

Solution Brief

Virtuora® AX Network Intelligence

Analytics Transformation for Digital Infrastructure



Introduction

To simplify operations and increase subscriber satisfaction, Communications Service Providers (CSPs) are transforming network analytics with intelligence-driven automation. The combination of data intelligence and automated policy enforcement enables CSPs to proactively drive efficiencies throughout network operations with planning and service delivery powered by machine learning and artificial intelligence.

Connection-aware microapplications and microservices transform systems data into valuable insights, going beyond anonymous transactions to create personal digital experiences. Throughout this value creation cycle, network intelligence continuously informs connected services with finely-tuned business and customer outcomes.

Solution Overview

Virtuora AX is a collection of cloud-native microapplications that uses actionable and automated network intelligence to extend traditional network monitoring.

Virtuora AX includes several components:

- Application-building infrastructure capabilities for DevOps
- Network Intelligence tools
- Network models
- Learning engines
- Microapplication library for network operations

Virtuora AX delivers explainable AI for sophisticated data sets, with tools that operations, planning, engineering, and professional services teams can leverage to improve network quality of experience and service. Combinations of any or all of the Virtuora AX Network Intelligence toolset and Virtuora AX microapplications deliver specific automated network control and management across domains, layers, and systems.

Virtuora AX Network Intelligence

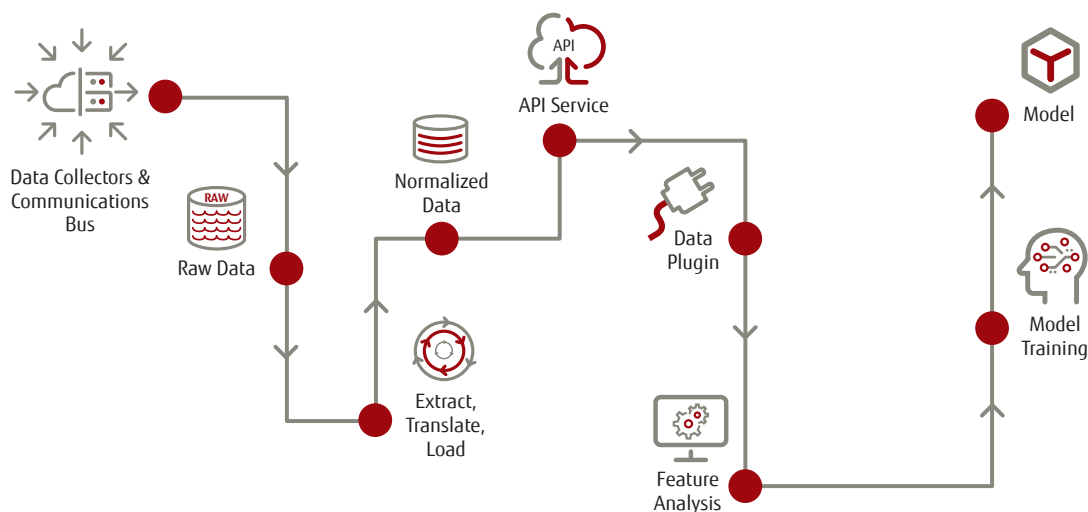
Virtuora AX microapplications use the Virtuora Network Intelligence tools to provide a user interface, data analytics and modeling, system integration, and automated actions in a private cloud environment.

The infrastructure includes:

- Graphical User Interface (GUI) with real-time data stream views
- Command-Line Interface (CLI)
- User administration and security, including role-based user access, multi-user support, LDAP authentication, and user logs
- Standard integration for SNMP, TL1, REST, and gNMI protocols
- Network and service assurance models
- Application-building capabilities that enable policy-based workflows

With Virtuora AX's open infrastructure, DevOps can build custom network management applications, or network operations teams can choose from the network management use cases in the Virtuora AX microapplications library.

Data Management Tools and Models



Virtuora AX Data Management

The data management tools ingest raw data from the network or from other distributed data sources, including offline data, network data and events collected by a multivendor SDN controller, a native Element Management System (EMS), manual workflows, assurance events, or the system itself.

A communications bus manages big data connections, topic distribution, and Elasticsearch database integrations. The data management tools normalize data from selected sources and make it available to the models and learning engine for analysis and action.

The Service Assurance Model

The Service Assurance Model performs multidimensional detection, prediction, and root-cause analysis to identify and analyze network problems. By examining network conditions and context, the model uses a combination of machine learning, topology data, and expertise to detect anomalies, correlate events, and recommend automated corrective actions.

Network Models

The network models (optical, packet, IP) are continuously trained and updated by machine learning, using distributed data sources, dynamic topologies, and dependencies between physical and virtual network elements. Users can define model training schedules and store model training configurations.

Learning Engines

The learning engines monitor and analyze network behavior in order to train the network model with new information, details, and events.

The Anomaly Detection Learning Engine

- Identifies outlier network behavior by comparing steady-state data representations against a dynamic network model
- Includes dual-compete anomaly models that run concurrently on the same data set, allowing users to choose the action that delivers the best performance

The Predict Learning Engine

- Applies forecasting models to time-series data sets
- Includes a dual-compete modeling microservice that enhances predictive results based on specific use cases

The Correlation Learning Engine

- Provides deep analysis and network intelligence for complex data sets
- Automates correlation, prediction, and anomaly detection

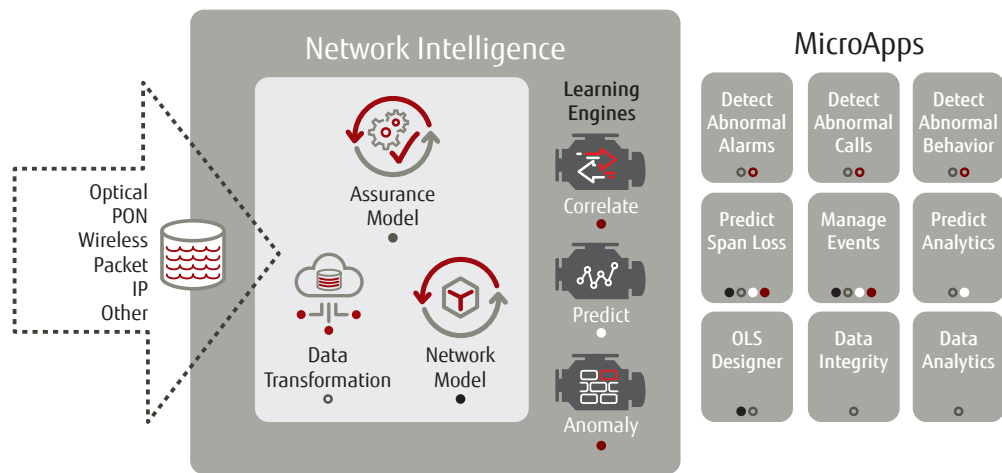
Virtuora AX Microapplications

Virtuora AX microapplications combine Virtuora AX network intelligence with automation to continuously evaluate and improve service delivery and the digital infrastructure that powers it. The microapplications provide network management for specific use cases, proactively applying policy-based actions and remediation using advanced analytics, AI, and automated workflows.

Virtuora AX microapplications enable a wide range of network management applications, including:

- Open line system design and planning
- Traffic predictions
- Fault predictions
- Anomaly detection
- Automated network operations management
- Data analytics and integrity

Simplify Operations, Increase Subscriber Satisfaction



Virtuora AX Functional Architecture

Total Network Automation, Powered by Virtuora

Virtuora AX is a member of the Virtuora cloud solutions family of products. Virtuora cloud solutions unify orchestration, control, and management of the multilayer, multivendor network stack, unwinding complexity and enabling powerful functionality. Virtuora cloud solutions are part of the Fujitsu hybrid CT/IT infrastructure, which expands the reach, productivity, and value of the communications network within the enterprise. With Virtuora, anyone can build a network around offerings and services powered by software.

Technical Requirements

Servers

- Master (VM 1):
 - 32 Gb RAM
 - 16 vCPUs
 - 500 Gb hard disk space
- Worker 1 (VM 2):
 - 48 Gb RAM
 - 24 vCPUs
 - 400 Gb hard disk space
- Worker 2 (VM 3):
 - 48 Gb RAM
 - 24 vCPUs
 - 400 Gb hard disk space
- Worker 3 (VM 4):
 - 48 Gb RAM
 - 24 vCPUs
 - 400 Gb hard disk space

Web Browser

- Google® Chrome® Version 76.0.1 (recommended), 73.0.1, and 69.0.1
- Mozilla® Firefox® Version 77.0.3865.90, 81.0.4044.138, and 81.0.4044.129

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