BLOCKCHAIN

The Sphereon Blockchain APIs

Provide Authenticity and Trust
to all information you create,
process, store and distribute

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Digital Disruption Is Here

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The application of new digital technologies causes seismic upheavals in all markets: retail, services, healthcare, manufacturing and even public and non-profit organizations.

The exponential growth of technology in mobility, AI, wearables, video, cloud, analytics, and other digital technologies radically transforms the ways we live, work and play.

The Agile Enterprise

To survive and thrive, the whole enterprise needs to embrace Agile in order to become capable of rapid response to change: to unexpected challenges, events, and opportunities. Agile IT encourages rapid and flexible response to change.

APIs are the tools for agile innovation

You can use APIs to share data and information and to enable transactions in legacy applications.

APIs enable you to leverage your internal data, or third-party data, or algorithms to create new products, services and business models.

Blockchain, the Big Disruptor

For the first time there is a technology that can add indisputable Proof of Authenticity to all the content we capture, store and share and to all the transactions we process.

Blockchain is the Big Disruptor, because we inherently can trust the information on a Blockchain. Therefore we no longer need intermediaries, which leads to endless possibilities.

Blockchain is the Big Disruptor, because we can inherently trust the information on a Blockchain.
Therefore we no longer need middlemen, which leads to endless possibilities.

Provide Authenticity and Trust to all information you create, process, store and distribute

A single version of the Truth

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Blockchain

Blockchain, best known as the underlying technology for Bitcoin, provides a Distributed Ledger mechanism to lock in information and making it independently verifiable and auditable.

For the first time there is a technology that can add indisputable Proof of Authenticity to all the content we create, store, process, share and distribute.

A single version of the truth
Currently each participant in a transaction has his own separate, individual ledger and therefore his own version of the truth.
Which is why we need to rely on intermediaries to provide trust and consolidation, which is inefficient, error prone and fraud sensitive, and leads to disputes.

With Blockchain there is a single ledger, shared by each participant as the single version of the truth.
So, we now no longer need to rely on intermediaries, which is much more efficient, safer and cheaper.

Why is Blockchain called Revolutionary?
Because we inherently can trust the information on a Blockchain, we no longer need intermediaries, the middlemen:

Banking without banks
Money transfers, deposit remittances, investments, loans can all be executed and backed by Blockchain.

Insurance without insurance companies
Communities can self-organize and use "smart contract" technology that will automatically collect fees, authorize claims and execute agreed payments.

Trade without letter of credits and consignments
Stakeholders in supply chains can use "smart contract" technology to directly settle payments upon delivery.

And many more disruptions we cannot even imagine now.

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Blockchain,
How does it work?

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Blockchain is best described as a distributed and replicated database.

Typically, a traditional database is stored in a central location, somewhere on a networked server.
The database is managed by one or more database administrators.
Users must be authorized to use the database. User transactions store, change and read data in the central database.

By contrast Blockchain is a decentralized database that is replicated on thousands of computers globally through the use of a peer-to-peer network.

A user-transaction added to the Blockchain database is replicated to all nodes in the network. The network uses a mathematical consensus mechanism to validate and approve each transaction.
Only after validation and consensus the transaction is committed to the database.

This database can typically be accessed by anyone (public blockchain) or anyone with a permission to access the database (permissioned blockchain).

Key concepts of Blockchain

Distributed ledger
A ledger is shared over many nodes in a peer-to-peer network. Transactions are hashed and then replicated in all the shared ledgers.

Hashing
Any generic data set (a value, a file, a database, the status of a transaction, etc.) can be hashed to produce a short unique identifier, an electronic fingerprint, called a hash.

Consensus
All transactions are validated through a consensus mechanism before they are committed. Different Blockchain systems can have different consensus mechanisms.

Public, Private or Permissioned Blockchain
A *Public* ledger can be used by anyone. By contrast a *Private* ledger is maintained and accessed by a single organization.
A *Permissioned* ledger is distributed, shared and used by multiple but specifically authorized users.

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Blockchain:
What can I do with it?

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Certify and authenticate content

The Sphereon Blockchain can create a unique electronic fingerprint (hash) for any document, object or data in Alfresco and anchor this on a Blockchain.

Anyone that has access to this object can now verify the authenticity by simply recreating the hash and verify it on the Blockchain.
When the object is unchanged, the hash will still be the same and is found on the Blockchain, including the timestamp of registration.

Create independently verifiable audit trails

You can register steps in a workflow on a Blockchain.

Each registration is linked to a specific case, document and action, creating a chain of transactions: an auditable trail.

This audit trail can then be verified by (authorized) third parties, providing Transparency, Compliance and -- most importantly -- Trust.

Create a better Electronic Signature solution

Use Blockchain to sign *any* digital object, not just PDFs, with a legally binding Digital Signature.
Without the need for a central Certificate Authority or central Time-stamping server.

The Digital Signature also lives independent of the object which enables parallel signing and independent verification, with or without the object itself.

Interact with Smart Contracts

The Sphereon Blockchain API can also interact with so-called Smart Contract applications .

This allows you to provide input required to execute a Smart Contract directly from within your applications.

Blockchain – For the first time ever there now is a technology that adds indisputable Authenticity and Trust to all content we create, store, process, share and distribute.

Provide Authenticity and Trust to all information you create, process, store and distribute.

Sphereon,
an API-driven cloud platform

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Sphereon offers an innovative platform that allows your organization to use APIs for Information Management, Document Processing and Blockchain.

Easy integration
We provide standard integration plug-ins for Alfresco, MS SharePoint and Office 365, making it very easy to integrate Sphereon, without the need of low level programming.

A broad range of intelligent APIs
Sphereon offers many smart APIs to extend and enhance the applications and solutions that you build for your business and for your customers. We offer APIs that unlock information stored in legacy ECM systems, Enterprise File Shares and Document Stores.

Also APIs that capture and extract data from objects, such as emails, photos, images, and documents.

Several of these APIs use Artificial Intelligence, for example to analyze or classify data objects, photos and documents.

Sphereon Blockchain APIs
Or use our Blockchain APIs to digitally sign emails, objects and documents.
Or to log transactions, data or objects as immutable and independent verifiable records.

- **Blockchain Proof API**
  A high-level API to prove, or disprove, the existence of any digital content at a certain point in time.

- **Easy Blockchain API**
  Provides a blockchain agnostic solution to create and manage interlinking Blockchain data structures.

- **Crypto Keys API**
  To create, import, and manage Secrets, Keys and Certificates. The API includes integration with MS Azure KeyVault.

Online Developer Documentation on all our Blockchain APIs can be found on the Sphereon.com website 🔗

Provide Authenticity and Trust to all information you create, process, store and distribute.

The Blockchain Proof API

With the Blockchain Proof API it is easy to prove or disprove existence and authenticity of data or digital documents at a certain point in time.

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Easy to use

The Blockchain Proof API is very easy to use, because we hidden away most of the complexities of the underlying blockchain technologies.

Behind the scenes it stores entries using the Factom (bitcoin), HyperLedger, Multichain or Ethereum blockchain by means of our generic blockchain API.

The flow is generally as follows:

1. Make sure a configuration is present.

2. Register content by uploading content, a file, or provide a Stream Location from our Storage API.
   When you upload of a file or stream location, our API will take care of the hashing.
   When you upload content you have to tell the API whether the data has already been hashed or not.

3. Verify content by uploading content, a file. or provide a Stream Location from our Storage API.
   When you upload of a file or stream location, our API will take care of the hashing.
   When you upload content you have to tell the API whether the data has already been hashed or not.

Prove or disprove existence and authenticity

- Prove or disprove the existence of any file or content at a specific time.
- Prove or disprove that a file or content has been tampered with.
- Easy registration and verification of one or multiple documents.
- Register hashes of your own content, by submitting a file or stream and leaving everything up to us. Or by just providing the hash yourself.
- Use either public, private or permissioned blockchains like Bitcoin (Factom), Ethereum, Multichain, Hyperledger.
- You don't have to worry about sharing or leaking confidential information on a public blockchain. Merely hashes are being used.

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The Easy Blockchain API

The Easy Blockchain API provides a blockchain agnostic solution to create and manage interlinking Blockchain data structures.

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A concept of chains to store related data

Our Easy Blockchain API enables you to build a kind of virtual Blockchain by enabling you to interlink different Blockchains into a data structure. This data structure can then be used to register content and meta-data.

Interlinking Blockchains, Chains and Entries

Our Easy Blockchain API enables you to programmatically determine the Chain ID of the Chain you want to link to.
The same goes for the Entry ID.

These IDs are used to deterministically create or lookup chains and entries. This allows you to determine whether certain information already exists, or to store information in a particular chain you calculated.

What's more, these Chains or Entries can exist in a different Blockchain or even a different Blockchain infrastructure.

This enables you to link between different Public, Private or Permissioned Blockchains and build data structures across multiple Blockchains.

The Sphereon Easy Blockchain API

- Create immutable data storage solutions
- Easy to use
- Allow linking of data from entries within one chain to entries in another chain
- Deterministic behavior to determine an ID based on content, both on and off the blockchain
- Support for multiple public and private blockchain solutions
- Fully blockchain agnostic
- Generic access to different Blockchains, such as Bitcoin (Factom), Ethereum. Hyper-ledger, Multichain.

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The Crypto Keys API

Our Crypto keys API enables you to create, import, and manage Secrets, Keys and Certificates.

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A concept of chains to store related data

The Crypto Keys API helps to safely store cryptographic keys and secrets used by applications and services.

The API allows you to import, create and work with symmetric and asymmetric keys and certificates.
You can use the Crypto Keys API to sign and verify digest values. To encrypt en decrypt input. And you can use the Crypto Keys API to hash and sign input values.

Hardware Security Modules (HSM) support

You can encrypt keys and secrets using keys optionally protected by Hardware Security Modules (HSMs). For example, the Crypto Keys API has an integration with Microsoft's Azure KeyVault.

The secret keys will never leave the HSM

This allows you to maintain control of keys that access and encrypt your data outside of your application.

You can further block access to the API based on 'IP-whitelisting'. This means your application has no access to keys directly and when placed in a HSM nobody has access to the key. This, combined with IP based protection makes your keys really very secure.

The Sphereon Crypto Keys API

- Create, import, and manage Secrets, Keys and Certificates
- Easy to use
- You don't have to store secret keys in your application
- Integration with Azure KeyVault (a FIPS 140-2 Level 2 certifies HSM)
- For account keys, authentication keys, encryption keys, PFX files and passwords
- To sign and verify digest values
- To encrypt end decrypt input
- To hash and sign input values
- Use IP white-listing with IP based protection for the most secure solution

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The Storage API

Provides easy uniform access to contents to multiple content backend systems.

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A concept of chains to store related data

Sphereon Storage API provides an abstraction layer to storage of (virtual) folders and streams (files/contents).

Like mentioned in the description of our Blockchain Proof API, you can register and verify files using our Storage API.

When you store a file using our Storage API or retrieve information, you will receive back a StreamLocation JSON object, that contains the information over where the file is stored.
You can use this JSON object to register of verify a file.

This means you have direct integration of the Sphereon Blockchain APIs with files stored in, for instance, Amazon S3, Google Cloud Storage or other backends.

The Storage API is fully agnostic with respect to the supported storage backends. This allows for easy uniform access to and manipulation of contents regardless of the content backend being used.

The Sphereon Storage API
- Create, Store, Retrieve and Manage Folders, Files and Content
- Use a single, generic API regardless of the type or location of your content
- Retrieve content from one backend and copy or migrate them in another location in same backend or another backend altogether
- The following backends are supported:
    - Sphereon Cloud Storage
    - Amazon S3
    - Google Cloud Storage
    - Microsoft Azure Blob Storage
    - Microsoft SharePoint and Office 365
- Through our integration with Xillio we also support many ECM/DMS content repositories like Alfresco, Documentum, Dropbox, FileNet, OpenText, and others.

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Co-creation in a Partner Ecosystem

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Change is not a constant, change is exponential

We live in a time of exponential growth of technology as described by Moravec, Vinge, Kurzweil and others.

Organizations will need to participate in ecosystems of networked vendors, partners, contract workers, as well as customers, that work together in order to thrive in today's fast-moving, hyper-connected world. We need to work together and co-create new products, services and business models faster and smarter.

We need to create real partnerships

The best partners have a deep, industry-specific, expertise across technologies and markets, creating the crucial ability to provide not only IT solutions and services, but also business knowledge.
Each partner will benefit from the "network effect" of the other organizations' knowledge, experience and efforts.

Sphereon is actively looking for such partnerships to co-create solutions for tomorrow today.

store.sphereon.com 🔗

Our APIs are public and published in our API Store.
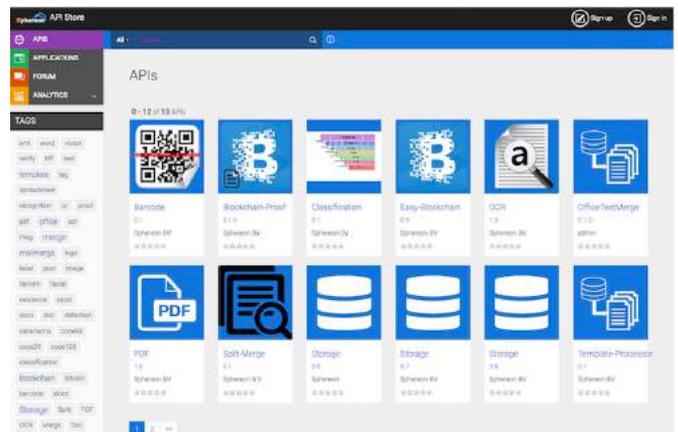
All our APIs are accompanied by extensive online documentation, live-try-outs, sample-code and SDKs for all modern programming languages like Java, C#, PHP, Phyton, and many more.

Online Developer Documentation on all our Blockchain APIs can be found on the Sphereon.com website 🔗

*APIs are essential to Blockchain.
They are the building blocks for
all Blockchain solutions.*

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About
Sphereon

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Sphereon is an innovative software company, often ahead of the curve, based in The Netherlands.

Sphereon was founded in 2015 by experienced industry veterans and a young CEO, with a mission to develop the Sphereon platform.

Sphereon provides an API-driven cloud platform for Document Processing and Blockchain.

The Sphereon platform is built using modern Micro-services technologies, while the functionality is based on our industry experience and the input and feedback from our partners and customers.

APIs are a crucial building-block in today's API economy. Where it is all about agility and co-creation is the name of the game. Adapt or Die.

This API-first, Cloud-first, approach allows us to offer our customers a very close integration with their projects and quickly adapt to their ever-changing needs.

It is our mission to help you quickly build powerful and flexible solutions that are relevant to your business.
Adopt, Adapt, Improve.

Our success is a result of the solutions that we build together with you, our customers. We provide the software platform and you have the knowledge and experience in your market domains.

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