Atrinet is an Independent Software Vendor (ISV) and Services company specializing in end-to-end vendor agnostic network management and control, automated discovery and service assurance for CSPs and large enterprises.

Partial List of Atrinet’s Partners & Customers

- Prodapt
- Smart
- Colt
- Partner
- Fujitsu
- Atrinet connectivity
- Amdocs
- Nokia
- Tata
- Slovak Telekom
- PCCW Global
- B
- Tele2
- Extenet Systems
- Lenovo
- PLDT
- HCL
- Infosys
- Verizon
- Vodafone
- Siklu
- Parallel Wireless
- ip infusion

Atrinet is founded in 2013.

Product – NetACE
Cloud-native Model-driven Open Network Automation, Accelerating Automation in telecom’s Networks

Expertise
Experienced telco team, Network designers, DevOps

Customers & Partners
Serving over 100 Tier 1-2-3 CSPs, Vendors and Partners

Technologies
OpenOSS, Controllers, 5G, Private Wireless, Cloud, SDN, NFV, OpenRAN, IoT

Atrinet is a Digital Transition Experts company.
NETACE – TELCO GRADE OPEN NETWORK AUTOMATION FRAMEWORK

Cross-technology physical, virtual & cloud-native networks

Cross-domain RAN, Transport, Core, 5G Network Slicing, IoT, Edge comp.

Vendor agnostic – auto discovery and LTO of all elements

Unified view and API of all elements and services in a clear way

Fast one time integration with upper layer systems

Realtime Assurance all fault alarms, elements status and performance monitoring are updated in Realtime

Do it yourself – Codeless open design portal for self-service delivery
Modular and flexible solution where the customer can start with one module and grow easily

Can be used / sold with broad OSS functionality or with a selected OSS module

Simple business model and low prices

Based on standard functionalities, Open-source modules and standard NaaS Open APIs

Scalable, cloud-native, microservice-based and can run on any Private or Public cloud

Powered by artificial intelligence (AI) and machine learning (ML) algorithms are changing how operators find answers to their problems
NetACE Open Network Automation Framework

Open - Modular - Cloud-native - Tailored - Vendor agnostic

- Open Design Portal
- Service Activation & Configuration
- Configuration Management, ZTP & Rollout
- Inventory Federation, Discovery & Reconciliation
- Performance Monitoring
- Fault Management & Event Correlations

- Data Lake
  - API Gateway
  - Unified WebUI
  - Open APIs Translator
  - Security (KeyCloak)
  - Workflow (Netflix)

- Mobile & Fixed Access
- Transport
- Core
NetACE Open Network Automation Framework

Open - Modular - Cloud-native - Tailored - Vendor agnostic

Kubernetes HA cluster

Shared Infra
Containerized
DevOps & CI/CD
Model-driven
NaaS Open APIs
Scalable
High Availability
Pre-integrated

Open Design Portal
Service Activation & Configuration
Configuration Management, ZTP & Rollout
Inventory Federation, Discovery & Reconciliation
Performance Monitoring
Fault Management & Event Correlations

TMF 633
TMF 634
TMF 640
NetConf/YANG
REST
MANO SOL003/005
TMF 640
NetConf/YANG
REST
TMF 639
TMF 638
TMF 645
CSV/XML
REST
TMF 628
TMF 649
REST
TMF 642
Syslog
REST

API Gateway
Unified WebUI
Open APIs Translator
Security (KeyCloak)
Workflow (Netflix)

Data Lake

Atrinet
Digital Transition Experts

Mobile & Fixed Access
Transport
Core
More than 70 Vendors supported
1,500 NE types & dozens of EMS/NMS supported
Weeks to onboard a completely new device/NMS model
Hours/days to update an existing device/NMS model
Self-service onboarding is allowed for our Customers & Partners
## LoBs & Technologies

### Typical LoBs & Network Targets

**Mobile** – Subscriber activation 3G/4G/5G Core; Voice, Voice mail, RAN configuration

**Wireline** – simple fixed PON, DSL; complex fixed Ethernet/MEF; MPLS VPNs, OTN, SDH/SONET; Controllers, EMS/NMSs

**NFV, SDN, IoT** - Network Virtualization and SDN e.g., Cloud Operating Systems, VNF/CNF config, Controllers, VNFMs, etc

**Converged** - VoIP, IMS, Pay TV, games, storage i.e., network-independent services across domains e.g., Multi-Play: single service across multiple LOBs

**Cable** - cable broadband, TV and VoIP e.g., IT-oriented servers, CPE, DHCP / DOCSIS and Packet Cable devices, CAS (TV), softswitch (VoIP), provisioning gateway (IMS)

### Northbound APIs

- REST
- TMF640 / TMF641
- TMF633
- TMF634
- NetConf/YANG
- Kafka/N.A.T.S
- Syslog

### Southbound APIs

- REST / TMF
- SOAP / XML
- CLI over SSH/Telnet
- NetConf/YANG
- SNMP
- S/FTP
- DB connectivity (sql...)
- Corba/3GPP/MTOSI
- Java RMI
- TCP Socket
- TL1
- TMF 640 / TMF 664
- ETSI MANO:
  - SOL005
  - SOL003
Atrinet Solution for Open OSS and Network Controllers

- Wireline Network Controller
  - Ethernet/IP/MPLS/SR/OTN/PON/MWR

- RAN Network Controller (3GPP/O-RAN/OpenRAN)
  - RU
  - DU
  - CU
  - xHaul

- Transport Controller
  - MWR (P2P, Mesh)

- Core Controller (3GPP/TMF Core Activation and OAM)
  - Cable
  - IP/MPLS/SR
  - Optical

- NFV/Cloud Controller (ETSI MANO)
  - Openstack
  - K8S
NetACE Open Cloud-native Network Automation Framework

**Open OSS**
- Inventory Data Integrity Assurance (DIA)
- Inventory Federation
- 5G Assurance (PM, FM, Slice monitoring)
- Configuration Management
- Unified Service Activation (mobile & fixed)
- AI/ML-based predictions

**Open Network Controller**
- 5G Transport Manager
- Private Wireless Management
- TIP TSS RMS
- OpenRAN Automation
- Vendor-Agnostic EMS
- White-Label NMS

**CI/CD, LAB, R&D Services**
- Building CI/CD pipe for lab testing scenarios
- Network migration & Swap
- Network rollout automation
- More…
NetACE DIA
Auto-Discovery & Reconciliation

- **NetACE Auto-Discovery Microservice** – Discovers and normalizes all physical and logical resources data by connecting to NMS/EMS, controllers, devices, 3rd party Inventory systems/databases, files, etc.
  It supports the following discovery options:
  - Periodically/scheduled – Bulk discovery of all devices under specific domain
  - On-demand – User request to discover specific devices or group of devices
  - Event-driven – Triggered by an event captured from the network

- **NetACE Reconciliation Microservice** – Performs data synchronization, discrepancy analysis (compares a documented data in the Inventory with a real data in the network discovered by NetACE Auto-Discovery) and drives discrepancy resolution workflows. It supports manual and automated, rule-based reconciliation.

- **3rd Party Resource Manager** – Inventory systems to document and manage all network data, for example E/// XNG/Granite, NetCraker NRI, Oracle UIM and similar.
NetACE Thin Inventory Federation

- Built as a pure Cloud-native, Containerized Microservice with High Availability (K8s-based) – No lift & shift, No legacy baggage.
- Expose a single, unified, northbound, Open API to all inventory-data-consuming applications, such as BSS/CRM, Orchestrators, Assurance, Controllers, Slice Managers and others.
- Open architecture, as much as possible open source. Open northbound TMF REST APIs, open-source Netflix Conductor Workflow Automation Engine and rapid workflow design using visualized tools, Google’s N.A.T.S event streaming.
- Federate multiple Inventory systems and data sources (any technology, any API)
- Federate and discover physical and logical inventory data from any NMS/EMS/Controllers and direct network elements. Allow for easy data access and make it part of the process.
- Support multiple use cases: Serviceability Check, Design & Assign, Data Enrichment, Data Update, etc

Benefits

With federation, operators can leverage their existing investments in OSS Inventories while making their data more cohesive and easily accessible.
NetACE Insights & Assurance

- Closely integrates with orchestrators, controllers and policy engines to trigger closed-loop automation sequences.
- Event-driven network, service and slice auto-discovery and mapping network resources to service flows/customers (for dynamic networks or in cases where there is no accurate inventory data available).
- Easily customizable for any type of reports at any level (port, device, end-to-end service, slice, etc.) with standard & proprietary KPIs / Threshold Crossing Alerts (TCA) / Faults.
- Vendor, technology and collecting-method agnostics. Can be customized via Open Design Portal by our Customers and Partners.
- State of the art WebUI for performance, fault and inventory data visualization and management.
- Support multi-vendor physical, virtual and cloud-native networks and cross-domain use cases, including 5G Service Assurance 3GPP TS 28.552, TS 28.554 and other (incl. LTE), fixed access e.g. PON/DSL, Ethernet, Transport.
- Atrinet received an OCS grant to build AI/ML solution.

Benefits

- Save on adapters development and focuses on analytics and resolution workflows
- Deliver solutions faster (due to Atrinet migrations and dozens of existing adapters OOTB)
- Reducing solution cost (due to Atrinet migrations and dozens of existing adapters OOTB)
NetACE Unified Service Activation

- Single converged platform for all LoBs
- ROI based on automation with low fallout (Consumer/SME high-volume, simple services)
- ROI based on configuration accuracy (Enterprise low-volume complex service)
- Model-driven and vendor-agnostic
- **Super high performance** activating millions of transactions a day
- Support for Open TMF REST APIs, reducing integration cost and time
- Service (RFS) and Resource Order support
- Wide range of operations defined
- Comprehensive Order Fallout Management
- On-going configurational service integrity validation, auto-discovery and CM
- **Open Design Environment** for Customers & Partners allows for **Build-it-Yourself** mode of operation.
NetACE
Open Network Controller

- NetACE ONC automation capabilities transform previously manual onboarding, configuration, provisioning to simplify and scale network operations (including closed loop use cases) and greatly minimize configuration errors.

- Rapid northbound integration with Service and Order Orchestrators, NFVO/VNFM, etc.

- Open Design Environment for Customers & Partners allows for Build-it-Yourself mode of operation.

- Can automate across technology domains and coordinate domain-specific controllers.

- Automatically discover devices to get end-to-end network visibility and an active network inventory.

- Listen and analyze network performance and events to tactically optimize the network.

- The three main use cases of the ONC are:
  - 5G Transport Domain Controller
  - Open RAN SMO
  - White-box Automation

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- 5G Transport Domain Controller
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NetACE
Cloud-native Vendor-Agnostic EMS
(3GPP NFMF & TN EMS in a single platform)

- E2E vendor-agnostic EMS solution supporting FCAPS, Auto-discovery & Service Provisioning, Network Slicing
- Covers 3G/4G/5G RAN, Transport and Core network functions from any vendor
- Acts as a full multi-vendor 3GPP NFMF (RAN and Core) and Transport Network Management
- Support Physical (PNF), Virtual (VNF) and Cloud-native (CNF) network functions
- Supports O-RAN compliant O1 interface
- Offers premium MicroApps on top (AI/ML-driven predictions, Data Reconciliation, Service Fulfillment Workflows, etc)
- Ideal for Private 5G/LTE and Wireless use cases to replace EMS/NMS from multiple vendors with a unified, cloud-native, model-driven management and abstraction layer
# Reduce Cost and Grow Revenue

## Business Outcomes

<table>
<thead>
<tr>
<th>Key area of improvement</th>
<th>Current state</th>
<th>Target state</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automation level</strong></td>
<td>Low ▼ High</td>
<td>Low ▼ High</td>
</tr>
<tr>
<td><strong>Fulfilment duration</strong></td>
<td>15 days</td>
<td>3 days</td>
</tr>
<tr>
<td><strong>Truck rolls for installation</strong></td>
<td>▼ ▼ ▼ ▼ ▼</td>
<td>▼ ▼ ▼ ▼ ▼</td>
</tr>
<tr>
<td><strong>Recover Stranded Assets</strong></td>
<td>Low ▼ High</td>
<td>Low ▼ High</td>
</tr>
</tbody>
</table>

- **Automation level** (serviceability & fulfilment)
  - Current state: Low ▼ High
  - Target state: Low ▼ High

- **Fulfilment duration** (reduce order-to-activation time)
  - Current state: 15 days
  - Target state: 3 days

- **Truck rolls for installation** (improve efficiency of workforce due to accurate last mile info)
  - Current state: ▼ ▼ ▼ ▼ ▼
  - Target state: ▼ ▼ ▼ ▼ ▼

- **Recover Stranded Assets**
  - Current state: Low ▼ High
  - Target state: Low ▼ High
### Improve Customer Experience

#### Key area of improvement

<table>
<thead>
<tr>
<th>Current state</th>
<th>Target state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serviceability duration (reduce sales cycle time)</td>
<td>3-10 days</td>
</tr>
<tr>
<td>Network readiness (resource availability and reservation during sales process)</td>
<td>Limited &amp; manual lack of network readiness visibility upfront delivering</td>
</tr>
<tr>
<td>Proactive Service Assurance</td>
<td>Low</td>
</tr>
</tbody>
</table>
NetACE Key Takeaways

- Open Network Automation solution
  - Fits Tier-1/2 and Tier-3/4 CSPs

- Open OSS and Open Network Controller
  - Cloud-native microservices, Open API

- Multi-vendor Multi-technology Model-driven
  - Reduce OPEX and improve CEX

- 5G, Private Wireless, Open RAN, Data Center, MEC, Optical & Packet Transport, Cable Networks
  - CI/CD pipeline and DevOps tools
Thank you