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# Maintaining Reliability During the Network Transformation to SDN and NFV

IEEE CQR Operations Panel

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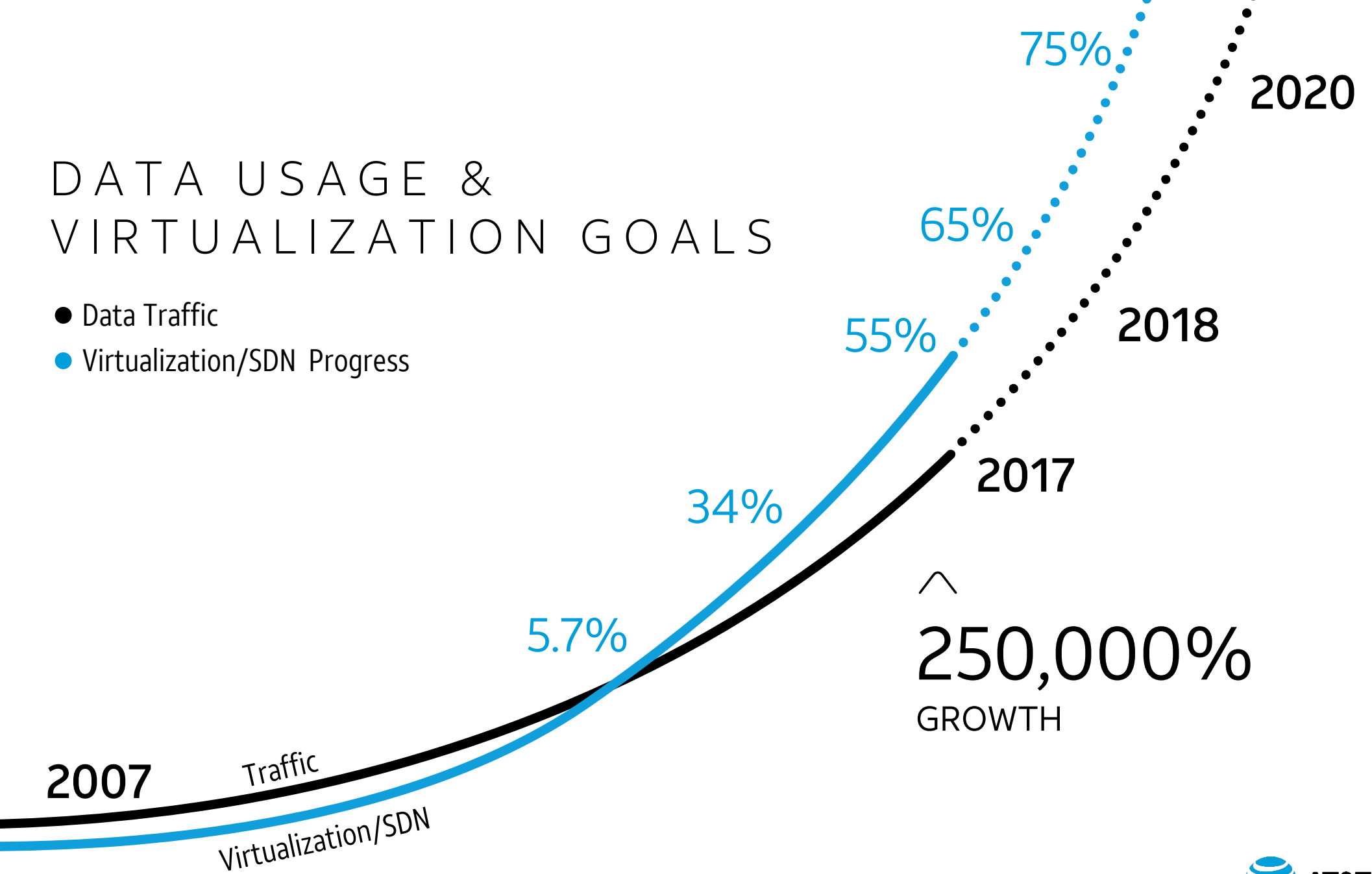
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# DATA USAGE & VIRTUALIZATION GOALS

- Data Traffic
- Virtualization/SDN Progress



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## CARRIERS ARE TRANSFORMING to SDN

Real-time, Agile Customer Enablement

Improved Efficiency, Reduced Cycle Times,  
Innovative Services & Apps, Faster

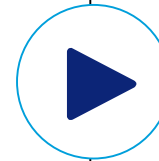
NFV

ONAP  
(ECOMP)

SDN

AT&T Integrated Cloud (AIC) : Shared, Common,  
Homogeneous

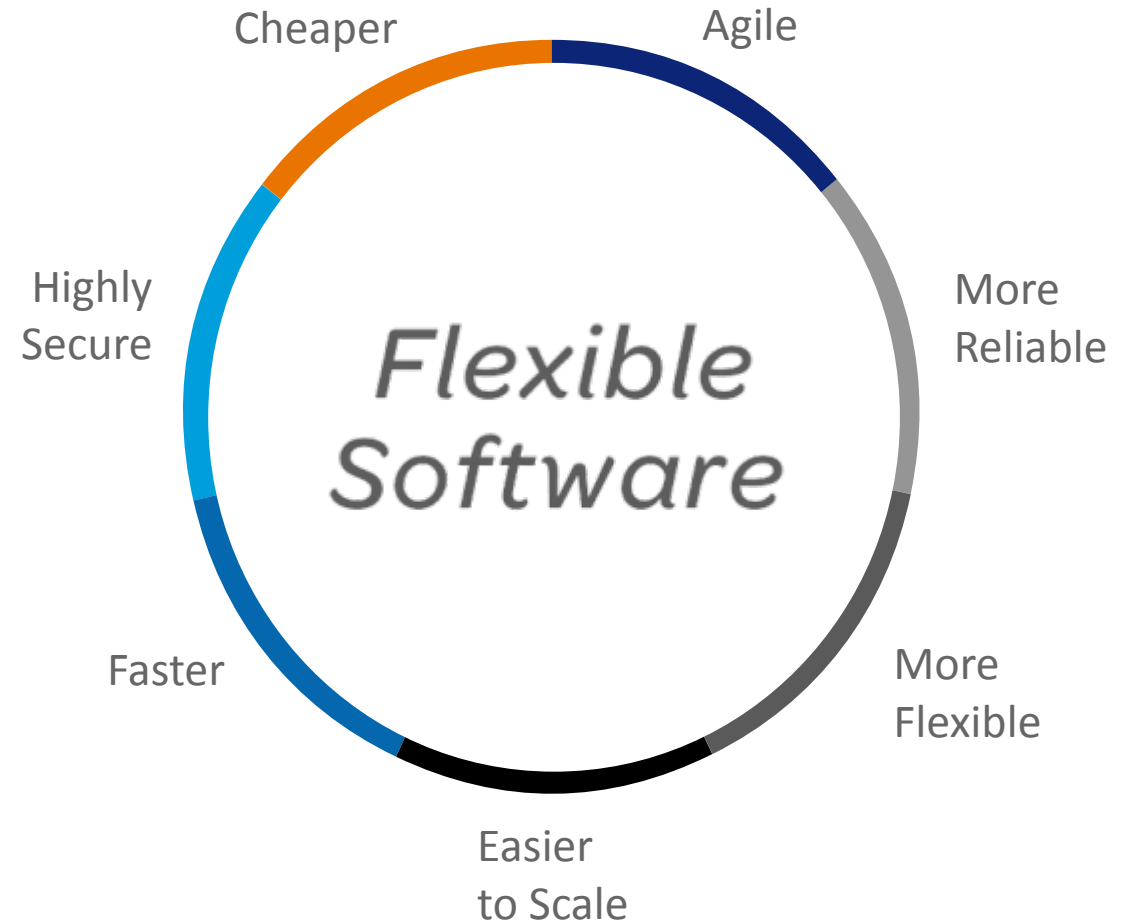
AT&T Internal Transformation - People, Process, Culture



New Paradigms  
for AT&T and the  
Telecommunications  
Industry

## RETHINK THE NETWORK

*Specialized  
Hardware*



## FUTURE MODE OF OPERATION (PARADIGM SHIFT)

- **Low Touch/No Touch solutions implemented using policy-driven configuration and recipes, that are informed by Machine Learning**
  - Expanded role of Operations in Policy Engineering, Recipe Engineering, Control Loop development, microservice development, requiring a pivot to software skills
- **Automation leads to flattened support structure, reduced need for onsite support**
  - Automated instantiation and configuration; Automated Control Loops for Fault/Incident Management eliminate traditional ticketing
- **Single teams work across different types of network functions**
  - Enabled by common hardware platform, VNFs “cattle” vs. “pets”
- **DevOps for continuous integration/continuous delivery**
  - Operations engaged from the beginning

## LESSONS LEARNED

- VNFs use functional decomposition. Complexity previously addressed by vendors requires operations visibility
- Early VNFs not fully mature - might not deliver all the OpEx benefits due to service level requirements
- Homogeneity is key but may be limited by tenant and cloud infrastructure maturity
- Performance/reliability needs for VNFs may drive stringent requirements at the cloud layer, causing more dependencies in early phases of deployment
- Early involvement of operations in design, certification/testing process is key to develop operational automation requirements and processes
- Close alignment of design validation and operational certification is critical
- Significant automation developed for legacy network services and must be developed in the new network cloud

## MANAGING THE TRANSITION

- **LEAD**: Executive leadership must be committed to the change
- **LEARN**: Joint Operations Pods - cross-functional teams, dedicated to learning together, from the very beginning of the technology introduction
- **PRACTICE**: Purposeful controlled introductions
  - Limit the blast radius in case something does not go as planned
  - Take advantage of Cap and Grow – New can fallback to the old
- **IMPROVE**: Prioritize automation for biggest benefit – new and legacy
- **MEASURE**: Measure and track operational efficiency

MOBILIZING  
**YOUR**  
WORLD™

