Identifying security challenges along the industrial value chain
--- Toshiba case ---

Takashi Amano
General Manager, Cyber Security Center
Toshiba Corporation
Toshiba’s digital transformation business region

- From order production to mass production
- From domestic production base to global production base
- Toshiba IoT Architecture **SPINEX** provides ‘digital twin economy’
Security challenges for digital transformation

‘Three Layers’
- data circulation
- cyber ⇔ physical
- supply chain

‘Six Elements’
- organization
- people
- component
- data
- system
- procedure

Three Layers:
1. Tier 1: Supplier
2. Tier 2: Manufacturer
3. Tier 3: Customer

Cyber and Physical interactions:
- Data circulation between tiers
- Cyber security considerations

Six Elements:
- Organization structure
- Human resources
- Hardware components
- Digital data
- Software systems
- Operational procedures

Federal Ministry for Economic Affairs and Energy
Platform Industrie 4.0
System evolution along digital transformation

**Visualization**
- **Out of Bounds model**
  - Separate OT and IT

**Optimization**
- **TOUCH model**
  - Limited external connections and functions
  - Limited External Conduits

**Automation**
- **INLINE model**
  - Measures for each OT zone
  - Safety Zone

**Autonomy**
Lifetime Protection Procedure

Monitoring
Predict and Detect threats and vulnerabilities
By SOC

Design
Security Assessment
Implement requirements

Response
Rapid Incident Response
By C/PSIRT

Evaluation
Penetration test
Cyber security exercise
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