

# INSOLAR

**Insolar**  
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<b>1</b>	<b>Overview</b>	<b>3</b>
<b>2</b>	<b>Distinctive Features</b>	<b>5</b>
2.1	Federation of Clouds . . . . .	5
2.2	Cloud . . . . .	5
2.3	Globular Network . . . . .	5
2.4	OmniScaling . . . . .	6
2.5	Domain . . . . .	6
2.6	Data Safety . . . . .	6
2.7	Capacity Marketplace . . . . .	6
2.8	Separation of Business Logic . . . . .	6
2.9	Business Templates . . . . .	6
2.10	Per-transaction Consensus . . . . .	6
2.11	Data and Execution Scattering . . . . .	7
2.12	Support for Large and Long Transactions . . . . .	7
2.13	Integration and Compatibility . . . . .	7
2.14	Native Support of Industry-standard Languages . . . . .	7
<b>3</b>	<b>Architecture</b>	<b>9</b>
<b>4</b>	<b>Glossary</b>	<b>11</b>



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**Note:** Insolar's documentation is under development, its structure is not yet finalized. Expect updates soon.

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Insolar outlines a new vision for blockchain, in which key features such as network capacity and consensus are addressed in a way that will enable shared business processes and optimize contractual transactions for enterprise operations.

The Insolar platform offers flexible governance, which will allow users to choose between using an Insolar public network—creating a domain with its own rules—or hybridizing the public network and a private domain. Private domains can be stand-alone private networks with their own servers or permissioned networks with resources provided by ecosystem members. This flexibility enables distributed business networks where everyone can select the configuration and domain features that best meet their needs.

Insolar's smart contracts are designed with enterprise developers' needs in mind. They are streamlined to work with business logic, and they are easy to develop using Golang and, soon, Java and other JVM-based code. Moreover, the Insolar platform provides data safety features that enable businesses to run their operations on public networks if they choose while being compliant with regulations such as the EU's General Data Protection Regulation (GDPR) and other country-specific or company-specific cryptography standards.

Insolar's vision is to facilitate seamless low friction interactions between companies by distributing trust, thus accelerating and opening up new opportunities for innovation and value creation.

The Insolar platform is the most secure, scalable, and comprehensive business-ready blockchain toolkit in the world. Insolar's goal is to give businesses access to features and services that enable them to launch new decentralized applications quickly and easily, whether they need a minimum viable product or full-scale production software and to integrate those applications with existing systems.





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### Distinctive Features

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The Insolar platform is built to satisfy enterprise requirements by combining distributed and cloud technologies and dozens of industry-first features. Insolar is currently designing the proposed platform in an incremental fashion allowing it to progressively grow into the ultimate decentralized collaborative environment for various kinds of industries, companies, governments, and communities. Insolar sees these many features and capabilities as a mandatory part of blockchain implementation and integrates them as part of the Insolar platform.

#### 2.1 Federation of Clouds

Transparently connects multiple clouds based on Insolar technology, where each cloud runs and is governed independently (e.g., by a community, company, industry consortia, or national agency).

#### 2.2 Cloud

Organizes and unifies software capabilities, hardware capacities, and the financial and legal liability of nodes to ensure the transparent and seamless operation of business services (more details provided in Section 4.14).

#### 2.3 Globular Network

The backbone of a cloud. It is a set of protocols enabling the coordination of P2P networks of up to 1,000 nodes and a hierarchical network of up to 100,000 nodes (more details provided in Section 4.9).

## 2.4 OmniScaling

Is an integral feature that utilizes a multi role model of nodes, a multichain organization of storage, and an innovative approach to distributing work across the network by combining a network-wide membership consensus with deterministic role allocation, and with individual validation groups per each transaction. As a result, OmniScaling enables near-linear and dynamic scalability by CPU, storage capacity, and traffic (network throughput) for domains running within a cloud.

## 2.5 Domain

Enables different governance models, it defines policies for data and contracts, such as to allow public or permissioned models, or to apply national or industry standards (more details provided in Section 4.13).

## 2.6 Data Safety

Cost-efficient data safety and leakage prevention for shared cloud solutions through data scattering and density limits, atomic re-encryption, permissioned node access, signatures from nodes that have accessed data, and so on.

## 2.7 Capacity Marketplace

A special domain within a cloud that defines procedures for business services to do spot and long-term trading for CPU, storage, and traffic as commodities (more details provided in Section 9.3).

## 2.8 Separation of Business Logic

Helps to focus on what is essential for a business to operate and allows for the deployment of new business services as easy as creating a new mailbox or a website.

## 2.9 Business Templates

Come from a separation of business logic with the use of domains, making the reuse of business logic possible either as components or as full application templates for easy deployment (more details provided in Section 9.1.3).

## 2.10 Per-transaction Consensus

Allows validation and finality requirements to be defined as business logic components on a per-transaction basis to match the value and risk of transaction versus the speed and cost of validation.

## 2.11 Data and Execution Scattering

Together with atomic proxy re-encryption algorithms, data and execution scattering significantly reduce the impact of intrusions and data leakage for off-premise settings.

## 2.12 Support for Large and Long Transactions

Makes it easy to exchange documents, build complex business services, and use dynamic binding of services via marketplaces. It significantly reduces the complexity of development and deployment for the storage and processing of off-chain documents, while simultaneously increasing the consistency and integrity of blockchain solutions.

## 2.13 Integration and Compatibility

Provided via contracts and virtual machines, which can be attached to specific nodes and operate as integration gateways.

## 2.14 Native Support of Industry-standard Languages

Native support of contracts based on industry-standard languages, such as Golang and JVM, as well as support for distributed transactions and microservice-like integrations of contracts to enable the use of existing practices and skills.



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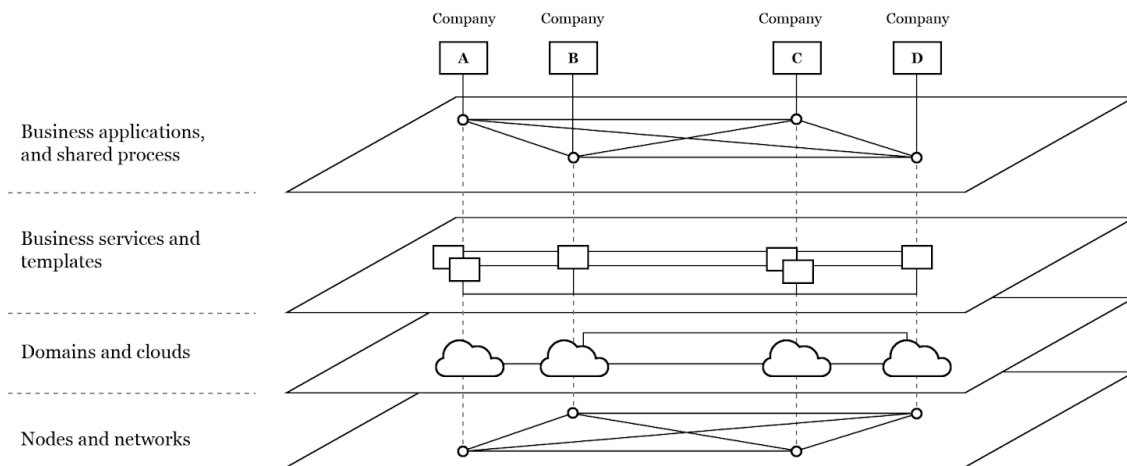
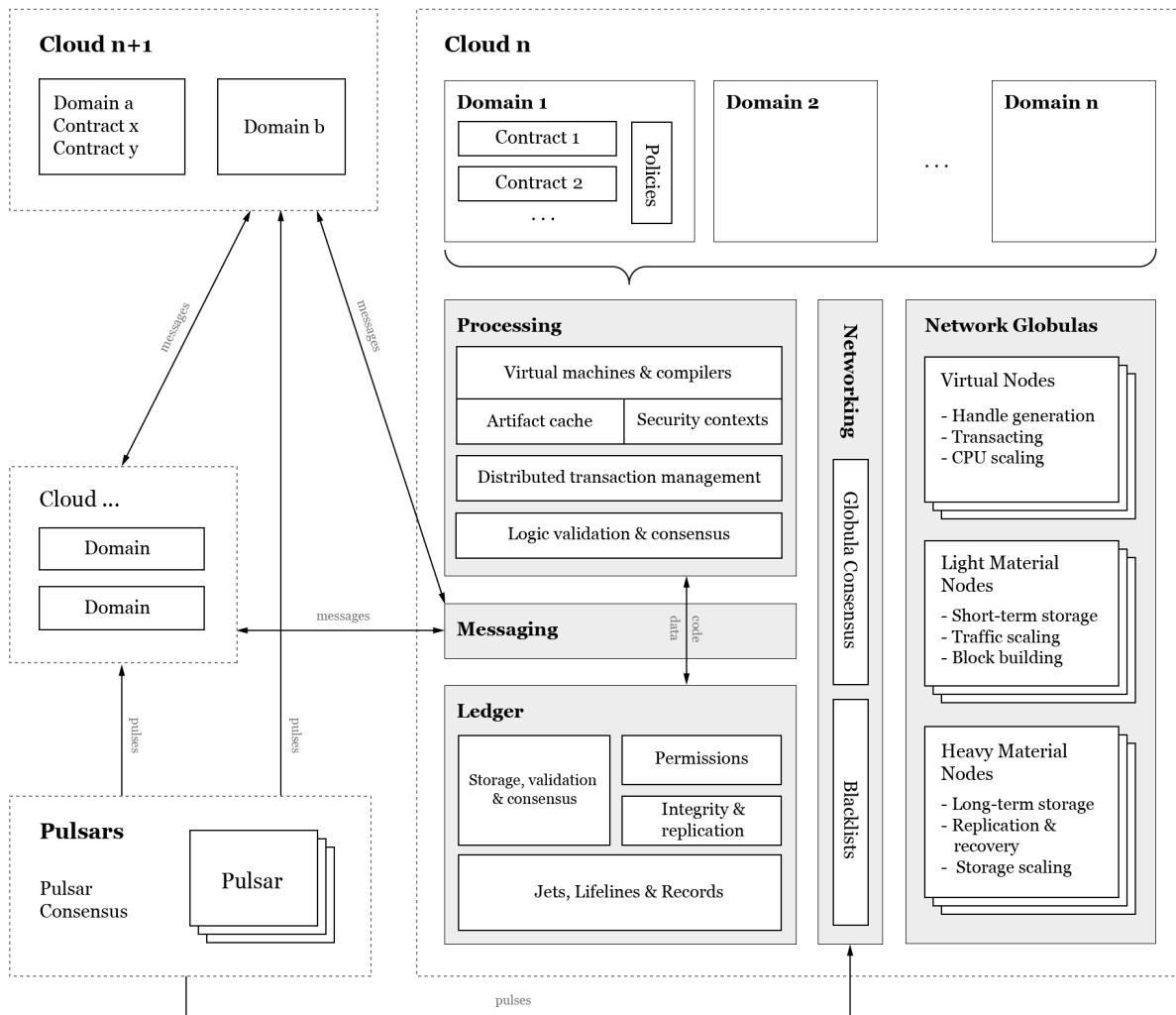
### Architecture

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The architecture of the Insolar platform is multilayer with multiple components and consensus to address complexity and a variety of requirements. The use of multilayer architecture makes platform design a challenging task, but with proper use it enables building complex solutions with better control of development risks and (later) of ownership costs.

Below is an illustration of the layered platform architecture that facilitates such a collaborative environment. The architecture is split into four layers. At the bottom layer, there are providers of hardware capacities, which are organized into national and/or industrial domains. At the next layer are clouds. This infrastructure can also be public and offered by governments or even communities as a public good (crowd-sourced computational resources). The next layer represents business services and templates for business applications provided by vendors. Finally, at the top layer, are applications owned by and tailored for companies who serve other companies.

Although this vision of a blockchain ecosystem might appear optimistic, Insolar is proving it is possible. Insolar is currently designing the proposed platform in an incremental fashion allowing it to progressively grow into the ultimate decentralized collaborative environment for various kinds of industries, companies, governments, and communities.



Below is a list of terms Insolar uses to designate its important concepts.

**Cloud** Blockchain network under the same node membership policy.

**Domain** Decentralized application (dApp) that governs access, consensus, mutability, and other capabilities for other dApps.

**Dust** Auxiliary object or record; a log record stored within a sidechain.

**Dustline** Removable Sideline for a Dust record.

**Federation** Interconnected blockchain networks running on the Insolar platform.

**Filament** Linked sequence of records.

**Jet Drop** Block of a shardchain with adjoined blocks of relevant sidechains that keeps records produced at a specific Pulse.

**Lifeline** Chain of records (Filaments) for a single object with relevant Sidelines, representing auxiliary information about the object.

**Material Jet** Shardchain that keeps records of a subset of objects contained by a cloud; it is allocated nodes to store related records.

**Node** Server that serves hardware capacity to a cloud.

**Object** Smart contract, dApp, application object.

**Pulse** Tick that opens up a new block.

**Record** Similar to a transaction record; Insolar has a variety of record types.

**Sideline** Sidechain (Filament) for auxiliary information, such as logs, etc.

**Virtual Jet** Logical group of affined objects for allocating nodes to process requests related to these objects.



C

Cloud, [11](#)

D

Domain, [11](#)

Dust, [11](#)

Dustline, [11](#)

F

Federation, [11](#)

Filament, [11](#)

J

Jet Drop, [11](#)

L

Lifeline, [11](#)

M

Material Jet, [11](#)

N

Node, [11](#)

O

Object, [11](#)

P

Pulse, [11](#)

R

Record, [11](#)

S

Sideline, [11](#)

V

Virtual Jet, [12](#)