Autonomous networks empowering digital transformation of Telecom Industry

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26 March, 2019
Outline

✓ Why network architecture innovation is a necessity for the future of telecom industry
✓ Incorporating AI to empower digital transformation for business, operations and networks of telecom industry
✓ Enabling new business models with the autonomous network: rethinking partnerships, collaboration & ecosystem
✓ Defining the future of operations transformation and network evolution with the autonomous network
✓ Cooperation & collaboration to achieve industry consensus for the autonomous network
Challenges of Telecom Industry

Architectural innovation to solve the structural problems

- **Complexity**: Silo, Fragmented
  - 75B devices by 2025

- **Infrastructure & Operations**: Manual, error-prone
  - 3 VS 300+
  - OTT Vs Telco to maintain

- **Efficiency**: 3

- **Simplification**: OpEx ratio: 50%->67%,
  - 1.9%
  - OpEx Vs CapEx: 3:1
  - Last 5 years

- **Automation**: TCO↑ > Revenue ↑

- **Intelligence**: Cost & Growth

- **Collaboration**: Isolation
  - Lack of global business collaboration
Opportunities to Telecom Industry --- “Zero” Experience

Autonomous Networks/ICT Services for Intelligent Society

“Zero” Experience

✓ Make the simplicity to the users
✓ Leave the complexity with the providers

As a Service
✓ One stop, real-time, on demand, automated, E2E full lifecycle network/ICT services

As a Platform
✓ Enablement of business collaboration & ecosystem between verticals and network/ICT service providers

Zero Wait
Swift
• Launch
• Delivery
• Care

Zero Touch
Simplified
• Operations
• Development
• Maintenance

Zero Trouble
Self-healing
• Business
• Services
• Infrastructure

Autonomous
Network

Agile
Operations

All-inclusive
Services
Digital Transformation of Telecom Industry

Autonomous networks enhance Telco Industry’s upgrading

**Business transformation**
- On-demand revenue
- Ecosystem revenue

**(Business) Operations transformation**
- Customer centric
- Ecosystem oriented
- Collaboration enabled

**(Network) Operations transformation**
- Full lifecycle automation
- Data/Knowledge driven & Platform based
- Knowledge as a Service

**(Architectural) Network transformation**
- Extremely Simplified Architecture
- Autonomous domains collaboration
- Enablement of on-demand production
- Support for collaborative production
Business Transformation

Beyond connectivity

Autonomous Network as a Service (ANaaS):
- One stop, real-time, on demand global network service
- Collaborative production
- Collaborative commercialization

Autonomous Network as a Platform (ANaaP):
- Friendly for developers
- Enablement to verticals
- Cross industries Collaboration
Network Operations Transformation

Knowledge as a service

Utilize the knowledge of network operations for efficiency, experience, performance and service management

- Aggregation of the knowledge for various network operations
- Sharing of the knowledge as the operator of the operators
- Monetization of the knowledge of network operation as SaaS Cloud
Network Architecture Transformation

Simplified architecture, autonomous domain

Simplified architecture
✓ Less layers
✓ Less hops
✓ High efficiency nodes

Autonomous domain
✓ Highly integrated domain: Integrated network autonomous domain for one RFS closed-loop
✓ Loosely coupled domains: collaboration at autonomous domain level

AS-IS

Siloed, complicated, many CRs, many faults, reactive, long timeframe of closed-loop

TO-BE

E2E 100% available, flex scale out, proactive, open easy integration, NOC free, No CRs, RPA

Simplified architecture
✓ Less layers
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Autonomous domain
✓ Highly integrated domain: Integrated network autonomous domain for one RFS closed-loop
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Autonomous Networks: automation levels

Data & knowledge driven intelligent, simplified networks

Self-configured, self-healing, self-optimized

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<td>System Complexity</td>
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<td>Sub-task Mode-specific</td>
<td>Unit level Mode-specific</td>
<td>Domain level Mode-specific</td>
<td>Service level Mode-specific</td>
<td>All modes</td>
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Best user experience, full lifecycle automation, maximum utilization
## Autonomous Networks: explanation and examples

### Level Definition

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<tr>
<td>🔄 Simple</td>
<td>🔄 Static</td>
<td>✓ Automation</td>
<td>✓ Complicated</td>
<td>✓ Dynamic</td>
<td>✓ Autonomous</td>
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### Assisted network automation

- **Key features**
  - With auxiliary tools, O&M personnel perform all dynamic tasks.
  - The system can execute a sub-task repeatedly based on rules.
  - The system continuously completes the control task of a unit based on the model.

### Self Network automation

- **Key features**
  - The system can implement complete closed-loop automation of single-domain scenarios.
  - The system can automatically analyze and execute cross-domain and service close-loop automation.
  - The system can perform complete dynamic tasks and exception handling in all network environments.

### Scope

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<tr>
<th>Scope</th>
<th>NA</th>
<th>Task</th>
<th>Unit</th>
<th>Domain</th>
<th>Cross network domain</th>
<th>E2E ICT domain</th>
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### Examples

- **Examples**
  - Manual upgrade
  - Manual provisioning
  - Manual Power outage recovery of cell sites
  - Reiterative Operation
  - RPA
  - Automated power outage recovery of cell sites
  - DC PUE (water cooling)
  - Dynamic standby of base stations
  - Dynamic power control per usage
  - Dynamic resource control per usage
  - Experience based radio optimization
  - Automated VoLTE service launch
  - Automated VPN service launch
  - Experience driven full lifecycle all scenarios
Collaboration on Industry Consensus of Autonomous Networks

- Initiate the program and activities
- Publish whitepaper etc
- Develop standards specs
- Marketing and events

- Collaborate among ETSI, GSMA and TMF
- Collaborate between CSPs and suppliers
- Collaborate with vertical industries

- Pioneer projects in industry organizations
- PoC with CSPs and partners
- Testing and verification
Thank You.