beyond

Jakarta EE

and microprofile

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"It's not work if you like it"
…so I never worked. #java

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learn once,
never migrate

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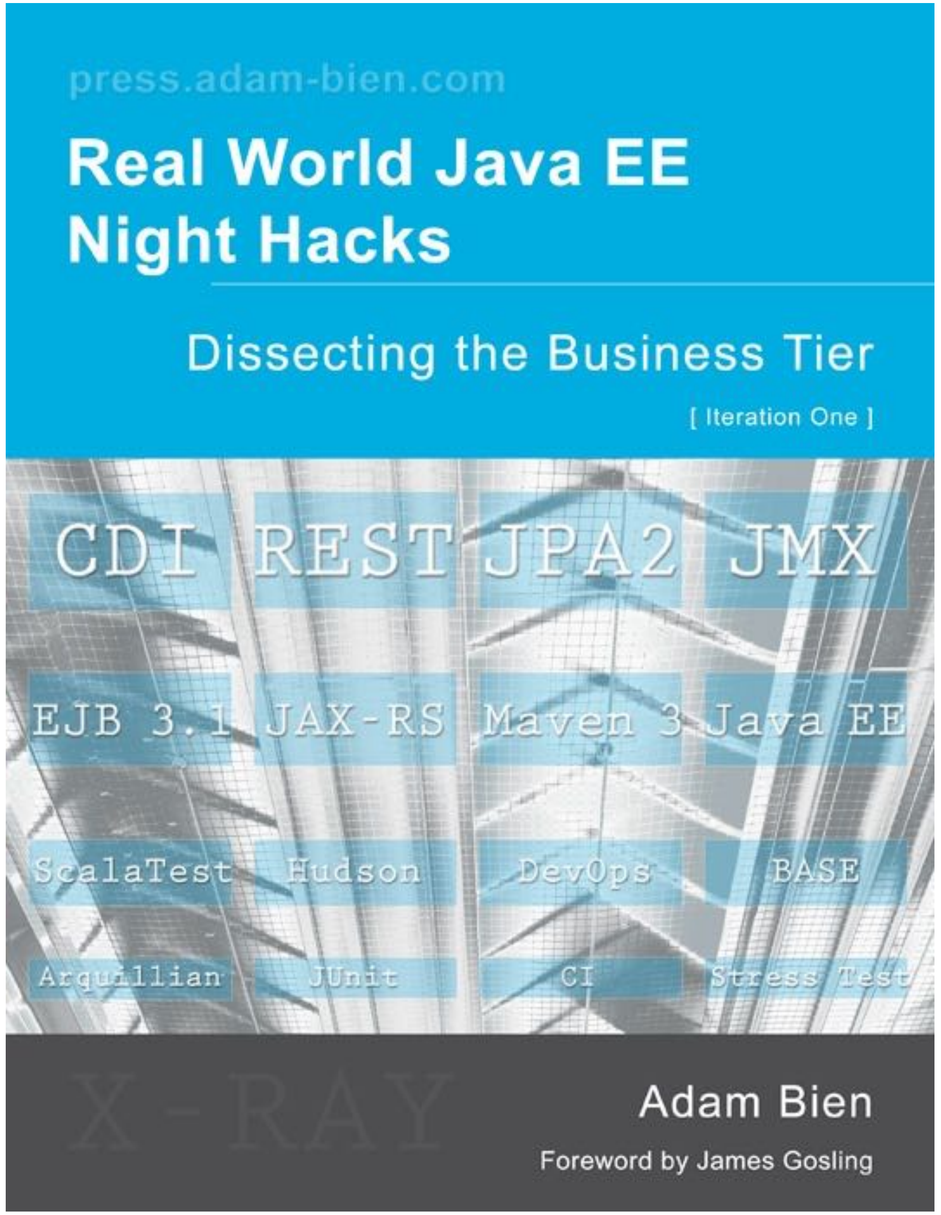

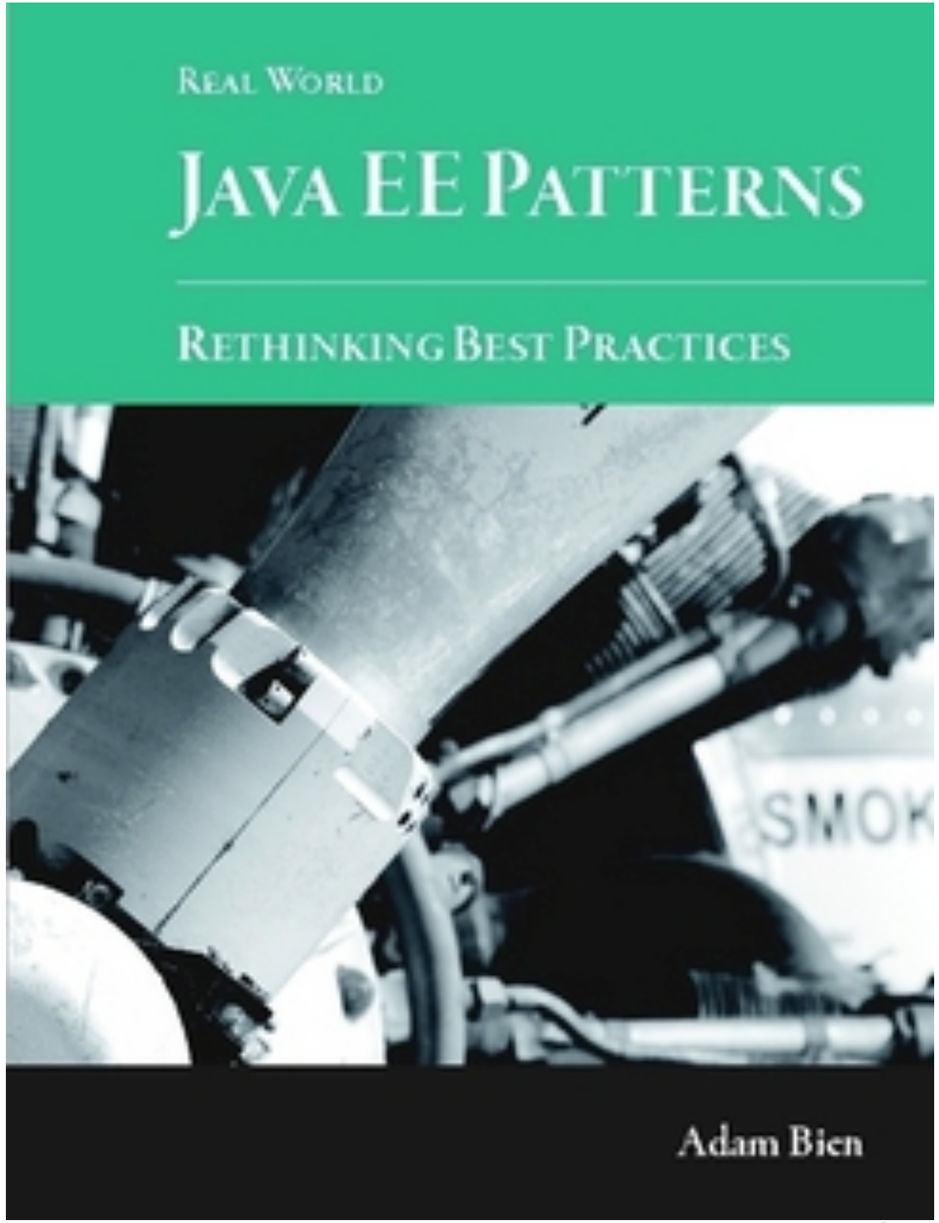

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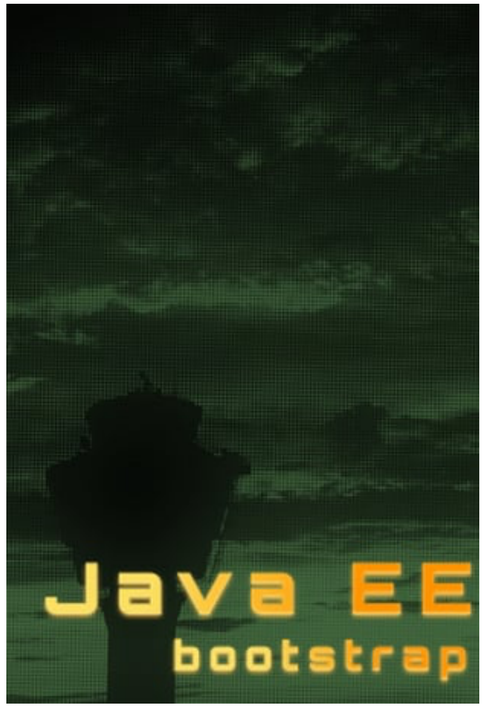
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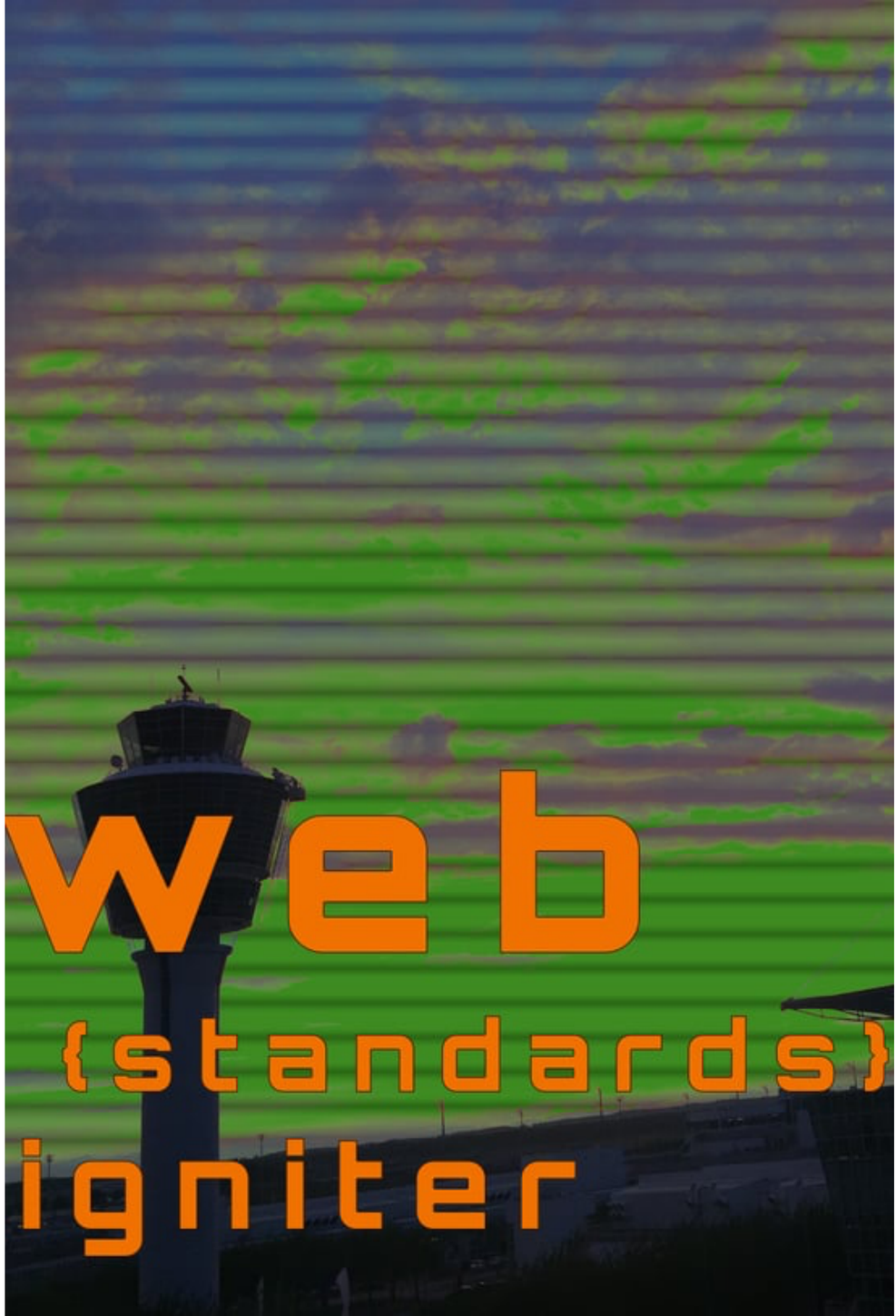

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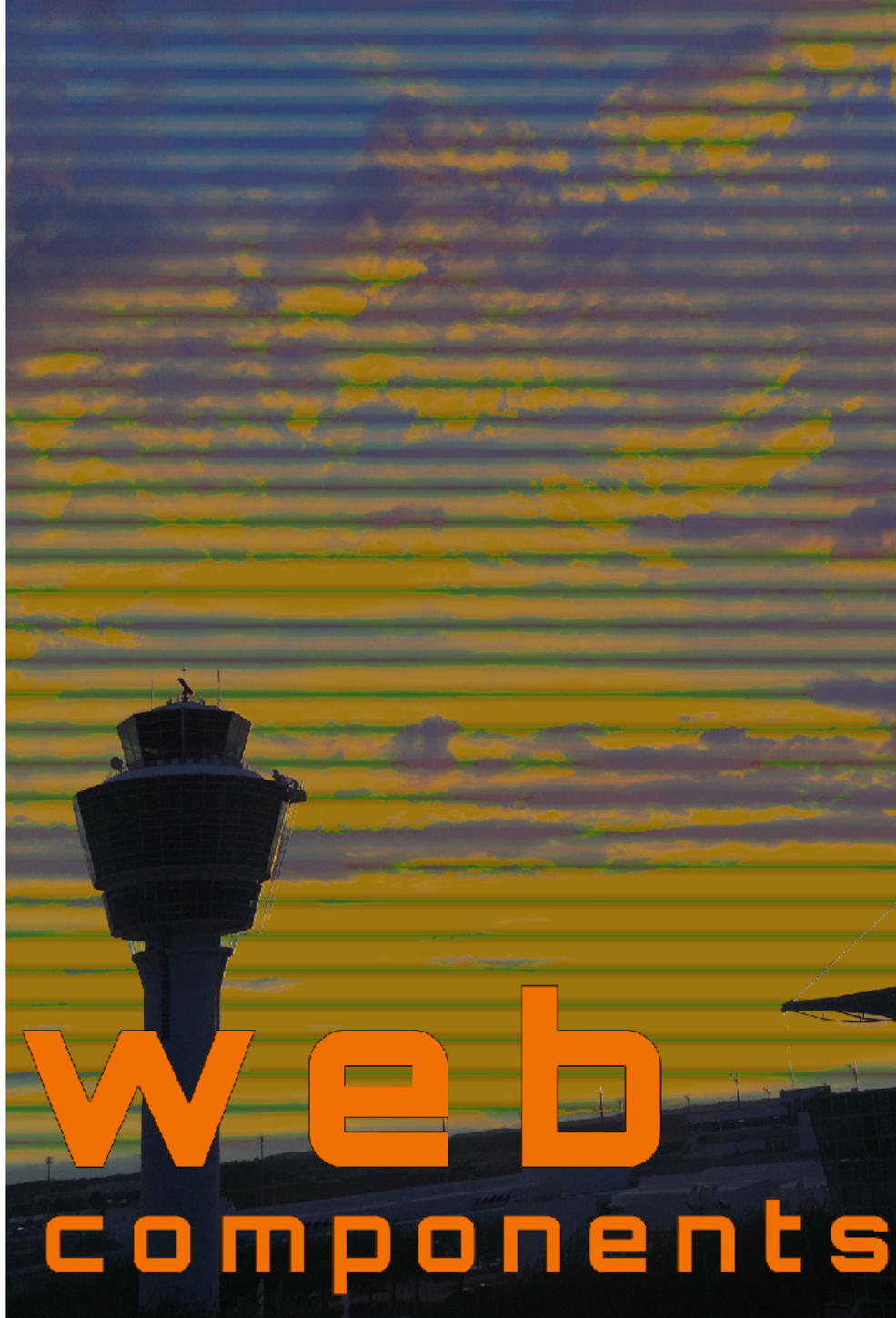

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AI

Fluid Logic

RBAC

Runtimes

Logging

Read phenomena

https://en.wikipedia.org/wiki/Isolation_(database_systems)#Read_phenomena

Dirty Reads

- A dirty read (aka uncommitted dependency) occurs when a transaction is allowed to read data from a row that has been modified by another running transaction and not yet committed.

Non-repeatable reads

- A *non-repeatable read* occurs, when during the course of a transaction, a row is retrieved twice and the values within the row differ between reads.

Phantom reads

- A *phantom read* occurs when, in the course of a transaction, new rows are added or removed by another transaction to the records being read.

Isolation Levels

- Serializable
- Repeatable reads
- Read committed
- Read uncommitted

Understanding CAP in Java EE context

CAP vs. FLP (Fischer, Lynch and Paterson)

In an asynchronous network where messages may be delayed but not lost, there is no consensus algorithm that is guaranteed to terminate in every execution for all starting conditions, if at least one node may fail-stop.

Paxos, Multi Paxos, Fast Paxos

RAFT

Raft is a consensus algorithm designed as an alternative to Paxos. It was meant to be more understandable than Paxos by means of separation of logic, but it is also formally proven safe and offers some additional features.[1] Raft offers a generic way to distribute a state machine across a cluster of computing systems, ensuring that each node in the cluster agrees upon the same series of state transitions.

https://en.wikipedia.org/wiki/Raft_(computer_science)

Principles: ACID, BASE, Copy On Write, Lazy / Eager Loading, Optimistic / Pessimistic Locking

Non-Relational DBs (NoSQL)

NoSQL

- Key Value
- Document
- Graph

Clustering

- Don’t Distribute
- Replication
- Distribution (Sharding)
- P2P
- Master-Slave

Write Consistency

- Write-write conflicts
- Conditional updates
- Session consistency
- Replication durability (HTTP Session)
- Locks

Read Consistency

- Read-write conflict
- Replication consistency
- Conditional updates

Transactions

- System Transactions
- Business Transactions
- Simplicity -> System TX == Business TX

Principles: ACID, BASE, Copy On Write, Lazy / Eager Loading, Optimistic / Pessimistic Locking

Versioning

- Counter
- Timestamp
- UUID
- Content based: Hash (see Merkle Tree)
- Composite
- History: vector clocks

Map-Reduce

- Inter-Aggregate computations
- 2 Phases:
  - Map: parallel filtering, extraction, transformation
  - Reduction: Map results transformed into single values

Dynamo

Consistent Hashing

Gossip Protocol

Vector Clocks

Hinted Writes

Read Repair

Merkle tree

Serialization, Externalization and optimizations

Graal VM

Off-heap memory

Column and row based stores

What is map-reduce?
Samples and use cases.

Distributed and persistent caches

- Infinispan (JBoss Cache)
- Hazelcast

Esoteric DB Integrations

Serverless

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Thank You!

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