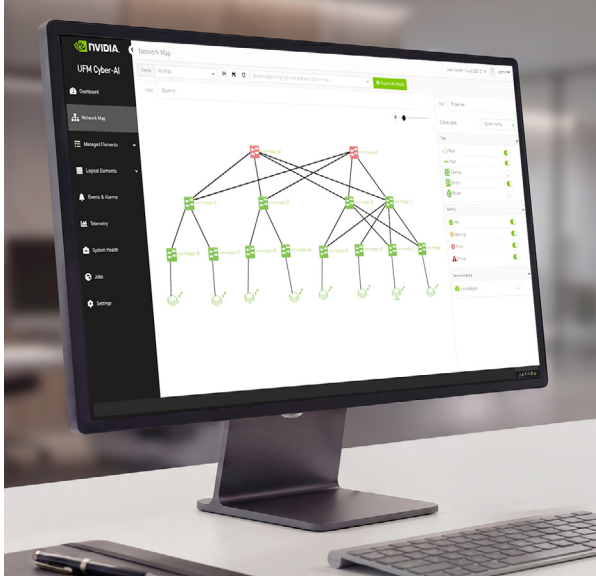
Datasheet

NVIDIA Unified Fabric Manager (UFM)

An AI-powered cyber intelligence, analytics, and orchestration platform.



Transforming Data Center Networking

Modern data centers serve a multitude of users and applications, which means keeping them operational and healthy is crucial. Shutdowns can result in millions of dollars in losses. And rogue or malicious users can exploit data center access to misuse compute resources, like running prohibited applications, resulting in increased operating costs.

The NVIDIA UFM™ platform revolutionizes data center networking management by combining enhanced, real-time network telemetry with AI-powered cyber intelligence and analytics. It facilitates the efficient scale-out of InfiniBandconnected data centers. Empowering the discovery of operation anomalies and predicting network failures for preventive maintenance, the UFM platform comprises multiple levels of solutions and capabilities to suit your data center's needs and requirements.

From Telemetry to Advanced AI-Driven Insights—on Premises and in the Cloud

At the basic level, **UFM Telemetry** provides network validation tools and monitors network performance and conditions. It captures, for example, rich real-time network telemetry information, workload usage data, and system configuration and streams it to a defined on-premises or cloud-based database for further analysis.

Figure 1: UFM Telemetry

Key Features

- Central console for fabric management
- In-depth fabric visibility and control
- Advanced traffic analysis
- Enables multiple isolated application environments on a shared fabric
- Service-oriented automatic resource provisioning
- Quick resolution of fabric problems
- Seamless failover handling
- Open architecture

UFM Enterprise adds enhanced network monitoring, management, workload optimizations, and periodic configuration checks. In addition to including all of the UFM Telemetry services, it provides network setup, connectivity validation, secure cable management, automated network discovery and network provisioning, traffic monitoring, and congestion discovery. UFM Enterprise also enables job scheduler provisioning and integration with Slurm and Platform LSF, in addition to network provisioning and integration with OpenStack, Azure Cloud, and VMware.

UFM Cyber-AI recognizes a data center's unique vital signs to identify performance degradation, component failures, and abnormal usage patterns. Building on the capabilities of the UFM Telemetry and UFM Enterprise services, it captures in-depth telemetry data over time and utilizes the power of deep learning algorithms.

UFM Cyber-AI learns the data center's "heartbeat," operation mode, conditions, usage, and network workload signatures. By creating a comprehensive database of telemetry information, it identifies correlations between events. When it detects performance shifts or profile changes, it issues alerts regarding abnormal system behavior and possible failures. This allows system administrators to swiftly counter potential security threats and failures, as well as automate corrective actions.

Expanding on this concept, **UFM Cyber-AI** issues alerts for various network components, including adapters, switches, cables, links, and the entire network. It also offers several drill-down modules and root-cause analysis tools to help administrators respond rapidly to anticipated issues.

UFM Cyber-AI detects past and current events and forecasts performance drops and abnormal data center usage by monitoring changes in its heartbeat. These insights activate predictive analytics and trigger alerts about atypical system and application behavior and potential failures. System administrators can quickly address these potential threats, cutting operational costs and maintaining high performance to meet end-user service-level agreements (SLAs). UFM Cyber-AI's predictive accuracy increases as it collects more system data.

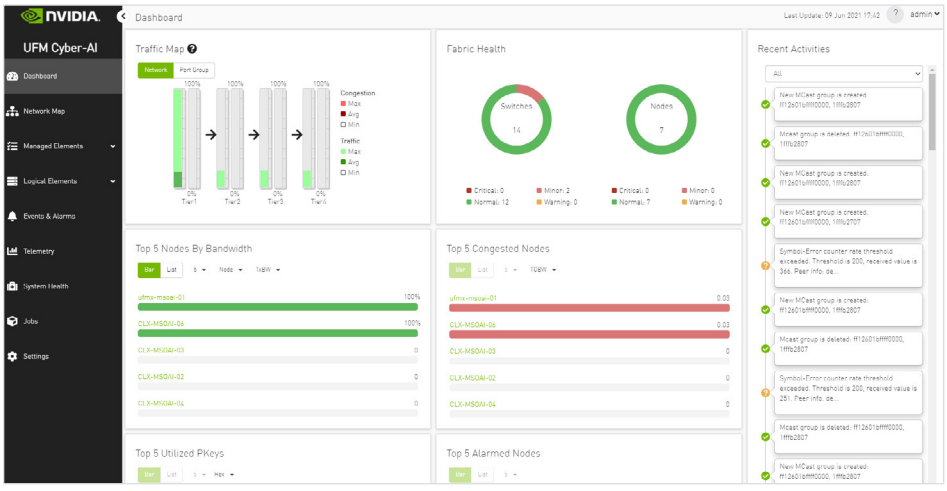


Figure 2: UFM Prediction Dashboard

Seamless Third-Party Plug-In Integration

The **NVIDIA UFM SDK** extends the UFM platform with additional tools for easy third-party plug-in integration. The SDK includes third-party plug-ins for open source platforms, such as Grafana, FluentD, Zabbix, and Slurm, as well as software tools that streamline integration with the UFM REST API and improve developer productivity.

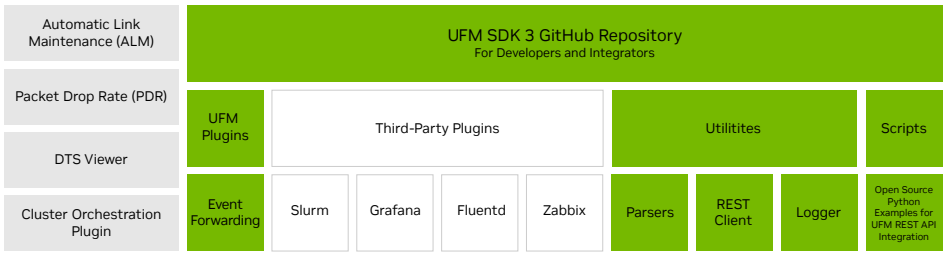


Figure3: Third-party plugins and tools.

UFM Software Architecture

The **NVIDIA UFM software** architecture enables seamless scalability, high availability, and flexible deployment across complex network environments. Built as a modular, distributed platform, it integrates a centralized control layer with extensible services and open APIs, empowering organizations to automate operations, accelerate integration, and adapt quickly to evolving infrastructure needs. By design, it ensures resilient, efficient management of large-scale fabrics while simplifying expansion and long-term growth.

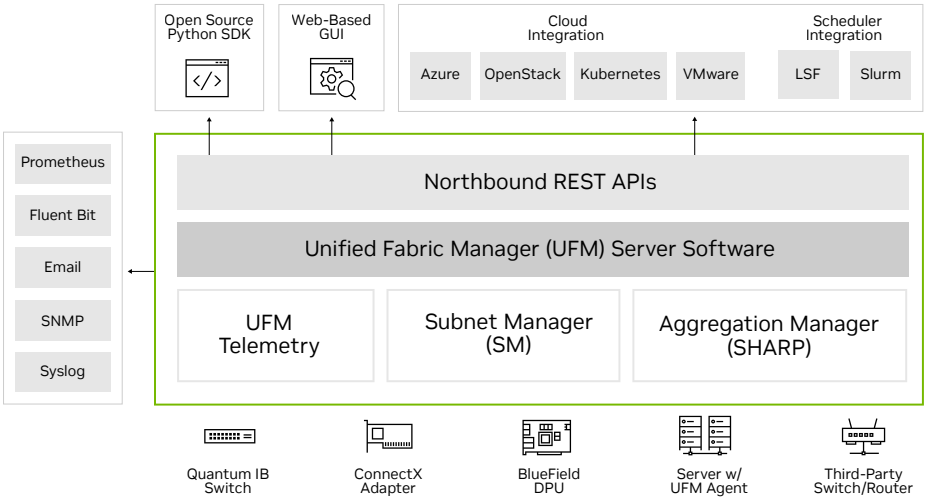


Figure 4: UFM software architecture.

NVIDIA UFM Platform Product Suite

NVIDIA UFM Telemetry	NVIDIA UFM Enterprise	NVIDIA Cyber-AI
Real-Time Monitoring	**Fabric Visibility and Control**	**Cyber Intelligence and Analytics**
UFM Telemetry builds a rich database of real-time network telemetry, workloads, system configuration, and more. > Switches, adapters, and cables telemetry > System validation > Network performance tests > Streaming of telemetry information into an on-premises or cloud-based database	UFM Enterprise combines the benefits of UFM Telemetry with enhanced network monitoring and management. > Automated network discovery and validation > Secure cable management > Congestion tracking to identify traffic bottlenecks > Problem identification and resolution > Global software updates > Job scheduler provisioning, integrated with Slurm and IBM Spectrum LSF > Advanced reporting and comprehensive REST APIs > Rich, unified, web-based GUI	UFM Cyber-AI enhances the benefits of UFM Telemetry and UFM Enterprise, providing preventive maintenance and cybersecurity for lowering supercomputing opex. > UFM Telemetry and UFM Enterprise inside > Detects performance degradations > Detects usage profile changes over time > Detects abnormal cluster behavior > Detects link anomalies > Issues alerts for required preventive maintenance > Optimizes predictive accuracy with continuous system data collection

Product Specifications and Part Numbers

Details of the UFM Enterprise Appliance, with UFM Telemetry and the UFM Cyber-AI Appliance are available in the following user manuals.

UFM Appliance User Manuals

UFM Appliances

UFM Software User Manuals

Enterprise Software

Telemetry Software

Cyber-AI Software

Ready to Get Started?

To learn more about NVIDIA UFM software, visit nvidia.com/infiniband-ufm

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