deployed alongside all applications, services, and network functions. Each component can scale independently in order to maximize resource usage and control costs within the enterprise environment. Greymatter.io provides traffic control, load balancing, retries, circuit breakers, congestion control, and traffic splitting/steering mechanisms for layer 3, 4, and 7. The platform provides in-depth observability and management of complex multi-environment applications, APIs, services, and network functions. This level of detailed visibility into your decentralized network operations enables elastic management, growth, interoperability and the rapid introduction of new capabilities. Greymatter.io enables effective and efficient service provider network operations while reducing

complexity, management and maintenance costs.

Greymatter.io's features include:

- Mesh-enabled business intelligence, insight, and resource management,
- Full control and data plane configuration and control,
- A collection of bespoke filters for security, audit and reporting,

- Full zero-trust certificate authority management suite security out of the box,
- A RESTFUL configuration API and resource cataloging and tooling,
- Unique layer 3, 4, and 7 visibility and control,
- Interoperability with OSS to include Prometheus, Grafana, Jaeger, Zipkin, and Elasticsearch,
- Multi-platform support to include K8s, AWS EKS, Azure AKS, Openshift OCP, OKD, Konvoy, and bare metal,
- API-Gateway functionality, and
- Enterprise support ensuring your core mesh network is always patched with security and other relevant updates.

Greymatter.io resolves the many challenges introduced by service based architecture, microservices, and mesh-enabled application approaches. It also optimizes the ability to manage, secure and control a decentralized infrastructure. All of these features enable any capability provider more business visibility into the core network.

The most prominent features Greymatter.io enables for any service based architecture are listed in detail below:

Control East/West connections to/from applications, services, and network functions - Being deployed alongside each application, service, and network function the Greymatter.io data plane acts as both an inbound and outbound proxy for all instances. This eliminates point to point direct connections each with their own separate configuration from sprawling throughout your enterprise networks.

Improved load balancing in a decentralized cloud-native system-of-systems - Greymatter.io supports 5 different load-balancing algorithms. Schemes include weighted round robin, weighted least request, ring hash, maglev, and random. These schemes can be set differently per cluster of data planes, improving operational efficiency and performance.

Improved routing control and resiliency - Greymatter.io supports routing traffic at both L3 and L7, with numerous options for how to shape traffic as well as improving resiliency. Traffic splitting is enabled across all protocols, and HTTP traffic can be routed based on path, method, header, cookies, and query parameters. Traffic through Greymatter.io gains added resiliency through circuit breaking, automatic retries, outlier detection, and active health checking.

Supports metrics, KPIs and reporting - As service requests are proxied throughout Greymatter.io, the platform collects, correlates, and visualizes metrics and measures KPIs related to message processing such as request and response counts or messages/sec or average transaction latency, etc. With this information, Greymatter.io is in a unique position to provide a view of network health indicators at any given time, regardless of how decentralized your applications, services or network functions are.

Supports canary testing - Greymatter.io is crucial when rolling out new operational software releases. The platform facilitates control over new capability release exposure, limiting it to a fraction of the users as necessary. Changes can be incrementally tested per service, application or network function on real-world traffic at granular levels with real-world users.

Application, service and network function congestion control - Via software configuration and segmentation, the enterprise can reprioritize traffic based on a number of request parameters or traffic patterns caused by legitimate high volume or malicious/rogue consumers. This protects the function being accessed from overload and cascade failures throughout your decentralized mesh network. In the future, Greymatter.io will introduce AI mesh anomaly detection to identify and prioritize important information allowing further automation for the network.

Summary

The new decentralized model for constructing enterprise service-based architectures allows service providers to leverage service re-use, enables service providers and consumers the ability to evolve independently, and facilitates service providers to incrementally and rapidly introduce new capabilities with lower risk and effort, but *"with great power, comes great responsibility."* This additional flexibility, agility and deployment speed will require new processes, software, infrastructure governance and understanding. Greymatter.io addresses key challenges introduced by decentralized, multi-cloud, and hybrid enterprise operations, providing control, security, resiliency, and observability features as a core platform crossing your enterprise networks.

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