



# An Introduction to the BSN (Blockchain-based Service Network)

BSN Foundation

# The Blockchain Bottleneck

Current blockchain technology resembles the early stage of the Internet:

- There are many differing underlying structures and frameworks;
- System and network environment set up is complicated; and
- Application development, deployment, and maintenance are expensive;

**The evolution of any new technology always moves from diversification to unification, from complexity to simplification, and from high to low cost.**

# New Infrastructure

A worldwide universal blockchain infrastructure is needed to

- Simplify the process of building and maintaining blockchain environments
- Lower the cost of developing, deploying, and managing applications
- Adapt both permissioned and permissionless blockchain frameworks
- Achieve a universal cross-framework and cross-chain data interchange
- Deploy blockchain applications to any cloud service at any chosen international location
- Allow users to access all applications with a single DID and private keys
- Enable developers to deploy and manage their applications through any portal

**What we need is an Internet of Blockchains**



# What is the BSN?

## Blockchain-based Service Network

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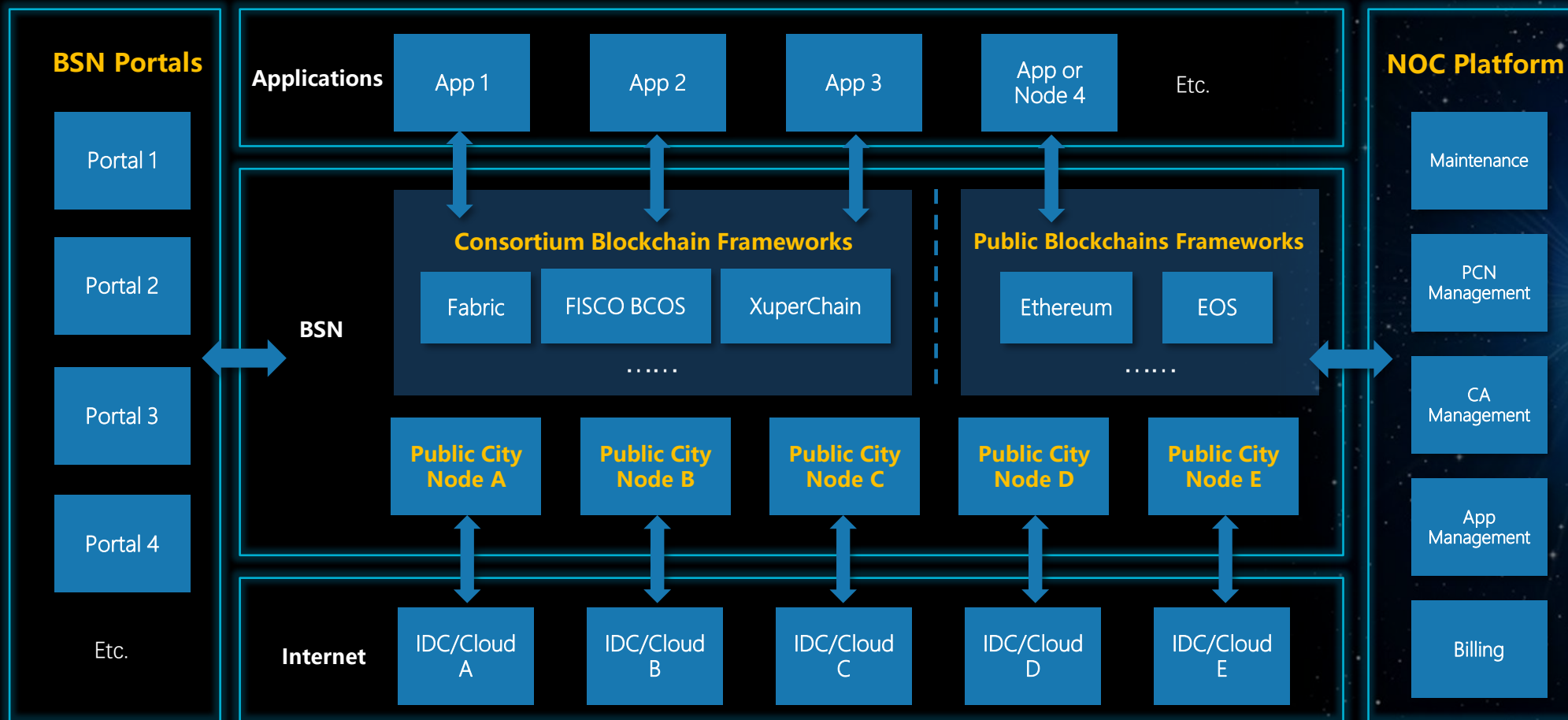
A cross-cloud, cross-portal, and cross-framework public network that enables developers to easily and affordably develop, deploy, and manage permissioned and permissionless blockchain applications and nodes.

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# BSN Architecture

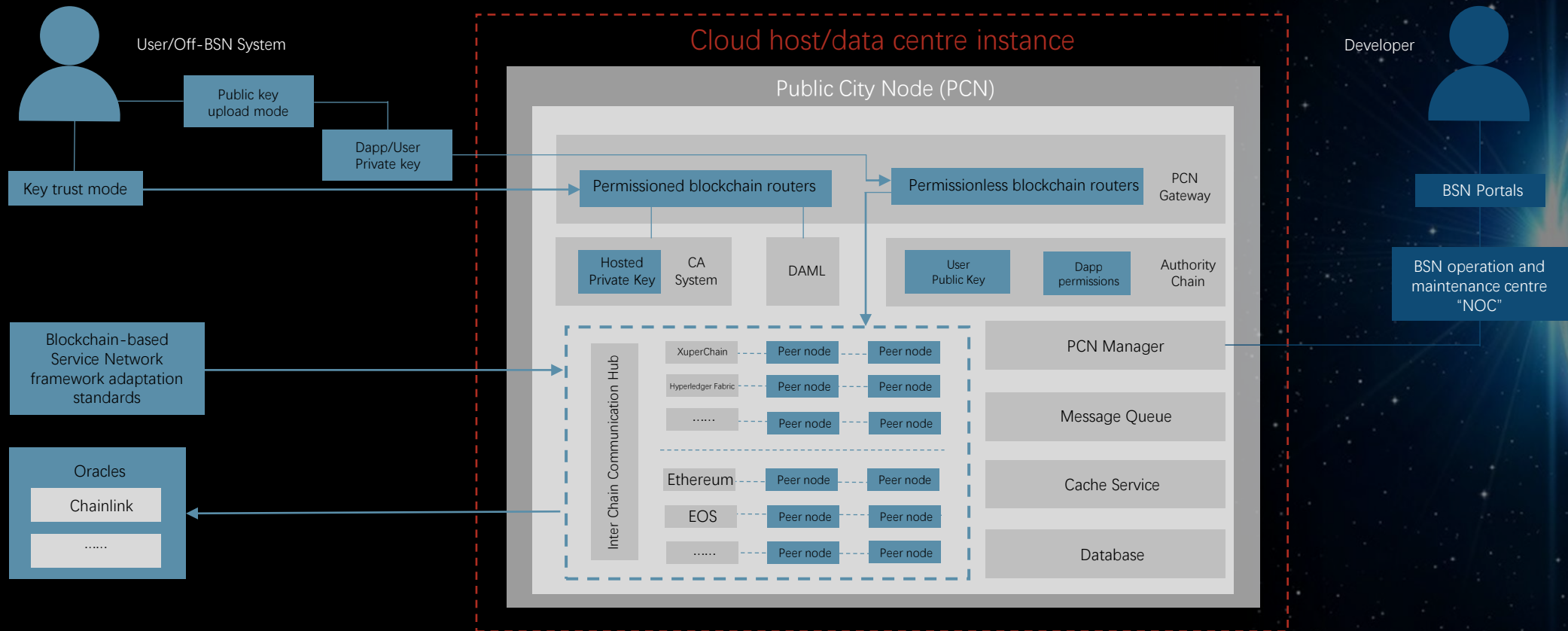


# Public City Nodes (PCNs)

- 1 Any cloud/IDC service provider can establish one or more PCNs by installing the **free BSN PCN protocol software**.
- 2 In each PCN, the provider can allocate shared cloud resources (computing power, storage, and bandwidth) to the BSN for purchase by developers via BSN portals.
- 3 All PCNs are connected via the Internet to form the BSN. A PCN is usually named after the city where the IDC is physically located (e.g., Beijing PCN, Paris PCN, Bangkok PCN#2).



# PCN Structure



# BSN Portals



BSN portals are used by developers to purchase BSN cloud resources and to develop, deploy, and manage blockchain applications, including full-functioned, permissioned only, permissionless only and open permissioned only portals



A BSN portal can be the BaaS (Blockchain as a Service) part of an existing website or a standalone portal. The BSN provides APIs to portal operators.



Portal operators build UIs, user management system, and payment systems by themselves. They do not need to share user information with the BSN.



# Frameworks

Blockchain frameworks act as the operating systems of blockchain applications.

The BSN adapts most mainstream frameworks as follows:

**Permissioned:**

- FISCO BCOS
- HYPERLEDGER
- XUPER 百度超级链
- RIVTOWER 溪塔科技
- 京东数科

**Permissionless:**

- ethereum
- EOS
- IRISnet
- NERVOS
- neo
- Tezos
- Algorand™
- SOLANA
- ShareRing

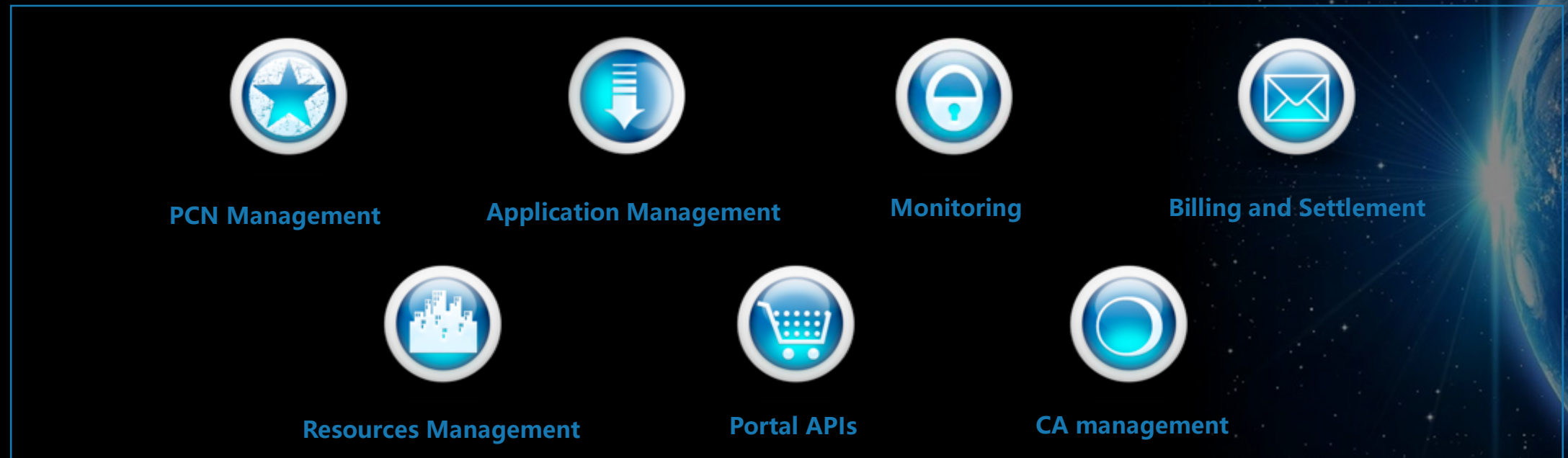
**Open Permissioned:**

- ethereum
- CØSMOS
- Polkadot.
- Tezos
- Algorand™
- Huobi Chain

All adapted frameworks are installed on every PCN and are ready to be utilized by applications.

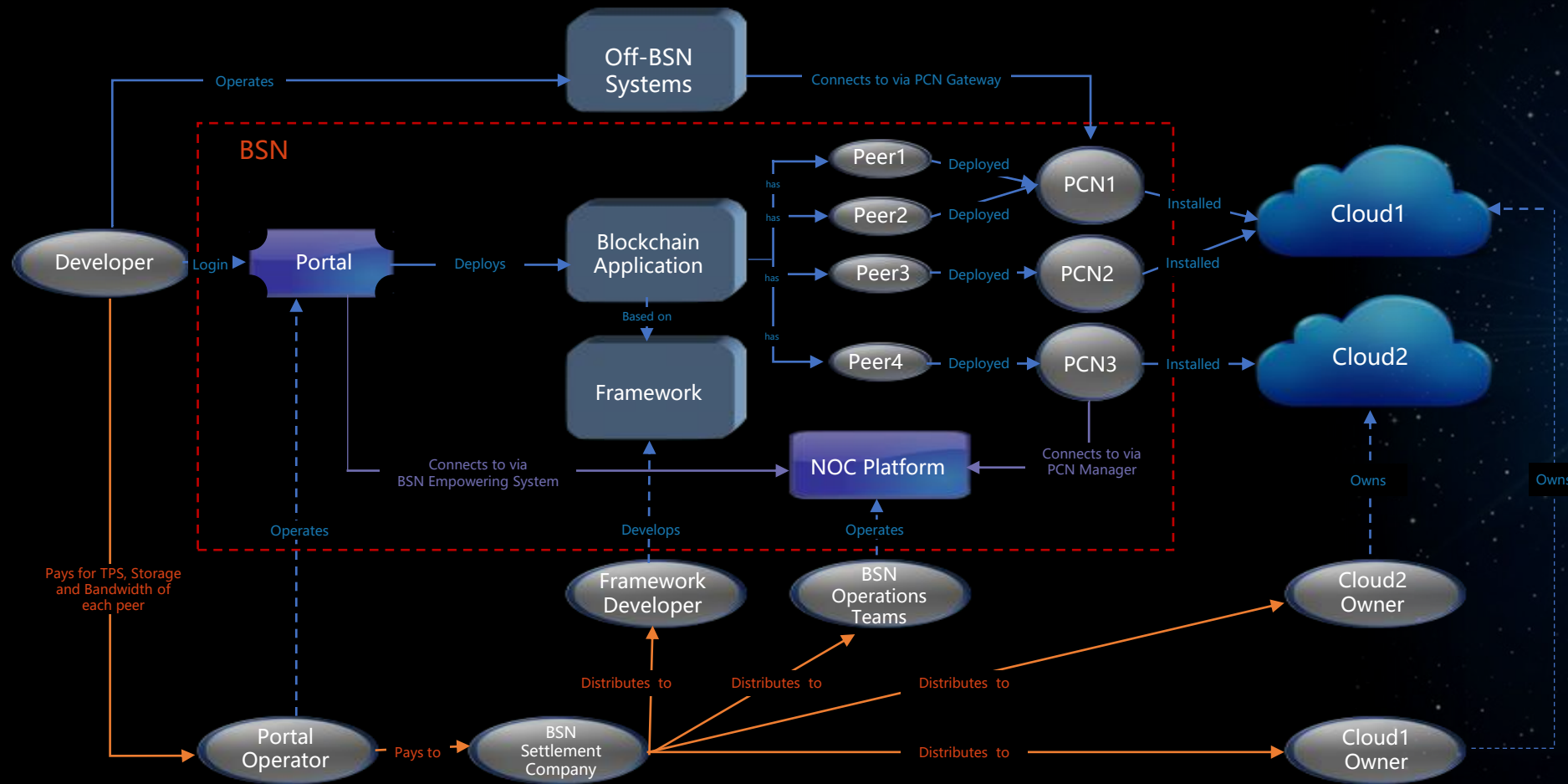
# NOC Platform

The BSN is operated and managed through Network Operations Center (NOC) Platform, which consists of the following systems:



The above systems are administrated by several BSN founding members, including China Mobile, China UnionPay, and Red Date Tech.

# BSN Business Flow Chart (Permissioned)



# The BSN Partners

## Permissioned Blockchains



## Permissionless Blockchains



## Cloud Service Providers



## Technical Partners



## BSN Founders





# BSN China and BSN International

	<b>BSN China</b>	<b>BSN International</b>
Governance	BSN Development Association	BSN Foundation
Regions	China	Outside China
Frameworks	Permissioned Interchain Open Permissioned	Permissioned Permissionless Interchain and IPFS
Official Portals	<a href="http://www.bsnbase.com">www.bsnbase.com</a>	<a href="http://www.bsnbase.io">www.bsnbase.io</a>
One Interoperability Network		



# BSN Dimensions

The BSN architecture can be described as a unified ecosystem **along two core dimensions**, with **three major components** to each one.

**01**

**Infrastructure:** Public City Nodes (PCN) , Service Access Portals, and Blockchain Frameworks.

**02**

**Services:** **Permissioned Services** (Private Blockchain Networks), **Permissionless Services** (Public Blockchain Networks), and **Cross-Chain Services** (Interoperability)

# BSN 5-Step Security (Permissioned)

**01** Encrypt the data through BSN SDK or user's own methods before uploading to the chain.

**02** Two Certificates: DApp Access Certificate and User Transaction Certificate. (two sets of private keys)

**03** Two Certificate Modes: Key Trust Mode and Public Key Upload Mode (recommended)



**04** Smart Contract functions and roles configuration

**05** Use smart contracts to define more detailed user access and authorities.

# BSN Privacy

The BSN is technically not a blockchain protocol of itself, but rather an interoperability network to connect other siloed blockchain ecosystems together. As such, the BSN itself does not hold state, user information, or transactional records by itself.

In addition, the BSN requires all networks to re-encrypt all data transfers with an additional layer of encryption to pass through the BSN interoperability hub, resulting in an even more secure than across any one blockchain ecosystem alone.

All user data is held by local service portals for a particular country/region/organization (i.e. not Red Date or the BSN consortium). The service portals must be fully compliant with a country's GDPR, data localization and privacy regulations.

Red Date is setting up partnerships and committees on security and privacy with leading organisations around the world to maintain the highest caliber of standards for data and user privacy.





# BSN vs. Blockchain Cloud Services

BSN	Blockchain Cloud Services
Cross-cloud, cross-framework, cross-portal	The same cloud, a few frameworks, and a single portal
All applications on the BSN can interchange data easily through different clouds and different frameworks	Every application is totally isolated, deployed individually with a different framework and a different encryption algorithm
Blockchain developers on the BSN do not require prior blockchain knowledge. One-day learning curve	Developers require blockchain knowledge and programming ability
A blockchain system administrator is not required	A system administrator is required to maintain the production environment
All applications on a PCN share system sources based on TPS and Requests. Costs are less than 10% of the cost of cloud services	One peer node uses one VCPU. Ten times more expensive than BSN
One user can use one private key to access all permissioned applications deployed on any given PCN with one gateway and one set of APIs	One user needs to have one private key, one gateway, and one set of APIs for each permissioned application they want to access

# Key BSN Numbers

## Public City Nodes

**135**  
(in China)                      **8**  
(Outside of China)

## Cloud Resources

**9500** VCPUs, **100** TB Memory  
**1.5** PB Storage, **11** Gbps bandwidth

## Portals

**10**

## Adapted Frameworks

**6**                                      **9**  
Permissioned                      Permissionless

As of September 3, 2020

# Private BSN

Large organizations in many industries still have group-wide intranet due to security concerns and administration of all internal information systems and applications, such as banks, carriers, power grids, militaries and governments etc. The Private BSN is a network product based on the core BSN technology to build a blockchain environment on an intranet so that the organization's information office can:

- 1 Manage all blockchain applications with same development, deployment and maintenance standards and protocols;
- 2 Manage the unified CA with all certificate issuing and permission settings for all blockchain applications and users;
- 3 Manage the system resources (vCPUs, storage and bandwidth) allocated to the Private BSN always at 60-70% efficiency with the flexibility to add or remove resources on the fly;



# Private BSN (continued)

- 4 Train in-house developers and contractors who have no prior knowledge on blockchain technology to learn how to develop blockchain applications on the Private BSN in three days;
- 5 Grant permissions to the applications so that they can interchange data easily across different frameworks;
- 6 Allow the applications to deploy peers to the desired outside cloud services (AWS, Azure and Google) on the Public BSN for external business partners via dedicated lines.
- 7 Install Master Node (optional) to manage a supervision peer for each blockchain application deployed on the Private BSN for the purposes of auditing and monitoring.

**And much more!**



# BSN Empowerment Platform

BSN Empowerment Platform is a software to provide BSN APIs to websites. It is installed locally on websites' systems.

<b>Portal Type</b>	<b>Full-Functioned</b>	<b>Permissionless Service Only</b>	<b>Permissioned Service Only</b>	<b>Open Permissioned Only</b>
<b>EP Required?</b>	BSN EP Installed	Remote APIs	BSN EP Installed	Remote APIs
<b>Revenue Model</b>	Licensing fee + Maintenance Fee + Revenue Split	Prepaid daily requests or deposits	Licensing fee + Maintenance Fee + Revenue Split	Revenue Split of gas fee sold among portals, frameworks and BSN
<b>Example</b>	Bsnbase.io	IRISnet Community	Bsnbase.com	Under Construction

# BSN Long-term Vision



1 Open-source everything, everybody can build a PCN or a portal and connect to the BSN.

2 Integrating all major permissioned and permissionless frameworks with a standard interoperability protocol.

3 Everybody who has a computer can easily and cheaply build or access to any chain they want.

The BSN becomes the Internet of blockchains.

Millions of Dapps deployed on the BSN can interoperate with each other with five line of codes.

Innovations will boom with such low barrier to entry, and blockchain technology will change the world like Internet did.



# The closest thing to the Internet of Blockchains

[www.bsnbase.io](http://www.bsnbase.io)

Contact: [info@bsnbase.com](mailto:info@bsnbase.com)



# BSN Cross-Cloud, Cross-Framework and Cross-Portal Chart

