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# DAFTAR PUSTAKA

Ashok, S., Harsh, V., Godfrey, B., Mittal, R., Parthasarathy, S., dan Shwartz, L. (2024). Traceweaver: Distributed request tracing for microservices without application modification. In *Proceedings of the ACM SIGCOMM 2024 Conference*, ACM SIGCOMM '24, page 828–842, New York, NY, USA. Association for Computing Machinery.

Axelsson, S. (2000). The base-rate fallacy and the difficulty of intrusion detection. *ACM Transactions on Information and System Security*, 3(3):186–205. https://doi.org/10.1145/357830.357849.

Bakshi, K. (2017). Microservices-based software architecture and approaches. *2017 IEEE Aerospace Conference*, pages 1–8. https://doi.org/10.1109/AERO.2017.7943959.

Cha, D. dan Kim, Y. (2021). Service mesh based distributed tracing system. In *2021 International Conference on Information and Communication Technology Convergence (ICTC)*, pages 1464–1466.

Chen, Z., Pu, J., dan Zheng, Z. (2025). Tracezip: Efficient distributed tracing via trace compression. *Proc. ACM Softw. Eng.*, 2(ISSTA). https://doi.org/10.1145/3728888.

Cilium Authors (2025a). Architecture. *https://docs.cilium.io/en/stable/reference-guides/bpf/architecture/*.

Cilium Authors (2025b). BPF and XDP Reference Guide. *https://docs.cilium.io/en/stable/reference-guides/bpf/index.html*.

Cinque, M., Corte, R. D., dan Pecchia, A. (2021). Microservices monitoring with event logs and black box execution tracing. In *2021 IEEE World Congress on Services (SERVICES)*, pages 12–12.

Craun, M., Hussain, K., Gautam, U., Ji, Z., Rao, T., dan Williams, D. (2024). Eliminating ebpf tracing overhead on untraced processes. In *Proceedings of the ACM SIGCOMM 2024 Workshop on eBPF and Kernel Extensions*, pages 16–22.

Deering, D. S. E. dan Hinden, B. (2006). IP Version 6 Addressing Architecture. RFC 4291.

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eBPF Authors (2024). What is ebpf? an introduction and deep dive. *https://ebpf.io/what-is-ebpf/*. [Online]. Available: https://ebpf.io/what-is-ebpf/. [Accessed: 27-Jul-2025].

Gorton, I., Fong-Jones, L., dan Larsson, A. (2024). Observability q&a. *IEEE Software*, 41(1):50–54. https://doi.org/10.1109/MS.2023.3330234.

Gu, S., Rong, G., Ren, T., Zhang, H., Shen, H., Yu, Y., Li, X., Ouyang, J., dan Chen, C. (2023). Trinityrcl: Multi-granular and code-level root cause localization using multiple types of telemetry data in microservice systems. *IEEE Transactions on Software Engineering*, 49(5):3071–3088. https://doi.org/10.1109/TSE.2023.3241299.

Hallur, J. (2024). From monitoring to observability: Enhancing system reliability and team productivity. *International Journal of Science and Research (IJSR)*, 13(10):602–606. https://doi.org/https://doi.org/10.21275/sr241004083612.

Jaccard, P. (1912). The distribution of the flora in the alpine zone. *New Phytologist*, 11(2):37–50. https://doi.org/https://doi.org/10.1111/j.1469-8137.1912.tb05611.x.

Jain, R. (1991). *The Art of Computer Systems Performance Analysis: Techniques For Experimental Design, Measurement, Simulation, and Modeling*. Wiley, New York.

K, R., Tammana, P., Kannan, P. G., dan Naik, P. (2022). A case for cross-domain observability to debug performance issues in microservices. In *2022 IEEE 15th International Conference on Cloud Computing (CLOUD)*, pages 244–246.

Kabamba, H. M., Khouzam, M., dan Dagenais, M. (2023). Vnode: Low-overhead transparent tracing of node.js-based microservice architectures. *ArXiv*, abs/2311.11095. https://doi.org/10.48550/arXiv.2311.11095.

Kusuma, G. Y. dan Oktiawati, U. Y. (2022). Application performance monitoring system design using opentelemetry and grafana stack. *Journal of Internet and Software Engineering*, 3(1):26–35. https://doi.org/https://doi.org/10.22146/jise.v3i1.5000.

Landau, D., Barbosa, J., dan Saurabh, N. (2025). Retrofitting service dependency discovery in distributed systems. arXiv:2510.15490 [cs.DC].

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Levin, J. dan Benson, T. A. (2020). Viperprobe: Rethinking microservice observability with ebpf. In *2020 IEEE 9th International Conference on Cloud Networking (CloudNet)*, pages 1–8.

Liu, C., Cai, Z., Wang, B., Tang, Z., dan Liu, J. (2020). A protocol-independent container network observability analysis system based on ebpf. In *2020 IEEE 26th International Conference on Parallel and Distributed Systems (ICPADS)*, pages 697–702.

Mateus-Coelho, N., Cruz-Cunha, M., dan Ferreira, L. (2021). Security in microservices architectures. *Procedia Computer Science*. https://doi.org/10.1016/J.PROCS.2021.01.320.

Montgomery, D. C. (2017). *Design and Analysis of Experiments*. Wiley, 9th edition.

Niedermaier, S., Koetter, F., Freymann, A., dan Wagner, S. (2019). On observability and monitoring of distributed systems – an industry interview study. In Yangui, S., Bouassida Rodriguez, I., Drira, K., dan Tari, Z., editors, *Service-Oriented Computing*, pages 36–52, Cham. Springer International Publishing.

Phan, L.-A., Wang, M., Wu, G., Dawei, W., Liqun, C., dan Jin, L. (2025). Crosstrace: Efficient cross-thread and cross-service span correlation in distributed tracing for microservices. *arXiv preprint arXiv:2508.11342*.

Pixie Authors (2024). Using pixie | pixie product documentation. `https://docs.px.dev/`. A Cloud Native Computing Foundation sandbox project. Originally created and contributed by New Relic, Inc. [Online]. Available: https://docs.px.dev/. [Accessed: 23-Apr-2026].

Rangaiyengar, R., Komondoor, R., dan Medicherla, R. K. (2023). Multi-layer observability for fault localization in microservices based systems. In *2023 IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER)*, pages 733–737.

Rein, P., Lincke, J., Ramson, S., Mattis, T., Niephaus, F., dan Hirschfeld, R. (2019). Implementing babylonian/s by putting examples into contexts: Tracing instrumentation for example-based live programming as a use case for context-oriented programming. In *Proceedings of the 11th ACM International Workshop*

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*on Context-Oriented Programming*, COP '19, page 17–23, New York, NY, USA. Association for Computing Machinery.

Rezvani, M., Jahanshahi, A., dan Wong, D. (2024). Characterizing in-kernel observability of latency-sensitive request-level metrics with ebpf. In *2024 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, pages 24–35.

Salii, S., Ajdari, J., dan Zenuni, X. (2023). Migrating to a microservice architecture: benefits and challenges. In *2023 46th MIPRO ICT and Electronics Convention (MIPRO)*, pages 1670–1677.

Santana, M., Sampaio, A. R., Andrade, M., dan Rosa, N. (2019). Transparent tracing of microservice-based applications. *Proceedings of the 34th ACM/SIGAPP Symposium on Applied Computing*. https://doi.org/10.1145/3297280.3297403.

Saxena, D. dan Bhowmik, B. (2023). Paradigm shift from monolithic to microservices. In *2023 IEEE International Conference on Recent Advances in Systems Science and Engineering (RASSE)*, pages 1–7.

Sharma, B. (2023). Improving microservices observability in cloud-native infrastructure using ebpf. Master's thesis, Purdue University.

Sharma, B. dan Nadig, D. (2024). ebpf-enhanced complete observability solution for cloud-native microservices. In *ICC 2024 - IEEE International Conference on Communications*, pages 1980–1985.

Shen, J., Zhang, H., Xiang, Y., Shi, X., Li, X., Shen, Y., Zhang, Z., Wu, Y., Yin, X., Wang, J., Xu, M., Li, Y., Yin, J., Song, J., Li, Z., dan Nie, R. (2023). Network-centric distributed tracing with deepflow: Troubleshooting your microservices in zero code. In *Proceedings of the ACM SIGCOMM 2023 Conference*, ACM SIGCOMM '23, page 420–437, New York, NY, USA. Association for Computing Machinery.

Sigelman, B. H., Barroso, L. A., Burrows, M., Stephenson, P., Plakal, M., Beaver, D., Jaspan, S., dan Shanbhag, C. (2010). Dapper, a large-scale distributed systems tracing infrastructure. Technical report, Google, Inc.

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Soldani, D., Nahi, P., Bour, H., Jafarizadeh, S., Soliman, M. F., Di Giovanna, L., Monaco, F., Ognibene, G., dan Risso, F. (2023). ebpf: A new approach to cloud-native observability, networking and security for current (5g) and future mobile networks (6g and beyond). *IEEE Access*, 11:57174–57202. https://doi.org/10.1109/ACCESS.2023.3281480.

Tak, B.-C., Tang, C., Zhang, C., Govindan, S., Urgaonkar, B., dan Chang, R. N. (2009). vpath: Precise discovery of request processing paths from black-box observations of thread and network activities. In *USENIX ATC*, volume 9.

V, T., Dixit, V. R., S, N. R., Gowda, V. K., Vasudevan, S. K., dan Kalambur, S. (2022). Misertrace: Kernel-level request tracing for microservice visibility. In *Companion of the 2022 ACM/SPEC International Conference on Performance Engineering*, ICPE '22, page 77–80, New York, NY, USA. Association for Computing Machinery.

Wang, Y., Zhu, Z., Fu, Q., Ma, Y., dan He, P. (2024). Mrca: Metric-level root cause analysis for microservices via multi-modal data. In *2024 39th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, pages 1057–1068.

Yang, W., Chen, P., Liu, K., dan Zhang, H. (2025). Zerotracer: In-band ebpf-based trace generator with zero instrumentation for microservice systems. *IEEE Transactions on Parallel and Distributed Systems*, 36(7):1478–1494. https://doi.org/10.1109/TPDS.2025.3571934.

Yang, W., Chen, P., Yu, G., Zhang, H., dan Zhang, H. (2024). Network shortcut in data plane of service mesh with ebpf. *Journal of Network and Computer Applications*, 222:103805. https://doi.org/https://doi.org/10.1016/j.jnca.2023.103805.

Zavarella, T. D. (2022). *A methodology for using eBPF to efficiently monitor network behavior in Linux Kubernetes clusters*. PhD thesis, Massachusetts Institute of Technology.