

# References

- [1] NGMN, “NGMN 5G White Paper,” NGMN, Tech. Rep., Feb. 2015.
- [2] 3GPP, “3GPP TS 23.501 ;System architecture for the 5G system (5GS);Stage 2 (Release 16),” Dec. 2019, technical specification. [Online]. Available: <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3546>
- [3] ETSI, “Network Functions Virtualisation (NFV);Architectural Framework V1.1.1,” ETSI, Tech. Rep., Oct. 2013.
- [4] F. Yousaf, M. Bredel, S. Schaller, and F. Schneider, “NFV and SDN—Key Technology Enablers for 5G Networks,” *IEEE Journal on Selected Areas in Communications*, vol. 35, no. 11, pp. 2468–2478, 2017.
- [5] ETSI, “Mobile Edge Computing (MEC); Technical Requirements, v1.1.1,” Mar. 2016.
- [6] I. Afolabi, T. Taleb, K. Samdanis, A. Ksentini, and H. Flinck, “Network Slicing and Softwarization: A Survey on Principles, Enabling Technologies, and Solutions,” *IEEE Communications Surveys Tutorials*, vol. 20, no. 3, pp. 2429–2453, Mar. 2018.
- [7] H. Zhang, N. Liu, X. Chu, K. Long, A. H. Aghvami, and V. C. M. Leung, “Network Slicing Based 5G and Future Mobile Networks: Mobility, Resource Management, and Challenges,” *IEEE Communications Magazine*, vol. 55, no. 8, pp. 138–145, Aug. 2017.
- [8] D. Soldani, “Fighting COVID-19 with 5G Enabled Technologies,” White paper,Huawei Technologies, Tech. Rep., Apr. 2020.
- [9] Y. Siriwardhana, P. Porambage, M. Liyanage, J. Walia, M. Matinmikko-Blue, and M. Ylianttila, “Micro-Operator Driven Local 5G Network Architecture for Industrial Internet,” in *IEEE Wireless Communications and Networking Conference*, 2019, pp. 1–8.
- [10] S. Kekki *et al.*, “MEC in 5G Networks,” White paper No.28,ETSI, Tech. Rep., Jan. 2018, first edition.

- [11] T. Taleb, K. Samdanis, B. Mada, H. Flinck, S. Dutta, and D. Sabella, “On Multi-Access Edge Computing: A Survey of the Emerging 5G Network Edge Cloud Architecture and Orchestration,” *IEEE Communications Surveys & Tutorials*, vol. 19, no. 3, pp. 1657–1681, 2017.
- [12] M. Matinmikko, M. Latva-aho, P. Ahokangas, S. Yrjola, and T. Koivumaki, “Micro Operators to Boost Local Service Delivery in 5G,” in *Wireless Personal Communications*, vol. 95, 2017, pp. 69–82.
- [13] S. Wijethilaka and M. Liyanage, “Survey on Network Slicing for Internet of Things Realization in 5G Networks,” *IEEE Communications Surveys Tutorials*, pp. 1–1, Mar. 2021.
- [14] M. A. Habibi, B. Han, and H. D. Schotten, “Network Slicing in 5G Mobile Communication Architecture, Profit Modeling, and Challenges,” 2017, arXiv:1707.00852v1.
- [15] S. Staff, “What is Dynamic Network Slicing?” Dec. 2017. [Online]. Available: <https://www.sdxcentral.com/5g/definitions/dynamic-network-slicing/>
- [16] Q. Li, G. Wu, A. Papathanassiou, and U. Mukherjee, “An End-to-End Network Slicing Framework for 5G Wireless Communication Systems ,” 2016, arXiv preprint arXiv:1608.00572.
- [17] R. D. Silva, Y. Siriwardhana, T. Samarasinghe, M. Ylianttila, and M. Liyanage, “Local 5G Operator Architecture for Delay Critical Telehealth Applications,” in *proc. IEEE 5G World Forum*, Sep. 2020.
- [18] A. Osseiran *et al.*, “Scenarios for 5G Mobile and Wireless Communications: The Vision of the METIS Project,” *IEEE Communications Magazine*, vol. 52, no. 5, pp. 26–35, 2014.
- [19] Z. Pi and F. Khan, “An Introduction to Millimeter-wave Mobile Broadband Systems,” *IEEE Communications Magazine*, vol. 49, no. 6, pp. 101–107, 2011.
- [20] L. Lu, G. Li, A. Swindlehurst, A. Ashikhmin, and R. Zhang, “An Overview of Massive MIMO: Benefits and Challenges,” *IEEE Journal of Selected Topics in Signal Processing*, vol. 8, no. 5, pp. 742–758, 2014.
- [21] I. Hwang, B. Song, and S. Soliman, “A Holistic View on Hyper-dense Heterogeneous and Small Cell Networks,” *IEEE Communications Magazine*, vol. 51, no. 6, pp. 20–27, 2013.

- [22] J. Matias, J. Garay, N. Toledo, J. Unzilla, and E. Jacob, “Toward an SDN-enabled NFV Architecture,” *IEEE Communications Magazine*, vol. 53, no. 4, pp. 187–193, 2015.
- [23] G. C. Valastro, D. Panno, and S. Riolo, “A sdn/nfv based c-ran architecture for 5g mobile networks,” in *2018 International Conference on Selected Topics in Mobile and Wireless Networking (MoWNeT)*, 2018, pp. 1–8.
- [24] N. McKeown *et al.*, “OpenFlow: Enabling Innovation in Campus Networks,” *ACM SIGCOMM Computer Communication Review*, vol. 38, no. 2, pp. 69–74, Mar. 2008.
- [25] D. Kreutz, F. Ramos, P. Veríssimo, C. E. Rothenberg, S. Azodolmolky, and S. Uhlig, “Software-Defined Networking: A Comprehensive Survey,” *Proceedings of the IEEE*, vol. 103, no. 1, pp. 14–76, 2015.
- [26] P. Hedman *et al.*, “Description of Network Slicing Concept,” NGMN Alliance, Tech. Rep., Jan. 2016.
- [27] M. Richart, J. Baliosian, J. Serrat, and J.-L. Gorricho, “Resource Slicing in Virtual Wireless Networks: A Survey,” *IEEE Transactions on Network and Service Management*, vol. 13, no. 3, pp. 462–476, 2016.
- [28] M. Matinmikko-Blue and M. Latva-aho, “Micro Operators Accelerating 5G Deployment,” in *2017 IEEE International Conference on Industrial and Information Systems (ICIIS)*, Dec. 2017, pp. 1–5.
- [29] A. Prasad, Z. Li, S. Holtmanns, and M. A. Uusitalo, “5G Micro-Operator Networks — A Key Enabler for New Verticals and Markets,” in *2017 25th Telecommunication Forum (TELFOR)*, Nov. 2017, pp. 1–4.
- [30] P. Ahokangas, M. Matinmikko-Blue, S. Yrjölä, V. Seppänen, H. Hämmäinen, R. Jurva, and M. Latva-aho, “Business Models for Local 5G Micro Operators,” *IEEE Transactions on Cognitive Communications and Networking*, vol. 5, no. 3, pp. 730–740, Mar. 2019.
- [31] J. S. Walia, H. Hämmäinen, and M. Matinmikko, “5G Micro-Operators for the Future Campus: A Techno-Economic Study,” in *2017 Internet of Things Business Models, Users, and Networks*, Nov. 2017, pp. 1–8.
- [32] M. Matinmikko-Blue, S. Yrjölä, V. Seppänen, P. Ahokangas, H. Hämmäinen, and M. Latva-aho, “Analysis of Spectrum Valuation Approaches: The Viewpoint of Local 5G Networks in Shared Spectrum Bands,” in *2018 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Oct. 2018, pp. 1–9.

- [33] Y. Siriwardhana, P. Porambage, M. Ylianttila, and M. Liyanage, “Performance Analysis of Local 5G Operator Architectures for Industrial Internet,” *IEEE Internet of Things Journal*, vol. 7, no. 12, pp. 11 559–11 575, Dec. 2020.
- [34] B. Felter, “5 Exciting 5G Use Cases and Their Future Network Impact,” Jul. 2020. [Online]. Available: <https://www.vxchnge.com/blog/exciting-5g-use-cases>
- [35] 3GPP, “3GPP TR 22.826 : Study on Communication Services for Critical Medical Applications (Release 17),” Aug. 2019, technical Report. [Online]. Available: <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3546>
- [36] S. Pradhan, “The Present and Future of Ingestible Sensors - The New Taste of Science,” Jan. 2019. [Online]. Available: <https://www.prescouter.com/2019/01/ingestible-sensors-innovations/>
- [37] S. Vishnu, S. R. J. Ramson, and R. Jegan, “Internet of Medical Things (IoMT) - An overview,” in *proc. International Conference on Devices, Circuits and Systems*, Apr. 2020.
- [38] 3GPP, “3GPP TS 23.502 ; System Aspects;System Architecture for the 5G System (5GS);Stage 2 (Release 16),” Dec. 2019, technical specification. [Online]. Available: <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3546>
- [39] J. Farkas, L. Bello, and C. Gunther, “Time-Sensitive Networking Standards,” *IEEE Communications Standards Magazine*, vol. 2, no. 2, pp. 20–21, 2018.
- [40] J. Sachs, G. Wikstrom, T. Dudd, R. Baldemair, and K. Kittichokecha, “5G Radio Network Design for Ultra-Reliable Low-Latency Communication,” *IEEE Network*, vol. 32, no. 2, pp. 24–31, 2018.
- [41] M. Jaber, M. Imran, R. Tafazoll, and A. Tukmanov, “5G Backhaul Challenges and Emerging Research Directions: A Survey,” *IEEE Access*, vol. 4, pp. 1743–1766, 2016.
- [42] Cisco, “Cisco ASR 1000 Series Aggregation Services Routers Data Sheet,” Mar. 2019. [Online]. Available: <https://www.cisco.com/c/en/us/products/collateral/routers/asr-1000-series-aggregation-services-routers/datasheet-c78-731632.html>