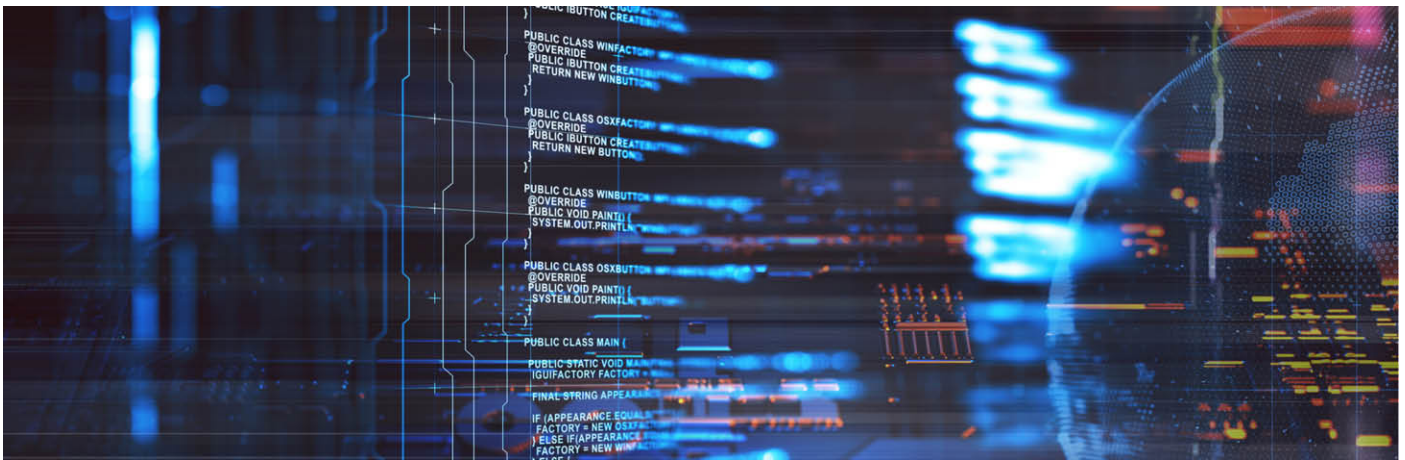




HPE TRUEVIEW

Real-time active inventory tracking network topology and device configuration changes in hybrid networks



Active inventory management is at the center of operations in telecom networks. HPE Trueview extends over physical and virtual network functions, their elements, networks, and infrastructure management systems down to individual network elements to enrich, collect, and reconcile dynamic network configuration and topology data. Accurate and current network data is required to support successful business process automation—ranging from order management to assurance correlation and intent-based orchestration supporting zero-touch service management.

THE HPE APPROACH TO RESOURCE INVENTORY

Active inventory

To achieve a successful automation of your service provisioning processes, you first need to have an accurate information about the available resources that can be assigned to services. And share this information with the service order management system to help ensure a high rate of successful requests. To provide an effective service assurance to your customers, allowing you to quickly identify the root cause of a problem, you also need to know your network topology and how your services are allocated on top of your resources. HPE Trueview is designed to discover and to reconcile your network information, offering data quality of resource inventory.

Rely on network data

While legacy inventory systems are repositories to store the representation of your network data obtained from various sources, at Hewlett Packard Enterprise, we consider that the network is the only trusted source of information required to build a resource inventory. From the network elements (NEs), we can collect not only the physical information about the device, but also the relationship between various devices. This information is called active data.

Built-in productized model

HPE Trueview implements out-of-the-box and common network technology models and algorithms. These are defined by the international standards International Telecommunication Union (ITU) Telecommunication Standardization Sector (ITU-T), European Telecommunications Standards Institute (ETSI), and Internet Engineering Task Force (IETF) and used by network equipment providers (NEPs) to help ensure interoperability. Adaptation to project-specific needs is available with user-defined attributes.

Service stitching

Analyzing active data, HPE Trueview is able to reverse-engineer the services running on the network, implementing service stitching. This mainly consists of a set of algorithms that collate the information from the disparate network elements to show the end-to-end service. HPE Trueview's service stitching, combined with the built-in data model, allows the solution to understand, compare, and reconcile your network information against what's already available in its inventory, with automated resolution of inconsistencies.

Real-time network discovery and reconciliation

New network technologies such as 5G, virtualization and the automation of service provisioning are accelerating the pace of changes in the network. Daily scheduled discovery is not enough anymore to keep an up-to-date representation of the network. HPE Trueview is able to detect changes in the network and to execute, as a result, discovery in real time.

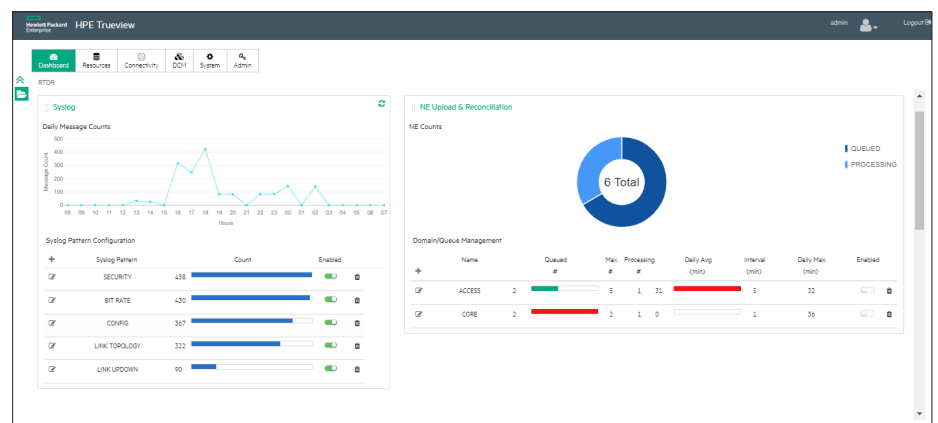


FIGURE 1. Real-time discovery and reconciliation dashboard

Iterative approach for service stitching

There are always data that cannot be discovered, for example, building layouts, distribution frames, and so on. These passive data are obtained from external systems. Because HPE Trueview decouples active and passive data, a delivery project does not need to wait until all data has been migrated to be put in production. In addition, the overall migration process is much quicker, with the quantity of data quality errors reduced. Therefore, cleansing data becomes less of a risk.

Ready for hybrid networks

With a library of hundreds of adapters, HPE Trueview is able to model resources implemented with traditional physical network functions (PNFs). HPE Trueview is also capable of managing virtual network functions (VNFs) deployed on top of server infrastructures. In addition to representing the resources, HPE Trueview keeps track of the relationship between physical servers, virtual machine assignment, VNFs, and the resources assigned to each of them (CPU, memory, disk, vPort assignment, and so on). HPE Trueview also maps the virtual resource connectivity to the underlying physical resource connectivity, to provide a complete view of hybrid networks.

It is also important to keep the virtual infrastructure information updated and aligned with the network. To achieve this, HPE Trueview includes the adapters to identify the virtual machines together with the resources they are consuming, and the algorithms to align the inventory information with what has been discovered.



Cloud deployment

HPE Trueview is fully aligned with future direction toward cloud-native OSS solutions. It can be delivered as a virtual machine or a container, which can be automatically deployed and operated from an orchestrator. This provides a quick response to performance needs and helps to quickly resume from disaster situation.

Architected to scale

HPE Trueview is designed to scale, adapting to your needs. Whenever the amount of users or managed network elements grows, HPE Trueview is able to grow to help ensure an appropriate performance. When the needs of your OSS change, add more modules to the existing HPE Trueview. If your business spans across multiple geographies, HPE Trueview supports a federated deployment model for the different locations.

Device configuration management

To complement its inventory management and discovery and reconciliation capabilities, HPE Trueview is also able to store a representation of the devices' configuration and operating system. By leveraging common data, it is possible to automatically execute backup and restore operations, in a vendor-agnostic approach. Adapters available off-the-shelf from our library translate generic commands to load configuration files from a NE, or restore corrupted files for all types of equipment, irrespective of the vendor, protocol, and technology. Monitoring of changes, combined with policy management, helps ensure the automation of the process.

No vendor lock-in

HPE Trueview is built to support multiple network technologies and to document information of devices coming from any network vendor. The built-in standard-based data model is designed to cover any network element, and is abstracted from the vendor-specific formats through the HPE Trueview NE adapters. HPE can not only provide these adapters but can also give you an appropriate training to enable you to build your own NE adapters.

In addition, we believe that network resource information is key for many systems such as platforms, service orchestration, and service assurance. To address this need, HPE Trueview exposes the stored network information through assurance APIs, providing an ease of integration with any platform. HPE Trueview is preintegrated with other components of the HPE OSS portfolio.

HPE TRUEVIEW OVERVIEW

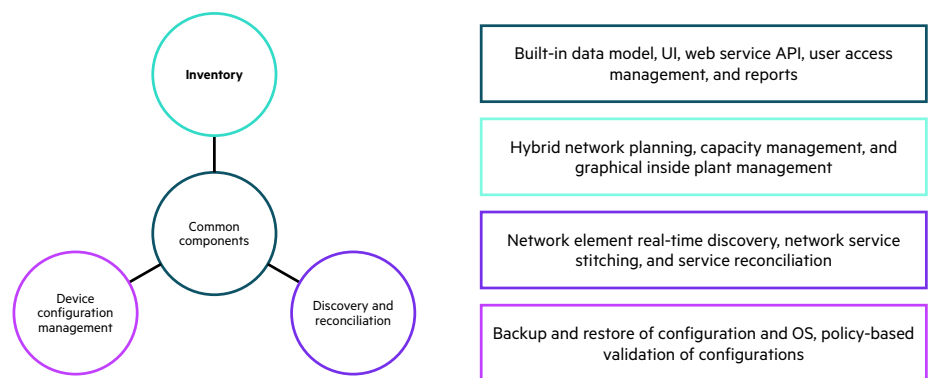


FIGURE 2. HPE Trueview modules



HPE Trueview is divided into the following modules, which can be deployed independently or combined as needed:

- **Common components:** Implementing the built-in standard-based model, offering user-based access control and reporting capabilities, as well as ensuring horizontal and vertical scalability
- **Inventory:** Managing your hybrid network, supporting planning and capacity management, and providing a graphical representation of the managed resources and inside plant
- **Discovery and reconciliation:** Collecting data directly from the network independently of vendors and technology in manual, scheduled, and in real time, to provide an up-to-date representation of the existing network elements and the network connectivity services across them
- **Device configuration management:** Tracking network resource configuration changes independently of the vendor and technology, validating compliance to policies and applying configuration changes to groups of devices

FEATURES

TABLE 1. Key Features

Resource inventory	<ul style="list-style-type: none"> • ITU and Metro Ethernet Forum (MEF) networking standards data model implemented out-of-the-box • Network adapters provide adaptation to NEP specification as software product
Discovery and reconciliation	<ul style="list-style-type: none"> • Populate resource inventory from the network in real time—rely on network data • Leverage productized model to reconstruct network connectivity by applying predefined algorithms • Automate resolution of inconsistencies in use cases
Device configuration management	<ul style="list-style-type: none"> • Shared architecture and object model • Vendor and technology agnostic

TABLE 2. Software prerequisites

Software	Version
Operating system	Red Hat® Enterprise Linux® 7.7 CentOS Linux 7.7
Database	Oracle 12c R1 PostgreSQL 11.5
Application servers	WildFly 10 / 15.0.1
Browsers	Firefox 71 Chrome 78
Java	OpenJDK 8 / 11



HPE OSS FULFILLMENT SOLUTIONS

HPE Trueview is part of the HPE OSS Fulfillment portfolio, a set of software solutions and services that help communication service providers (CSPs) streamline and automate business processes and network operations. These multiservice, multivendor, and multitechnology solutions are built for CSPs to meet carrier-grade requirements.

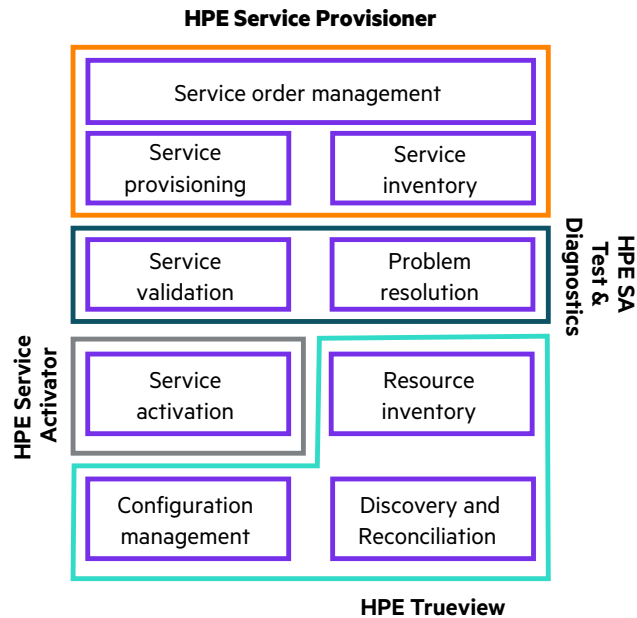


FIGURE 3. HPE OSS Fulfillment portfolio view

Prepackaged, preconfigured solution offerings for various service types covering assurance, orchestration, and digital trust use cases enable quicker time to value and reduce project risks.

COMMUNICATIONS AND MEDIA SOLUTIONS, HEWLETT PACKARD ENTERPRISE

Communications and Media Solutions is the business unit at HPE that provides vertical solutions to the communications and media industry. With over 30 years of experience in the industry, we have over 50 solutions, over 1500 active contracts, and more than 300 telco customers in 160 countries. We provide software and services that enable your digital transformation, automate your operations, and help you grow your business with innovative cloud-native network solutions and digital, 5G-ready services.

ABOUT HEWLETT PACKARD ENTERPRISE

Hewlett Packard Enterprise is the global edge-to-cloud platform-as-a-service company that helps organizations accelerate outcomes by unlocking value from all of their data, everywhere. Built on decades of reimagining the future and innovating to advance the way people live and work, HPE delivers unique, open, and intelligent technology solutions, with a consistent experience across all clouds and edges, to help customers develop new business models, engage in new ways, and increase operational performance.

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