1Spatial Inc. Cloud – Security, Infrastructure and Processes

Version 1.0

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Introduction

Document Purpose and Intended Audience

This document outlines the security, infrastructure, and service processes for 1Spatial Cloud Services.

Its intended audience is 1Spatial Customers and 1Spatial prospective customers – specifically those people working in information security, procurement, application and technology architecture and similar and related roles.

This document is not intended as marketing material nor an outline of 1Spatial software.

For a more accessible explanation and outline of the benefits of 1Spatial Cloud Services, please refer to the document entitled *"1Spatial Cloud Services: Executive Briefing"*.

Document Scope

1Spatial, as a software company, retains a wide variety of proprietary business software applications – loosely referred in their collective to as "1Spatial Products".

In general, 1Spatial Products may be deployed on the hardware of the 1Spatial Customer ("on-premises"), or on cloud infrastructure. This document deals with only the latter.

Cloud infrastructure refers to infrastructure using cloud computing services – whereby computing services are provided over the Internet using shared resources.

1Spatial maintains a suite of common cloud infrastructure, from which 1Spatial Products may accessed by 1Spatial Customers. This common infrastructure ("1Spatial Cloud Services") allows 1Spatial to maintain a shared level of security, resilience, and monitoring amongst all the 1Spatial Products made available via 1Spatial Cloud Services.

This document expressly outlines the details – technical, procedural, and service-relates – of these 1Spatial Cloud Services.

As a final note, not all 1Spatial Products may be deployed on-premises – and hence, use of 1Spatial Cloud Services is the only mode for 1Spatial customers to procure and use these.

The exact details of whether a particular 1Spatial product may be deployed on-premises or using 1Spatial Cloud Services or both may be obtained separately from this document – for example, by asking a 1Spatial team member for details.

Questions and Clarifications

This document is intended to be a complete and thorough outline of 1Spatial Cloud Services for prospective 1Spatial customers, to address questions and concerns around security, infrastructure, and processes around 1Spatial Cloud Services.

From a practical perspective it is difficult to precisely outline the full detail of 1Spatial Cloud Services when it comes to security, infrastructure, and processes.

There are several reasons for this:

- For security reasons (to not advertise an attack vector)
- Because using written text to communicate the true complexity of the software involved may render this document much harder to read and navigate
- Because our ongoing commitment to security and resilience means that we may update 1Spatial Cloud Services faster than we would update this document

Accordingly, if something is missing from this document, please ask us (for example, ask a member of the 1Spatial team, and they will be able to route your questions to us). We will be as open as we can be to the sensitive nature of security measures and will try to answer your questions as fully as we can, and are open to meetings, calls or similar.

Document History

Date	Revisions
22nd November 2023	Created
18th April 2024	Updated wording for United States

1Spatial Cloud Services Overview

It's important when reading this document to differentiate between products (e.g. software application products, which when sold as such may mean that the customer is responsible for deploying and maintaining those applications) and services (e.g. software applications sold as part of a managed service, where the responsibility for deploying and maintaining those applications fall on the supplier).

1Spatial offers both products ("1Spatial Products") and services.

This document outlines 1Spatial Cloud Services, which are used to offer a managed service of 1Spatial Products to 1Spatial customers. It does not include the precise details of the specific 1Spatial Product being deployed in the cloud (this 1Spatial-Product-specific information is available elsewhere – for example, at https://1spatial.com/documentation, or by asking a member of the 1Spatial team).

1Spatial Cloud Services comprise a suite of software applications, components, pipelines, and tools. These together represent the technology we use to provide access to 1Spatial Products via the cloud.

Cloud Platform/Cloud Service Provider

1Spatial Cloud Services all use Microsoft Azure, as well as various services deployed within and native to Microsoft Azure.

For 1Spatial Cloud Services, we do not maintain capabilities for other cloud service providers such as Amazon Web Services nor Google Cloud Platform.

The 1Spatial Products themselves are not tied to Azure, and 1Spatial Customers may deploy these themselves onto other cloud service providers.

Our decision factors in Microsoft Azure's service history, their commitment towards environmental sustainability, and availability of cloud-native services to help us make our 1Spatial Cloud Services more secure and resilient.

Microsoft's commitment for Azure towards use of 100% renewable energy by 2025, water positivity by 2030, and zero-waste certification by 2030 is significant for 1Spatial's ISO:14001-certified Environmental Management System.

Due to the nature of the infrastructure, we have created and the Azure services we take advantage of this decision is fixed in the short-medium term. However, in the medium-long term we remain open to other cloud service providers should Microsoft Azure services prove unsuitable for 1Spatial's ongoing business needs, and architect our 1Spatial Cloud Services where possible to enable this possibility.

Team and Personnel Security

1Spatial maintains a team of professionals solely dedicated to the provision, enhancement, and monitoring of 1Spatial Cloud Services.

While we do not make guarantees as to the precise professional backgrounds of the members of this team at any point in time, we strive to ensure that they have expertise in and experience of the following fields:

- Developer operations ("DevOps")
- Application architecture
- Cloud infrastructure
- Security
- Service design
- Product management

All access and permissions across 1Spatial Cloud Services are granted on a needs-only basis, and more broadly zero-trust principles are applied to our internal infrastructure.

If after reading this document you have further questions or wish to meet one or more members of this team, we would be happy to oblige, as well as answer any questions.

1Spatial's Certifications Relating to Security & Quality

1Spatial is certified to ISO9001:2015 for our Quality Management System – which ensures quality of our products and services.

System Security

Penetration Testing & Code Analysis

1Spatial conducts security scans and penetration testing on each 1Spatial Product available via 1Spatial Cloud Services. For security reasons we do not publish the results of these tests.

The outcomes of these penetration tests are divided into Common Vulnerabilities & Exposures (CVEs) and Issues. Each of these are then further categorized into Critical, High, Medium, Low and Informational categories.

If necessary, a Critical Issue might trigger an immediate fix and roll-out, but otherwise we strive to resolve all Critical and High Issues for the next release.

Critical/High CVEs are investigated, and if they relate to our code, we examine options for patching.

Static code analysis is performed throughout development, with any significant security defects highlighted being resolved.

Denial of Service

1Spatial maintains infrastructure to protect against distributed denial of service (DDoS) attacks.

Versioning and Dependencies

1Spatial Cloud Services maintains an active versioning policy for all 1Spatial Products deployed via 1Spatial Cloud Services, as well as an active versioning policy for 1Spatial Cloud Services themselves.

This versioning policy comprises releases to all software components within the stack as new versions of these components become available and are typically packaged together to minimize downtime and subsequent customer disruption. This allows for the adoption of the latest and most secure versions of software components, reducing risk.

1Spatial also uses scanning tools to conduct analyses of libraries and dependencies to identify CVEs.

Downtime, Upgrades, and Deployment to Live Environments

1Spatial updates 1Spatial software at a regular cadence in line with the active versioning policy. These updates entail downtime and will be communicated to the 1Spatial customer with advance notice. For further information (including service level agreements), please refer to your contract or licensing agreement with 1Spatial.

Cloud Resourcing Tiers

1Spatial Customers exhibit heterogeneous requirements for computing resources, and their business use-cases differ in needs for throughput, speed, and concurrent processing.

To accommodate this, 1Spatial Cloud offers different Cloud Resourcing Tiers for diverse types of 1Spatial Customer use-cases:

Features by Cloud Resourcing Tier

Tier	Standard	Team	Premium	Enterprise
Maximum number of simultaneous data processing jobs	1	3	6	As needed
Available memory (GB)	16	32	64	As needed
Max cache storage	128GB	256GB	1024GB	As needed

Support package	Standard US business hours	Standard US business hours	Premium US business hours	Premium with options for outside of US business hours
Trial/UAT environment	No	No	Yes	Yes
Low latency processing[1]	No	No	No	Yes
Choice of data location[2]	East US 2	East US 2	East US 2	East US 2

[1]Processing speeds vary by the size and complexity of the data, and the amount and complexity of the rules processing that data.

The Standard, Team, and Premium tiers offer increasing degrees of performance.

The Enterprise tier offers the option for the 1Spatial Cloud Team to specifically configure the performance of the software to ensure low-latency processing by having engines on hot standby and ready to start immediately, assuming that there is a business need for this.

Low-latency processing is not applicable in all cases (e.g., large processing tasks where the startup times are small in comparison) but depending on your business needs we will be able to work with you to meet these needs.

[2]For further details, see Data Location/Data Residency.

Enterprise Tier

1Spatial Customers vary across a wide range of use-cases and industries.

While the Standard, Team and Premium tiers cover most use cases and a range of differing needs for compute, there may be business needs which require a different profile of resourcing.

One such example would be low-latency processing (see above), whilst other examples could involve the need for more simultaneous data processing jobs, or larger amounts of data caching.

As such we offer bespoke configuration of cloud resources for your specific needs under the Enterprise tier.

To achieve this, we typically configure a trial environment with your business rules, run scenarios representative of real-life business needs, then configure the production environment accordingly.

Data Location/Data Residency

By data location/data residency, we refer to the physical location of the 1Spatial customer's data at rest.

Choice of Data Location (Cloud Resourcing Tiers)

Depending on the 1Spatial customers' cloud resourcing tier (see Cloud Resourcing Tiers), 1Spatial customers primary data location will be in the East US 2 Azure Region. We offer a standard USA-only data location and residency.

The Impact of Data Location on Resilience

1Spatial Cloud Services are agnostic of data location, and broadly offer the same levels of security, monitoring, and resilience.

The one exception to this relates to resilience – specifically, use of Azure native backup services for purposes of disaster recovery. Not all Azure regions are equal in terms of their native backup capabilities, and some regions do not offer the same high level of resiliency that we would like.

Since we use solely Azure as the cloud service provider, we make use of Azure's in-built/native backup capabilities, rather than scripting these ourselves within the Azure infrastructure.

These Azure backup capabilities utilize the concepts of GRS, ZRS, and LRS. You can find out more about Azure's in-built/native storage solutions here, but these terms broadly refer to what level of failure of physical infrastructure would be required to make the data backup in question unavailable in a disaster recovery scenario.

For example, a GRS (geo-redundant storage) backup would be available even if the primary Azure Region goes completely offline. Not all Azure regions offer the same level of twinning and redundancy.

Thus, the choice of data location affects the resilience of the overall system – hence our preference for certain Azure regions, and hence certain data locations within each area.

For more information, please see Replication_and_Backup.

Given the changing nature of Azure's Regions (and the evolving maturity of capabilities for data backups etc. within each Azure Region), this document is not the right place to outline exactly what is available where – but please reach out to a member of the 1Spatial team to ask us if you have a particular data location/Azure Region in mind.

Data Backup and Data Location

For the sole purpose of disaster recovery, 1Spatial Cloud Services transmits your data from one region to another, paired Azure Region.

For USA-only data locations, the paired Azure Region also falls within the respective data location. Both the primary Azure Region and the paired Azure region fall within the USA

Considerations for Data in Flight

1Spatial Cloud Services operate within an Azure Region. There are no 1Spatial Cloud Services which transmit customer data outside that Azure Region, other than for backup purposes as outlined in the previous section.

1Spatial customers often use 1Spatial Products in conjunction with other third-party software solutions, with data being ingested and processed by 1Spatial Products before being transmitted elsewhere.

While we offer a robust and secure suite of options for data egress from 1Spatial Products, we ourselves cannot make assurances as to the data-at-rest location of third-party software solutions.

Metadata, Logs and Monitoring

As part of the processing of geospatial data regularly undertaken using 1Spatial Products; log files, metadata (e.g., metadata on the job being processed) and similar are generated. These log files and metadata remain in the Azure Region from which they arose.

The exception is our monitoring and alerting solutions for resilience. Where 1Spatial Products are deployed in the cloud, we use various tools for gathering metadata relating to overall analytics. These metadata feed into various dashboarding and alerting tools for application and infrastructure monitoring.

These metadata are metadata by nature - other than the name of the customer, these metadata do not relate to the data owned by a particular customer. An example of our monitoring capabilities is “number of 1Integrate jobs run per environment”. We do not transmit sensitive data relating to your business as part of these metadata.

The ultimate destination of the metadata and logs may be a different location to the location of the 1Spatial customer data-at-rest – for example, a 1Spatial DevOps expert may review metadata and logs from the UK or from the USA. However, given the nature of these metadata and logs (not containing sensitive data relating to the customer’s business other than the name of the customer) we are confident that this is consistent with 1Spatial customer expectations for data-at-rest and data security.

Monitoring

The 1Spatial Cloud team maintains a suite of monitoring tools for application and infrastructure monitoring.

We do not share these monitoring tools externally.

For more information regarding the privacy and data residency aspects of this data, please see Metadata, Logs and Monitoring.

Service Resilience and Business Continuity

Our approach

Our approach to resilience and business continuity focusses on ensuring 1Spatial Cloud Services are resilient as they can be – and planning for continuation of service in the scenarios where that resilience ceases to be effective (e.g., total failure of an Azure region).

The precise architectural nature of 1Spatial Products varies, but in general can be said to comprise:

- a database layer,
- an application layer,
- a suite of data relating to a particular 1Spatial Customer.

Owing to the differing availability of replication and backup native to Azure for each of the above, as well as our desire to ensure the best continuity we can, we use the best available replication and backup methods available at each layer.

These backups are then available for us to use in a disaster recovery scenario.

Impact of Data Location on Resilience

Please see The Impact of Data Location on Resilience

Resilience outside of a Disaster Scenario

1Spatial Cloud Services are designed to be resilient outside of a disaster scenario.

An example of this design approach is automatically scaling compute resources available for a particular environment to meet the need for compute at a particular time, then scaling it back down again, as well as various capabilities to restart services should they fail while maintaining processing and availability.

Replication and Backup of Data

Database Layer

The database layer is high availability: two synchronized databases running concurrently within two different zones in the same Azure region. This gives 7 calendar days of continuous history.

Outside of that Azure region, a snapshot is made to the paired Azure region every 24 hours.

Customer-specific data

1Spatial Customer instances will often have data that is specific to that customer.

This could entail configuration for a particular customer, data and results from previous processing jobs, or media (e.g., logos) – the data we address in this sub-section sits outside the database, and thus has a separate mechanism for backup.

These data types are backed up twice a day into a storage account within Azure that is both geographically and zone redundant.

Application Layer

The core 1Spatial application images do not differ between customers – any specific configuration for a particular 1Spatial Customers' needs is held outside the application images (and thus falls into the two layers listed above when it comes to backup and replication).

We maintain images of each 1Spatial application separately on a third-party cloud provider, which is only visible to 1Spatial. These images are stored to be both geographically and zone redundant.

Disaster Recovery Process

We maintain tools to enable us to replicate 1Spatial Cloud Services in a different Azure Region.

Combined with the data replication and backups, these allow 1Spatial to restore live service 1Spatial Products.

Due to the asynchronous nature of data backups, and the possibility of the circumstances leading to a failure event being replicated from a backup, the backup process is currently manual.

It involves restoring images of 1Spatial applications, customer-specific data, and a copy of the database layer from an appropriate point in time to extant and available Azure Region(s). The exact Azure Region(s) will depend on which regions are affected but it is anticipated to be the paired Azure Region.

Recovery Point Objective

In a full disaster recovery event, a historic snapshot of the system (images of 1Spatial applications, customer-specific data, and a copy of the database layer) will be restored for live service to resume.

The "recovery point objective" refers to the difference in time between the system failing, and the time that the historic snapshot represents.

For example, if the system fails at 11:00AM EST on Wednesday, the system is live once again at 3:00PM EST on Wednesday, and the historic snapshot to which the system is restored is from 9:00AM EST, then the recovery point has been 2 hours. This would then be compared to the recovery point objective outlined below.

While the exact recovery point will depend on the cadence of backups, 1Spatial has a recovery point objective of 24 hours.

Recovery Time Objective

The recovery time objective refers to the difference in time between the system failing and the system being live once again.

This would then be compared to the recovery time objective outlined below.

Your recovery time objective will depend on the level of support specified in your contract or licensing agreement with 1Spatial.

Within that framework of your contracted level of support, 1Spatial's recovery time objective is 6 hours.

For example, if your contracted level of support is business hours Monday-Friday 9:00AM-5:00PM EST, the recovery time objective of 6 hours applies to 6 business hours within Monday-Friday 9:00AM-5:00PM EST.

Force Majeure and Azure Outages

While contracts and licensing agreements between 1Spatial and 1Spatial Customers cover off a general definition of a *force majeure* event, there is one specific *force majeure* even of relevance for 1Spatial Cloud Services: an outage of two or more Azure regions.

1Spatial Cloud Services are designed to be recoverable if a particular Azure region goes down. This involves using the redundancy services inherent to the paired Azure region – for example, East US 2 is paired with Central US. If the East US 2 Azure Region fails entirely, we would perform disaster recovery using the backups available on Centra US (although we would not necessarily restore to Central US).

In this example, if both East US 2 and Central US *both* fail entirely, this would represent a failure of both an Azure region and its paired region. This expressly represents a force majeure event, with the circumstances specified in the contract between 1Spatial and the 1Spatial Customer applying.

Product Documentation and Support

Documentation

To review product documentation such as Installation Guides, Web Help, and other release notes, please visit our website: https://1spatial.com/documentation

Support

To contact 1Spatial Support, please visit our website: https://1spatial.com/support-services/support/

Training

For training enquiries please contact your Account Manager or email: training@1spatial.com