



CLOUD COMPUTING

REFERENSI LENGKAP

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Katalog Dalam Terbitan

Hak cipta dilindungi undang-undang

Dilarang memperbanyak maupun mengedarkan buku tanpa

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Kata Pengantar

Puji syukur penulis panjatkan ke hadirat Tuhan Yang Maha Esa atas segala limpahan rahmat dan karunia-Nya sehingga buku ini yang berjudul “Cloud Computing: Referensi Lengkap” dapat diselesaikan dengan baik. Buku ini disusun untuk memberikan pemahaman komprehensif mengenai konsep, arsitektur, teknologi, serta implementasi Cloud Computing yang saat ini menjadi fondasi utama dalam transformasi digital di berbagai sektor.

Cloud Computing telah berkembang menjadi pilar penting bagi dunia industri, pemerintahan, pendidikan, dan bisnis modern. Perkembangan layanan digital, otomatisasi, Internet of Things (IoT), Artificial Intelligence (AI), serta kebutuhan akan penyimpanan dan pemrosesan data dalam skala besar menjadikan teknologi cloud sebagai infrastruktur strategis. Oleh karena itu, buku ini dirancang sebagai panduan lengkap yang tidak hanya menghadirkan teori, tetapi juga memberikan pemahaman praktis dan studi kasus yang relevan.

Buku ini terdiri dari lima belas bab yang disusun secara sistematis. Bab pertama memperkenalkan konsep dasar cloud computing, karakteristik, sejarah perkembangan, manfaat, hingga evolusi teknologinya. Bab kedua membahas model-model layanan utama seperti SaaS, PaaS, dan IaaS serta keunggulan, keterbatasan, dan implementasinya. Bab ketiga dan keempat mengulas arsitektur cloud computing serta platform cloud populer seperti AWS, Google Cloud, Azure, IBM Cloud, dan Oracle Cloud.

Pembahasan kemudian dilanjutkan pada topik penting seperti virtualisasi, manajemen biaya, arsitektur jaringan cloud, aplikasi layanan cloud, pengelolaan cloud storage, dan keamanan data dalam lingkungan cloud. Buku ini juga menyajikan praktik terbaik dalam manajemen cloud,

termasuk tata kelola, kepatuhan, otomatisasi, monitoring, dan rekayasa reliabilitas. Pada bagian akhir, pembaca diperkenalkan dengan integrasi cloud-edge computing, peran cloud dalam IoT, serta tren masa depan seperti dominasi AI, multicloud, interoperabilitas, green cloud, dan quantum computing.

Penulis berharap buku ini dapat menjadi referensi yang bermanfaat bagi mahasiswa, dosen, peneliti, praktisi IT, maupun siapa saja yang ingin memperdalam pemahaman mengenai Cloud Computing. Dengan cakupan materi yang luas dan terstruktur, buku ini diharapkan mampu mendukung proses pembelajaran, pengembangan kompetensi profesional, serta implementasi teknologi cloud dalam berbagai bidang.

Semoga buku ini dapat memberikan manfaat yang luas dan menjadi kontribusi nyata dalam upaya meningkatkan literasi teknologi serta mendukung percepatan transformasi digital di Indonesia.

November 2025
Penulis

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Mengampu mata kuliah Pengantar Teknologi Informasi, Sistem Operasi, Komunikasi Data dan Jaringan Komputer, Manajemen dan Desain Jaringan Komputer, Teknologi Antar Jaringan.

Sebelumnya pernah bekerja di beberapa perusahaan sebagai support and system engineer, dilibatkan dalam proyek komputer dan jaringan di sekolah dan perusahaan.

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Butsiarah lahir di Kendari, pada 11 Mei 1991. Saat ini penulis sebagai dosen di Universitas Negeri Makassar. Tercatat sebagai lulusan Universitas Muslim Indonesia Fakultas Ilmu Komputer Jurusan Teknik Informatika (S1) pada tahun 2012 dan lulusan Universitas Negeri Makassar Program Studi Pendidikan Teknologi dan Kejuruan Kekhususan Pendidikan Teknik Informatika dan Komputer (S2) pada tahun 2017.



Taufik. Sedang menempuh pendidikan doktoral di Prodi S3 Matematika dan Ilmu Pengetahuan Alam Universitas Airlangga dengan tema penelitian "Teknologi Informasi untuk Disabilitas". Sebelumnya telah menempuh pendidikan S1 dan S2 di ITS Surabaya. Saat ini ia sebagai dosen tetap di Prodi S1 Sistem Informasi Fakultas Sains dan Teknologi Universitas Airlangga.

Mengampu mata kuliah Pemrograman Web, Pemrograman Mobile, Jaringan Komputer, Keamanan Sistem Informasi, Pengembangan Proyek Sistem Informasi, Design Thinking, Design UI/UX.

Aktif sebagai peneliti di beberapa lembaga pendidikan inklusi, komunitas disabilitas, komunitas Cyber Security, dan lain-lain

Penelitian dan produk aplikasi yang sedang dikembangkan antara lain aplikasi yang mendukung pembelajaran untuk anak-anak disabilitas berbasis web dan mobile, aplikasi monitoring kesehatan bagi disabilitas fisik berbasis mobile, data-driven untuk inovasi teknologi bagi disabilitas, micro-service.

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George Morris William Tangka memperoleh gelar Sarjana Komputer (S.Kom) dan gelar Magister Administrasi Bisnis (M.B.A.) dari Kunshan University, Taiwan. Saat ini, ia menjabat sebagai Dosen di Universitas Klabat, Indonesia. Minat penelitiannya mencakup bidang analitik data, sistem pendukung keputusan, dan pembelajaran mesin. Karya-karyanya berfokus pada pemanfaatan teknik berbasis data dan sistem cerdas untuk meningkatkan proses pengambilan keputusan dalam konteks

organisasi dan bisnis.

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Rahmad Bahri adalah dosen di Universitas Samudra yang memiliki keahlian di bidang jaringan komputer dan keamanan komputer. Ia aktif dalam kegiatan pengajaran, penelitian, serta pengabdian kepada masyarakat yang berfokus pada pengembangan infrastruktur jaringan, dan keamanan sistem informasi.

Sebagai akademisi, harus memiliki visi untuk mengintegrasikan konsep keamanan dan efisiensi jaringan dalam pembelajaran berbasis teknologi masa depan, khususnya dalam konteks transformasi digital dan adopsi cloud computing di Indonesia.



Mhd. Basri, S.Si., M.Kom. Lahir di Binjai pada tanggal 11 Juli Tahun 1988. Menyelesaikan pendidikan dasar di SD Negeri 112162 Rantau Prapat (SDN 13 Rantau Utara) tahun 2000 , Kemudian dilanjutkan SMP di sekolah Negeri 1 Rantau Utara tahun 2003 dan SMA di Negeri 1 Rantau Utara tahun 2006. Wisuda Sarjana di Universitas Negeri Medan (UNIMED) Medan pada bidang ilmu matematika pada tahun 2011, dan menyelesaikan program Magister di Fakultas Ilmu Komputer dan Teknologi Informasi pada program studi Teknik Informatika di

Universitas Sumatera Utara (USU) tahun 2017. Sebagai tenaga pengajar yang bertugas di Fakultas Ilmu Komputer dan Teknologi Informasi UMSU pada tahun 2020 sampai sekarang. Penulis juga mengasuh mata kuliah Analisis dan Desain Sistem, Mikrokontroler dan Bahasa Assembly, Internet of Thing (IoT) dan Robotik pada program studi Teknologi Informasi.



Raemon Syalumairi telah menyelesaikan Pendidikan Program S1 di UPI "YPTK" Padang dan S2 di UPI "YPTK" Padang. Ia adalah dosen tetap pada Program Studi Teknik Komputer, Jurusan Teknologi Informasi, Politeknik Negeri padang.

Mengampu mata kuliah Database, Pemrograman Web Dasar, Sistim Enterprise, Sistem Informasi Geografis, Pemrograman Mobile. Selama ini terlibat aktif sebagai dosen pembimbing mahasiswa Teknik Komputer, Manajemen Informatika dan Rekayasa

Perangkat Lunak dengan luaran Rancangan dan Sistim Informasi. Sejak tahun 2022 sampai sekarang terlibat sebagai pengurus Provinsi Sumatera Barat Departemen Hukum dan HKI pada organisasi IndoCEISS dan sejak tahun 2023 juga terlibat sebagai anggota pada organisasi IAII.

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Robbi Rahim adalah seorang akademisi dan peneliti di bidang ilmu komputer, khususnya keamanan siber dan kriptografi. Beliau dikenal sebagai individu yang produktif dalam menghasilkan karya ilmiah, dengan banyak publikasi di jurnal-jurnal internasional dan prosiding konferensi.

Beberapa poin penting mengenai Robbi Rahim:

Bidang Keahlian: Keamanan siber, kriptografi, forensik digital, jaringan komputer, dan sistem informasi.

Aktivitas Akademik: Selain aktif meneliti dan mempublikasikan karya, beliau juga sering menjadi pembicara di berbagai seminar dan lokakarya terkait bidangnya.

Publikasi: Beliau memiliki rekam jejak publikasi yang mengesankan, menunjukkan dedikasi dan kontribusinya pada pengembangan ilmu pengetahuan.

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Muharman Lubis sekarang menjabat sebagai Kaprodi Magister Sistem Informasi di Telkom University dari tahun 2021. Dia merupakan akademisi dan peneliti di bidang Strategi Sistem Informasi Organisasi yang meraih gelar Doctor of Philosophy (Ph.D.) bidang Information Technology dari International Islamic University Malaysia pada tahun 2017, setelah sebelumnya menyelesaikan Master of Information Technology pada tahun 2011, dan Bachelor of Information Technology (Computer Networking) di Universiti Utara Malaysia tahun 2008. Pada tahun 2025 menyelesaikan Magister Manajemen di Universitas Widyatama.

Selain itu, dia juga sedang menempuh Sarjana Hukum di Universitas Terbuka, serta mengikuti program Double Degree di International Open University untuk Bachelor of Arts (Islamic Studies) dan Bachelor of Science (Psychology). Saat ini, dia juga tengah melanjutkan studi Program Doktorat Hukum Islam terkait Ekonomi Syariah di UIN Sunan Gunung Jati. Dalam kiprahnya, dia mengampu berbagai mata kuliah strategis yang relevan dengan perkembangan teknologi informasi di antaranya Tata Kelola Data & Teknologi Informasi, Analisis Data & Bisnis Perusahaan, Transformasi & Strategi Digital, Inovasi & Kewirausahaan Teknologi, Manajemen Pengetahuan & Sumber Daya, Metodologi Penelitian, serta Hukum & Etika Siber. Keahliannya tidak hanya terbatas pada pengajaran, tetapi juga meluas ke penelitian interdisipliner, kepemimpinan akademik, dan pengembangan kurikulum yang inovatif.

Prestasi akademik dan profesionalnya sangat menonjol. Ia merupakan lulusan terbaik S2 pada Konvokesyen ke-27 IIUM, serta dianugerahi sebagai Dosen Muda Berprestasi Nasional (Silver Award Sinta) 2024. Ia juga termasuk dalam Top 10 Dosen Publikasi Karya Tulis Terbaik 2019, serta terpilih sebagai Dosen Penggerak Inovasi Digital di Telkom University tahun 2024. Sebagai pengakuan atas kompetensinya, ia telah meraih lebih dari 300 sertifikasi kompetensi nasional dan internasional, menjadi Asesor PIKOB dan RPL, serta aktif berkontribusi dalam berbagai forum akademik global. Dalam karya ilmiah, telah menulis lebih dari 250 dokumen ilmiah terindeks, menjadi pengarang di lebih dari 150 buku kolaborasi, serta pemegang lebih dari 150 hak cipta. Selain itu, ia juga berperan sebagai pengulas (reviewer) untuk lebih dari 100 artikel

jurnal bereputasi internasional dan 50 konferensi terindeks Scopus, menunjukkan reputasi internasionalnya sebagai akademisi yang diakui.

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Baso Ali, S.Pd., M.Pd., adalah seorang dosen di Universitas Cokroaminoto Palopo yang memiliki keahlian di bidang pendidikan dan pengajaran. Beliau aktif melakukan penelitian yang berkaitan dengan pengembangan pendidikan.



Sirmayanti lahir di Makassar tahun 1979 dan tercatat sebagai lulusan Master of Engineering (M.Eng) & Doctor of Philosophy (Ph.D) di bidang Electrical and Electronic Engineering di Victoria University of Melbourne masing-masing pada tahun 2008 dan 2015. Selain aktif sebagai dosen ASN dan peneliti di Politeknik Negeri Ujung Pandang (PNUP), Sirmayanti juga produktif sebagai penulis buku dan karya ilmiah yang telah dipublikasikan dalam berbagai jurnal dan prosiding bereputasi nasional maupun internasional. Hingga saat ini, ia telah menerbitkan 20 buku ber-ISBN, memegang 4 paten, serta 30 hak cipta Kekayaan Intelektual dari berbagai karya inovatif yang diciptakannya. Sirmayanti merupakan anggota aktif Centre for Applied

Telecommunications Technology Research Group (CATTAR) yang fokus pada penelitian di bidang Wireless Communication Technology, Sistem Nirkabel 4G–5G, Radio Frequency, Internet of Things (IoT), Big Data, Machine Learning, dan Artificial Intelligence.

Selain kegiatan akademik dan riset, Sirmayanti juga aktif dalam organisasi profesi insinyur melalui keterlibatannya sebagai pengurus di tingkat cabang, wilayah, dan pusat Persatuan Insinyur Indonesia (PII). Ia juga aktif di Badan Keahlian Elektro (BKE) Pusat PII serta di Forum Perempuan Insinyur (FPI-PII) Indonesia. Pemegang sertifikat Insinyur Profesional Utama (IPU), ASEAN Engineer dan APEC Engineer ini saat ini juga dipercaya sebagai Head of Indonesia Representative pada Working Group the ASEAN Engineering Inspectorate (AEI) Electronics dan AEI Electrical Installation di bawah ASEAN Federation of Engineering Organisations (AFEO).



Dr. Ir. Janner Simarmata, S.T., M.Kom. (C.SP., C.BMC., C.DMP., C.PI., C.PKIR., C.SF., C.PDM., C.SEM., C.COM., C.SI., C.SY., C.STMI INT'L, CBPA., C.WI.) Sarjana Teknik Informatika dari STMIK Bandung, Magister Ilmu Komputer dari Universitas Gadjah Mada (UGM) dan Doktor Pendidikan Teknologi Kejuruan (PTK) diperoleh dari Universitas Pendidikan Indonesia (UPI) Bandung bidang kajian Blended Learning. Program Profesi Insinyur (PPI) dari Institut Teknologi Indonesia (ITI).

Alumni Taplai II 2024 Lemhannas RI . Menulis buku sejak tahun 2005 dan telah menulis 315 buku dan 200 HKI. Dosen di Pendidikan Teknologi Informatika dan Komputer (PTIK) Fakultas Teknik Universitas Negeri Medan.

CLOUD COMPUTING

REFERENSI LENGKAP

Cloud Computing telah berkembang menjadi pilar penting bagi dunia industri, pemerintahan, pendidikan, dan bisnis modern. Perkembangan layanan digital, otomatisasi, Internet of Things (IoT), Artificial Intelligence (AI), serta kebutuhan akan penyimpanan dan pemrosesan data dalam skala besar menjadikan teknologi cloud sebagai infrastruktur strategis. Oleh karena itu, buku ini dirancang sebagai panduan lengkap yang tidak hanya menghadirkan teori, tetapi juga memberikan pemahaman praktis dan studi kasus yang relevan.

Buku ini membahas:

- Bab 1 Pengenalan Cloud Computing
- Bab 2 Model Layanan Cloud Computing
- Bab 3 Arsitektur Cloud Computing
- Bab 4 Platform Cloud Computing Populer
- Bab 5 Virtualisasi dalam Cloud Computing
- Bab 6 Backup dan Pemulihan Data di Cloud
- Bab 7 Pengelolaan Biaya Cloud
- Bab 8 Cloud Networking
- Bab 9 Aplikasi Cloud Computing
- Bab 10 Cloud Storage
- Bab 11 Cloud Security: Proteksi Data
- Bab 12 Manajemen Cloud Praktik Terbaik
- Bab 13 Edge Computing dan Cloud
- Bab 14 Cloud untuk Internet of Things (IoT)
- Bab 15 Tren Masa Depan Cloud Computing



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