



Commonwealth  
Cyber Initiative  
COASTAL VIRGINIA

# Risk at the Edge: A Framework for xG Security

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# Outline

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- Fast Facts about 5G et seq.
- Architecture
- FCC TAB CSRIC 16 Guidance
- Security Framework(s)
- CHIPS S.106 and education/WFD implications
  
- “Because WiFi doesn’t work”

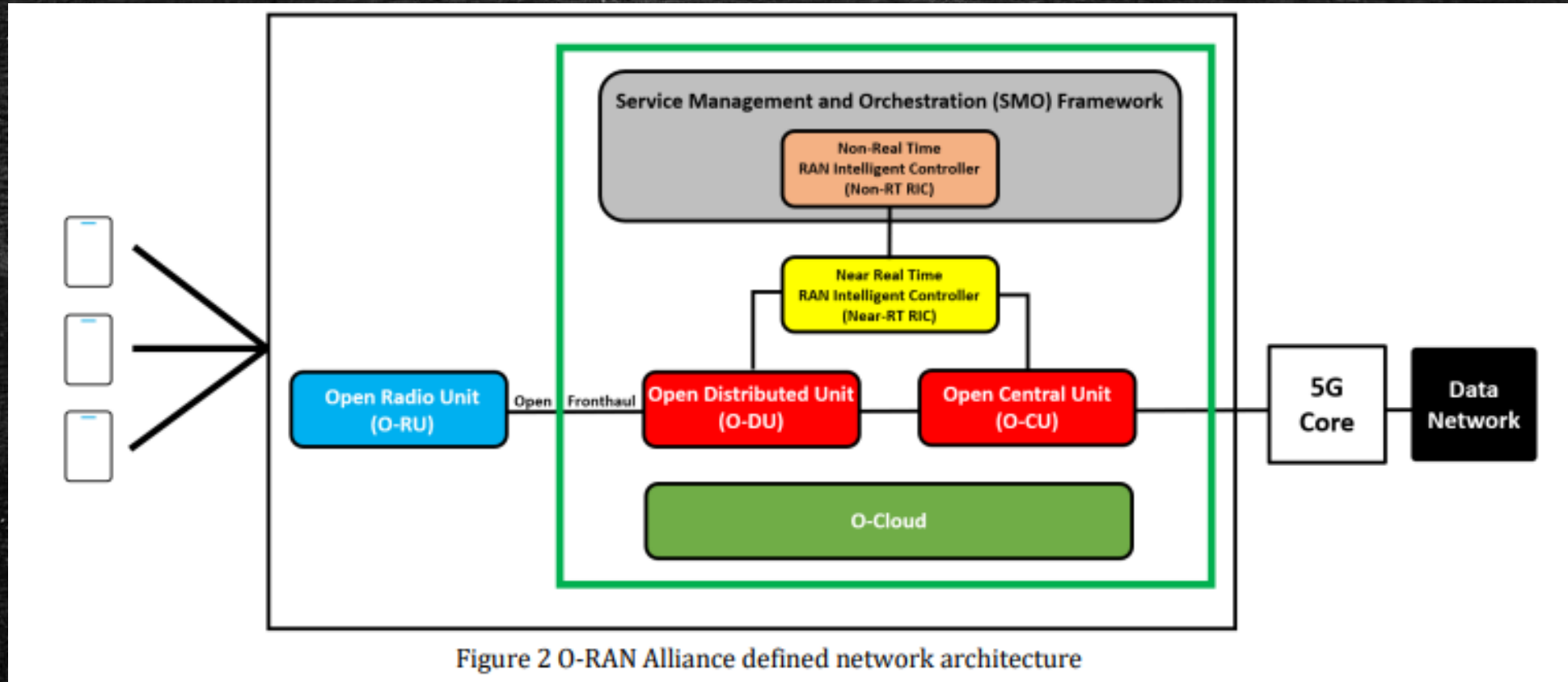


# Fast Facts

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- 3GPP spec freeze begat LTE, then 5G, now 6G, call it xG or FutureG
- Cloud-based open source solutions
  - SDN, NFV in “service mesh”
  - Open RAN, Magma core
- Low latency, high aggregate data rate, QoS; new 20 GHz devices, (2023)
- Control distributed between core and edge and base station
- Realtime policy enforcement and authentication at edge
- L<sub>4</sub> E2E CO TLS “ZTA” mentioned

# O-RAN Alliance defined architecture





# CSRIC VII Guidance (And Conventional Wisdom)

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- Based on examination of 3GPP Rel 15-16
- Need Stingray countermeasures
- Improved authentication (cf IDM, AAA)
- Edge AI countermeasures
- More conventional wisdom
  - Assess authentication
  - Study DDoS of MIMO/Beamforming AI ML RL poisoning
  - Assess UAS handovers



# Notional Framework

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- 50 published stateful interfaces
  - Develop instrumentation / dissectors
- Re-examine ability of endpoints to do PKI
- Latent issues
  - Invoke depth and trust
  - New DDoS at every layer especially stateful transactions
- Testbed(s) using Firecell Labkit and Baicells/Dish
  - Private 5G – private SIM cards
  - Use case: precise location services in-building (manufacturing)



# Education and Workforce

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- FutureG as “pillar” of dual-use CTE/WFD/2Y program
  - Multi-cluster pathway with IT, Construction, Cyber
  - Paired with CompTIAs, CCENT, CFOT (for FWA, Small Cells, FTTH)
  - Active, experiential, informal learning
- CHIPS s.106 “5G Readiness”
- Private 5G adoption, s.t. 20 GHz NR general availability



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