Capital Markets Day 2021

Nishant Batra
Chief Strategy and Technology Officer (CSTO)
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Our industry is evolving in three waves to enable critical networks

Maximize network **performance** – at lowest TCO – maximizing physical resource utilization
Our industry is evolving in three waves to enable critical networks

1. **System performance**
   - Maximize network **performance** – at lowest TCO – maximizing physical resource utilization

2. **Software agility**
   - Create an **agile** network – to enable rapid service creation – in a webscaled-network world

3. **Critical networks capability**
   - Industry adoption
Our industry is evolving in three waves to enable critical networks

1. System performance
   - Maximize network **performance** – at lowest TCO – maximizing physical resource utilization

2. Software agility
   - Create an **agile** network – to enable rapid service creation – in a webscaled-network world

3. Network as-a-Service
   - Simplify the operations paradigm – transform the business model – adopt **as-a-Service** consumption
Our industry is evolving in three waves to enable critical networks

1. System performance

2. Software agility

3. Network as-a-Service

Maximize network **performance** – at lowest TCO – maximizing physical resource utilization

Create an **agile** network – to enable rapid service creation – in a webscaled-network world

Simplify the operations paradigm – transform the business model – adopt **as-a-Service** consumption
Connected Industries will drive new Critical Networks

1. System performance

2. Software agility

3. Network as-a-Service

Critical networks for consumer connectivity:
- Mobile Internet: 3B smartphone users
- Few centralized edge clouds
- E-commerce and social platforms
- High performance networking

ICT* and OT* coming together in the 5G era

*ICT = Information & Communications Technologies, OT= Operational Technologies

Critical networks for industrial IoT:
- > 25B IoT devices and sensors by 2025
- Multitude of micro edge clouds
- Augmented intelligence control platforms
- Fit-for-purpose network SLAs

ICT* and OT* coming together in the 5G era

ICT* and OT* coming together in the 5G era
Connected Industries will drive new Critical Networks

1. System performance
2. Software agility
3. Network as-a-Service

Engineered critical networks:
- Custom network slices
- Coordination between network & application
- Negotiated terms & conditions
- Semi-automated network life cycle

Frictionless critical networks:
- ‘Instant’ cloud + network mash-ups
- Easy intent-based APIs
- Business outcomes driven
- Fully automated network aaS life cycle

Critical Networks
Cloud native plus automation enabled aaS delivery
Industry adoption
Nokia’s strategic commitments shape these technology waves

1. System performance
2. Software agility
3. Network as-a-Service

Critical Networks capability

Industry adoption
Nokia’s strategic commitments shape these technology waves

1. System performance
2. Software agility
3. Network as-a-Service

Trusted partner for Critical Networks
Nokia’s strategic commitments shape these technology waves

Focus on technology leadership in each business

Critical Networks capability

1. System performance
2. Software agility
3. Network as-a-Service

Trusted partner for Critical Networks
Nokia’s strategic commitments shape these technology waves

1. System performance
   - Focus on technology leadership in each business

2. Software agility
   - Capture value shift to cloud and new business models

3. Network as-a-Service
   - Trusted partner for Critical Networks

1. Critical network capability
2. Software agility
3. Network as-a-Service

Industry adoption
Nokia’s strategic commitments shape these technology waves

1. System performance
   - Focus on technology leadership in each business

2. Software agility
   - Capture value shift to cloud and new business models

3. Network as-a-Service

Create value with long-term research and intellectual property

Trusted partner for Critical Networks
1. System performance
Deliver technology leadership through best of breed products at lowest TCO

### Custom Chips
- Increased throughput
- Density and power efficiency
- Custom features

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## 1. System performance
Deliver technology leadership through best of breed products at lowest TCO

### Custom Chips
- Increased throughput
- Density and power efficiency
- Custom features

### Advanced Software
- Optimize performance
- High reliability
- Specialized algorithms

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- CloudBand
- PSE-V
- CloudBand
1. System performance
Deliver technology leadership through best of breed products at lowest TCO

- **Custom Chips**
  - Increased throughput
  - Density and power efficiency
  - Custom features

- **Advanced Software**
  - Optimize performance
  - High reliability
  - Specialized algorithms

- **Spectrum Optimization**
  - Maximize spectrum utilization
  - Leverage spatial reuse
  - Optimize fiber link capacity

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# 2. Software agility
Technology leadership through cloud & automation with business value at the intersection of CSPs, Webscales and Connected Industries

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## 2. Software agility

Technology leadership through cloud & automation with business value at the intersection of CSPs, Webscales and Connected Industries

### Openness
- Open architectures & interfaces
- Leverage webscale ecosystem

### Cloud Native
- Elastically scalable, resilient, stateless
- Cloud-agnostic software

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- Openness
  - Open architectures & interfaces
  - Leverage webscale ecosystem

- Cloud Native
  - Elastically scalable, resilient, stateless
  - Cloud-agnostic software

- Network & Service Automation
  - Multi-vendor, multi-domain orchestration
  - AI/ML enabled
3. Network-as-a-Service
Business model evolution for simple and elastic consumption underpinned by aaS technologies

NaaS Delivery

- Intent driven APIs
- Operational automation
- Built in security

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- Intent driven APIs
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3. Network-as-a-Service

Business model evolution for simple and elastic consumption underpinned by aaS technologies

Industrial Outcomes aaS

- Rapid ‘mash-up’ service innovation
- Dynamic scalability
- Low asset/operations overhead
- Predictable opex

NaaS Delivery

- Intent driven APIs
- Operational automation
- Built in security
Strong business groups leveraging strengths of each wave

1. System performance
2. Software agility
3. Network as-a-Service

Mobile Networks: Performance renewal and capitalizing on virtualization, cloud agility and open ecosystems

Network Infrastructure: Leading system performance and driving automation transformation

Cloud & Network Services: Cloud native evolution underway and evolving to aaS

Nokia Technologies: Delivering value with intellectual property