

ARCHITECTURE TYPES

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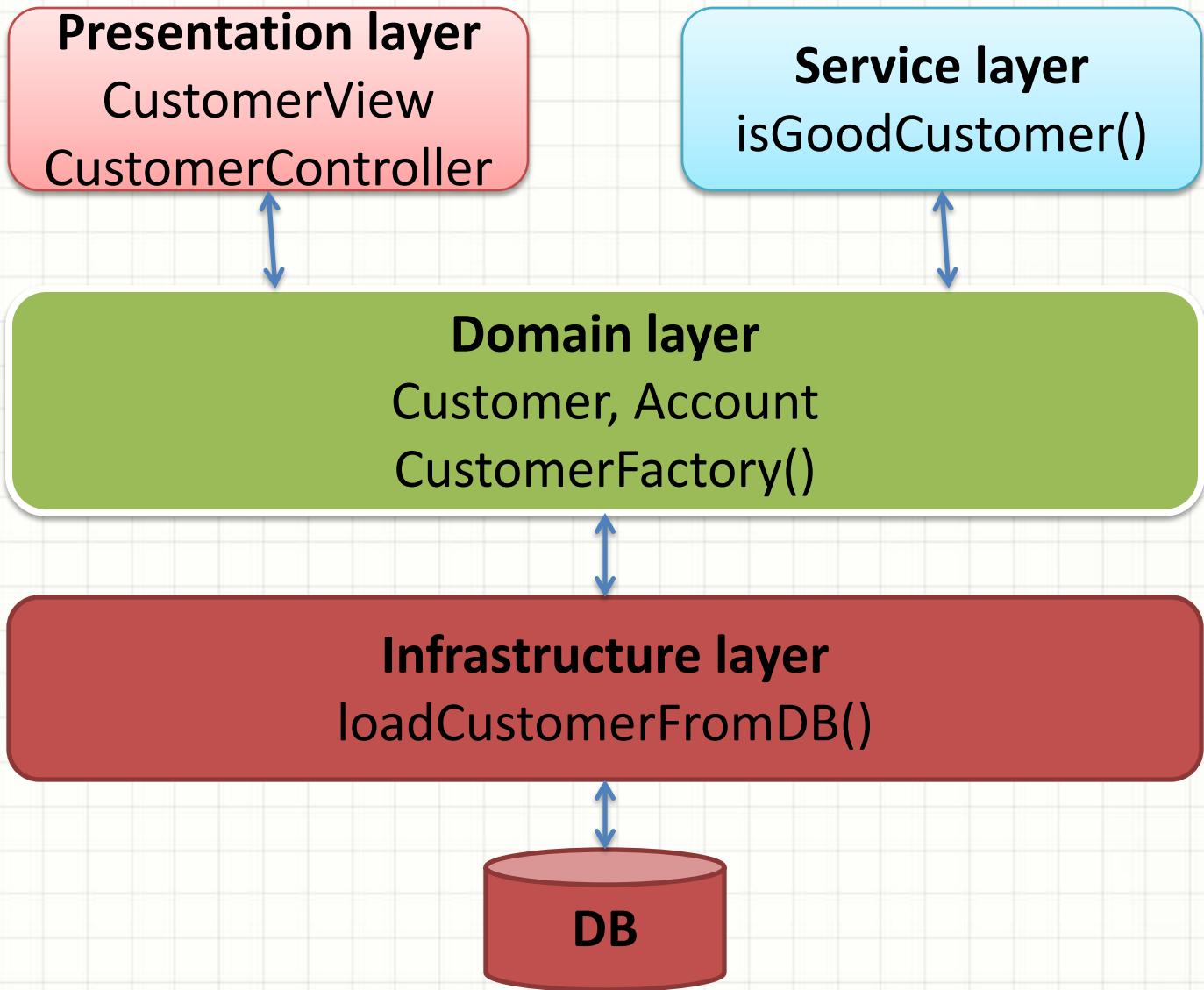
Agenda

- Layered architecture
- SOA
- Event-driven architecture
- Space-based architecture
- Micro service

LAYERED ARCHITECTURE



Example – banking



Benefits

- Less code per layer
- Reduced complexity
 - Easier maintenance
 - Easier extensibility
 - Easier to test
- Code reuse

SERVICE ORIENTED ARCHITECTURE



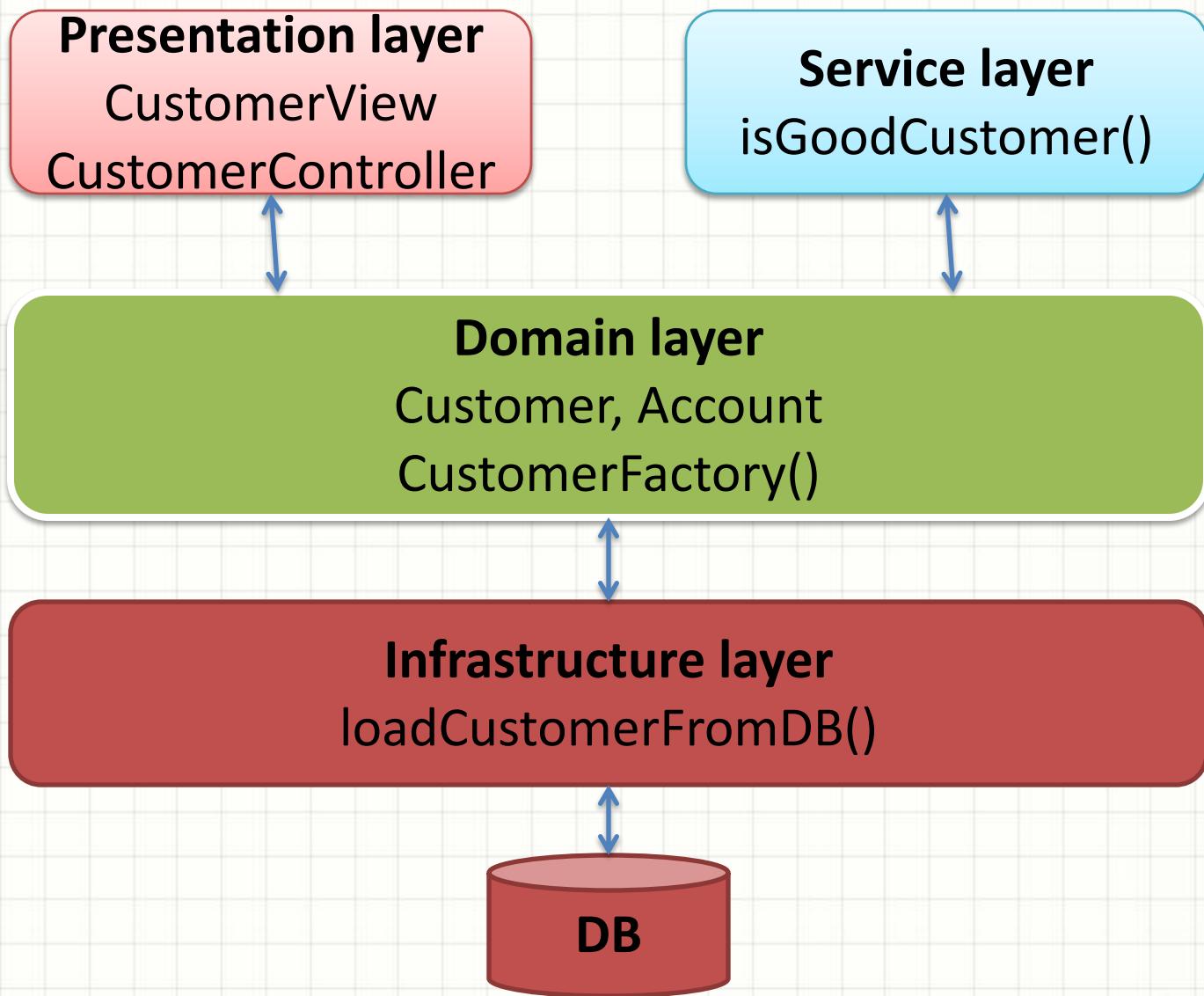
What is SOA?

- An architecture based on reusable building blocks, “services”, which:
 - Are autonomous, stateless business functions
 - Use a request/responses pattern
 - Use well-defined, standard interfaces

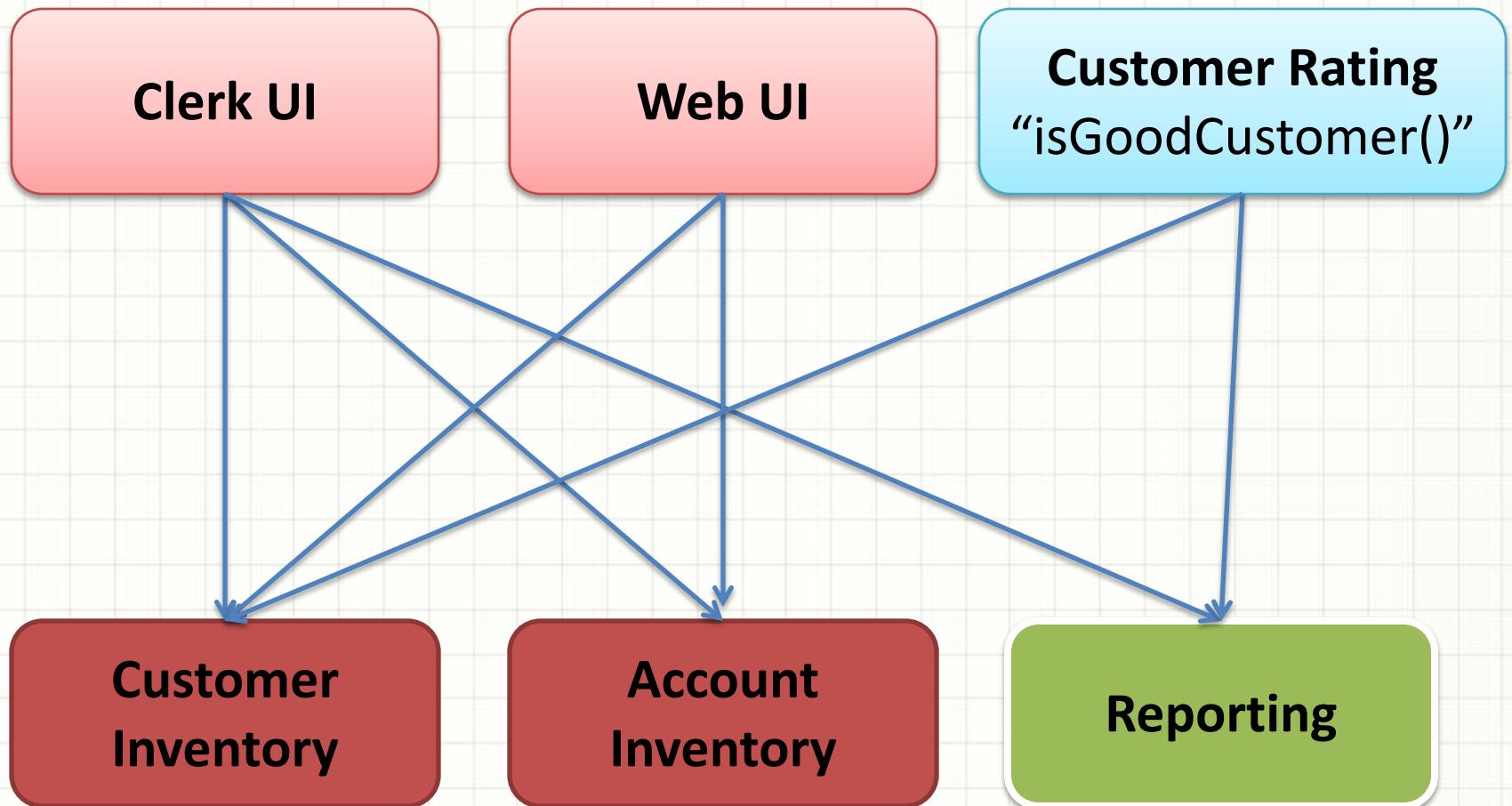
SOA features

- Communication through standard protocols
 - XML, SOAP, JSON, HTTP, etc.
- OS-, language- and platform-independent
- Discoverability
 - Service registries
- Loosely coupled
- Explicit boundaries

Example – banking layers

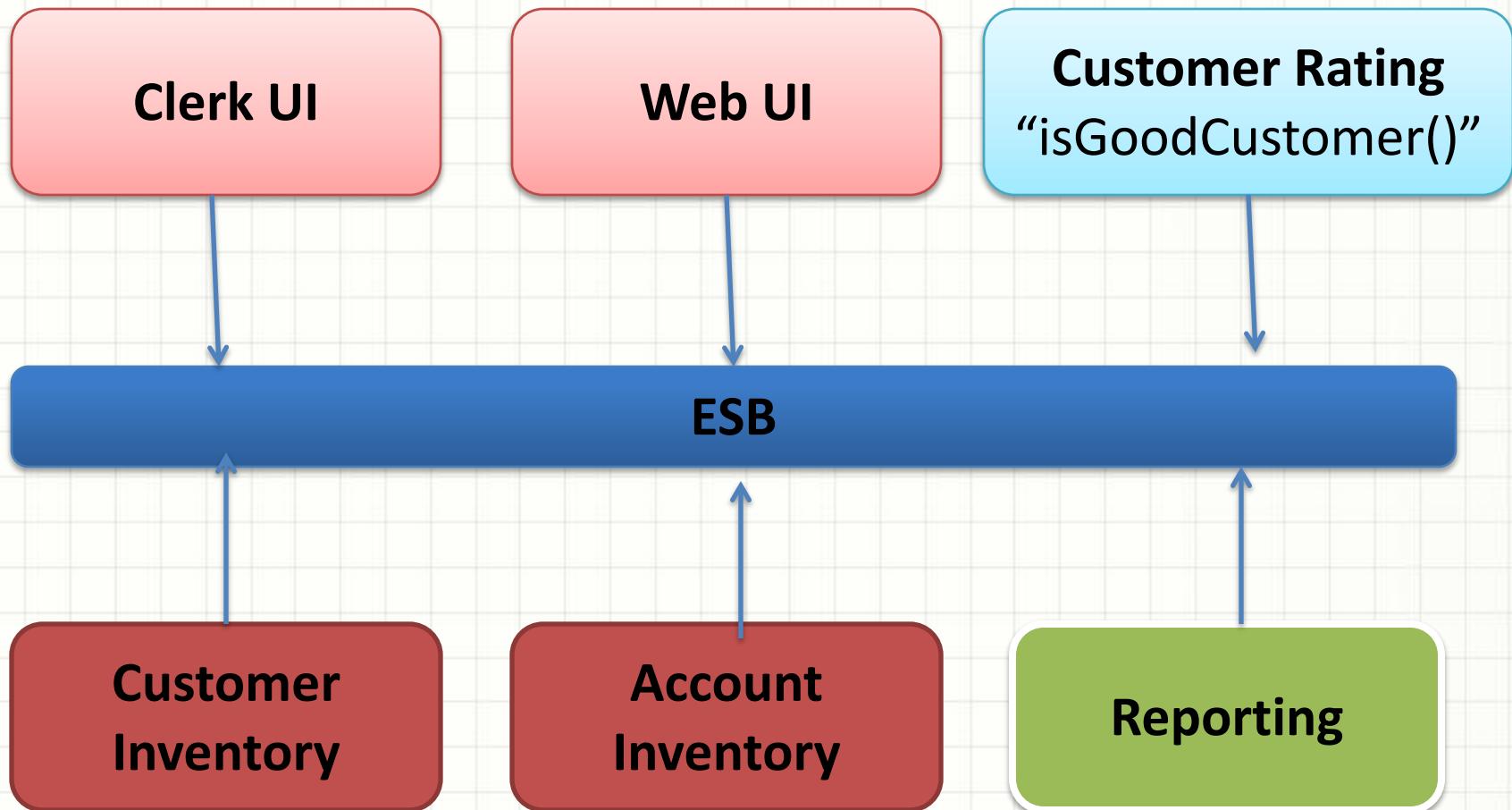


Example – banking SOA





Example – banking SOA



EVENT DRIVEN ARCHITECTURE



Interactions

Type of interaction	Initiator	Details
Time-driven	Time	Eg: batch processing
Request-driven	Client	Client / server
Event-driven	Event	Open ended

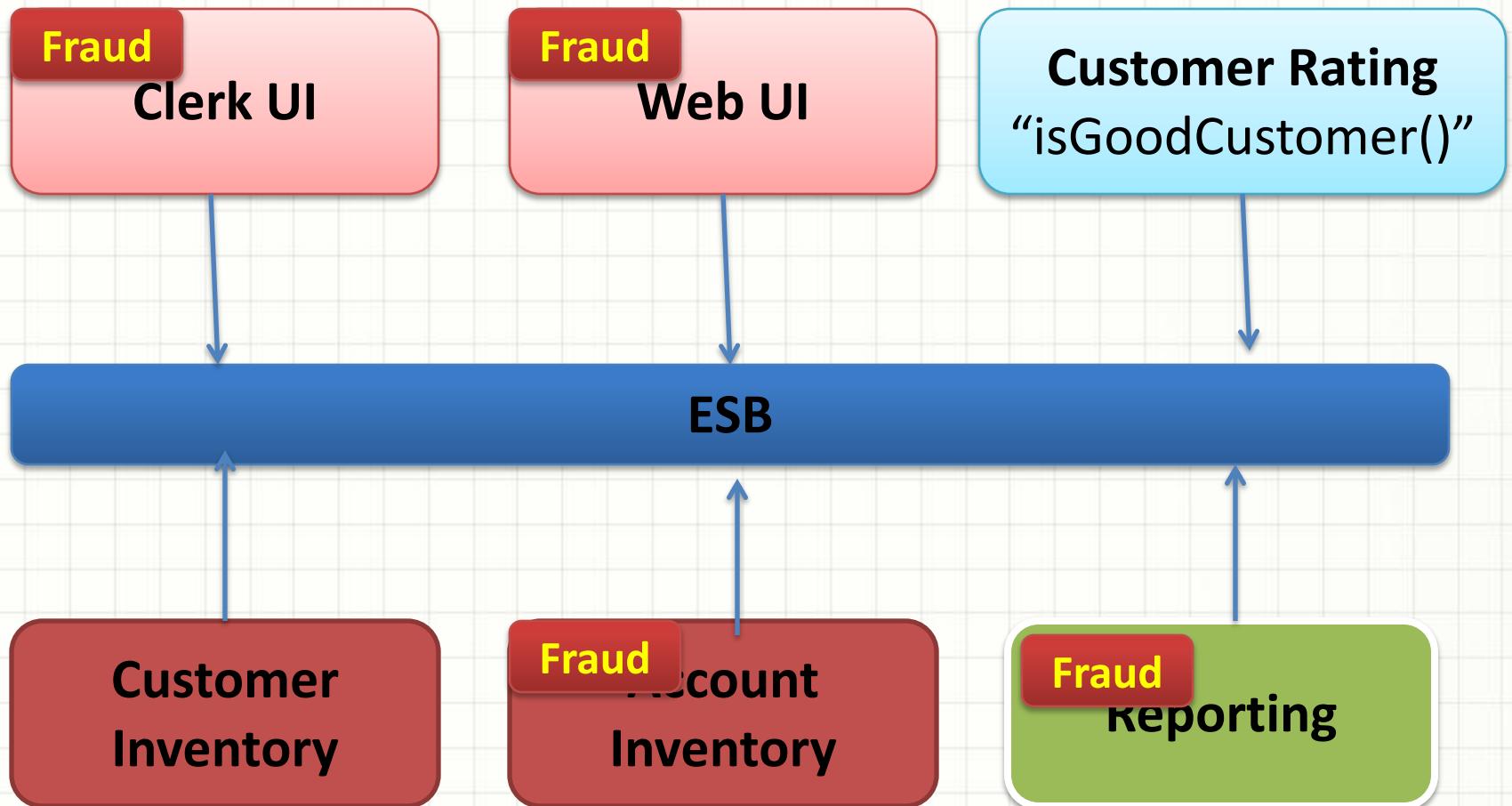
Event-driven architecture

- Architecture
 - Producer / event bus / consumers
 - No central control
 - Stateless
- Event types
 - Notification
 - Transactional
 - Event reported can change something
 - Reliable transport

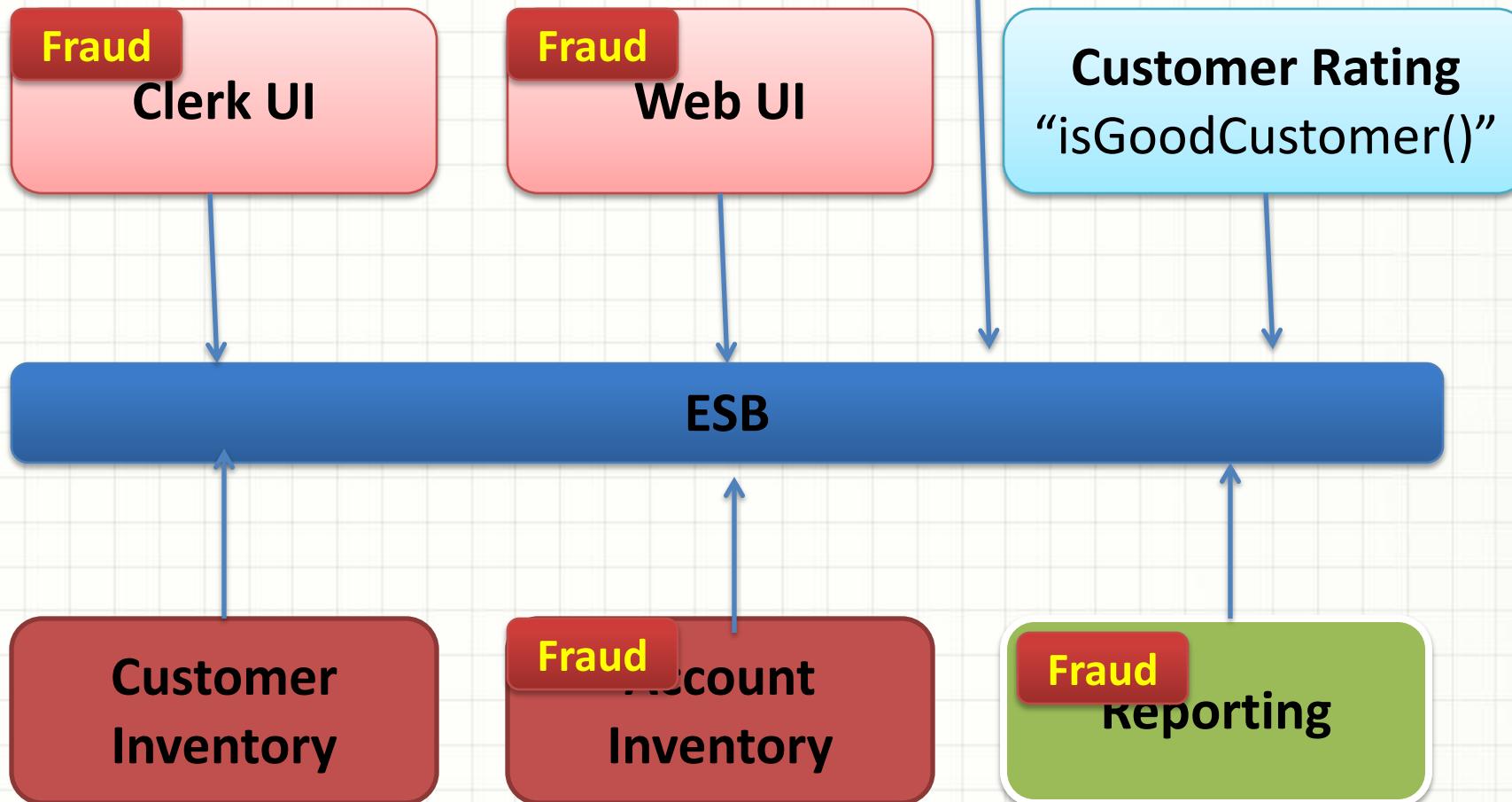
Considerations

- Time ordering of events
- Once and only once delivery
- Payload format – need schema support
- -> choice of message broker
 - Resilience
 - Slow consumers
 - Durable / non durable subscriptions
 - Payload
- Security: event can carry sensitive data

Let's add fraud detection



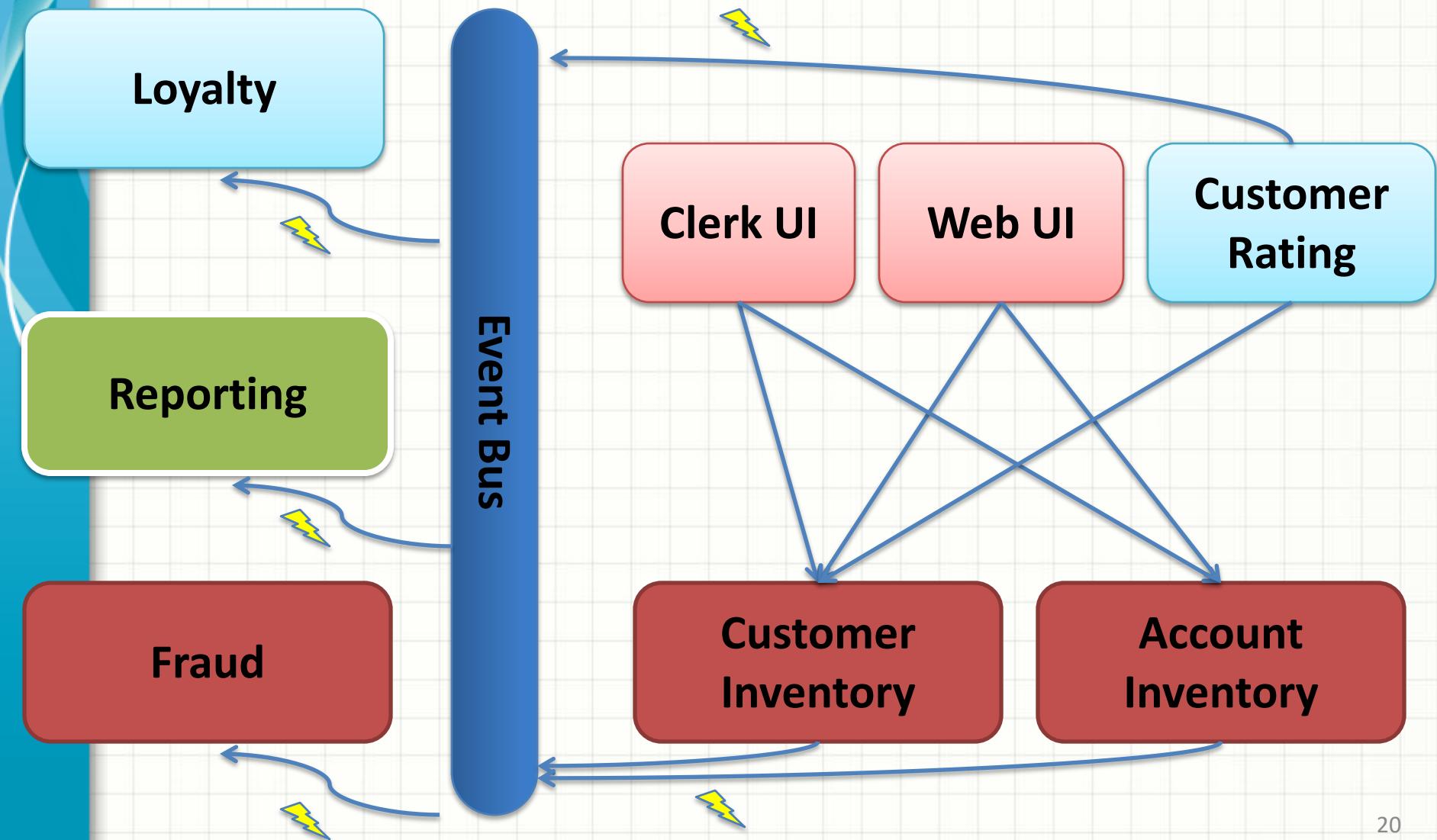
And a loyalty program



Benefits

- Less integrations point (not point to point), fire & forget
- Performance, scale
- SOA doesn't handle aspects very well. Some logic spreads all over and domain become polluted by extra logic
- EDA handles cross-cutting aspects better
- Designed for extensibility

SOA + EDA



EDA use cases

- Government: border control, taxes
- Compliance (Eg: regulatory)
- Track and trace
- Fraud, trading
- Equipment monitoring

SOA / EDA

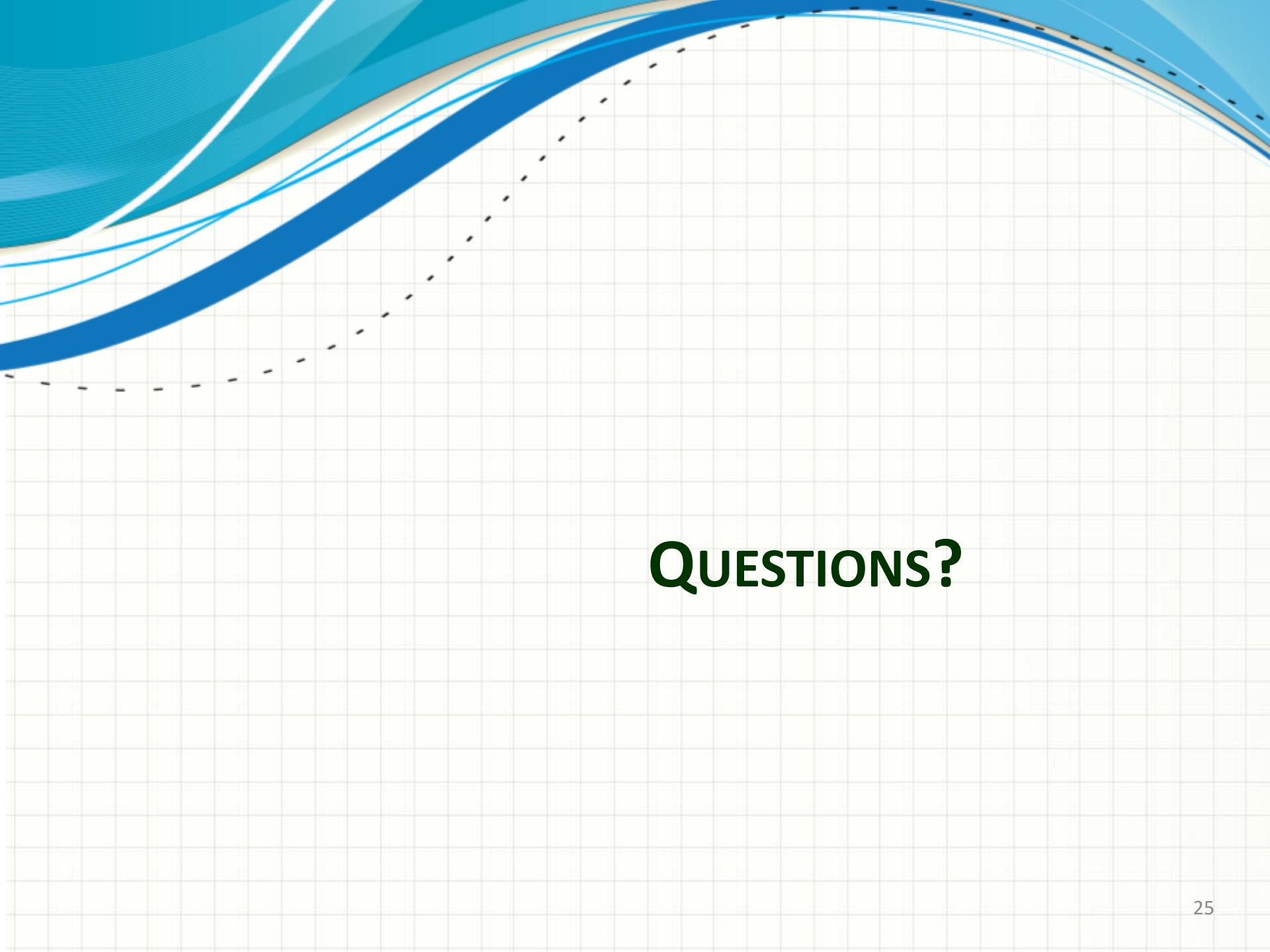
- SOA
 - Messages drive computations
 - Interfaces of operations
 - Sync or async
 - Business processes attached to services
 - Sustained performance depends on weakest link
- EDA
 - Events drive computations
 - Interfaces of events
 - Always async
 - Business processes attached to complex events
 - Harder to test
 - EDA can absorb peaks (but requires tuning of the system)

SPACE BASED ARCHITECTURE



What is Space-based architecture?

- Linear scalability
- Multiple processing units
- Requires problems that can be sliced in parallel chunks
- Computing grid vs. data grid
 - See SETI@Home and other computational grids



QUESTIONS?