GRID AVD Pilot

Service Agreement

Harbour Energy

Date:	27/05/2025
Version:	2.2
Main Author:	Jonathan Moore / Steve Donne
Customer Approver:	Matthew Thompson

Key Contacts and Document Control

Harbour Energy

Name	Role	Email
Mathew Thompson	Global Platform – Cloud and Identity Manager	matthew.thompson@harbourenergy.com
Malcolm Brown	Project Manager	malcolm.brown@harbourenergy.com
Daniel Robinson	AVD Design Engineer	daniel.robertson@harbourenergy.com
Andy Cordiner	Cloud & Platform Architect	andy.cordiner@harbourenergy.com
Ricky Smith	Senior Engineer	ricky.smith@harbourenergy.com
David Hughes	Senior Engineer	ricky.smith@harbourenergy.com

Cloud Direct

Name	Role	Email
Jonathan Moore	Azure Pre-Sale Architect	Jonathan.moore@clouddirect.net
Steve Donne	Account Director	Steve.donne@clouddirect.net

Authors & Reviewers

Role	Revision	Name	Company
Author	1.0	Jonathan Moore	Cloud Direct
Reviewer	1.0	TDA	Cloud Direct
Author	2.0	Jonathan Moore	Cloud Direct
Reviewer	2.0	TDA	Cloud Direct
Author	2.1	Jonathan Moore	Cloud Direct
Reviewer	2.1	TDA	Cloud Direct

Review History & Change Control

Date	Revision	Change Description
1.0	18/03/2025	First Version
2.0	12/05/2025	Customer feedback - Requested updates to Technical Requirements (2.2) - Requested updates to Pilot Success Criteria (2.3) - Additional Milestone added: Requirements Workshop (4.1, 5.1, 10.1) - Pilot support moved to separate Milestone (4.1, 5.1, 10.1) - Additional Risk added based on outstanding requirements (6.1) - Additional Deliverable added: Prioritised Requirements List (7)

		- Timeline added (9.1) - Additional effort added: - Additional workshop added - DR and Future regional deployment design - DR deployment through Nerdio - Additional images for Windows 11 testing - Additional time for extended handover and knowledge sharing workshops - Commercial updated to reflect above (10.1)
2.1	20/05/2025	- TR8: OS changed to Windows 11 23H2 - TR17: Azure AD changed to Microsoft Entra ID - TR47: OS changed to Windows 11 for images being deployed for the production environment - 2.3: The success criteria can be discussed and finalised in the requirements workshop in Milestone 1 - 3.4.2: Text updated. Removed reference to charges and included suggested test regarding Harbour best effort - 3.4.5: "1 hour" removed from sentence. Cloud Direct change, as cadence and length of update to be aligned with Harbour requirements - 4.2: Diagram replaced with higher resolution one - EX02: Performance has now been included as a joint effort; Harbour to create testing and performance plan (with input from Cloud Direct) listed as dependency DP9. Performance tuning to be performed by Cloud Direct. Additional effort included for design (MS2) and implementation (MS3) - 6.4 – Cloud Direct change: Some of the original dependency milestones were incorrect and have been changed. - 5.2: Test/Dev environment design included. Additional effort included. - 6.4: DP8 – Updated and additional effort included - 4.1: Statement added to confirm Discovery and Design milestones are fixed, with milestone 3 being indicative and Milestone 4 being T&M - 11: Signature block added
2.2	27/05/2025	- Changed document title to Service Agreement to align with previously agreed T&Cs

Contents

1 Executive Summary

Cloud Direct is pleased to present this Service Agreement (SoW) for the design and implementation of a scalable Azure Virtual Desktop (AVD) Pilot platform for Harbour Energy to replace the existing GRID platform. This new AVD platform will utilise Nerdio and is designed to meet current use case requirements and is adaptable for a global multi-region estate. Comprehensive documentation will be provided to facilitate future expansion.

In summary this approach covers the following requirements:

- Develop a solution that effectively replaces the current on-premises GRID system.
- Ensure all costs are fully understood before deploying to the full production environment.
- Deploy Nerdio as part of the pilot phase.
- Provide technical design and implementation support throughout the project.
- Offer expertise and share best practices regarding Nerdio' s functionality.
- Ensure the environment can be easily scaled to meet production requirements if the pilot is successful.

Upon successful completion of the pilot a second Service Agreement will be provided to cover the work required to make the environment production live and assist with the migration of users into the new environment.

These deliverables aim to ensure a smooth transition from the current GRID solution to a scalable, cost-effective, and well-supported production environment using Nerdio.

2 Customer Requirements

2.1 Business Requirements

The following business requirements have been captured during pre-sales workshops with key stakeholders within Harbour Energy. These highlight the requirements that are applicable for the virtual desktop pilot as a whole and provide context. They are not intended to be solely delivered by this statement of work.

BR#	Requirement	Priority	Primary Stakeholder
1	Harbour Energy would like to work with a partner to help accelerate the AVD project	Must	Matthew Thompson
2	Solution should be a viable option to replace the current on-premises GRID solution	Should	Matthew Thompson
3	Costs should be fully understood before rolling out to the full Production environment	Must	Matthew Thompson
4	Harbour Energy would like to deploy Nerdio as part of any Pilot	Must	Matthew Thompson
5	Provide technical design and implementation support for the project. This should include challenging any Harbour Energy assumptions of the best solution for the Production environment.	Must	Matthew Thompson
6	Desktop management will be through Nerdio	Must	Matthew Thompson
7	Harbour Energy require expertise and knowledge sharing around functionality and good practice with Nerdio	Must	Matthew Thompson
8	Should the Pilot be successful, the environment should be easily scaled to meet Production requirements	Must	Matthew Thompson
9	Instructions of steps for deployment of the solution to other Microsoft Regions for other business units	Must	Matthew Thompson

2.2 Technical Requirements

The following technical requirements have been captured during pre-sales workshops with key stakeholders within Harbour Energy. These highlight the technical requirements that should be met as a result of this statement of works.

TR#	Area	Requirement	Priority
1	Locations	UK South/North Europe (DR). AVD Prod/DR currently has this configuration although it's primarily that way due to poor capacity in UK West traditionally. General business DR for UK non-AVD is UK West.	Must

2	Number of Users	120 (Production Numbers)	Could
3	Desktop type	Both - Dedicated and pooled desktops. All profiles will have the option of dedicated desktops depending on software outliers/performance demands. **Pooled Desktop (Non-Persistent)** Pools for Geology, Geophysics, Reservoir Engineering, Production Engineering, Ops Geology **Dedicated Desktop (Persistent)** Dedicated for CCS and Data Manager/IS (CCS due to apps requiring databases on local C drive that we have been told we can't host centrally due to being unsupported database types) – (Data Managers, as they frequently require old versions of apps or retired apps that we don't issue to standard users). Data manager and Carbon capture profiles will only be one-to-one dedicated desktops due to the variability in software stack.	Must
4	Number of personas (user groups)	8 profiles (Geologist, Geophysicist, Reservoir Engineer, Production Engineer, Petrophysicist, Ops Geologist, Data Manager (personal desktop only), Carbon Capture (personal desktop only). Unsure of how this translates to groups for Prod currently, they aren't in groups at the moment, as far as I'm aware, in general AD terms, only the groups I created to assign them access the pools/hosts for each profile in Pilot. This will be dependent on the eventual number of pools for Prod and how many groups that dictates.	Must
5	Number of users per persona (Production Numbers)	Geology – 31 Geophysics – 20 Reservoir Eng – 31 Production Eng – 11 Petrophysics – 5 Op Geology – 5 CCS – 3 Data Manager/IS – 10 to 15	Could
6	Expected working hours	Most users work standard office hours, but all disciplines can frequently be involved in work 24/7 in support for things like drilling operations.	Must
7	Peak concurrency for each user	The point of the POC (phase 1 of testing) to determine theoretical concurrent capacity per host but we likely won't	Must

		know how many concurrent users there are until the Pilot most likely, since the usage will likely vary depending on business activity.	
8	Operating system	Windows 11 23H2	Must
9	Common apps	M365 + Edge	Must
10	Business apps	See accompanying excel spreadsheet	Must
11	CPU/RAM requirements	Various SKUs: NV6ads_A10, NV12ads_A10, NV18ads_A10	Must
12	Storage requirements	P10 disk for OS so far, may need to be increased and/or have data disk depending on non-app storage requirements	Must
13	Image refreshing AVD process	Current process should be replaced by Nerdio	Must
14	Licensing	Pilot users will leverage existing E5 licences	Must
15	Users	All users will be treated as Internal users for the Pilot	Must
16	DR Design	Disaster Recovery design to be included based on a 4-hour RTO	Must
17	User Authentication and Authorisation	Integration with Microsoft Entra ID for user authentication. Role-based access control to manage permissions for different user roles.	Must
18	Resource Management	Dynamic allocation of computing resources based on user demand. Auto-scaling of virtual machines to handle peak loads and optimise costs.	Must
19	Session Management	Persistent and non-persistent session management for different user needs. Centralised management of user sessions and desktop pools.	Must
20	Application Deployment and Management	Automated deployment and updating of applications across all virtual desktops. Centralised application management to ensure consistency and compliance.	Must
21	Monitoring and Reporting	Real-time monitoring of system performance and resource utilisation. Detailed reporting and analytics for usage, performance, and cost management.	Must
22	Collaboration Tools	Support for collaborative workflows among geoscientists, engineers, and other stakeholders. Integration with tools like Microsoft Teams for communication and collaboration.	Must
23	Scalability	The system must support horizontal and vertical scaling to accommodate varying workloads	Must
24	Scalability	Elasticity to quickly adapt to changes in user demand without performance degradation.	Must

25	Performance	High throughput and low latency for data processing and transfer. Optimised performance for compute-intensive tasks.	Must
26	Reliability	High availability with minimal downtime. Robust failover mechanisms to ensure continuity of service.	Must
27	Usability	User-friendly interface for both administrators and end-users. Comprehensive documentation and support resources.	Must
28	Maintainability	Modular architecture to facilitate easy updates and maintenance. Automated backup and recovery processes.	Must
29	Energy Efficiency	Optimisation of resource usage to minimise energy consumption. Implementation of green computing practices.	Must
30	Cost Efficiency	Cost-effective resource management to optimise operational expenses. Utilisation of Azure's pricing models to reduce costs.	Must
31	Login/Logout	Secure access to the virtual desktop environment.	Must
32	Usability	User-friendly interface for both administrators and end-users. Comprehensive documentation and support resources.	Must
33	Maintainability	Modular architecture to facilitate easy updates and maintenance. Automated backup and recovery processes.	Must
34	File Management	Upload, download, and manage files within the virtual desktop.	Must
35	Session Persistence	Option to save and resume sessions as needed.	Must
36	User Management	Add, remove, and manage user accounts and permissions.	Must
37	Resource Allocation	Configure and allocate computing resources based on user roles and needs.	Must
38	Monitoring and Reporting	Access to real-time monitoring tools and detailed reports.	Must
39	Application Deployment	Deploy and update applications across the virtual desktop environment.	Must
40	Customisation	Customise virtual desktop settings and configurations to meet specific requirements.	Must
41	Application Support	Ensure compatibility and performance optimisation for industry-specific applications.	Must

42	Application Deployment and Management	High Level Design (HLD) to be provided for HBR Approval, c/w any diagrams being available in Visio format.	Must
43	Application Deployment and Management	Details of the Cloud Direct test plans are to be provided for review.	Must
44	Application Deployment and Management	The design needs to detail the DR environment.	Must
45	Application Deployment and Management	List of expected RFCs (Request For Change) and high-level detail of their content.	Must
46	Data Management	To be able to access and pull in real time drilling data (e.g. WITSML protocol) to relevant subsurface applications.	Must
47	Application Deployment and Management	Windows 11 images to be deployed for the production environment	Must
48	Costs	Solution must leverage most cost effective solution	Must
49	Reporting	A report to show AVD that have been on for certain duration.	Must
50	Application Deployment and Management	Design should allow for the provision of test/pre-prod environment to allow applications support team to test and configure new software, and applications updates. As well as associated end user acceptance testing.	Must
51	Session Management	Data Managers\ 3rd party\ some specific users may require Published desktops rather than published apps or other "workable solution".	Must
52	Application Deployment and Management	Delegation of access for different support users	Should
53	Application Deployment and Management	Base minimum guaranteed production services and DR services are required. The levels of availability and costs of this need to be advised by Cloud Direct.	Must

2.3 Pilot Success Criteria - TBD

The following success criteria has been determined by Harbour Energy for this Pilot. These will be evaluated by Harbour Energy during the Pilot and at its completion. We have included some examples below:

SC#	Success Criteria	Measure Example
SC01	Detailed costs for full solution can be established both Azure monthly and implementation	Detailed costs are documented
SC02	The Apps can be patched/updated easily and redeployed	App redeployment is understood and takes less than “X” time
SC03	User experience should be as good, if not better than, the existing environment	Users overall reported a positive experience giving the process mark out of 10 that exceeds the benchmark set by the tester

3 Cloud Direct Standard Approach

3.1 Microsoft Accreditations

We're one of Microsoft's most trusted and capable partners, with more than 15 of their most stringent competencies, including Infrastructure, Applications, Data and Security. At the heart of our business, we're a certified Azure Expert MSP. After being one of the first Azure Experts to meet Microsoft's requirements, we've been expanding our capabilities ever since. There are many benefits to working with an Azure Expert MSP, we're an audited and proven safe pair of hands, and you have access to all Microsoft funding programmes that will be outlined in the commercial section of this proposal.

3.2 Well-Architected Framework

The Cloud Adoption Framework works hand-in hand with the Microsoft Well-Architected Framework. While the Cloud Adoption Framework considers the whole estate migration, the Well-Architected Framework is used to produce a high quality, stable and efficient workload. It is focussed around 5 key pillars:

Pillar	Description
Reliability	The ability of a system to recover from failures and continue to function.
Security	Protecting applications and data from threats.
Cost Optimization	Managing costs to maximize the value delivered.
Operational Excellence	Operations processes that keep a system running in production.
Performance Efficiency	The ability of a system to adapt to changes in load.

3.3 Security Overview

Cloud Direct's design and delivery approach is aligned to the Microsoft Cloud Security Benchmark (v1) which provides prescriptive best practices and recommendations to help improve the security of workloads, data, and services on Azure. It is used in conjunction with the Cloud Adoption Framework, the Azure Well-Architected Framework and Microsoft Security Best Practices.

The Azure Security Benchmark focuses on cloud-centric control areas. These controls are consistent with well-known security benchmarks, such as those described by the Center for Internet Security (CIS) Controls, National Institute of Standards and Technology (NIST), and Payment Card Industry Data Security Standard (PCI-DSS).

Cloud Direct utilises defined and documented deployment blueprints for individual Azure resources, locked down to meet the Azure Security Benchmark. Any changes or deviations from these blueprints required for a workload to function correctly are understood and recorded, to provide a view of the overall security posture.

Security is at the heart of our offerings. We build it into everything we do to ensure your business is secure. We've been awarded a range of competencies from Microsoft, and other vendors, as part of our continued security efforts, including:

- Microsoft Threat Protection Advanced Specialisation
- Microsoft Information Protection and Governance Advanced Specialisation
- Microsoft Identity and Access Management Advanced Specialisation
- Cyber Security Essentials
- ISO 27001

3.4 General Processes

The following general processes and their restrictions have been costed within this Service Agreement. Should additional elements be required then a change request will be raised, and additional cost will be incurred.

3.4.1 Documentation Issue and Review

Any documentation issued by Cloud Direct should be reviewed by Harbour Energy within 5 days and comments returned. Comments must be collated by Harbour Energy before returning them so they only come from one source.

Cloud Direct will address these comments and re-issue the document, with no further reviews, and will be considered accepted at this point. If additional review cycles are required, Cloud Direct will raise a change request, and a cost will be incurred by Harbour Energy. This cost may include not only the time taken to update the document but also any additional work to previously delivered or ongoing tasks that may be affected.

If there are no comments received within the initial 5 days, the document will be deemed as approved and any subsequent comments treated as a new review cycle and charged.

3.4.2 Harbour Energy Change Process

To adhere with the Harbour Energy change process, change request details will be provided to Harbour Energy to allow change requests to be raised. Harbour Energy must inform Cloud Direct of the information areas required at least one week before the RFC needs to be submitted.

The RFC will be created by Harbour Energy and Cloud Direct will not attend the Change Advisory Board (CAB) or the Technical Review Board (TRB). The RFC should be represented by Harbour Energy project personnel.

Harbour Energy will make best efforts as part of their changes process to limit or minimise the impact of change to the CAB or TRB schedule where possible, including rejections from the CAB or TRB.

Should any other preparation, meetings or documentation be required before the RFC can be actioned, additional costs will be incurred.

3.4.3 Cloud Direct Testing

Cloud Direct will conduct testing at several points during the project as identified in the project plan. Any testing will be identified and results recorded. Tests will be conducted once, with any defects identified logged in the test results. Any Cloud Direct defined Critical and Major severity defects will be remediated if possible and if within Cloud Direct's remit. Any applicable tests will be rerun to confirm that the defect has been resolved; a full re-run of all tests will not be conducted.

3.4.4 Harbour Energy testing

It is anticipated that Harbour Energy will conduct testing at several points during the project as identified during the project plan. 5 days has been allowed for each of these testing cycles. Should additional testing time or Cloud Direct support/remediation be required, additional costs may be charged.

3.4.5 Meetings

Project update meetings will be scheduled for once a week. Should attendance at any other management meeting be required, for example a Steering Committee, an additional cost will be charged.

There are several walkthroughs with Harbour Energy noted in the Service Agreement. Each of these walkthroughs will be conducted as a single meeting with a duration of a maximum of 2 hours unless noted otherwise in the relevant section of this Service Agreement. If additional time or meetings are needed, the impact on the project will be assessed and additional costs charged.

3.4.6 Project Plans

There are several tasks in the project plan that are either fully or partially delivered by Harbour Energy. Should these take longer than indicated in the approved joint plan or not occur when originally scheduled, additional costs may be charged depending on the impact.

4 Service Agreement Overview

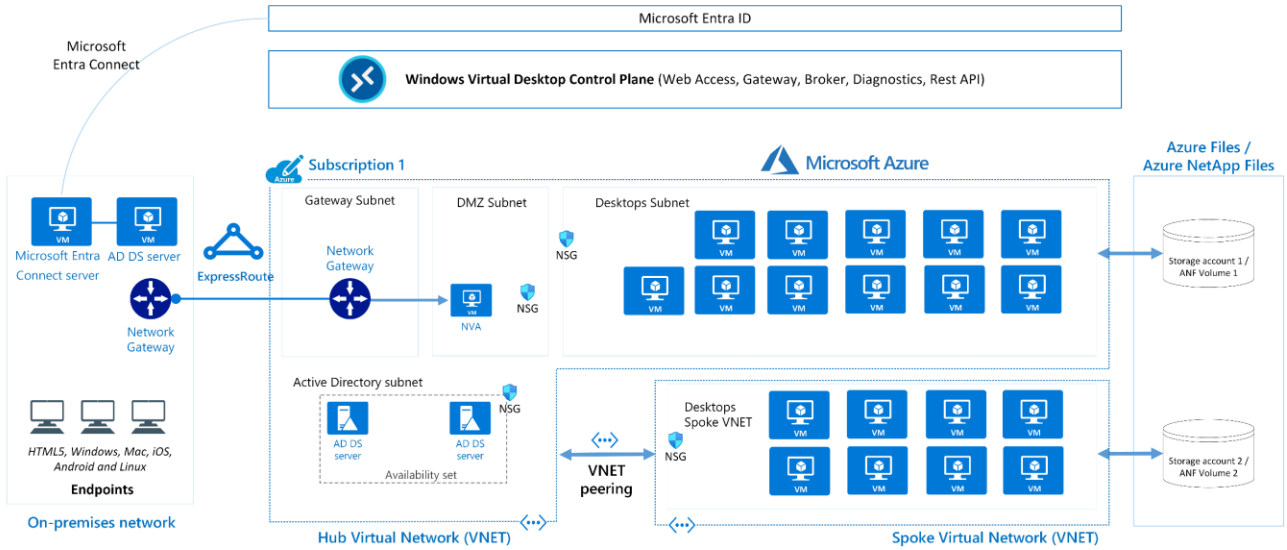
4.1 Scope and Milestones

Cloud Direct have captured the expected scope of works for the discussed AVD project as shown below. This phased approach will allow Cloud Direct to build out services in line with Harbour Energy requirements and timescales. A more detailed view of each milestone is provided further in this document. Anything not included is assumed as out of scope, however if any changes are required to the below, they will be captured and added as per our normal change control process. Milestones 1 and 2 are provided as firm and fixed with milestone 3 listed as indicative only. The contents of these indicative milestones and their associated costs will be altered with Harbour Energy's agreement as the design progresses, until they become fixed before completing the previous milestone. Milestone 4 is T&M and may not be required.

- **Project Initiation**
  - Kick off meeting
  - Pre-requisites check
  - Access to environments
- **Milestone 1 : Finalising requirements**
  - Outstanding requirements workshop
- **Milestone 2 : AVD Pilot Design**
  - Workshop
  - AVD design and documentation
  - Customer playback
- **Milestone 3 : AVD Pilot Implementation**
  - AVD Deployment and configuration (including Nerdio)
  - Generate Windows 10/11 Gold Images
  - Cloud Direct Testing
  - Knowledge share
- **Milestone 4 : Additional Support and Feedback**
  - Go Live Support (up to 3 days)
  - Pilot feedback workshop
- **Project Completion**
  - Project Acceptance
  - Documentation handover
  - Project Close

4.2 Indicative Target State Environment

The diagrams below are a high-level indication of how the target state environment may look, based on our reference architecture and experience of deploying similar technologies. Cloud Direct will gather more detailed requirements via Subject Matter Expert (SME) and Stakeholder engagement as part of the initial design phase and will be able to provide a more accurate set of designs for Harbour Energy validation and sign off once the design phase is fully complete. Part of this validation will be alignment of the design to the Microsoft Well Architecture framework (WAF). The framework will ensure Harbour Energy are delivering services that are balanced between cost optimisation, operational excellence, performance efficiency, reliability and security.



Microsoft Azure

4.3 Out of Scope (Exclusions)

The following exclusions to the statement of work have been defined.

EX#	Description of Exclusion
EX01	Anything that is not stated as in scope, is out of scope.
EX02	Cloud Direct will perform internal functional testing post implementation focused on individual server function and connectivity. Any other form of testing is excluded.
EX03	Any software development required for compatibility with Azure services or for any other purpose.
EX04	Configuration of on-premises hardware such as networking devices, servers, and user workstations.
EX05	Configuration of third party/non-Microsoft appliances or devices within Azure (except for Nerdio).
EX06	Design or provision of network connectivity outside the Azure connectivity boundary
EX07	Application and AVD licensing are the responsibility of Harbour Energy
EX08	Any direct user support, whether for access to AVD or application support
EX09	For any applications identified, Cloud Direct will spend no longer than 1 day trying to implement it in AVD (using Nerdio). Any additional time that may be required above this is excluded from this proposal.
EX10	No external users are included in the Pilot
EX11	Federation of identity with any outside domain
EX12	Provision of a new domain controller
EX13	Additional documentation not defined within the Deliverables section

5 Detail of Works

Subject to the project initiation and planning, Cloud Direct have broken down the project task and milestones as follows.

5.1 Milestone 1: Requirements Workshop

5.1.1 Requirements Workshop

Harbour Energy have a number of requirements that were submitted for the AVD project that require further discussion and clarification. To allow the next stage of the design workshops to be most effective, Cloud Direct will host a workshop to finalise the requirements for the project. This 2 hour workshop will be held remotely over Teams the output of which will be a defined list of requirements to be met by the project, prioritised using the MoSCoW technique.

A list of the outstanding requirements submitted can be found in Appendix B.

5.2 Milestone 2: AVD Pilot Design

5.2.1 Design Workshop

Cloud Direct will ensure that all requirements have been captured and validated through a workshop with Harbour Energy SMEs and stakeholders. The workshop will be led by one of our architects to cover requirements of the AVD deployment and will cover these key areas:

- Current design review
- Implementation overview
- Ongoing Management (using Nerdio):
    - Profile management
    - Application packaging
    - Image management
    - Security requirements
    - Cost management
- Disaster Recovery options for a 4-hour RTO (design only)
- Test/Dev Requirements

5.2.2 High level design and playback

The high-level design will be created by a Cloud Direct architect based on the validated functional and non-functional requirements. Once the right solution has been identified, it will be designed in line with Harbour Energy requirements. This design will be internally validated, then issued to Harbour Energy for review. Once Harbour Energy are satisfied the design reflects validated requirements, the project will move into an implementation phase.

5.3 Milestone 3: AVD Pilot Implementation (Indicative)

AVD presents an opportunity to leverage cloud-native services and transform from an on-premises solution to a PaaS-based one. AVD provides a scalable and flexible environment that allows Harbour Energy to deploy and manage virtual desktops for their users. Users can launch any Azure Virtual Desktop client to connect from any device to their published Windows desktops and applications through a native application or Azure Virtual Desktop HTML5 web client.

Licensing is simple as the rights to use the Windows 10/11 multi-session are already included in several Microsoft 365 SKUs; Business Premium, E3 and E5. Harbour Energy users of the Pilot will have E5 licenses allocated.

Nerdio

Harbour Energy have expressed an interest to include Nerdio in the AVD Pilot project. Nerdio will be used to create the windows host images and then used later to manage AVD. Deployment and configuration of Nerdio will be performed by Cloud Direct.

Nerdio will be installed with a trial license (free for 30-days) which should align with the 4-week window for the pilot. Standard costs for Nerdio are a minimum of $1,000 per month, with a per user price of $10 per active user. This means, the monthly running cost will be a flat rate of $1,000 for up to 100 users, at which point any additional users are charged at $10 each.

What is being proposed is a 30-day trial and then moving to a monthly subscription model, the billing appearing as a 3rd party line item on Harbour Energy's monthly Azure bill.

Platform Build and AVD Deployment

The AVD is secure by design with several measures deployed by default in line with the best practice security recommendations from Microsoft cloud security benchmark. These cover areas such as networking, data protection and identity.

Windows Host Image Creation

Cloud Direct will create a 3 Windows 10 multi-session host images from a Microsoft gallery image that includes Microsoft Office.

Any additional applications will be added for the Pilot, will be confirmed by Harbour Energy during the requirements workshop. The assumption has been made that all applications can be installed using Nerdio Apps Management, if the application requires manual installation to the gold image, this will be the responsibility of Harbour Energy, supported by Cloud Direct. Once the image has been finalised, Cloud Direct will publish the gold image to the image gallery.

Any required additional configuration of the host Operating System will be carried out by Cloud Direct. Any final changes to AVD configuration will be carried out at this point and Cloud Direct will apply FSLogix profile configuration and application masking as required.

Current Image Refreshing AVD process

Harbour are currently using Azure VM image builder to refresh their images. Every month they refresh the hosts via logic app on a per-pool basis. The logic app first deploys new hosts in drain mode using the latest image to allow for Intune policies + sanity checks. Next, it makes the new hosts live, the old hosts drained and then removes the original hosts.

Harbour Energy would like to replace this functionality using Nerdio as part of the Pilot.

Testing and Validation

Cloud Direct will perform functional testing to ensure the AVD environment performs as expected, ensuring Harbour Energy can successfully establish user acceptance testing (UAT) against their predefined criteria.

As part of the user acceptance testing, performance will be tested. Cloud Direct will provide support to tune AVD and Azure resources to enhance the user experience where possible. This may be performed directly through the Azure portal or through Nerdio.

Knowledge share

Cloud Direct will provide knowledge transfer to Harbour Energy IT team around the solution provided including administration, optimisation, and general troubleshooting using Nerdio.

5.4 Milestone 4: Pilot Support (T&M)

Once deployed, the Pilot environment will be available for the Harbour Energy to conduct their Pilot as they see fit. Cloud Direct will provide support to Harbour Energy IT team for the Pilot including administration, optimisation, and general troubleshooting across AVD and Nerdio. This support will be capped at 3 days effort within the first month; should more effort be required; this will incur additional cost. Example of additional support rates would be £1,500 per day on a T&M basis for a senior consultant, or £1,200 per day for a consultant.

6 Risks, Assumptions, Issues and Dependencies

6.1 Risks

The following initial risks have been captured and will placed on the project risk register upon agreement with this Service Agreement. It includes the likelihood of the risk turning into an issue (1 = low to 5 = high) and the severity of the impact if it does occur (1 = low to 5 = high).

R#	Description of Risk	Likelihood (1 to 5)	Impact (1 to 5)	Mitigation
1	Performance Baseline/Success Criteria isnt defined	1	3	Cloud Direct have made defining the success criteria a pre-requisite for the project to ensure it doesn't delay the project once it is in flight
2	Most project requirements listed as "Must Have's" including some that are not recommended or possible	5	5	Cloud Direct have scheduled a requirements workshop as the first milestone within the project to agree any outstanding based on feasibility and best practice

6.2 Assumptions

This Service Agreement has been based on the following assumptions. Should these assumptions be incorrect, additional charges may occur.

AS#	Description of Assumption
1	Harbour Energy will ensure the relevant stakeholders attend the data gathering workshops.
2	Any change and release management processes will be defined during the project initiation.
3	Harbour Energy will ensure staff are available for planning, scoping, and any vendor meetings.
4	All work including workshops are to be conducted remotely.
5	Attendees at workshop will provide and validate technical and business requirements.
6	All work is performed during normal working hours, except where specified.
7	Cloud Direct will be provided with sufficient permissions and access to make configuration changes where required.
8	Any Microsoft Partner of Record or Partner Admin Link requirements will be declared during the project initiation.
9	Cloud Direct will perform internal testing post implementation, if Harbour Energy require additional testing, then this must be captured within the project initiation and scoping.
10	All work will be carried out within Cloud Direct's standard operating hours except where specifically mentioned within the scope of work.

11	All Azure consumption is expected to be under Harbour Energy's EA agreement
	Service Agreement Specific Assumptions
12	All users will use 1 of 3 gold images
13	Applications will be installed and managed through Nerdio
14	Applications are compatible with Nerdio
15	Any manual applications installations will be the responsibility of Harbour Energy (with support from Cloud Direct)

6.3 Issues

The following initial issues have been captured and will placed on the project issue register upon agreement with this Service Agreement. It includes the severity of the impact (1 = low to 5 = high) and a description of that impact.

R#	Description of Issue	Impact (1 to 5)	Impact Description
1	No issues identified		

6.4 Dependencies including pre-requisites

The following dependencies on Harbour Energy have been identified, covering customer resource, technical and process. These are not exhaustive but provide an initial view of the resources and actions that will be required and the milestone in which they are relevant. These are all subject to change, with the project plan held jointly between Cloud Direct and Harbour Energy holding the latest dates.

Any dependency marked as a pre-requisite must be met prior to this Service Agreement commencing. Dependencies marked with a milestone must be met at the beginning or during that milestone.

DP#	Dependency	Likely Milestone
1	Harbour Energy will need to ensure all stakeholders are available for project phases (planned via Cloud Direct project management).	Pre-requisite
2	Cloud Direct will need to have the relevant access to Azure resources as required for completion of the project. Ideally this should be granted for the duration of the project to avoid delay and limit the risk of personnel re-assignment.	Pre-requisite
3	Harbour Energy will need to appoint a project and technical resource to function as the main points of contact prior to the project initiation. These resources must have this statement of work as their main priority	Pre-requisite

DP#	Dependency	Likely Milestone
4	Harbour Energy must provide valid licensing for all software that will run in the Cloud. This could include operating systems, any workloads, and virtual appliances.	Pre-requisite
5	Harbour Energy resources to provide estate and workload/application knowledge.	Pre-requisite
6	If Microsoft Funding is being used, Harbour Energy must consent to the Funding email sent to them from Microsoft	Pre-requisite
7	Harbour Energy defining the success criteria for the pilot	Pre-requisite
8	Documentation and designs produced by Cloud Direct will be reviewed by Harbour Energy within 5 working days. If no response is received within 5 working days, the project will continue as planned. This covers two reviews iteration only. If additional review iterations are required, this may result in an additional charge	Milestone 1 & 2
9	Harbour Energy resources to create a test plan for performance testing including a baseline performance requirements and application testing. Cloud Direct will provide advice on what metrics to be included as part of the performance testing	Milestone 2
10	Harbour Energy resources to test applications once they have been migrated to AVD	Milestone 3
11	Harbour Energy users to conduct the Pilot user testing	Milestone 3

7 Deliverables

Cloud Direct will deliver against the captured requirements as below.

DB#	Description of Deliverable	Milestone	Delivery Criteria	Stakeholder
1	Project Delivery Document (PDD) which will include key Project information including: - Project schedule - RAID log - Deliverables - Exclusions - Scope changes	0	PDD shared with Harbour Energy at the beginning of the project and updated throughout	TBC
2	Prioritised Requirements List (PRL)	1	This will be the agreed list of requirements for the project	TBC
3	The Design Pack will consist of the following elements. - Solution Design for AVD inc. DR - Implementation Plan AVD Pilot inc. DR - Configuration Options for AVD/Nerdio - Testing Plan for Functional Testing	2	Document provided to Harbour Energy	TBC
The following deliverables are indicative only and may change depending on the output from Milestone 1				
4	AVD Environment in Harbour Energy Azure tenancy according to agreed Solution Design	3	AVD Pilot environment in Harbour Energy Azure tenancy	TBC
5	POC Support	3	Up to 3 days of support effort, delivered within one month of environment handover	TBC
6	Project Completion Document	3	Document provided to Harbour Energy	TBC

8 Delivery

Cloud Direct will deliver the proposed work for milestone 1 as a fixed price with a defined scope. This will ensure that all deliverables will be achieved within the stated costs minimising financial risk to Harbour Energy. The list of deliverable items is detailed in the previous Proposed Deliverables section.

8.1 Approach and Methodology

The primary objective for all projects delivered by the Cloud Direct Professional Services team is to ensure that they are delivered in an efficient manner, on budget, and adhere to our aim of providing a timely and easy customer experience.

Cloud Direct will provide Harbour Energy a fully project managed engagement utilising our Professional Services Project Management, Delivery Teams, and Technical Design Authority Architect team.

8.2 Delivery Schedule

Cloud Direct will deliver all tasks within phased milestones, which will be co-ordinated via Project Management with tasks planned between all stakeholders. This will ensure the right resources are available at the right time from all parties maximising efficiencies within a project.

During the project initiation, Cloud Direct will capture all relevant information to create a project plan to include important dates, deadlines, change control processes, review timings, testing, and release schedules.

8.3 Schedule Resourcing

Cloud Direct will deliver this proposal using our Azure professional services delivery teams or by carefully selected partners. These teams are comprised of Azure expert level consultants that have a proven track record delivering Azure based programmes of work. They will be supported by a project management office who will initiate the programme and ensure the relevant resources are secured to conduct the work tasks, and our Technical Design Authority architects will identify the solution and design based on Harbour Energy requirements.

As part of our commitment to delivering optimal services and maintaining operational efficiency during project delivery, Cloud Direct reserves the right to engage third-party entities to perform certain tasks or complete specific work on our behalf.

This decision is driven by our dedication to ensuring the highest standards of quality and timeliness in all our endeavours. The engagement of third parties will be conducted with careful consideration of their expertise, professionalism, and alignment with our organisational values.

Any third parties involved will be subject to strict confidentiality agreements and quality control measures to safeguard the integrity and confidentiality of the work in question. Our commitment to excellence remains unwavering, and the utilisation of third parties is a strategic measure intended to enhance our overall capabilities and meet the diverse needs of our valued clients.

As cloud implementation projects are delivered remotely, there is no need for Cloud Direct to deliver any of the work from a Harbour Energy location.

9 Schedule of Works

9.1 Indicative High Level Project Plan

The following high level project plan shows indicative dates for when milestones and activities are likely to complete. This is subject to change and should be used for guidance only.

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Weeks 8 – 12	Week 13	Week 14
Governance	Milestone 0	Project Management									
Discovery & Design	Milestone 1.1	Design Workshop									
	Milestone 1.2		AVD Design		Customer Review						
Implementation	Milestone 2.1					AVD Implementation and functional testing		Nerdio Workshop and handover			
	Milestone 2.2								Customer testing		
	Milestone 2.3								Pilot Support		
	Milestone 2.4									Feedback Workshop	
	Milestone 2.5										Project Close

10 Commercials

Cloud Direct will deliver the proposed solution in line with the price identified below.

If there are extra works required outside of the scope, then Cloud Direct Project Managers can raise the relevant change requests to include this work within the project. This may include additional charges for the work depending on the change. Harbour Energy will be consulted prior to any extra scoped work starting.

10.1 Professional Services Costs and Microsoft Funding

The fixed cost and indicative costs for this Proposal are broken into their phased milestone as below. **Cloud Direct will invoice 50% upfront and 50% on completion of each milestone**:

MS#	Description of Milestone	Total Price
MS1	Discovery	£2,500
MS2	Design	£19,000
MS3	Pilot Implementation (Indicative)	£25,000
MS4	Additional Support (T&M)	£5,000
	Totals	**£51,500**

Total	Totals
Total Professional Services	**£51,500**
Estimated Microsoft Funding Contribution	*£12,000*
Total Estimated Customer Contribution	**£39,500**

Microsoft Funding is an estimate until a PO is received from Microsoft.

Harbour Energy will be liable for any costs incurred where AMM/ECIF funding is not paid by Microsoft to Cloud Direct for any reason.

All prices are valid for 30 days from date of issue.

Any changes or cancellations to resource bookings made to a project within 5 working days will incur a charge. If all pre-requisites specified in this document are not completed by the customer, which subsequently delays consultancy activity, additional chargeable consultancy effort may be required.

10.2 Estimated Azure Monthly Costs and Microsoft Azure Credit

A generalised estimation of the monthly Azure costs has been provided. These are indicative only and will be further refined as the design and migration progresses. It is understood that this will be built on MCA so Harbour Energy can continue to receive the benefits of Microsoft's Unified Support Agreement.

Estimator URL	Description	Monthly Azure Cost

AVD Estimate	AVD Estimate for Production	£7,180

The above pricing is based on the following: -

- 95 Pooled desktops – NV18ads
- 15 Dedicated desktops – NV6ads
- 10 Dedicated desktops – NV12ads
- 230 hours
- 128 GiB SSD
- 1TiB bandwidth

11 Commercial Acceptance

Provision of services in accordance with the terms set out in the agreed Terms and Conditions v11.4 as executed and agreed between the Parties.

Signed for and on behalf of Customer:

Name:	Elaine McLean
Signature:	Elaine McLean (May 30, 2025 11:56 GMT+1)
Date:	05/30/2025

Signed for and on behalf of On Direct Business Services Limited

Name:	Steve Price
Signature:	Steve Price (May 30, 2025 12:00 GMT+1)
Date:	05/30/2025

12 Appendix A – RACI

The RACI table provides a high-level indicative model that splits the expected areas of work between Harbour Energy and Cloud Direct. It is based on the following understanding of RACI.

Responsible:	This role does the work to complete the activity. Only one role is responsible, but other roles can help as needed.
Accountable:	This role approves the completion of the high-quality deliverable to fulfil the activity. Only one party is accountable for each specific task or deliverable.
Consulted:	This party is an individual or a group who is consulted to provide opinions or technical expertise to complete an activity or deliverable. They are typically subject-matter experts (SMEs) who are in communication with the people who are responsible for activities.
Informed:	These parties are notified of progress, often only when a task or deliverable is completed. One-way communication exists with these parties.

MS#	Category	Sub-Category	Activity	Cloud Direct	Customer
1	Initiation	Project	Project setup	R, A	C, I
1	Initiation	Project	Customer Kick Off Meeting	R, A	C, I
1	Initiation	Project	Initial Cloud Direct Project Plan	R, A	C, I
1	Initiation	Project	Alignment with Overall Project Plan	C, I	R, A
1	Initiation	Support	Onboarding Questionnaire	R, I	A, C
1	Initiation	Support	Internal Support Handover	R, A, C	I
1	Initiation	Project	Link CPOR/DPOR or PAL to Cloud Direct	R, A	C, I
1	Initiation	Project	Finalise PID	R, A	C, I
1	Initiation	Project	PID Sign-off	R, I	A, C
1	Planning	Support	Provisioning activities (if required)	I	R, A, C
All	Planning	Project	Continuous tracking and updating of Cloud Direct project plan	R, A	C, I
1	Planning	Design	Customer workshops	R, A	C, I
1	Planning	Design	Application compatibility testing	C, I	R, A
1	Planning	Design	AVD design	R, A	C, I
1	Planning	Design	Testing and user acceptance planning	C, I	R, A
1	Planning	Design	Produce Design Document	R, A	C, I
1	Planning	Design	Walkthrough of the design	R, A	C, I
1	Planning	Design	Design Signoff	C, I	R, A
2	Platform	Build	AVD build	R, A	C, I

MS#	Category	Sub-Category	Activity	Cloud Direct	Customer
2	Platform	Build	Deploy security controls	R, A	C, I
2	Platform	Build	Deploy DevOps (used by Cloud Direct)	R, A	C, I
2	Platform	Build	Deploy Nerdio	R, A	C, I
2	Platform	Build	Create Windows Images	R, A	C, I
2	Platform	Test	AVD Functional Testing	R, A	C, I
2	Platform	Test	AVD Customer UAT	C, I	R, A
2	Platform	Test	Security Testing	C, I	R, A
2	Platform	Handover	Workload customers sign off	R, I	A, C
3	Handover	Support	Early life support	R, A	C, I
3	Closure	Update	Design Documentation Update	R, A	C, I
3	Closure	Update	Final Walkthrough with Customer	R, A	C, I
3	Closure	Signoff	Project signoff	C, I	R, A
3	Closure	Signoff	Project completion checks and closure	R, A	C, I

13 Appendix B – Outstanding requirements

Below are a list of previously submitted technical requirements that require further discussion during the requirements workshop in Milestone 1

Area	Requirement	Priority	Reason for discussion
High Performance Data Transfer	Implementation of high-performance transport protocols for bulk data transfer.	Must	Multicast isnt supported for use within AVD and Azure. The requirement needs further discussion.
Security	Implementation of advanced security measures, including encryption and multi-factor authentication. Regular security audits and compliance checks.	Must	All data in Azure is encrypted at rest. Multi-factor authentication is a function of Azure-AD. If MFA is already configured and in use, it can be leveraged by users of AVD. If required, configuration of MFA in Azure AD is currently outside the scope of this project.
Data Management	Efficient handling of large datasets, including seismic data and reservoir models. For example, integration with Petrel for seamless data access and manipulation.	Must	Requirement not clear and needs further discussion
Compliance	Adherence to industry standards and regulations for data protection and privacy. Regular compliance audits and updates.	Must	AVD adheres to the following industry standards and certifications for data privacy and security: ISO27001, ISO27018, SOC 1, SOC 2, SOC3 and GDPR. Please confirm if there are other standards required?
Application Access	Ability to access and use authorised applications like Petrel.	Must	Confirmation Petrel is to include in the list of applications to be installed on the images being used in the Pilot (I believe it is)
Integration	Integrate third-party tools and services with the virtual desktop environment.	Must	We would need to get specific here as AVD is PaaS service from Microsoft and as such only certain 3rd party tools (like

			Nerdio) are availble for use with AVD.
Application Deployment and Management	Not to be domain joined. Cloud identity only.	Must	This is possible but has implications. Can be discussed during the design workshop.
Application Deployment and Management	Low Level Design (LLD) to be provided for HBR Approval, c/w any diagrams being available in Visio format.	Must	Cloud Direct provide a single design document alongside a configuration
Application Support	User guide/s.	Must	Access if very simple and via a windows application installed on the user's computer. Cloud Direct feel that a user guide isnt required for access to AVD. If the user's guide is for the applications, this falls outside the scope of this SOW.
Application Support	Admin Training for configuring the environment, Nerdio and for providing user support, complete with a guide.	Must	This will form the basis of the knowledge sharing session, including how to access Nerdio and AVD documentation. The session will be recorded and transcribed, both of these will be shared with Harbour. Cloud Direct havent included any time for additional documentation, but this can be discussed and added if required in addition to the recording.
Application Deployment and Management	Detailed documentation that has sufficient information for the operations team to be able to support the service following UAT testing completion.	Must	Requirements of what additional information will be required, or an example of existing documentation would be helpful.
Usability	Allow for data transfer between multiple applications via locally installed plugins/data connectors.	Must	We believe this can be achieved but would needs further discussion.

Application Deployment and Management	Connectivity for applications with databases, application servers, license servers & high-performance compute clusters (both in-house and third-party) plus any applications that are slated to be deployed through the current procurement process (Lumin & RoQC for example).	Must	This will depend on current connectivity between Azure and other parties/on-premise being established and tested
Data Management	Be aware that some of the applications share data that the AVD design needs to be able to accommodate and will have to be tested. This includes:- Sharing of subsurface data between colleagues in other business units who will not be utilising the AVD environment or other cloud solutions (geocloud).	Must	Considered out of scope. "This is not expected to be a specific task for Cloud Direct but for awareness."
Application Deployment and Management	Consideration should be taken in the design to ensure this is easily deployed to other Microsoft data Centre Regions and documented instructions provided so our technicians can easily follow them to deploy the solution to other Business Units.	Must	This will be best handled through functionality within Nerdio. This can be demonstrated and the relevent existing Nerdio documentation shared
Application Deployment and Management	Cloud Direct will design and build the environment based on Harbour's current AVD environment's security measures.	Must	As an example, CrowdStrike is compatible. However, the rest of the secuirty measures need to be defined/shared
Data Management	Ability to run Cegal Tracker Web and Cegal SDM software that are accessed via the browser.	Must	All apps will need to test, if not already successfully deployed as part of the PoC
Application Deployment and Management	Automate the provisioning of Subsurface software applications in Azure upon approval of user requests in ServiceNow. (Make sure the application is exposed as a group).	Must	This would be deemed out of scope for this project as it would require development of Service Now. This can be a point of further discussion.
Application Deployment and Management	Application configuration data needs to follow users between hosts/sessions. For example, Petrel CRS configuration.	Must	This is possible but will require data to be stored in the user's profile.
Application Deployment	Bypass method for long running published apps.	Must	This will need to be balanced with drive for

and Management			reduced costs. Matt mentioned there are other options internally for performing these tasks.