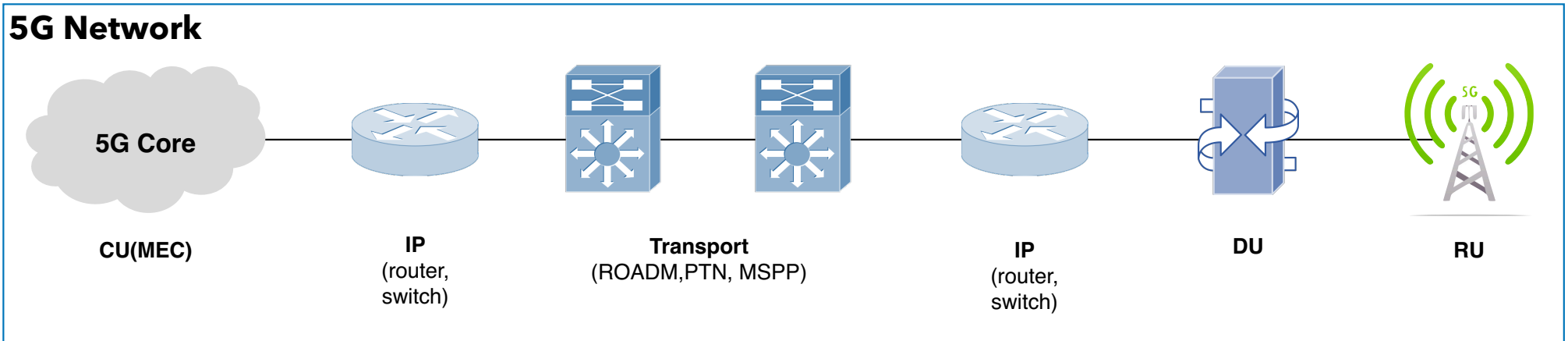


Wired and Wireless Failure Cross-domain Root Cause Analysis to Operate Telecommunication Network

Complex network analysis of infrastructure systems

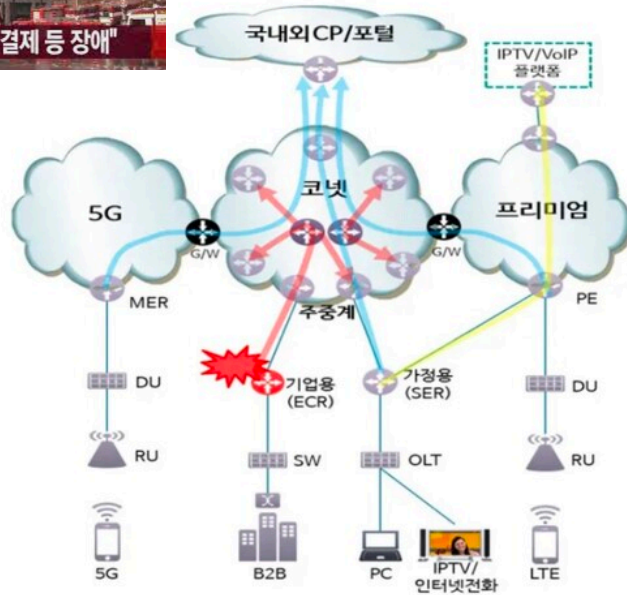
2023.06.24 Soo-Jeong Kim(@KoreaTelecom)
1crystal111@gmail.com

Root Cause Analysis in Korea Telecom



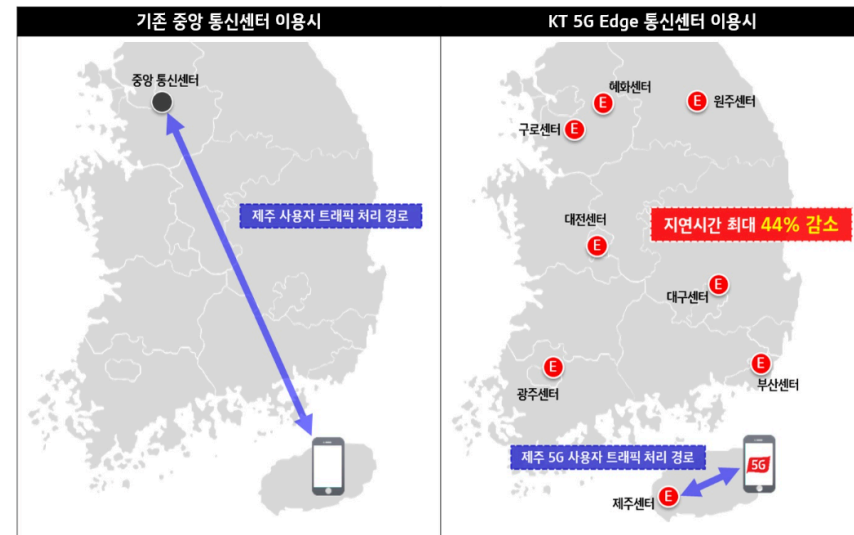
Root Cause Analysis in Korea Telecom

Step 3. Cross-domain (Multilayer Network) RCA



Cross-Domain 대형 장애 발생

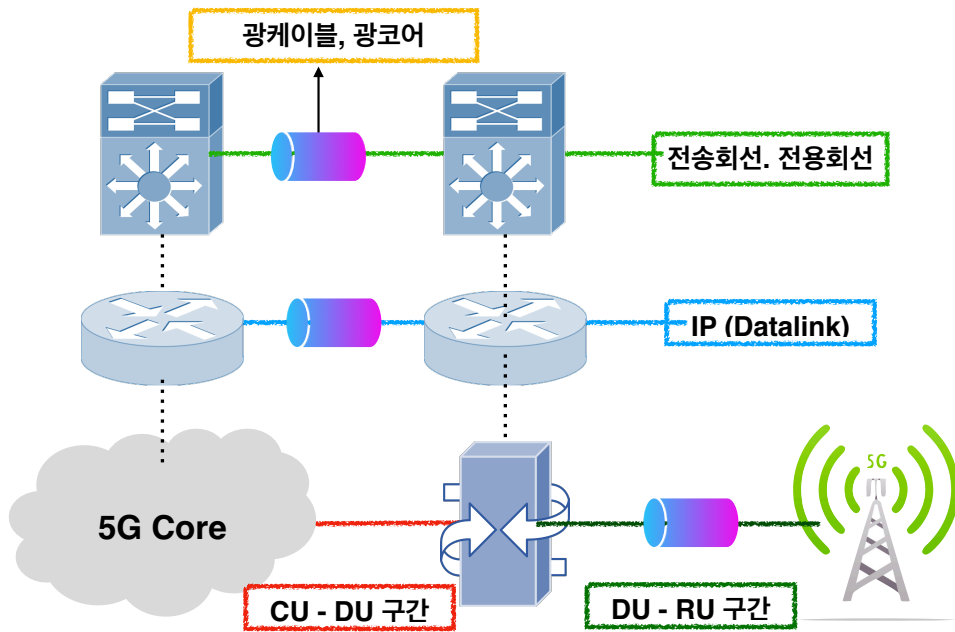
서비스기반의 시스템 운용 : ☆ As A Service



기존 트래픽 구조(왼쪽)와 5G 엣지 통신센터를 통한 트래픽 구조 비교, 자료/KT

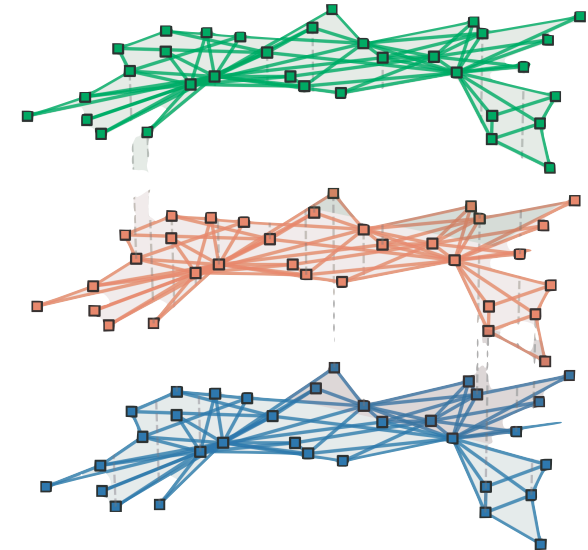
5G 엣지 코어 광역화

Cross-domain Telecommunication & Multilayer Network



장비군 별, 통신 방식 별 시설/운용

노드 : 장비
링크 : 통신
레이어 : 통신방식



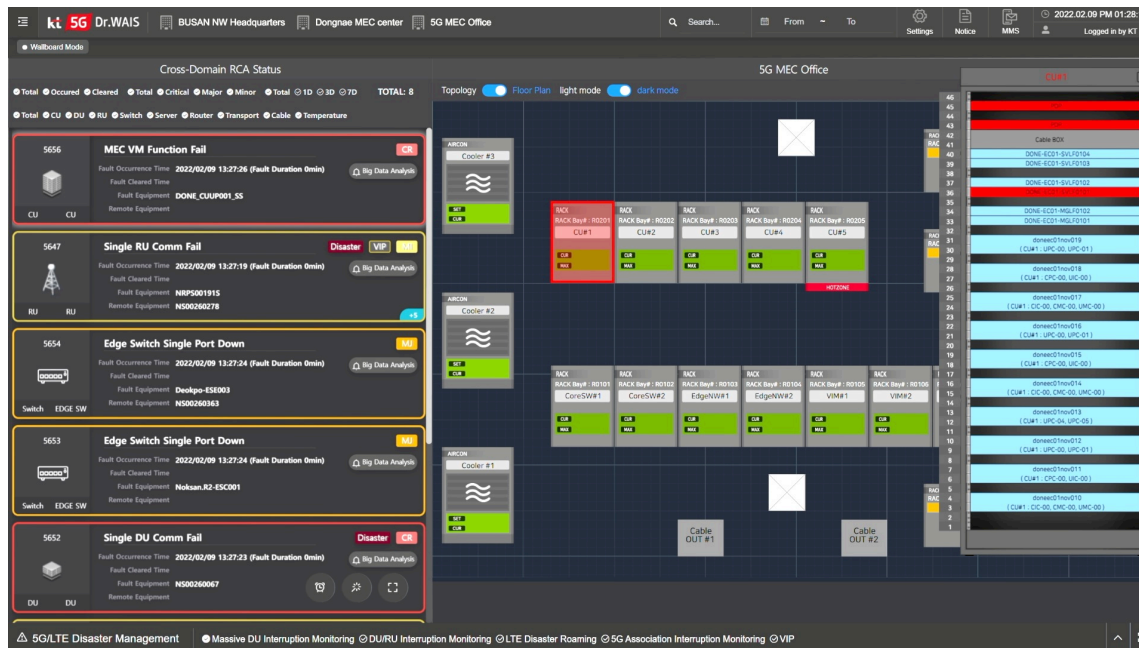
하나의 Multi-layer System 운용

Cross-domain RCA example 2

Step 3. Cross-domain System RCA

KT Dr. WAIS Fault Management :

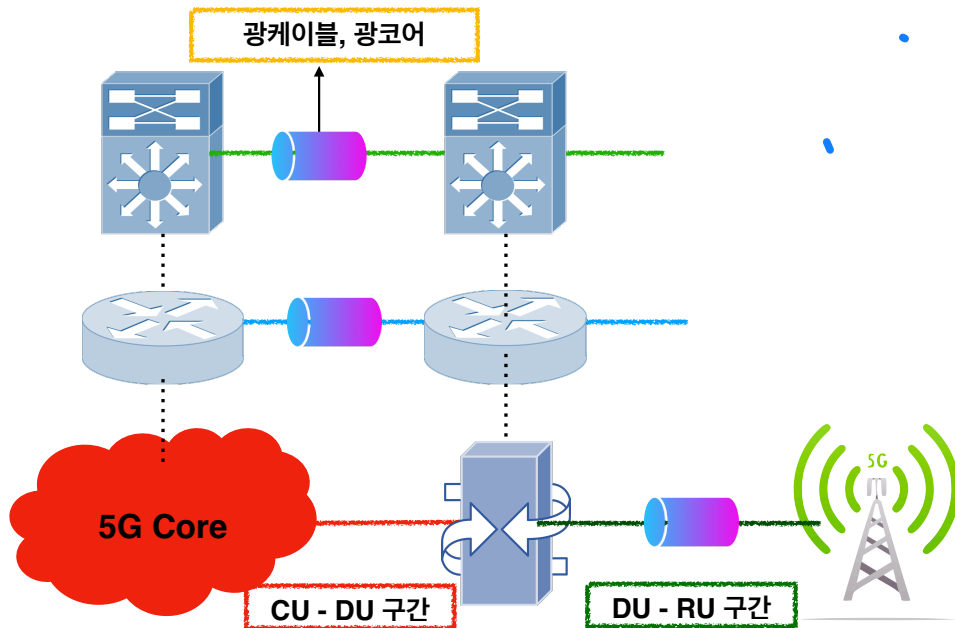
5G망 Cross-Domain 지능형 근원장애 분석 솔루션



Cross-domain RCA example 2

2. CU(MEC) DOWN

경보 클러스터링(시간,토폴로지 기반) + RCA rule을 통해 근원 장애 분석



5G망 Cross-Domain e2e tology DB

1st GraphUserGroup seminar

Cross-domain RCA example 3

3.전원장애

Layer간 공통 정보를 지리적 위치로 이용해, 지역 전원, 건물 전원 장애 분석
(ex. 한전 작업으로 인한 특정 지역 정전 등)

장비명 내 설치위치 공통점 이용 -> 퇴근으로인한 전원 Off 경우 비장애로 처리
(ex. 지하철역, 우체국, 공장 등)

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Catastrophic cascade of failures in interdependent networks

[Sergey V. Buldyrev](#) , [Roni Parshani](#), [Gerald Paul](#), [H. Eugene Stanley](#) & [Shlomo Havlin](#)

[Nature](#) **464**, 1025–1028 (2010) | [Cite this article](#)

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Figure 1: Modelling a blackout in Italy.



Future Work

Graph Theory

Digital Twin

Q&A