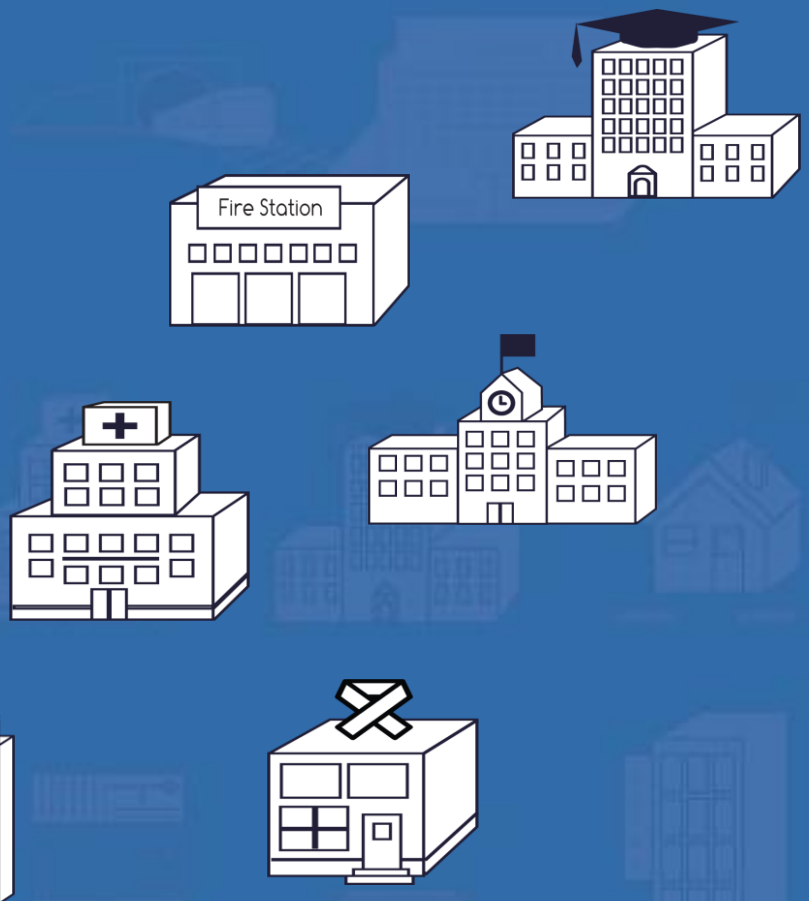


Managed Private Cloud – Big Data



Contents

| | |
|---|----|
| Service Overview | 3 |
| Why Vysiion? | 3 |
| Cloud characteristics delivered | 5 |
| Key characteristics of our service..... | 5 |
| Key features | 5 |
| Service Components..... | 6 |
| Service Level Agreement | 10 |
| Pricing and packaging..... | 11 |
| Trial service | 12 |
| Onboarding | 12 |
| Data migration | 12 |
| Maintenance | 13 |
| Customer responsibilities..... | 13 |
| Termination..... | 14 |
| Ordering and invoicing | 14 |

Service Overview

What the service provides

Vysiion's Managed Private Cloud – Big Data product provides single-tenant Compute as a Service hosted either in one of our data centres or in your Crown Hosting Data Centre (CHDC).

What the service can help you achieve

- A private infrastructure that is architected for the type of workload typical of Big Data platforms
- The assurance of isolation within the community of UK public-sector customers
- A compute platform that is accreditable to UK government security classifications, OFFICIAL (including OFFICIAL-SENSITIVE) and SECRET

Key service capabilities

- Designed around your requirements — the perfect balance between a bespoke solution and the efficiency of a dedicated environment
- Choice of location for your infrastructure — hosted with Vysiion (OFFICIAL only) or in your CHDC facility (OFFICIAL and SECRET)
- Secure
- Remote Access
- Scalable
- Big Data or High Performance Compute hosting

Why Vysiion?

Vysiion is a strategic partner of Ark Data Centres with offices at Spring Park, Corsham and Cody Park, Farnborough. We have:

- ISO9001 and ISO27001 accreditations for quality and information security
- Cyber Essentials PLUS
- Highly resilient Tier 3 data centres, on UK sovereign territory and separated by >50 miles for geographical diversity
- Security Cleared staff
- 24/7 ITIL aligned Service Desk

The diagram in Figure 1 illustrates the complementary capabilities and services available from Vysiion. These can be procured alongside this service to support an organisation's transition towards more commodity based ICT.

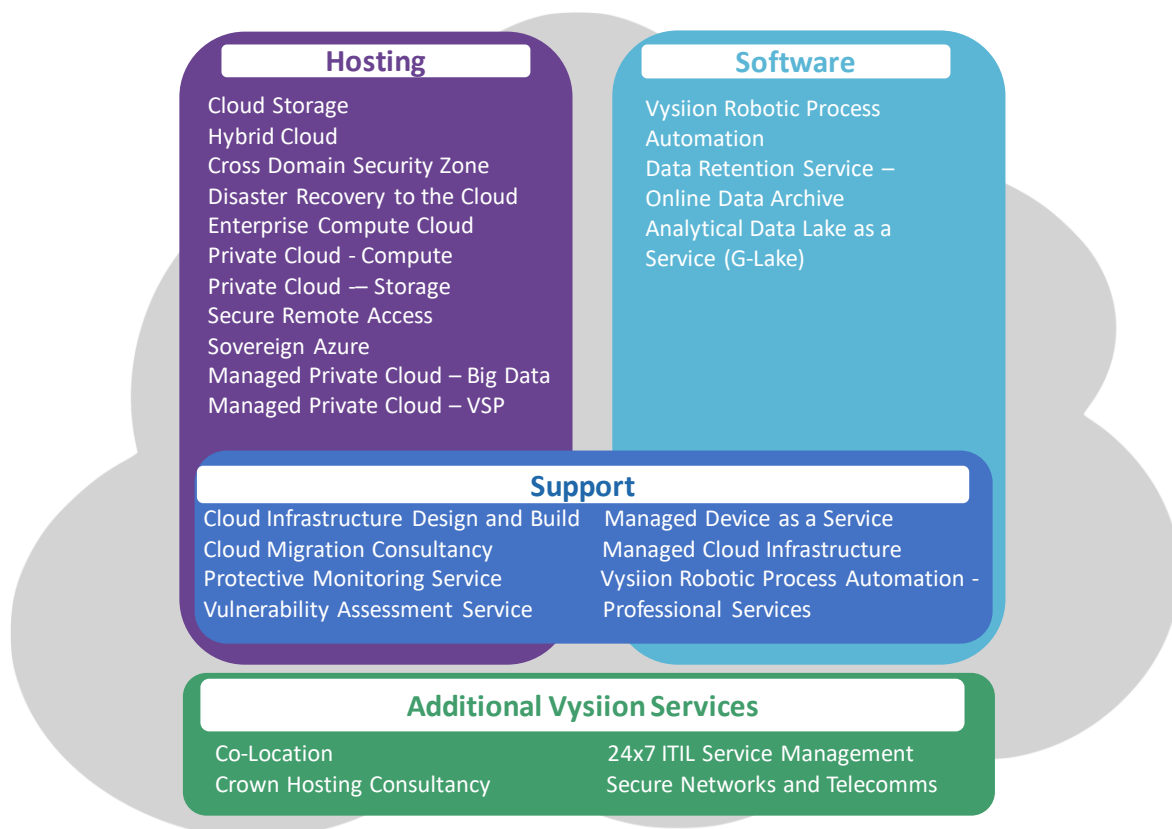


Figure 1 - Vysiion's Services

The following Cloud Support Services are of particular relevance:

- Cloud Migration Consultancy
- Cloud Infrastructure Design and Build Service

Cloud characteristics delivered

- Elasticity — scalable as your needs grow
- Measured usage — SLA and capacity reporting giving you full visibility of the service you're getting
- Networking — connect via DDoS-protected internet or using your own dedicated circuits
- Pricing — unit-based pricing

Key characteristics of our service

The service is designed for organisations whose requirements suit a dedicated compute infrastructure typical of Big Data platforms, rather than a multi-tenant compute solution. It is ideal if you need:

- Standard architecture — the Managed Private Cloud - Big Data service follows standard design patterns for Big Data and high-performance compute (HPC) architectures, based on blueprints from major industry vendors (including Dell, HP, HortonWorks, Apache)
- Scale — grow predictably using a unique hardware configuration (for example, high-capacity Data Nodes for Hadoop)
- Enhanced assurance — for isolation within the community of UK public-sector customers
- Control over your budget — choose between a predictable cost model or ownership of the infrastructure asset

Key features

Managed Private Cloud – Big Data provides a high-assurance, cost-effective alternative to hosting and managing your own compute infrastructure. It offers the following features and benefits:

- Dedicated infrastructure — the compute infrastructure is designed for the exclusive use of each customer, and provides the highest levels of separation and isolation from other customers
- Crown Hosting — we can deliver your infrastructure in-situ within your CHDC suite as Compute as a Service
- Native compatibility with a wide variety of operating systems (for example, Linux or Windows) and applications (for example, YARN, Hadoop, NiFi, Splunk)
- Support — 24 x 7 ITIL based Service Desk and Smart Hands service
- ITIL aligned service management processes

Service Components

Managed Private Cloud – Big Data provides customers with a managed, bare-metal compute platform to run Big Data solutions. Networking is provided which is typical of Big Data reference architectures, such as Hadoop Clusters.

Compute

Three server roles are available with this service:



- Master Node(s) – Master nodes serve as the control nodes for the Big Data platform. This node typically requires large amounts of CPU and RAM resources.
- Data Node(s) – Data nodes hold the data as well as execute filtering and sorting jobs. Data nodes typically require large amounts of local disk.
- Edge Node(s) – Edge nodes lie on the perimeter of the dedicated Big Data network and bridge the environment with the production IT environment or WAN. Edge nodes typically require large amounts of CPU resources.

Server specifications can be altered to meet bespoke requirements.

Networking

The Managed Private Cloud – Big Data service infrastructure provides a network and security architecture that is scalable and may be configured to be highly resilient. There are two main components:

- Core Network – provides a tiered network suitable for secure connectivity to the corporate network or WAN. Includes DMZ, boundary and core firewalls, load balancers and core switching. To achieve high availability of the networking components, two Core Networks can be adjoined. Servers can be connected to the Core Network in smaller solutions, without the need for any further networking components.
- Worker Pod – in larger environments, connectivity of Data Node servers is provided by additional networking 'pods', which allows for the expected growth of the Big Data platform. As more Data Nodes (or any other type of node) are added to the platform, Worker Pods will be added for connectivity back to the Core Networking.

The image in Figure 2 describes how the networking components of the Managed Private Cloud - Big Data are typically configured together:

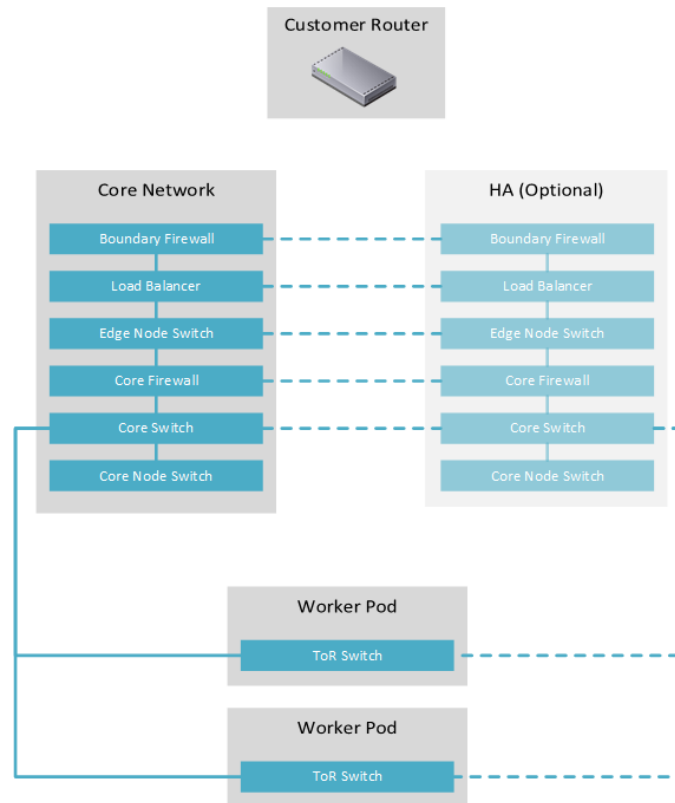


Figure 2 - Managed Private Cloud - Big Data Networking Options

Management Platform

The Managed Private Cloud – Big Data service includes as standard a management platform which provides the following capabilities:

- Anti-Virus
- Monitoring and Alerting
- Centralised Network Authentication
- Remote Administration Service (RAS)

Accreditation

Vysiion will work with the customer to obtain the necessary accreditation for the platform. To achieve this Vysiion will provide the following roles on an ongoing basis if required:

- Infrastructure Technical Architect – responsible for the design and build of the platform to meet the required security classification
- IT Security Officer – the security design authority for the platform

These roles are expected to include the following activities:

- Attendance at appropriate Security Working Group meetings
- Assistance in generating a Risk Management Accreditation Document set (RMADS)
- Ensuring compliance with appropriate Code of Connections such as may be required for connectivity to community WANs (e.g. PSN, RLI, SLI)

Service Desk

Vysiion's ITIL aligned Service Desk is available 24 x7x365 and provides a single point of contact for all incident logging, access requests and progress requests. Users will be able to log calls via a dedicated telephone number, email address or via an on-line customer portal. The aim is for the Service Desk to restore normal service as quickly as possible, for example fixing technical faults, fulfilling a Service Request (Access Requests, Service non-conformance issues, etc.) or answering a query on a particular system or process.

The Service Desk scope is:

- Logging, categorising and prioritising incidents and requests
- Fulfilling request for information, advice, a standard change or access to a service. E.g. password changes, service availability questions, etc.
- 1st line support - investigation and diagnosis of issues (2nd/3rd line support and external 3rd Party support partners)
- Managing the full lifecycle of an incident or request, escalating as appropriate and ensuring customer satisfaction before incident or request closure
- Informing users and/or incident initiators of incident and requests progress or service issues
- Conducting customer/user satisfaction call-back/surveys
- Updating the helpdesk incident management system based on ITIL Configuration Management Systems (CMS)

Network Monitoring

Our server monitoring toolset monitors key components of the infrastructure to ensure the platform remains available and is operating as efficiently as possible and offering the optimum balance between performance, capacity and cost. System reports will be generated by the monitoring tool and are available to the customer monthly.

During the on-boarding process, Vysiion will benchmark the server and network components to gauge the service thresholds and set the alerting within the monitoring software to enable an early warning and a tailored system.

Managed Antivirus

All managed servers will have an Anti-Virus and Anti-Malware agent installed. This agent will ensure that:

- Important or sensitive data is protected from all known types of threats, including viruses, rootkits, worms and spyware
- All files are checked before they enter the computer system and again whenever they are accessed from the filesystem
- Users and administrators are alerted about a virus before it causes any damage to their computer or company data

Anti-virus/anti-malware definition updates will be scheduled to be automatically installed to ensure the servers are always kept up-to-date. Vysiion administrators will be automatically alerted in the event of a virus being detected.

Change and Release Management

Change Management manages customer specific changes, enabling them to be deployed in a controlled fashion that minimises disruption and, more importantly, does not affect the live services. Vysiion's ITIL Change Management ensures each proposed change is formally evaluated, documented, prioritised and approved. Post implementation testing assures an effective change. All changes are logged as per ITIL and ISO9001 change management processes.

Change and Release Management may involve one or more of the following:

- Hardware
- Infrastructure e.g. network changes
- Process changes
- Documentation changes
- Software or Applications e.g. Critical Application Patches
- Application enhancements
- Customer specific application patches
- Application bug fixes

Capacity and Availability Management

Vysiion's Capacity Management process ensures that we are able to respond to demand, growth and change. Capacity planning processes and procedures are designed to cope with:

- Reactive capacity issues and events
- Predictions of future issues, for example storage capacity usage trends

Availability Management processes will ensure that the G Cloud contractual SLAs:

- Meet or exceed agreed targets for service availability
- Are aligned with the customer's business security requirements and objectives as per the contract and SLAs

Configuration Management

Vysiion uses ITIL Configuration Management Systems to manage both the service and infrastructure components and to maintain accurate system configuration records. This ensures accurate baseline records and traceability of item lifecycles within the systems.

Incident and Problem Management

Vysiion aims to restore normal service as quickly as possible through good Incident Management processes. These are either:

- Logged by automated systems through Event Management
- Reported to the Service Desk by users as issues

The Incident Management process is invoked for all incidents and these are managed in line with SLAs and incident priority levels. For major incidents an incident manager is assigned with a formal escalation process defined and agreed with the customer during the onboarding process.

All incidents are logged at the Service Desk, dated, time stamped and given a unique service number. The incident will remain open until closure is agreed with the initiating user. Progress and outcomes will be logged against the incident until closure.

A problem is an unknown cause of one or more incidents and Problem Management is used to identify and resolve the problem to known SLAs. The problem management is managed end to end by our Service Desk focusing on:

- Diagnosis
- Resolution determination
- Prevention of repeat offenders
- Root cause analysis
- Maintenance of a Knowledge Database with known repeat errors to facilitate quick issue resolution

There is often a conflict between the need to restore service quickly to maintain business operations and the need to understand what caused an incident to prevent reoccurrence. Vysiion works with customers proactively to ensure we find the best balance between Incident and Problem Management for each customer.

Named Service Delivery Manager

The Service Delivery Manager (SDM) monitors and measures Service Level Targets to ensure these meet the contract SLAs. The agreed SLAs are formally agreed and documented between Vysiion and the customer within the contract. The SDM will report service level performance against targets in monthly service reports.

Service Level Agreement

Vysiion can offer a tailored managed service to meet individual customer requirements. Therefore, the service level agreements for this service will be designed on a per customer basis. Factors in this design will depend upon the individual customer's requirements regarding the following:

- Incident and Service Request priorities
- Response times, fix times, and update frequency
- Availability targets
- Service Catalogue items
- Service Desk hours of operation
- Service schedule and maintenance windows

Vysiion operates a Service Desk and Smart Hands capability within Ark Data Centres, at both the Spring Park and Cody Park campuses. This unique capability allows for rapid deployment of hands-on support of equipment located in CHDC rooms and is especially useful in arrangements where remote support of the system is not possible over the Internet.

Pricing and packaging

Vysiion's Managed Private Cloud – Big Data service offers two pricing options:

- Vysiion Cloud – Vysiion supplies and manages the complete platform
- Customer Cloud – Vysiion manages a customer owned platform

For both options a unit-based pricing scheme is used, allowing for complete flexibility when designing the solution to meet your requirements. Vysiion will allow for a hybrid of Vysiion Cloud and Customer Cloud components, allowing you to reuse your existing hardware to build the complete Managed Private Cloud – Big Data solution.

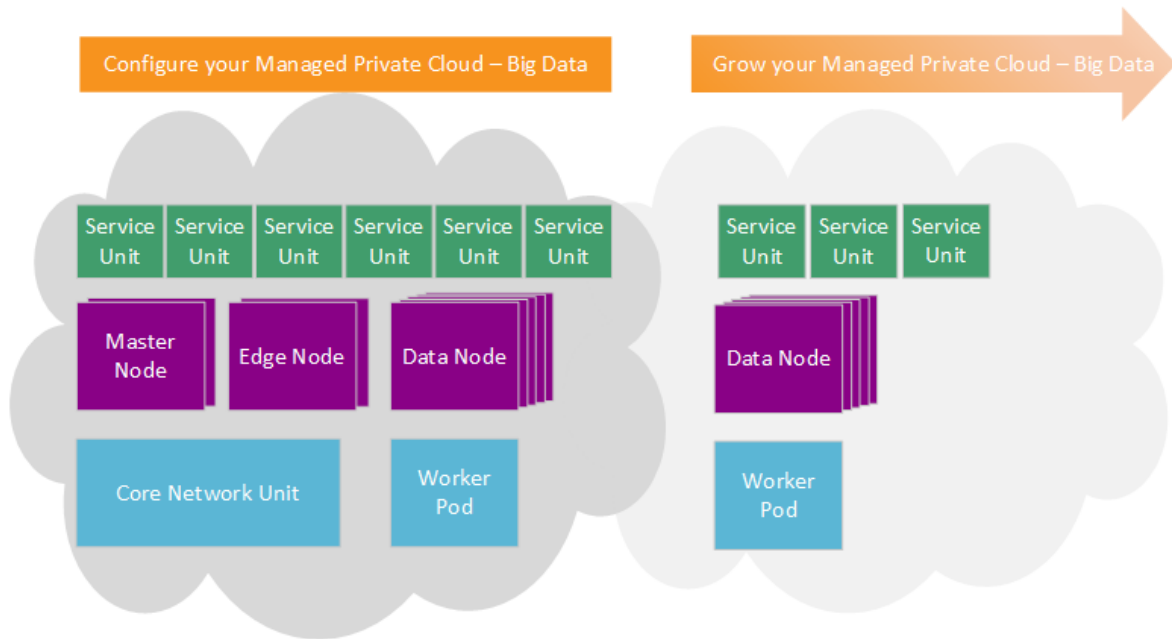
Managed Private Cloud – Big Data

| | On-Boarding | Vysiion Cloud Price per unit/month | Customer Cloud Price per unit/month |
|--------------------------|-------------|---------------------------------------|--|
| Core Network Unit | £11,300 | £3,400 | £310 |
| Worker Pod Unit | £2,600 | £720 | £30 |
| Management Platform Unit | £6,500 | £540 | £540 |
| Edge Node Unit | £790 | £810 | £160 |
| Master Node Unit | £790 | £1,100 | £160 |
| Data Node Unit | £790 | £810 | £160 |
| Service Unit | - | £1,200 | £1,200 |

The following units are available with Managed Private Cloud – Big Data:

| Units | Description |
|--------------------------|--|
| Core Network Unit | ■ Core networking and security components |
| Worker Pod Unit | ■ Networking for compute nodes |
| Management Platform Unit | <ul style="list-style-type: none"> ■ Monitoring and Alerting tools ■ Anti-virus ■ Remote Administration Service (RAS) |
| Edge Node Unit | ■ High CPU compute |
| Master Node Unit | ■ High CPU and RAM compute |
| Data Node Unit | ■ Large capacity disk compute |
| Service Unit | ■ Configurable service |

Unit numbers are built up to support the required solution, subject to design. Additional units can be added or subtracted, to adjust the platform capacity or the level of support provided.



Trial service

Owing to the exclusive-use, single-tenant nature of this service, no trials are available.

Onboarding

Given the nature of this service, on acceptance of an order, Vysiion will work with the customer to create a detailed design for the Managed Private Cloud – Big Data platform. This design will formalise the dedicated components required for the solution, such as server and storage hardware, systems management software, network configuration and cabling.

Lead times for delivery and handover will depend on the solution design.

The dedicated components will be procured by Vysiion or by the customer, depending on the package requested.

Vysiion will send the customer a Welcome Pack.

Customers have the choice of deploying the solution in one or both of Vysiion's UK data centres, or into their own CHDC space.

Vysiion can also deliver additional services, such as support and professional services (see 'Why Vysiion' above).

Data migration

In many circumstances, Vysiion can help facilitate a bulk migration to the platform using local data import. This is priced on a time-and-materials basis from the Vysiion SFIA rate card.

Vysiion can also help facilitate a bulk migration to the platform using offline data ingest and extraction — please ask for details.

Maintenance

Vysiion will adhere to the following in terms of maintenance windows:

Planned Maintenance

‘Planned Maintenance’ means any pre-planned disruptive maintenance to any of the infrastructure relating to the service. Planned Maintenance activity may result in periods of degradation or loss of availability depending on the nature of the activity required. In such cases, Vysiion will provide affected customers with at least fourteen (14) days advance notice of the Planned Maintenance.

Planned maintenance will be reported as an SLA event but will not be eligible for service credits.

If during Planned Maintenance there is a loss of availability outside the scope described in the planned maintenance notification to the service, an SLA event will be triggered and will be eligible for service credits.

Emergency Maintenance

‘Emergency Maintenance’ means any urgent maintenance required to prevent or mitigate against any event compromising the infrastructure relating to the service. Whenever possible, Vysiion will: a) provide affected customers with at least six (6) hours advance notice and b) carry out the emergency maintenance between the hours of 00:00 and 06:00 (UK local time) Monday to Friday or between the hours of Saturday 00:00 to 06:00 (UK local time) on Monday, (including bank holidays) unless there is an identified and demonstrable immediate risk to customer environment(s). Emergency Maintenance may result in periods of degradation or loss of availability depending on the nature of the activity required.

Emergency maintenance will be reported as an SLA event, but will not be eligible for service credits.

Customer responsibilities

- The control and management of access and responsibilities for end users, including appropriate connectivity, security and accreditation if required
- If access is required over government secure networks such as N3/HSCN, Janet, RLI, SLI or PSN (including legacy networks), you are responsible for adhering to the relevant Code of Connection (CoCo)
- Licensing, installation, management and administration of software layers above the Compute components - this includes the operating systems and applications that use the Managed Private Cloud - Big Data platform

NOTE: Vysiion’s other Cloud Support services may be used to compile a managed service comprising the platform, operating system and application components

- Arranging the installation of your own hardware and associated software, if required
- Setting up a service and maintenance contract for your own hardware
- Raising service requests through the Vysiion service portal when you need configurations implemented
- Raising incident tickets if you experience any issues with your service
- Giving us time to plan the installation of any additional hardware

CHDC Environments

- If the customer chooses to locate its hardware solution in a CHDC environment, the customer will be wholly responsible for setting this arrangement up through the Crown Hosting framework
- The customer is responsible for providing all WAN connectivity into its CHDC environment
- A minimum of six named Vysiion personnel need to be added to the whitelist to access the CHDC, to ensure maintenance and capacity upgrades can be carried out

Termination

Terms

You may terminate an Agreement by providing not less than 30 days' advance notice in writing.

Offboarding

Prior to terminating the contract, the customer must make the final payment (exit charge).

The customer will be required to make arrangements to take ownership of the disks associated with the Big Data platform.

Ordering and invoicing

The service can be ordered via the G-Cloud Framework and must be supported by a valid purchase order.

The client can engage with Vysiion by:

- Email to cloudsales@vysiion.co.uk
- Telephone: 01249 446500 and ask to speak to the G-Cloud sales team

Following detailed discussions about your requirement, Vysiion will assist you to develop the G-Cloud Call-Off order to meet your requirements.

Once the work is completed and deliverables are accepted and signed-off, Vysiion will invoice you for the work.

Vysiion will issue invoices as follows:

- At point of order for upfront fees and service options
- Annually in advance for pre-payment fees
- Monthly in arrears for monthly fees

For larger projects, milestone payments will be agreed with the customer. Once the milestones have been completed, accepted and signed by the client, Vysiion will invoice the client for the relevant portion of work. Payment is expected within 28 days.

We are able to use a range of electronic purchase and payment systems.