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Billion Dollar Company

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InfraGraf®

InfraGraf® is an intelligent infrastructure platform that optimizes enterprise technology infrastructure investments. It models enterprise technology infrastructure as a complex system consisting of interconnected servers, network devices, internet of things, industrial equipment etc. The powerful machine learning and graph theory based algorithms built into the platform identifies and predicts stand-alone as well as chain of events and incidents which could be related to system warnings, failures, outages, performance, availability and sub-optimal performances. InfraGraf® is a Big Data complex event processing engine that enables enterprises to innovate and make strategic decisions regarding their technology infrastructure. This can be achieved through actionable insights by correlation and causation analysis of structured and unstructured data. InfraGraf® is an Enterprise level Big Data correlation engine that generates technology infrastructure insights.

- InfraGraf® identifies & predicts key incidences leading to failure in technology infrastructure
- Complex systems based modeling of InfraGraf® solves problems arising from direct and indirect factors affecting infrastructures
- It enables automation of repeatable tasks with respect to monitoring and resolution
- Conduct location analytics forecasting to arrive at geo specific infrastructure strategies
- InfraGraf® generates root cause analysis of incidences, failure, performance, availability, errors and tickets
- Provides early warning systems and near to real-time device failures prediction using pattern recognition, network evolution and machine learning
- Identifies interdependencies, cascading and ripple effect between component and machines

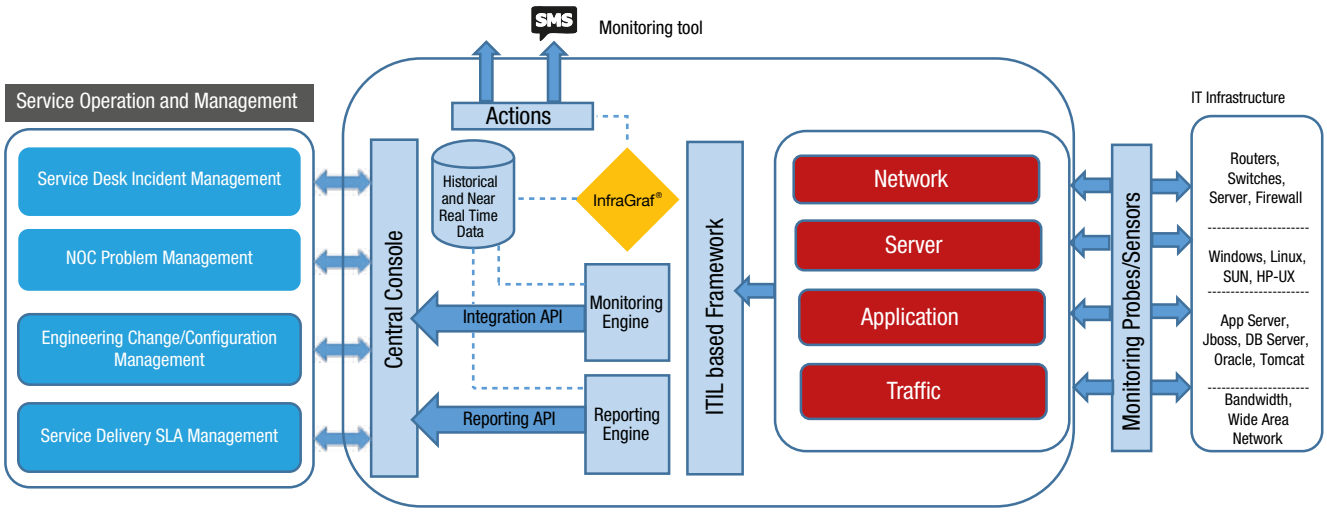
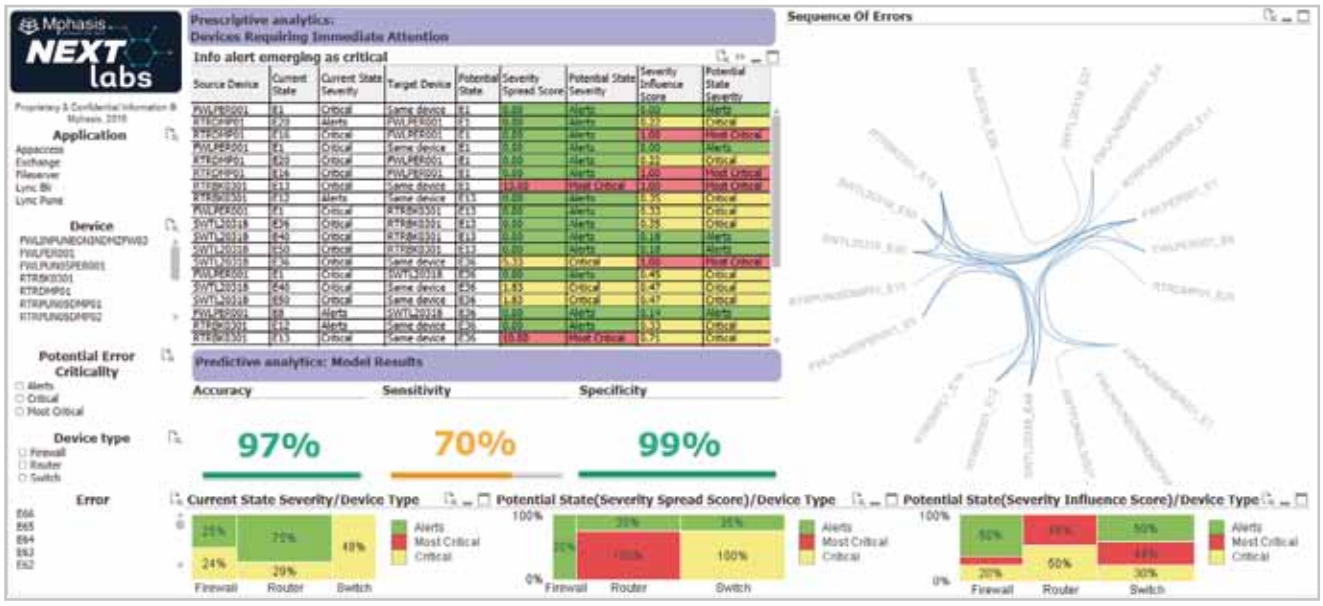


Figure 1: InfraGraf® mapping within Enterprise Infrastructure

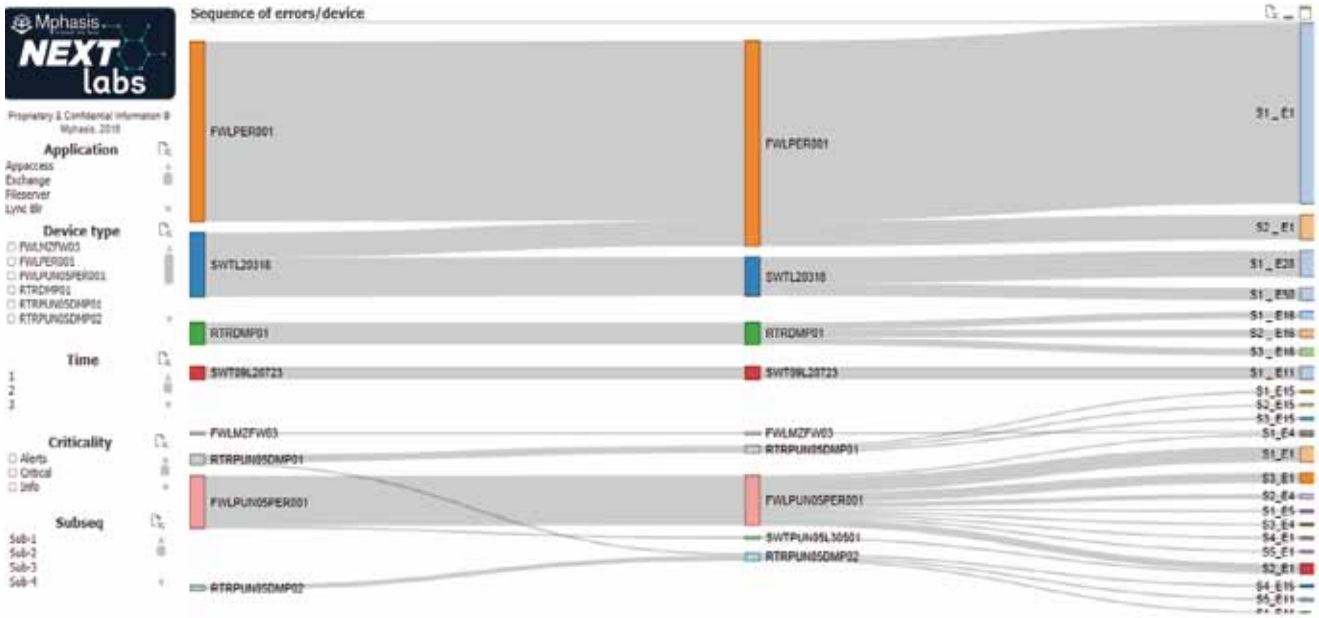
Device Health Prediction

InfraGraf® identifies and predicts key incidences leading to major failures in IT infrastructure, resulting in improved network health, reduced downtime, effective early warning and near real-time device failure prediction. It makes use of historical failure trends for structured and unstructured data. InfraGraf® includes proprietary algorithms based on sequencing mining, pattern recognition & stochastic modeling.



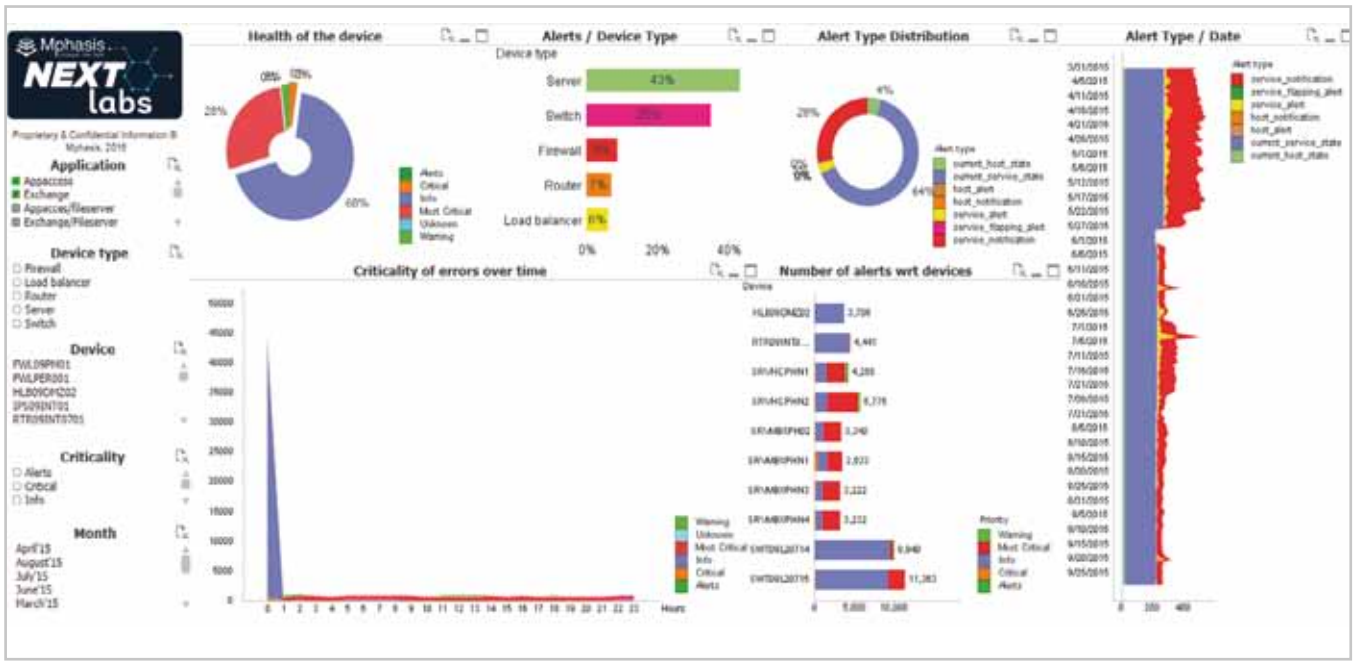
Complex Interdependency Analytics

Enterprise technology infrastructures are complex systems where multiple systems and devices are connected to each other. These interdependencies lead to cascading effects in the system. InfraGraf® identifies error dependencies between system components and predicts sequence of events between affected systems to prevent interconnected failures. It is based upon proprietary algorithm, which is based on complex systems analysis, graph theory, pattern recognition, and machine learning to identify sequence of events.



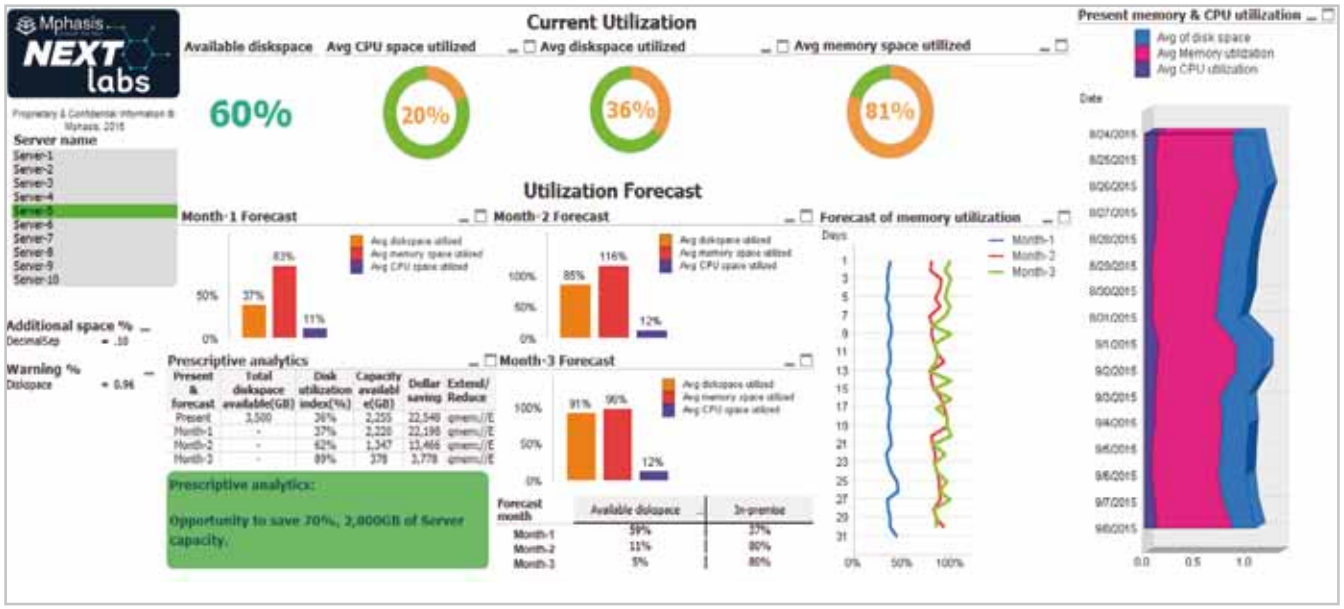
Root Cause Analysis

Maximal time is spent on isolating and diagnosing problems. InfraGraf® facilitates in reducing this time through Root Cause Analysis (RCA) or failure investigation. This helps service engineers to identify the reason for breakdown and take corrective actions at the earliest. It correlates events across time, error criticality and between devices.



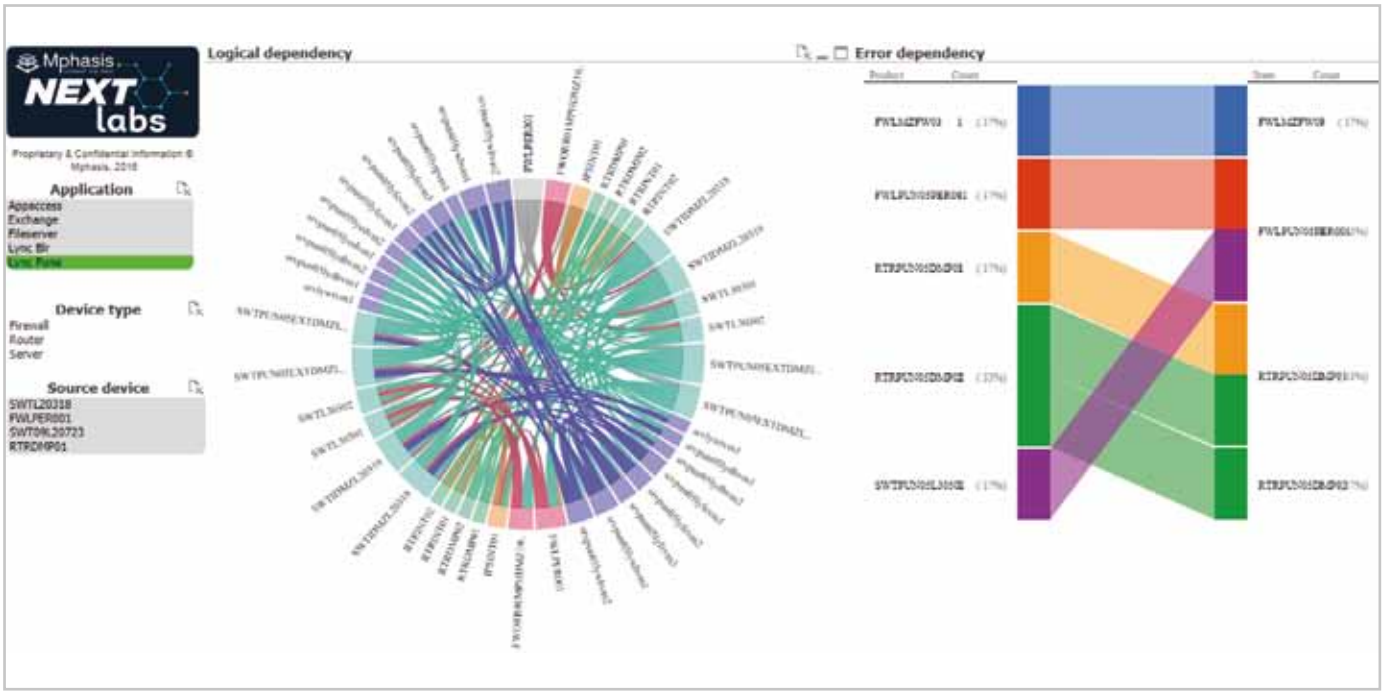
Storage/Capacity Management

Upto 30% of servers are comatose and no longer needed, which could lead to lowering infrastructure and maintenance costs. Based on historical analysis and pattern matching, InfraGraf® predicts the demand and makes recommendations as to when enterprises need to go on cloud or extend or reduce the virtual capacity for optimized cost.



Incident Management

InfraGraf® facilitates efficient incidence management through ticket and resource prediction automated ticket logging, resolution and analysis. It improves ability to manage and prevent incidents, thereby reducing turnaround time.



Case Study - Mphasis InfraGraf® solution for a large IT service provider

Client

- A large IT service provider with over 24,000 employees

Key Business Driver and Challenges

- Client required a scalable, accurate and easy to use solution, which allowed them to solve the key challenge:
  - » Predict machine down and cascading error ahead of time
- The solution had to provide the following key capabilities
  - » Generate actionable insights out of multi-structured data
  - » Ability to share the insights with other stakeholders
  - » Aggregated results with drill-down capability across multiple fields
  - » Predict failures in 4 major applications which contributes to 80% of overall applications

Mphasis Solution

- InfraGraf® predicted key incidences leading to failure in technology infrastructure with a predictive accuracy of 95-97%
- InfraGraf® enabled client stakeholders to make Big Data insights driven decisions based on multi-structured data analysis
- Provided deep drill-down to identify root causes of failure and the interrelations between devices and failures
- Provided early warning alerts and near to real-time device failure prediction

InfraGraf® Analytics components

Statistical analysis, machine learning, graph theory and text mining were used to develop the following algorithms

- Device Factor Modeling: Sequential mining, Pattern mining, Network evolution algorithm
- Interdependent/cascading failures: Machine Learning, Sensitivity Analysis, Graph Theory
- Intra-device/component failure: Stochastic process models
- Independent failures: Life expectancy and ageing, load and stress factors, device complexity

- Enhanced uptime and reduction in failures of technology infrastructure through identification of key incidences leading to failure
- Automation of repeatable tasks with respect to monitoring and resolution
- Early warning alerts resulting in rear to real-time device failures prevention
- Reduction in man-efforts for problem resolution by identifying inter-dependencies, cascading and ripple effect between machines
- Accurate Root Cause Analysis (RCA) of failure investigation

Case Study - Mphasis InfraGraf® solution for a large ATM service provider

Client

A large ATM service provider with about 8500 ATMs spread across India, servicing some of the largest banks in the country

Key Business Driver and Challenges

- Client required a scalable, accurate and easy to use solution, which allowed them to solve two key challenges:
    1. How to increase ATM's uptime to increase potential revenue
    2. Predict card reader and dispenser failure for Chronic ATM machines
- The solution had to provide following key capabilities
    - » Generate actionable insights out of multi-structured ATM data
    - » Ability to share the insights with other stakeholders
    - » Aggregated results with drill-down capability across multiple fields
    - » Global heat map of ATMs with respect to issues and failures

Mphasis Solution

- InfraGraf® predicted key incidences leading to failure in ATM infrastructure with a predictive accuracy of 90-97%
- InfraGraf® enabled key decision makers to make Big Data insights driven decisions based on multi-structured data analysis
- Provided deep drill-down to identify root causes of failure and the interrelations between ATM components
- Provided early warning alerts and near to real-time device failure prediction

InfraGraf® Analytics components

Statistical analysis, machine learning and text mining were used to develop the following algorithms

- GLM ARIMA model to analyse the lag information
- SVR (Support Vector Machine based Regression) model built on the categorical data
- The optimal SVR model built for prediction with appropriate parameters

Benefits to Client

- Enhanced uptime and reduction in failures of ATM infrastructure through identification of key incidences leading to failure
- Automation of repeatable tasks with respect to monitoring and resolution
- Early warning alerts resulting in rear to real-time device failures prevention
- Reduction in man-efforts for problem resolution by identifying inter-dependencies, cascading and ripple effect between machines
- Accurate Root Cause Analysis (RCA) of failure investigation

About Mphasis

Mphasis is a global Technology Services and solutions company specializing in the areas of Digital and Governance, Risk & Compliance. Our solution focus and superior human capital propels our partnership with large enterprise customers in their Digital transformation journeys and with global financial institutions in the conception and execution of their Governance, Risk and Compliance strategies. We focus on next generation technologies for differentiated solutions delivering optimized operations for clients.

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VAS 13/06/16 Letter MM