

# 5G Security – Building Blocks for Secure and Resilient Networks

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# 5G Security

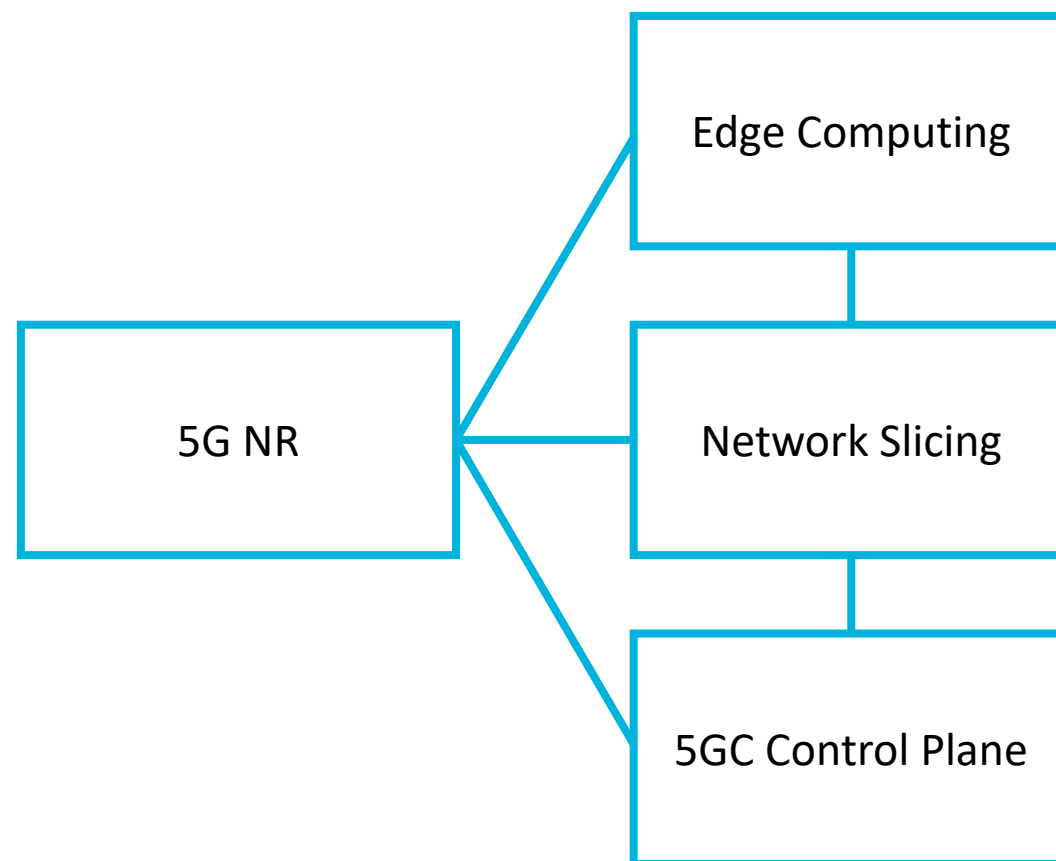


- **5G is the most secure mobile broadband standard ever**
  - New authentication and privacy modes
  - Patches whole range of weaknesses in earlier generations
  - New mmW technology has limited range making interception more difficult
  
- **HOWEVER, 5G is radically new**
  - Entirely new architecture – new implementations = bugs = vulnerabilities
  - Order of magnitude increase in complexity – will be deployed insecurely
  - Core equipment not custom hardware anymore – vulnerable to cloud-based exploitation techniques

# 5G Building Blocks and Security



- Spectrum: mmW, sharing
- Waveform: MU-MIMO
- Approach: small cells, SATCOM integration



- Extends the cloud into the core network to reduce latency
- New and yet to be defined approach and management plane

- Virtually slice the mobile, Internet, and cloud for private networks
- New protocols and management plane

- Turns core into cloud services environment
- Entirely new PKI-based security framework

# 5G Security

## Waveform Security

- TRANSEC
  - Spectral efficiency has inherent TRANSEC properties
  - mmW and smallcell deployment models have AJ properties
- COMSEC
  - Improvements over 4G in waveform identity protection
  - Broader authentication and identity models to support IoT

## Core Security

- Control Plane
  - PKI-based security model to enable federated and perimeterless control plane
- Software-Defined Data Plane
  - Dynamically reprovision networks for elastic network resilience and defense
  - DDoS protection, botnet defense, moving target defense

# Supply Chain Concerns



- **Ongoing concerns over Huawei market dominance in 5G**
- **Economic concerns turn into national security concerns, especially as 5G technology is applied to critical applications**
- **Efforts to slow China down**
  - Sanctions (Huawei/ZTE ban, Commerce entity list)
  - Reduce ally adoption to impact global adoption
- **Efforts to speed the US up**
  - Reboot US innovation ecosystem in telecom, focused on 5G applications and beyond-5G core technologies
- **Efforts to operate securely in spite of supply chain**
  - Secure network slices
  - Zero trust networks/architectures

# Secure and Resilient Tactical and First Responder Use

