HPE Intelligent Assurance Suite

The HPE Intelligent Assurance Suite is a Big Data and Machine-Learning based platform that provides a powerful way to transform vast amounts of network data into actionable insight that paves the way toward zero-touch operations and self-driven networks. In its version 1.1, the HPE Intelligent Assurance Suite provides Machine-Learning driven correlation and automation to dramatically reduce the number of alarms and both identify and operationalize unknown problems, helping operations prevent major outages.

Challenges

Today, communications service providers (CSPs) and digital service providers (DSPs) are striving to increase customer satisfaction and lower operational costs, while at the same time developing competitive differentiation. In this climate, it is essential that the underlying network infrastructure operates at peak effectiveness and efficiency. To reach this goal, the service assurance process has to evolve toward “zero-touch” operations, which implies that automation growingly needs to be derived from the knowledge hidden in the vast amounts of network data.

Today’s two main challenges in the service assurance process for network operations are:

• Lack of availability of network domain experts to facilitate knowledge acquisition.

• Event and alarm management in the new networks (virtual or software-defined networks). Indeed, network operation domains cannot wait for knowledge to be accumulated over the coming years, while operating the network inefficiently. The level of complexity to operate these cloudified, virtualized networks is much higher than in traditional networks, since the number of elements involved is much larger and dynamic in nature. There is no other way to acquire and apply knowledge on how to operate new networks than doing it automatically.
The HPE Intelligent Assurance Suite v1.1 helps CSPs to extract the hidden knowledge from the network. It leverages historical data to automatically identify groups of alarms that occur on a regular basis, that is, patterns helping operations to operationalize rules in HPE Unified Correlation Analyzer (UCA) that will, in turn, automate the actions to handle them whenever they occur. Those automated actions can be removal of non-significant alarms and duplicated alarms, or reduction in symptomatic alarm information, focusing attention on root cause, with or without automated resolution.

The HPE Intelligent Assurance Suite addresses specific use cases that are of interest to operations in different situations, bringing to market solutions that provide tangible value to CSPs and DSPs in the OSS domain:

• Increasing efficiency of the operations for problem detection and resolution
• Leveraging Machine-Learning techniques to find relevant patterns in historical data, helping operations identify unknown problems and reduce flows of alarms, reusing available Big Data/AI open-sources
• Processing existing data sources and delivering end-to-end use cases that manage network events and faults

The HPE Intelligent Assurance Suite addresses those various use cases, thanks to two main blocks in its architecture: the Foundation and Intelligence layers. Within the first, Fault Archival and Statistics provides insights of a descriptive nature, constitutes the foundation for the intelligent use cases and measures their benefits. Within the second, Pattern Discovery and Operationalization provide insights that can be used to trigger automatic correlations or preventive actions, leading to the automatic resolution of incidents before they become serious problems that impact the customers.

Hewlett Packard Enterprise delivers a product whose ultimate goal is not to provide Machine-Learning capabilities, but to use them to automate the end-to-end Fault Management process with much more effectiveness than ever before.
Out-of-the-box features

Fault Archival and Statistics

HPE Fault Archival and Statistics augments the traditional fault management OSS with powerful alarm reporting and analysis functions achieved by exporting in real time all the incoming alarms into a Big Data platform, making all alarms available irrespective of their current state. With an optimized dimensional model, you can quickly access large amounts of fault information for analysis and reporting, thereby extracting knowledge and insight from fault management data.

By generating detailed statistical analysis and reports about all the faults from this warehouse, HPE Fault Archival and Statistics allows you to better understand network behavior and how it is managed.

A set of off-the-shelf notice boards allows monitoring of both overall network health and network management activity. A number of charts are made available to provide information on network entities, operation contexts and domains directly accessible from HPE Unified OSS Console.

The HPE Fault Archival and Statistics KPIs can be split into several dimensions:

- **Improvement in Fault Management effectiveness**: Percentage of filtering and correlation reducing the number of actionable alarms, percentage of automation reducing the need for ticket creation by operator intervention and increasing automated problem resolution

- **Improvement in responsiveness**: Percentage reduction in the diagnostic time, percentage reduction in time needed for trouble ticket creation

- **Improvement in customer satisfaction**: Percentage reduction in resolution time of problems

- **Improvement in NOC staff effectiveness**: Percentage increase in number of problems resolved by NOC FTE per shift/day/week/quarter/year

Figure 2. HPE Intelligent Assurance automating the Fault Management process
Pattern Discovery and Operationalization

The primary objective of the application of Pattern Discovery is to find automatically:

1. Groups of alarms with similar attributes or properties into sets. This results in reducing the volume of alarms that need to be processed by operations teams and allows them to work with higher quality and richer information.

2. Correlations emerging from the application of statistical techniques, leveraging Machine-Learning.

Pattern Discovery also provides a GUI to help discover new patterns. This GUI has a wide set of attributes to easily adjust and fine-tune the results. Most important attributes are: support of the pattern, time window, and confidence.

Once a Pattern Discovery run has finished, the end user is able to easily navigate among the patterns that have been discovered, understand the benefits of a certain pattern versus other related patterns, and ultimately decide which patterns should be operationalized.

The results emerging from the application of the Pattern Discovery are operationalized within a production correlation solution: automatic integration with HPE UCA is part of the feature set of the HPE Intelligent Assurance Suite.

The ultimate goal of the operationalization of discovered and selected patterns in the Correlation engine (that is, HPE UCA) is to reduce the number of incidents to be managed by operators, who can use HPE vTeMIP to monitor the network.

By reviewing the results provided by out-of-the-box reports in Fault Archival and Statistics, users can quantify the improvement in the volume of alarms managed before and after operationalizing a certain pattern (or a set of patterns).
Scenarios of patterns that can be operationalized in HPE UCA (in version 1) are:

1. **Suppression**: One given element is producing low priority alarms every minute and the field called operator note is empty. The outcome is the suppression of these repetitive events.

2. **Compression**: A given system is generating several different alarms also within the minute or a very short time window: Operating System alarm, Database alarm, and Network node alarm. In this case, the compression maintains only one of the occurrences of the repetitive event.

3. **Problem-alarm**: It is known that the outcome of a certain pattern is an incident (for example: network outage) that needs to be prevented. Here the outcome is raising a ticket in the ticketing system in order to prevent the network outage when the pattern is detected.

In certain scenarios, faults can be enriched with information coming from other data sources, which allows to increase the level of automation, provided that the different data sources are preprocessed to fit the format expected by the Pattern-Discovery engine. As an example: if alarms are enriched with information related to trouble-tickets, the number of patterns eligible to be operationalized can be reduced (as interesting patterns are only those ending up in an alarm related to a ticket), leading to lot of time saved by the operators.
HPE Intelligent Assurance Suite technical specifications

Solution based on proven technologies
The unique technology of the HPE Intelligent Assurance solution relies on best-in-class and proven technologies, such as:

- High-performance report generation with the best-in-class visualization capabilities: HPE Unified OSS Console
- Highly scalable and flexible data management architecture that allows to store and analyze huge amounts and types of data, all in a single open source platform: Apache Hadoop and Apache Spark
- A solution fully integrated within HPE vTeMIP or other Fault Management systems, through a high-speed and reliable mediation bus based on Apache Kafka
- A solution fully integrated with HPE UCA, for automatic correlation in Pattern Discovery scenarios

System requirements

Hardware and software

For the HPE Intelligent Assurance Suite
Linux®: Any Intel® Xeon®, Intel® powered x86-64 Server (see supported platforms/operating system support)

For the HPE Unified OSS Console web client applications
Supported web browsers: IE, Firefox, Google™ Chrome

Please contact your sales representative for up-to-date information on supported versions.

For memory, disk, and CPU dimensioning, an analysis of hardware requirements is strongly recommended. Please contact your sales representative for a sizing study request.

Third-party software

Apache Hadoop (Cloudera), through HPE specific part numbers for Cloudera (HPE and Cloudera have an established OEM resell relationship)

Supported platforms for the HPE Intelligent Assurance Suite

Operating system support
Red Hat® Enterprise Linux 7
Please contact your sales representative for up-to-date information on support for newer versions.

Hadoop support
Cloudera CDH 5.13

Considerations

Growth
The minimum hardware/software requirements for any future version of this product may be different from the current version requirements.
Work with a leader

As the trusted partner for OSS transformation, Hewlett Packard Enterprise has the unique combination of many years of consulting experience. We've gained this insight from small to large and complex OSS transformation projects worldwide, industry-leading solutions, mature deployment methodologies, and highly experienced delivery teams.

HPE is an active member of the TM Forum (TMF), helping drive the development and adoption of TMF Frameworx standards. HPE is equally active with Information Technology Infrastructure Library (ITIL®) and is the author of one of the five ITIL v3 core books. In addition, HPE has authored the ITIL glossary and has built the overarching process maps for the new library.

Combining this rich experience, HPE brings the best of both to our consulting and product development. An active participation in TMF, ITIL, and other bodies helps ensure that HPE solutions are closely aligned with where the industry is going, so investments made today continue to pay off long into the future.

The HPE OSS solution:

- Is built on more than 20 years of deep and broad OSS experience
- Was successfully implemented in more than 500 customer deployments worldwide; out of which 350+ are Assurance solutions
- Is backed by a portfolio of more than 300 field-proven best practices
- Integrates OSS capabilities from HPE and solution partners

Further, the HPE OSS solution:

- Gives customers access to HPE Pointnext services personnel worldwide
- Enables fast deployment with minimal disruption to existing operations
- Gives customers the peace of mind that comes with local experts based near them who speak their language
- Brings a complete capability to manage and operate OSS
- And depending on your needs, we can offer a variety of financing and operating approaches for OSS

Learn more at hpe.com/dsp/automate