

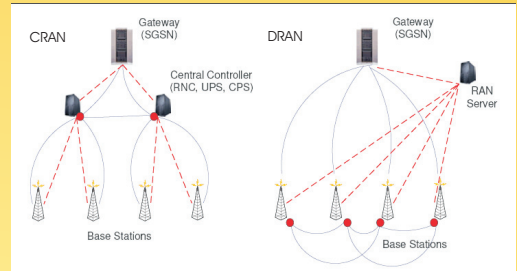
Impact of the Transport Architecture of Radio Access Networks on CAPEX and OPEX

Architectures

Two main proposals for future IP-based radio access networks (RANs) exist:

- **Controller-based RAN (CRAN)** architectures employ a centralized controller, e.g. a RNC.
- **Distributed RAN (DRAN)** architectures distribute the controller functionalities mainly towards base stations.

Architectures of future Radio Access Networks (RAN)

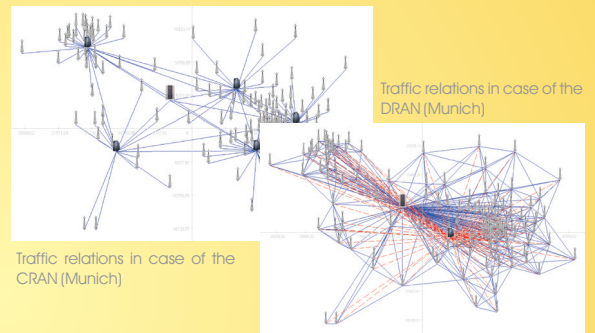


Application

The application of CRAN and DRAN architectures has been studied for real scenarios of several German cities including Berlin, Frankfurt and Munich.

The network planning and optimization tool TRIAS has been applied to compare the CRAN and DRAN architectures with respect to CAPEX and OPEX.

Overall about 2500 different network configurations have been evaluated based on real cost figures from network operators.



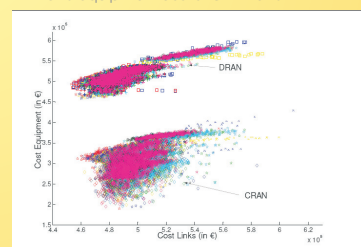
Results

Overall the DRAN architecture exhibits 20% higher cost.

The details are as follows:

- The minimal link cost of both architectures are similar.
- The DRAN exhibits higher mean link utilizations and increased delays.
- An analysis of the cost areas for the studied solutions shows that the cost of the DRAN are less sensitive with respect to network modifications.
- Chaining of base stations results in larger cost areas without decreasing the monthly cost for both architectures.

Link and equipment cost of CRAN and DRAN



Cost Areas for CRAN and DRAN

