INTELLECTUAL PROPERTY OFFICE

Response to ITT for the Provision of a Network Redesign Project – Low Level Design Service

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CDW PEOPLE WHO GET IT

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SECTION 1: MANAGEMENT SUMMARY

The Tenderer must provide a resume of the proposal.

The Intellectual Property Office (hereafter IPO) is an executive agency of the department of Business, Energy and Industrial Strategy (BEIS). IPO aims to enhance the competiveness of British industry and commerce on an international scale, working with its customers by offering them an accessible national and international system for granting intellectual property rights.

IPO is headquartered in Newport, South Wales, with periphery offices in London and Cwmfelinfach, South Wales. IPO's currently operates separate, air gapped networks for wired and wireless LANs, and is embarking on a project to merge the networks across all their national sites, whilst concurrently implementing stronger access points to provide authentication, authorisation and posturing, using Cisco ISE.

IPO has released a tender in order to find a suitable partner to review their current high-level design for the Cisco ISE implementation and provide a low-level design that includes a thorough implementation plan, whilst also offering ongoing support through consultancy and specialist internal resources.

As a Cisco Gold partner and authorised technology partner for Cisco ISE, CDW Limited is well placed in the market to meet IPO's requirements. CDW has implemented Cisco ISE solutions for a number of authorities across the UK, following our best practise implementation methodology, and can leverage this experience when reviewing IPOs current designs and building a low-level design and implementation plan.

Based on our previous experience, CDW has provided a detailed breakdown of the design and implementation phases we would expect to carry out and provided suggested timescales for each task.

As part of our solution offering, CDW will provide:

- **A detailed low-level design** following a review of IPO's high-level design and collaborative workshops to understand the full scope of your project;
- **A tried and tested build and test plan** that confirms with Cisco guidelines and industry best practise;
- **Resourcing assurance** for the elements of the project IPO is looking to complete internally, providing access to a wide range of solutions architects and onsite resources if requirement;
- **Expert deployment assistance** for the final Cisco ISE solution, leveraging our internal Cisco expertise to assist IPO in reaching your goals.

SECTION 2: UNDERSTANDING OF REQUIREMENTS

The Tenderer must confirm their understanding of the key requirements and scope of the services to be provided for the IPO.

CDW can confirm our understanding of the key requirements and scope of services to be provided for the IPO.

SECTION 3: REQUIREMENTS

The Tenderer must address the requirements of the ITT. However, the detail on charges (Section 8 in this document) must feature separately as Section 4 of the Tenderer's proposal. In addition the Tenderer may highlight where a specific constraint might significantly impinge on their ability to provide a satisfactory level of service.

5. OBJECTIVES OF THIS PROCUREMENT

5.1. Introduction

5.1.1. Currently the IPO has separate air gapped networks for wired and wireless LANs. We are undertaking a project to merge these networks at IPO sites whilst also implementing stronger access control providing authentication, authorisation and posturing using Cisco ISE. Single method for wired, wireless and remote connectivity.

CDW can confirm our understanding of this request.

6. REQUIREMENTS

6.1. Description

6.1.1. The IPO Network team are looking for a Cisco Gold Partner and ISE Authorised Technology Provider to take our existing high level design and provide a detailed low level design service with implementation plan and skilled resource to help deliver this.

CDW can confirm our understanding of this request.

6.1.2. To break this down we require:

i. **Detailed Low Level Design – specifically around Cisco ISE and upgrades to existing Wireless provision**
ii. **Build Plan and Pilot Test**
iii. **Assurance around elements of the project that are being carried out by IPO staff**
iv. **Assistance to deploy – specifically around Cisco ISE and upgrades to existing wireless provision.**

CDW can confirm our understanding of this request.

6.1.3. This will provide assurance to the IPO and support the wider implementation minimising risk and impact to service.

CDW can confirm our understanding of this request.

6.1.4. It also needs to be considered that there is a phase 2 to this project which includes replacing our core network (6500 VSS). The low-level design needs to ensure it is compatible and compliments the high level design shown in the phase 2 diagram.

CDW can confirm our understanding of this request.

6.1.5. IPO staff role is to carry out the work around building the aggregation switches – we have purchased 2 x Cisco 9500-40X-A which will be in a Stackwise Virtual configuration. IPO staff will be responsible for the merging of the wired and wireless Access switch stacks. IPO staff will also be responsible for any other LAN changes and firewall requirements.

CDW can confirm our understanding of this request.

6.2. Breakdown of Tasks

6.2.1. LAN:

i. **IPO staff will carry out the work to merge existing wireless and wired access switch stacks (3750/3850) – currently separated provision to provide wired and wireless connections for users (IPO in-house task).**
ii. **IPO staff will carry out the work to implement additional Aggregation switches to merge wired and wireless LAN.**
iii. **The provider should assure the model and advise on the necessary configuration to communicate with ISE.**

CDW can confirm our understanding of this request.

6.2.2. Wi-Fi:

i. **Work with IPO staff to ensure knowledge transfer**
ii. **Integrate with ISE**
iii. **Implement Flex connect for more efficient AP/data management.**
iv. **In addition to existing 5508 WLC's implement an Anchor wireless controller for Guest Internet.**

CDW can confirm our understanding of this request.

6.2.3. Cisco ISE:

i. **Work with IPO staff to ensure knowledge transfer**
ii. **Develop and configure existing ISE environment.**
iii. **User connects to network: wired, wireless, remote.**
iv. **Authenticates end user devices:-**
    - **802.1x using device certs; if fail provide internet access only.**
    - **Posture check – e.g. running latest AV? If not quarantine until upgraded.**

- **Authenticate and authorise user – via AD – if approved allow access – Security Group Tagging (SGT) applied which governs users access rights.**

v. **Remote Network connectivity – User connects via Cisco AnyConnect VPN to External ASA firewall – Authentication/authorisation passed through Internal ASA to ISE and AD.**

CDW can confirm our understanding of this request.

6.2.4. Cisco AnyConnect:

i. **Review set-up; advise on any necessary re-configurations, provide assurance on implementation.**

CDW can confirm our understanding of this request.

6.3. Timescales

6.3.1. Phase 1

i. **Design, test and planning work is expected to take place from 23rd April 2018 – 22nd June 2018.**
ii. **Delivery of final report 22nd June 2018**
iii. **Implementation in Q4 2018 (Oct-Dec).**

CDW can confirm our understanding of this request.

6.3.2. Phase 2

i. **Just for information Q1-Q4 2019 – not in scope for this proposal but is a critical phase 1 design consideration.**

CDW can confirm our understanding of this request.

6.4. Diagrams

6.4.1. Diagrams showing the IPO's existing wired and wifi networks and the proposed wired and wifi networks for Phase 1 and Phase 2 are shown in Annex A-C.

CDW can confirm our understanding of this request.

7. GENERAL REQUIREMENTS

7.1. Information Required

7.1.1. The IPO has a high-level plan to merge our wired and wireless networks, and to provide secure access for users whether at the office (wired and wireless) or working remotely. The requirement is for you to translate this into a detailed plan (including resources (days) and timescales) and to provide

assurance around the design. Please provide details of approach in undertaking this work.

The design assurance approach is broken down into several phases and sub-phases, time frames and task owner as detailed below.

Phases 1 and 2 describe the design assurance process and timeframes.

Note that phases 3 to 7 describe the staging, build, migration and deployment process and associated timeframes. Whilst this section of the response describes design assurance and the approach taken; CDW thought it prudent to include tasks and timeframes from design, deployment, and the eventual handover to IPO to provide full context and a single view of all project tasks required for a full end to end ISE deployment. Further details around the deployment approach are described in the next section.

Design and Deployment Tasks

Phase 1 – Planning and project initiation

Task	Who	Time and Effort
• Project definition workshop (design requirements ratification) • Risks, assumptions, issues and actions are defined	CDW	2 days

Phase 2 – Design

Task	Who	Time and Effort
Create Low level design (typical, but not limited to) • All pre-requisites detailed • Detailed network design • Networking requirements including wireless and wired asset and version verification	CDW	2 days
Create Schedule of Works (final) • Project plan • Contractual obligations from CDW and Intellectual Property Office	CDW	1 day

Phase 3 – Staging

Task	Who	Time and Effort
Ensure software is at correct versions and validated licenses	CDW	1 day

Cisco ISE Configuration, including the following but not limited to: [redacted]	CDW	3 days
Provide CDW resources to access required devices for configuration	IPO	

Phase 4 – Testing

Task	Who	Time and Effort
Basic Testing	CDW/IPO	2 days
Policy and Reporting Review	CDW/IPO	2 days

Phase 5 – Migration

Task	Who	Time and Effort
Based on review, finalise configuration of policy	CDW	1 day
Phase users defined within deployment to be authenticated by ISE. Troubleshooting and monitoring (as required)	CDW/IPO	2 days
UAT [redacted] Functionality Tests	CDW/IPO	2 days

Phase 6 – Hand Over / Service transition

Task	Who	Time and Effort
As-Built Documentation	CDW	1 day
Go-Live Cover	CDW	1 day

Phase 7 – Project Closure

Task	Who
Project closure	CDW / IPO

Project Governance

Task	Who
Project Management Office: • Project Plan Updates will be provided through a HLR Lite, which will cover the following areas and will be issued in a timely manner. The HLR Lite will not be 'information overload' but specific and to the point: • Key Milestones • Budget Spent and Remaining • Key Risks, Issues and Actions	CDW

Design considerations

The following design options are considered when creating a low-level design for IPO. Its important that each functional area is discussed and incorporated into the low-level design. It is assumed that IPO have previously procured Cisco ISE as a Network Access Control (NAC) solution, however the deployment has not taken place.

ISE Architecture

There are several factors which determine the ISE architecture and include the following. Each of these areas is used to determine the optimal low-level design based on IPO requirements.

ISE architecture consideration

- ISE Deployment Architecture [redacted]
- ISE Node Overview [redacted]
- Authorisation Methods (location mapping to DACLs, VLANs, SGT [redacted]

Internal Identity stores

- Internal Identity Store (Endpoints – 802.1x, MAB)
- Internal Identity Store (Users)
- Identity Groups (mapping of endpoint groups to endpoint policies)

External Authentication Identity Sources

ISE supports several External Authentication Services that can be integrated with ISE. ISE can call External Identity Sources to authenticate users against. Organisations commonly integrate ISE into an existing environment that already handles network-based authentication to resources, such as Microsoft Active Directory, which is the most common external identity source. ISE requires user accounts with specific domain permissions and attributes.

Identity Source Sequencing

Identity Source Sequences are used throughout ISE Policies to determine which Identity source to use for an authentication and need to be identified as part of the design.

Profiler Service and Profiling

The ISE profiler is the component service responsible for endpoint detection and classification. Methods of profiling include the below and during the design process its determined what the best profiling method is.

Profiling policies

Custom Profiling Policies can be created when one of the extensive default policies provided does not meet profiling needs.

Profiler Feed Service

The Profiler Feed Service allows the automatic download and updating of the Cisco profiler database.

Supplicant Configurations and Agents

Native supplicant configuration

Enabling of Windows native supplicant configuration for wired configurations is critical in solution design.

Certificates

Certificate Authority (CA)

A CA is an important design consideration to support certain connectivity methods which could be part of the ISE deployment. Its important this is discussed as part of the design. A CA is required for the deployment of the ISE Network Access Control in keeping with ISE deployment best practises.

Certificate distribution options

- Distribution of certificates from the internal Microsoft CA through Windows Native certificate provisioning processes simplifying the deployment to the bulk of the devices
- Manual enrolment and installation of a certificate
- 3rd party mechanisms to deploy the certificates to the device, such as an MDM

Certificate revocation configuration

- Configuration of ISE to periodically update its certificate list
- Use of OSCP

Certificate authentication profile

- These are used in authentication profiles for certificate-based authentication

Network Device Access

Network Access Devices (NADs) are devices that end clients connect to directly (e.g., network switches, Wireless LAN Controllers, ASA Firewalls, etc.).

NADs are configured to enforce an authentication method with clients when they connect. Authentication order and priority is an important design consideration.

Wired Design Components

The wired deployment is typically a phased approach and various deployment modes can be used throughout the process. These include Monitor, Low-impact and Closed deployment. The low-level design would need to address the deployment approach for the wired deployment.

Wired 802.1x

For network access, a host connects to the network device and requests to use network resources.

The network device identifies the newly connected host and requests authentication and authorisation for the user from ISE using the RADIUS protocol as a transport mechanism.

ISE supports network access flows depending on the protocol transported over the RADIUS Protocol.

- RADIUS-Based Protocols without EAP
- RADIUS-Based Non-EAP Authentication Flow
- RADIUS-Based EAP Protocols
- RADIUS-Based EAP Authentication Flow

MAC authentication bypass

If an endpoint does not support 802.1X, it will be unable to authenticate via 802.1X. These devices use MAC Authentication Bypass (MAB) as an alternative to gain dynamic access to the network.

Inaccessible Authentication Bypass

The inaccessible authentication bypass feature, or AAA fail policy, can be used when the switch cannot reach the configured ISE PSN RADIUS servers and new hosts cannot be authenticated.

7.1.2. You should also address the following:

i. **The IPO intends to use Cisco ISE to authenticate and authorise users and their devices whether in the office (wired and wireless) or working remotely. Please provide details of your approach to build, test and deploy this system.**
ii. **Wireless is a critical aspect of the IPO's plans. Please provide details of your approach to integrate the existing Cisco wireless infrastructure with Cisco ISE in authenticating and authorising users and their devices.**
iii. **Cisco AnyConnect is currently the IPO's chosen VPN. The current configuration needs to be assessed and improvements identified. Please provide details of your approach.**

IPO Requirements confirmation

- Set up new Cisco ISE deployment using latest software version on virtual/physical machines
- Configure ISE for Wireless and Wired Security (802.1X), AnyConnect/ASA VPN authentication including authentication of Corporate devices and BYOD scenarios
- Provide knowledge transfer to IPO staff

ISE Deployment Approach

Following on from the completion of the low-level design the project moves into the deployment phases. The CDW approach and deployment considerations are described as follows:

Pre-requisites

- Access to IPO Active Directory environment / Certificate Authority
- Cisco switch available for testing
- Suitable end user devices for access testing

ISE architecture

Typical tasks associated with building and integrating ISE nodes are: -

- Build required number of ISE v2.x Nodes (virtual / physical appliance)
- Integrate ISE nodes with IPO PKI and create deployment type (distributed or centralised)
- Join ISE deployment to IPO Active Directory environment
- Re-apply ISE licenses (if necessary)

Wireless Security Migration

IPO corporate workstations / laptops should be able to gain network access and be assigned an appropriate VLAN/security based on Active Directory user credentials. New SSIDs are created which utilise ISE for authentication; this means that users can connect to the SSIDs to test. If there any issues with ISE or the new SSIDs, the SSIDs can be disabled and users will default back to the original wireless network. The steps to achieve this are as follows: -

- Create test WLANs on Wireless LAN Controllers
- Create Policy sets to mirror existing ISE Wireless functionality (for example 802.1X / BYOD)
- Test functionality using non-production SSIDs
- Migrate 'live' SSIDs across to new ISE deployment

AnyConnect / VPN rollout

The approach to AnyConnect integration involves the following tasks: -

- Create test connection profile on ASA authenticating to ISE
- Test VPN policy set
- Configure test switch for Wired MAB
- Test wired policy set

Wired Security PoC

ISE is thoroughly tested and deployed in monitor mode before being transitioned to production. This is achieved as follows: -

- Enable profiling functionality on ISE
- Create Policy Sets for Wired Security accommodating 802.1X and MAB authentication
- Configure test switch for Wired Security 802.1X/MAB
- Test wired policy sets using suitable end devices

Wired Security Rollout

- Create 'Monitor Mode' and 'Secure' ISE Policy Sets
- Prepare configuration scripts for Access Switches
- Develop wired rollout plan with IPO IT Team
- Support IPO through the Wired Security rollout process

Testing

- Test functionality of Corporate and MAB device WLANs
- Amend ISE/WLC configuration as necessary

Handover

- Provide Knowledges Transfer to IPO staff

- Create technical as-built documentation (Remote)

8. CHARGES

This is completed in Section 4 as per IPO's original request.

9. TERMS AND CONDITIONS

9.1. Contractual Conditions

9.1.1. Any agreement arising from this procurement will be based on the terms and conditions of Crown Commercial Services Framework Network Services RM1045 – Lot 2.

i. **http://ccs-agreements.cabinetoffice.gov.uk/contracts/rm1045**

CDW confirms our understanding of this request.

9.1.2. Any terms and conditions agreed as part of any subsequent document will be based on the following document. No other terms and conditions will apply.

CDW confirms our understanding of this request.

9.1.3. Tenderers must confirm their acceptance of the above as part of their proposal.

CDW confirms our acceptance of the above terms.

9.2. Intellectual Property Rights

9.2.1. Subject to any pre-existing rights of third parties and of the Tenderer, the Intellectual Property Rights (other than copyright) in all reports, documents and other materials which are generated or acquired by the Tenderer (or any of its sub-contractors or agents) in the performance of the Services shall belong to and be vested automatically in the IPO.

CDW confirms our understanding of this request.

9.2.2. Tenderers must confirm their acceptance of the above as part of their proposal.

CDW confirms our acceptance of the above terms.

10. ACHIEVING TRANSPARENCY OF PUBLIC SECTOR PROCUREMENT

10.1. Requirement to Publish Contractual Information

10.1.1. Government has set out the need for greater transparency across its operations to enable the public to hold public bodies and politicians to account. This includes commitments relating to public expenditure, intended to help achieve better value for money.

Acknowledged.

10.1.2. As part of the transparency agenda, Government has made the following commitments with regard to procurement and contracting:

i. **All new central government ICT contracts over the value of £10,000 to be published in full online from July 2010;**
ii. **All new central government tender documents for contracts over £10,000 to be published on a single website from September 2010, with this information to be made available to the public free of charge;**
iii. **New items of central government spending over £25,000 to published online from November 2010;**
iv. **All new central government contracts to be published in full from January 2011.**

Acknowledged.

10.1.3. Suppliers and those organisations looking to bid for public sector contracts should be aware that if they are awarded a new government contract, the resulting contract between the supplier and government will be published. In some circumstances, limited redactions will be made to some contracts before they are published in order to comply with existing law and for the protection of national security.

CDW understands and accepts this request.

10.1.4. With the above in mind Tenderers must confirm that, except for any information which is exempt from disclosure in accordance with the provisions of the FOIA, the content of any subsequent Contract is not Confidential Information.

CDW understands and accepts this request.

10.1.5. The IPO shall be responsible for determining in its absolute discretion whether any of the content of the Contract is exempt from disclosure in accordance with the provisions of the FOIA. Notwithstanding any other term of the Contract, the Tenderer hereby gives consent for the IPO to publish the Contract in its entirety, (but with any information which is exempt from disclosure in accordance with the provisions of the FOIA redacted) including from time to time agreed changes to the contract, to the general public.

CDW understands and accepts this request.

10.1.6. The IPO may consult with the successful Tenderer to inform its decision regarding any exemptions but the IPO shall have the final decision in its absolute discretion.

CDW confirms our understanding of this request.

10.1.7. The successful Tenderer shall assist and cooperate with the IPO to enable the IPO to publish this Agreement.

CDW confirms our understanding of this request.

10.1.8. Tenderers must confirm their acceptance of the above or their bid may not be considered further.

CDW confirms our understanding of this request.

SECTION 4: CHARGES

It is important that the IPO be able to form a clear view of the charges of Tenderer's proposals over the period of the contract. Tenderer must state the basis on which charges will be calculated and outline any policies in respect of varying charges in the light of modified usage of services:

- **All charges must be included or summarised in the Tenderer's response. Charges which appear elsewhere in the proposal, but are not summarised in this section, will be presumed to have been waived.**

8. CHARGES

8.1. Purpose

8.1.1. The purpose of this Section is to define the information that Suppliers must supply in respect of their proposed charges.

CDW understands this request.

8.2. Composition

8.2.1. Charges must be detailed for the requirement specified in Section 6 above.

CDW understand this request. Please find pricing attached as IPO Pricing Schedule.

8.2.2. These charges must be provided as follows:

i. **Daily rates in respect of every grade of personnel you foresee would be involved in the provision of the Design, Build Plan, Testing and Deployment of this Requirement;**
ii. **The number of days required detailed by each individual grade to complete the requirements detailed in Section 6 above;**
iii. **Any other costs you foresee arising;**
iv. **An overall fixed price cost for Design, Build Plan, Testing and Deployment of this Requirement.**

Confirmed, Our days rate includes Expenses

8.3. Instructions

8.3.1. Expenses, if any, should be detailed at IPO standard rates, shown in section 6.4.

CDW understands this request.

8.3.2. To avoid doubt, all costs not listed within your bid will be deemed to have been waived.

CDW understands this request.

8.3.3. Any improvements you propose that are additional to our stated requirements, and any additional service options being offered, must be separately costed if applicable.

This is subject to further technical discussions

8.3.4. You must confirm that all charges submitted are exclusive of VAT.

Confirmed

8.3.5. You must confirm that all charges submitted will be held firm for a period of 30 days commencing from the quote return date

Confirmed

8.4. Expenses

8.4.1. SUPPLIERS must detail what travel and accommodation expenses you would apply to a contract (if any).

Confirmed

8.4.2. For the avoidance of doubt, any expenses paid under the contract must only be reasonably and necessarily incurred as a result of carrying out the contracted services, with due regard to economy. They will only be paid on proof of occurrence and will be paid at the IPO's standard rates which are as follows:-

i. **Overnight accommodation: London – maximum £150.00 (inc. VAT) per night, B&B. Elsewhere maximum £85.00 (incl. VAT) per night B&B;**
ii. **Car mileage rates at 0.45p per mile. This is for round trips of up to 150 miles. Journeys in excess of that must be undertaken by public transport;**
iii. **Rail fare at standard (or advanced or off-peak) fares;**
iv. **Flights at economy class;**
v. **Taxi fares will only be reimbursed where public transport or use of a private car is unsuitable or inappropriate;**
vi. **Parking fees / and toll charges, necessarily incurred may be claimed where supported by a valid receipt;**
vii. **No other form of expenses will be payable by the IPO.**

CDW understands this request.

SECTION 5: ANY OTHER INFORMATION

Any other information that the Tenderer wishes to add further to that already requested that they feel may further demonstrate their ability to meet the evaluation criteria listed at paragraph 4.7.1 below.

CDW and Cisco

Cisco is the world leader in creating technologies that connect the previously unconnected. Since 1984, the company has been pioneering innovation to address customer challenges and change the way we work, live, play, and learn. Cisco is the leading authority for the datacentre, and the largest networking company in the world, constantly striving to discover new ways to transform how we connect and interact on a daily basis. Accordingly, their technologies are an integral component in the datacentres and business infrastructures of some of the world's most successful companies.

CDW and Cisco's partnership spans over a decade. Our unrivalled expertise in transforming the datacentre and practical working knowledge of complementary technologies sees us well-placed to help our customers realise the true potential of digital-ready infrastructures powered by Cisco. We're proud that Cisco has recognised our exceptional know-how surrounding their technologies by certifying CDW as a Gold partner – their highest partner accreditation – a status we have held for more than seven years.

As one of the top three Cisco partners in the UK, CDW is:

- **One of only 15 shared support partners in the UK**, enabling us to deliver Cisco's partner shared support (PSS) and offer first and second line support to our customers.
- **An authorised technology partner (ATP)**. As an ATP for datacentre, security, mobility and enterprise networking, CDW is granted the earliest insight into every Cisco development across these areas.
- **One of only five partners on Cisco's partner technology advisory board (PTAB)**. This board is invitation only and entitles CDW to have direct involvement with specific Cisco processes. We also have membership of Cisco's partner organisation advisory board.
- **An award-winning partner**. CDW has received Cisco's 2017 award for Architectural Excellence (Datacentre), Global Partner of the Year 2016 and UK & Ireland Partner of the Year 2016 awards, among other accolades.
- **At the forefront of Cisco technology**, thanks to further accreditations including Cisco master cloud builder, Meraki managed service provider, Flexpod partner and Smart solution partner.

In recognition of our position as a leading global partner, CDW was presented Cisco's 2017 UK&I award for Architectural Excellence – Data Centre. We also received four awards at Cisco's 2016 partner summit:

- Cisco EMEAR Cloud Builder Partner of the Year

- Cisco Global EMEAR Partner of the Year
- Cisco UK & Ireland Cloud Builder Partner of the Year
- Cisco UK & Ireland Partner of the Year

Cisco awards are given to exemplary channel partners and are used to recognise best-in-class business practices. They acknowledge CDW's innovative practices, application successes, unique programmes and effective deployments of Cisco technology to help customers achieve their organisational and technical objectives.

CDW is a tier one Gold partner, which means we can buy equipment direct from Cisco or through distribution. We can provide our customers access to evaluation equipment through Cisco's try and buy programme, as well as flexibility in terms of stock levels and competitive pricing. Being able to buy direct from Cisco allows us to expedite urgent orders and pass on Cisco developments through our executive level peer-to-peer relationships and quarterly business reviews with the vendor.

CDW also has the broadest range of expertise across Cisco's three main architectures: Borderless Networks, Collaboration and Datacentre. Our chief technology officer, Andy Eccles, sits on Cisco's Enterprise Networks Advisory Board and Yvonne Matzk, vendor and alliances director, is a member of Cisco's executive exchange board. We also have constant presence at Cisco's partner operations advisory board. These engagements allow us to provide feedback from our customers directly to senior executives at Cisco on an operational and commercial level. CDW has integrated the deepest level of Cisco lifecycle services expertise into our offerings and can demonstrate a measurably high level of customer satisfaction.

Cisco ISE Capability

Cisco ISE provides authentication for wired, wireless and VPN and provides visibility of users and devices connecting to the network. Cisco ISE addresses different use cases for authenticating users and devices, including certificate-based authentication for corporate users and devices, Bring Your Own Device (BYOD) and guest access. ISE also supports integration with external identity sources, including Microsoft Active Directory and 2-Factor Authentication solutions.

Cisco ISE provides reporting for users and devices connected to the network across wired, wireless and VPN. The contextual information gathered during authentications is presented within the dashboard and in many pre-canned reports; reports can also be customised to tailor to SLaM's requirements. Cisco ISE reports are used with monitoring and troubleshooting features to examine user and device trends, monitor system performance and network activities from a central location.

ISE is capable of anomaly detection and automated remediation. ISE has Visibility Wizard, which can be used to explore different subnets in the network. The wizard will show what devices are connected to that specific subnet. ISE reports can be exported into the standard csv format. This is beneficial in terms of auditing. ISE can provide granular and detailed reporting in terms of authentication, authorization and accounting. ISE can provide suggestions to resolve authentication and authorization issues. ISE reporting can be stored to external servers if this is required.

CDW has worked with a number of our Public Sector customers to integrate ISE into their environments, including:

CDW's Professional Services

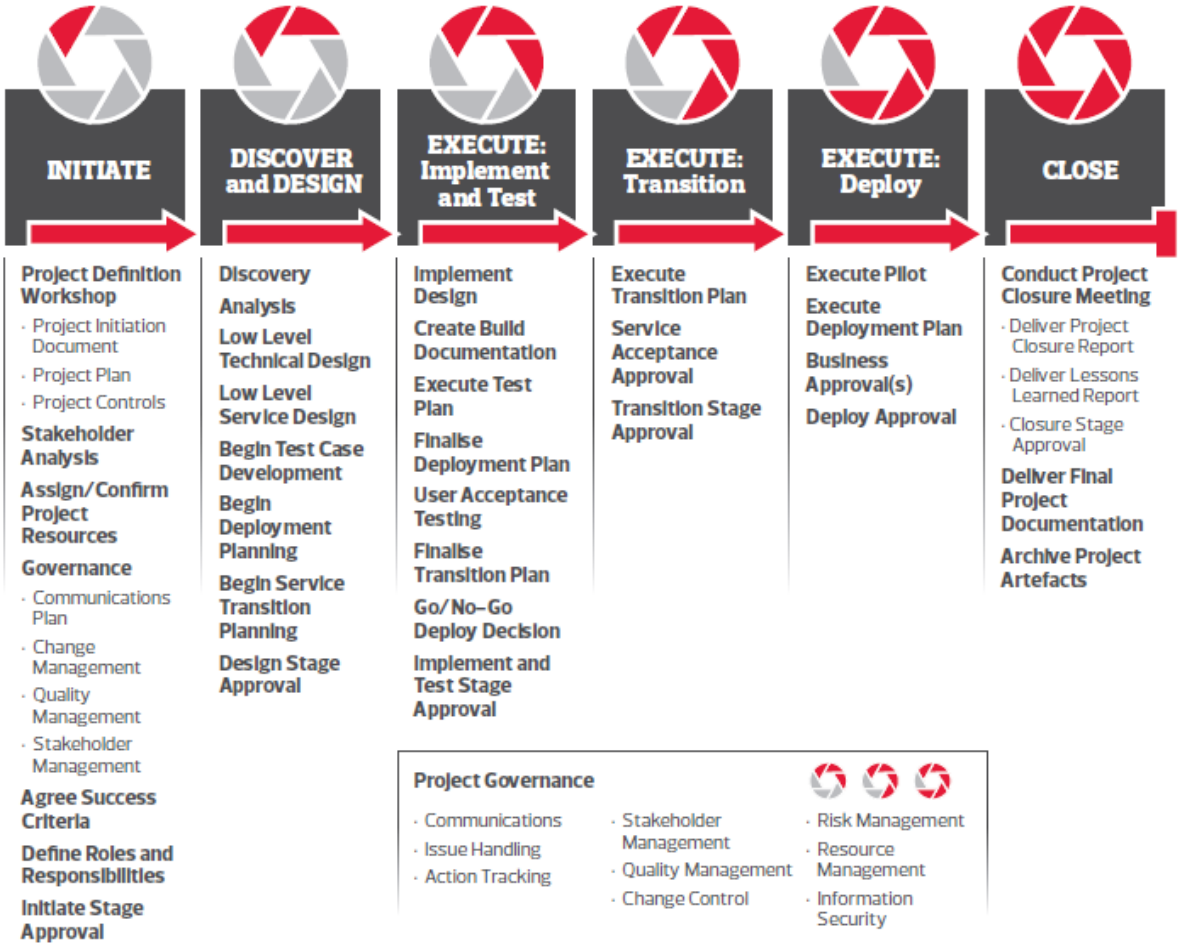
CDW can assist IPO in the implementation of complete solutions or in supplementing in-house expertise by providing access to a range of consultants and engineers from junior deployment staff through to individuals holding the highest level of accreditation in their field. This will allow IPO to augment its in-house capabilities with trusted external resource as projects and workloads dictate. Our professional services practice includes coworkers with a range of skills, such as:

TYPICAL ACCREDITATIONS	RESPONSIBILITIES
LEVEL 1	**DEPLOYMENT ENGINEER**
CompTIA A+, CompTIA N+, MCDST	• First line support roles • Basic hardware support (peripherals swap outs, monitor setups etc.) • Desktop moves/IMACs (with leadership from higher levels) • Lift and shift
LEVEL 2	**SENIOR DEPLOYMENT ENGINEER**
CompTIA A+, N+, MCDST, MCSA, CCNA, ACA	• Combined first and second line support roles - help desk analyst • Hardware support (HHD swap outs, memory installations etc.) • PC and laptop imaging • Basic network troubleshooting • Backup and storage administration (tape swap outs etc.)
LEVEL 3	**IMPLEMENTATION ENGINEER**
CompTIA A+, N+, MCDST,	• Second line support • Desktop/trade floor support

MCSA, CCNA, ACA, MCSE, ACSP, VCP	• Telecoms administration • Network troubleshooting • Server administration • Rack and stack (basic configuration)
LEVEL 4	**SENIOR IMPLEMENTATION ENGINEER**
CompTIA A+, N+, MCDST, MCSA, CCNA/CCNP, ACA, ACSP, VCP, ITIL (Found./ Interm.), PRINCE2	• Site leader/technical project lead • Third line support role • Network administrator • Server configuration • Rack and stack (configuration)
LEVEL 5	**TECHNICAL CONSULTANT**
As above plus HP AIS, Cisco Certified Design Professional (CCDP)	• Subject matter expert in data management, private cloud and infrastructure, end user computing, networking, security or collaboration • Provide technical implementation and design in a variety of technical specialisations covering IT hardware and software
LEVEL 6	**PRINCIPAL CONSULTANT**
As above plus HP Accredited Solutions Expert, VMware VTSP, Citrix CCEA/CCEE/CCIA,	• Subject matter expert in data management, private cloud and infrastructure, end user computing, networking, security or collaboration • Guides the practices of the consultancy team, typically the most senior consultants, with expertise in specialisations covering IT hardware and software • Escalation point for the consulting team
SOLUTIONS ARCHITECT	
As above plus HP Master ASE, Cisco Certified Integration Engineer (CCIE), VMware VCDX/VCAP, Citrix CCIE, NetApp NCDA	• Subject matter expert in data management, private cloud and infrastructure, end user computing, networking, security or collaboration • High level technical design across multiple complex hardware and software environments • Leads multiple technical design projects through the complete lifecycle

CDW has an in-house project management team with a range of experience at various levels, from project coordinators through to project managers and programme managers. Primarily using PRINCE2 methodologies, but also with other skills including Agile and MSP, the team is responsible for implementing a standard project governance approach to a project and managing the project through its lifecycle through to eventual close. They are available to not only govern CDW-delivered projects or programmes but can also supplement in-house resource by managing internal projects.

CDW will provide PRINCE2 certified project management resources to lead IPO's project. The project will be governed according to CDW's standard governance model, which comprises the following phases and products:



This proven methodology will ensure IPO's aims and objectives for the project are met. It underpins the documentation, governance and communication needed to successfully deliver all elements of the work. It will also enable the right level of engagement with IPO's own project manager and IT teams.

Governance activities include:

- Project definition workshop to clarify scope, constraints, resource requirement, roles and responsibilities, dependencies, assumptions, objectives, deliverables, risks and escalation paths. Physical output for sign off will include:
  - Project Initiation Document;
  - Project Plan;
  - Initial register containing identified planning assumptions and project risks.
- Weekly tracked project plan containing all resource requirements, dependencies and quality gates.
- Weekly updated action register containing current actions requiring attention.
- Weekly updated assumption, risk and issue register detailing mitigating actions, levels of risk and owners.

- Periodically updated change requests identifying items impacting time, cost or quality that are deemed to be outside the project scope but need to be addressed.
- Weekly highlight reporting detailing the status of the project, planned work, key issues and risks and a weekly burn rate of resources against the plan (time and materials only).
- Signed technical documentation including high and low-level designs, service design, test plans and an agreed handover process and documentation including, where possible, knowledge transfer to IPO's staff.
- Closure reporting incorporating any lessons learned.

ABOUT CDW

CDW DELIVERS IT SERVICES AND SOLUTIONS TO DRIVE COMPETITIVE ADVANTAGE. OUR INTERNATIONAL REACH WILL ACCELERATE YOUR SUCCESS.

CDW is a leading multi-brand technology solutions provider to business, government, education and healthcare organisations in the United Kingdom, North America and other international locations. We help our customers achieve their goals by delivering integrated solutions and services that maximise their technology investment.

Integrating new technologies into your organisation demands a careful balancing act: cost, security and competitive advantage all need to be considered as part of a forward-thinking IT strategy. At CDW we are recipients of the industry's highest achievable accreditations. Our IT solutions and services are designed to offer you strategic advantages over your competitors, helping you to attract and retain more customers, while increasing your market share.

At CDW we are People Who Get IT.

PROFESSIONAL SERVICES	MANAGED SERVICES	SOLUTIONS	SUPPLY
• Technical Consulting • Project & Programme Management • Onsite Deployment & Engineering • Training	• Infrastructure & Network Monitoring & Management • Desktop Management • Service Management • Field Engineering • Service Desk • Cloud Services (ServiceWorks)	• Data Centre • Workspace • Networking • Security	• Warehouse • International Logistics • Configuration • Disposal • Leasing • ServiceTrack

Partner Accreditations

- Adobe Platinum Partner
- Apple Authorised Reseller & Solution for Education Expert
- AppSense Gold Certified Solution Partner
- Checkpoint 4 Star Partner & CCSP
- Cisco Gold Partner & Master Cloud Builder
- Citrix Partner Platinum Solution Advisor
- Dell EMC Titanium Black Partner
- Fortinet Platinum Partner
- F5 Gold Partner
- Hitachi Data Systems Platinum Partner
- Hewlett Packard Enterprise Platinum Partner
- Microsoft Cloud Deployment Partner
- Microsoft LSP (Licensing Solutions
- Provider) and ADR (Authorised Device Reseller)
- Mimecast Service Partner
- NetApp Star Partner Multi Geo
- Nutanix Elite Partner
- Nimble Gold Partner
- Palo Alto Networks Platinum
- RedHat Premier Business Partner
- Riverbed Premier Partner
- RSA Focus Partner
- Samsung Team of Empowered Partners (STEP) - Platinum
- Symantec Gold Partner
- Toshiba Premier Partner

- HP Inc. Platinum Partner
- IBM Premier Business Partner
- Juniper J-Partner
- Lenovo Gold Partner
- Veeam Platinum Partner
- Veritas Platinum Partner
- VMware Premier Partner

Awards

- Nutanix Partner of the Year 2016
- NetApp FlexPod Partner of the Year 2016
- Cisco EMEAR Cloud Builder Partner of the Year 2016
- Cisco Global EMEAR Partner of the Year 2016
- Cisco UK & I Cloud Builder Partner of the Year 2016
- Cisco UK & I Partner of the Year 2016
- Citrix Most Influencing Partner for Networking EMEA 2015
- Citrix Global Innovation Award for Partners 2016
- CRN Managed Reseller of the Year 2014
- CRN Managed Services Provider of the Year 2014
- Dell EMEA Platinum Partner of the Year 2015
- Dell UK Partner of the Year 2015
- HP Inc. UK & I Computing Partner of the Year 2014
- Hewlett Packard Enterprise EMEA Growth Partner of the Year 2014
- Hewlett Packard Enterprise UK & I Services Partner of the Year 2014
- NetApp - Enterprise Partner of the Year 2014 & 2015
- NetApp - Outstanding Professional Services Achievement 2015
- NetApp - Outstanding Technical Achievement 2014
- Samsung UK Channel Partner of the Year 2014

Commitment to Quality

CDW is one of the few organisations in the UK to be certified to four ISO standards, which demonstrate our commitment to quality, security and environmental care:

- **ISO 9001:2008** Quality Management System
- **ISO/IEC 27001:2013** Information Security Management
- **ISO/IEC 20000-1:2011** IT Service Management
- **ISO 14001:2004** Environmental Management System

CDW at a Glance

- **$15.1b** global / **£858m** UK revenue
- **8,500+** global / **1,000+** UK coworkers
- **3,000+** global service roles / **800+** UK service roles
- **2,000** UK customers with **30%** FTSE 100

- Presence in both **Commercial** and **Public Sector**
- **Fortune 500** 2016 listed company
- **3 x** UK based data centres
- UK based **24x7** Service Desk

- **120,000 sq ft** National Distribution Centre (NDC) and **20,000 sq ft** Configuration Centre
- Purpose built **Service Operations Centre** (SOC)
- **International locations** include APAC, Middle East, Africa, USA and Canada