



DDS Cloud User Portal (CUP)

Managing User Access to G-Cloud services

Executive Overview for UK Government



Company Profile

Daemon Directory Services Ltd. (DDS) is an application service provider supplying SaaS services to the UK Government community.

DDS specialises in secure collaboration applications that can be used across multiple government agencies.

The services provided include federated user identity management, departmental directories and multi-agency SharePoint and MS Dynamics CRM. DDS also offers development and customisation skills for all of these collaboration platforms.

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The cloud is coming to Government and many CIOs are now looking to adopt cloud services in order to achieve much of the substantial cost-reduction that they are required to deliver.

The Cloud User Portal® is new technology that enables organisations to use Software-as-a-Service (SaaS) applications, reduce infrastructure costs, control software license costs, and integrate cloud services into their local ICT environment. Costs are slashed by providing seamless access to SaaS applications with reduced user support and licensing bills.

The DDS Cloud User Portal is operated on the Government Wide Service (GWS) network and is accessible as an IL3 service from the secure Government networks.

This is a time of massive change in Government ICT, summed up by Dave Coplin, Microsoft UK's industry architect who stated: "Francis Maude is the one guy who will have the most impact on government ICT ever"¹.

Many government organisations are missing opportunities to reduce their ICT budget by using cloud-based SaaS applications. They find it hard to integrate SaaS applications seamlessly into their local ICT environment, they buy too many software licenses because they don't know how many they will use, and find their current suppliers reluctant to adopt cheaper technologies and lower their bills.

The cloud, and specifically SaaS, saves money on IT infrastructure, licenses and other resources by focusing expenditure on what the organisation actually uses.

It also saves money by re-using 'pre-fabricated' solutions that provide out-of-the-box functionality that replaces expensive, bespoke developments demanding up-front investment and lengthy delays before they can be used.

That's the view of the Cabinet Office; in 2011 their G-Cloud Programme quoted "savings of up to 30% year on year ... and £3-4 billion a year saving.. from cloud and SaaS applications"².

Using the cloud makes good business sense, which is why so many commercial organisations have adopted it, but government faces a number of special challenges explaining its slower take-up of cloud technology, specifically:

- Government requires secure access and storage - difficult to assure in the cloud
- Managing suppliers must be done to strict accounting rules - difficult & time consuming when multiple (cloud) suppliers supply variable monthly services
- Government must comply with strict procurement rules; difficult when consuming pay-as-you-go cloud services

This is where the DDS Cloud User Portal comes in providing SaaS application management for Government.

The DDS AAMS Portal integrates cloud based SaaS products into the fabric the organisation's IT and makes it easy for government to procure these from multiple suppliers,

The customer uses the Cloud User Portal to procure and pay for SaaS services whilst the supplier uses it to catalogue its products, fulfil its orders, meter service usage & produce bills.

1. [Microsoft quotes Francis Maude as ICT transformation leader](#), PublicTechnology.net, Sept 2010

2. [Cabinet Office "The Cloud is coming – CIOs better beware"](#)

The Challenge of the Cloud

Lack of Cloud-based Integration

The key issue in getting value-for-money out of cloud products is integration. Government CIOs recognise that there's no point saving money by migrating to the cloud if users can't get their work done because the services aren't easy to access.

Cloud-based applications operate in a separate network domain for which users will need separate user ids and passwords. That means when users join or leave, separate SaaS accounts have to be created or removed for each supplier and for application they need access to. This loads the help-desk with password-related queries.

A technology is needed to integrate cloud-based applications into the corporate domain infrastructure so access is seamless and extra user management is not necessary.

The need for a Cloud Service Management Portal

How the Cloud User Portal meets these challenges is described in the sections that follow, but key to understanding the solution is seeing that it has to be used by both customers and suppliers; it needs workflow to connect them; and it has to understand its each user's identity to be able to keep tally of the services being used.

The following functions are essential, and are explained below:

- Identity Management
- Usage Metering
- Multi-Supplier Integration

Identity Management

Solving the integration problem requires the organisation's users to share their internal corporate identities with those used by the external SaaS applications.

The SaaS application needs to trust the organisation's IT to give it an authenticated user-id whenever the user accesses it. In this way, users do not have to login a second time when they access the SaaS application.

Solving this technological problem requires a way of federating user identities between the organisation and the SaaS applications. This will obviate the need for external SaaS users accounts and the extra management involved. Users will get seamless access and the organisation will see increased overall security and efficiency. The federation mechanism must be secure and follow industry standards, so any customer and SaaS supplier can share the necessary trust.

Usage Metering (and Billing)

Another challenge for SaaS services is how they are billed; to achieve the value-for-money customers need to be able to be charged only for what they use.

Therefore the SaaS suppliers' billing system should be enabled to monitor their customers' usage so periodic bills can be generated on a "pay as you go" basis. The supplier's billing system must be capable of tracking on-going usage of the SaaS application.

Matters are further complicated because SaaS applications almost always consume other supplier's resources which are typically charged on a per usage basis; e.g.: license and infrastructure service costs.

An organisation using SaaS will have to agree a separate deal with each SaaS application provider. A mechanism is needed to automate and generalise this process.

Multi-Supplier Integration

Some customers end up being locked into a single supplier because they can't find a way to integrate multiple suppliers into 'federated' desktop.

This limits the aim of G-Cloud to give customers the option to be able to choose best value products from any supplier.

There is thus a requirement to help organisations to consume SaaS services from multiple suppliers, ideally as a self-service function.

What is needed is a 'broker' portal service available to customers and suppliers on which suppliers could 'register' their SaaS products for customers to buy. Such a portal would provide seamless integration of every suppliers' application with the customers internal network and have all billable events metered and reported back to the suppliers for them to bill.

These requirements are illustrated in Figure 1 below:

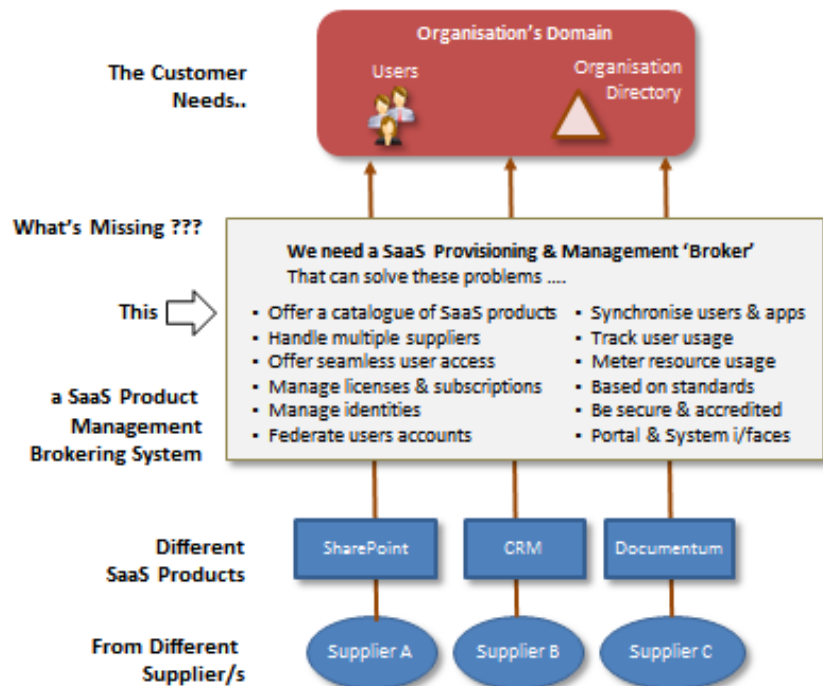


Figure 1 – The need for a SaaS provisioning broker

The DDS the Cloud User Portal[®]

The DDS Cloud User Portal provides an elegant solution to these challenges – as a brokering portal automating the provisioning of SaaS services and integrating the resulting SaaS applications into the fabric of the customers' internal ICT systems. The best way to understand what it does is to see it from both a customer and a supplier perspective.

The Customer View

The customer uses the Portal to order and provision SaaS products.

In most organisations buying a product or a service involves an internal dialogue between different parties in the organisation; most importantly application owners (and would-be owners) who will manage the app and budget holders who will pay for the app. The Portal provides standard workflow functions for automating this dialogue, expediting the process and cutting the costs of specifying, ordering and commissioning a SaaS service.

The Portal also takes care of “pay-as-you-go” charging. It does this by tracking each user's usage of the SaaS services so that accurate monthly bills can be produced reflecting usage of the applications.

Key to the Portal's user management functions is its integral federated user authentication system. This resolves the problem that organisations traditionally have when users access externally provided applications requiring them to provide a second login. The Portal includes an a secure identity federation solution based on SAML and WS-Trust standards which customer organisations can readily become partners of.

Where an organisation requires only a few of its users to use an application, full identity partnering may be inappropriate. In that case the Cloud User Portal has a secure local user directory for managing local accounts for those users. Further assurance of identity can be achieved through a “Two Factor Authentication” (chip'n'pin) option.

The Supplier View

From a SaaS service supplier point of view the Cloud User Portal provides a wider market place and automates their interaction with the customer.

Suppliers load their SaaS product and tariff information into the Portal Catalogue from which customers will select and order.

Once ordered, the Portal workflow system generates order fulfilment requests so that a supplier can either automatically or manually process the order and provision the service.

The Portal monitors the customers' usage of the services and at the end of every billing period uses its metering system to work out the charges and revenues due to the customer and supplier respectively. It can either generate the bills either as XML for the supplier to bill or send the customer an invoice on the suppliers' behalf.

Where the supplier's product consumes other suppliers services, (such as with SaaS software licenses or variable hosting charges), The Cloud User Portal makes usage-based calculations to ensure that each supplier in the supply chain gets the right fees.

An Example

Consider a supplier offering SaaS *MS SharePoint* sites as a pay-as-you-go product.

SharePoint sites are offered on a monthly tariff, typically based on disk storage number of users using the site.

Producing manual monthly bills will be an onerous activity. But the DDS AAMS system can readily manage this process by tying together the users assigned to the product and the product's tariff details.

The system generates an internal a monthly 'usage report' on each product, visible to customers as an invoice, and to suppliers as a payment record.

Automating the Supply Chain

This simple example hides an important complexity in the way SaaS services are delivered. The suppliers of 'upstream' services (such as licensees) need to receive commensurate revenues. The problem is to accurately and automatically apportion fees across the supply chain when a SaaS product re-uses other suppliers' SaaS services where those fees depend on metered usage.

In the example above, a *SharePoint* product could consume a per-user-per-month software license from Microsoft, and a per-disk-usage hosting fee from an infrastructure partner.

The Portal manages these automatically; upstream service suppliers register their services and tariffs and charges are then calculated and apportioned automatically across the entire supply chain.

The Portal thus delivers on its prime objective - to ensure that the SaaS industry can deliver real value to the customer. This is illustrated in Fig 2 below:

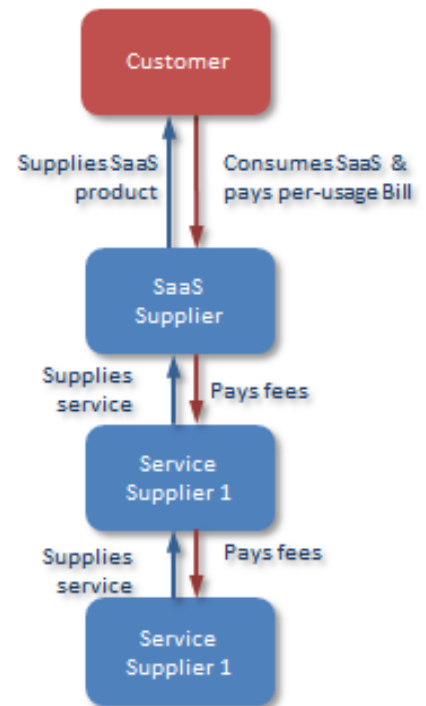


Figure 2 – The Supply Chain

The DDS Cloud User Portal – How it Works

The Cloud User Portal acts as a ‘broker’ between SaaS service customers and suppliers. It supports both a web portal interface and an open programmatic interface for system-to-system connections.

Customer Functions

In the following text, references in square brackets [n] refer to the functional units in the diagram.

Customer organisations access the system through the Customer Portal [1], which is configurable to support different customer roles, notably Users [A], Application Managers [B] and Budget Holders [C]. Application Managers specify, order and operate SaaS applications which they select from the SaaS Catalogue [6].

Budget Holders are organised by Cost Centres and authorise purchases. They also receive monthly bills for the services calculated by the SaaS Charging system [4a] which they authorise for payment.

Integral Workflow

The Customer’s user community [A] have visibility of the SaaS services through the Application Management system [2a] and can submit requests to Service Managers to search for or join a service.

The flow of messages between the Customer’s Users, Managers and Budget Holders etc. is automated through an integral Workflow and Tasking system [2b].

There is also a system interface through which the customers ERP systems [E] can be connected for the exchange of order and billing information.

User Identity Management

The importance of giving users seamless access to their external SaaS applications has already been noted. To achieve this, the customer will provide a link to their user directory for the Customer User Portal’s Directory Federated Identity

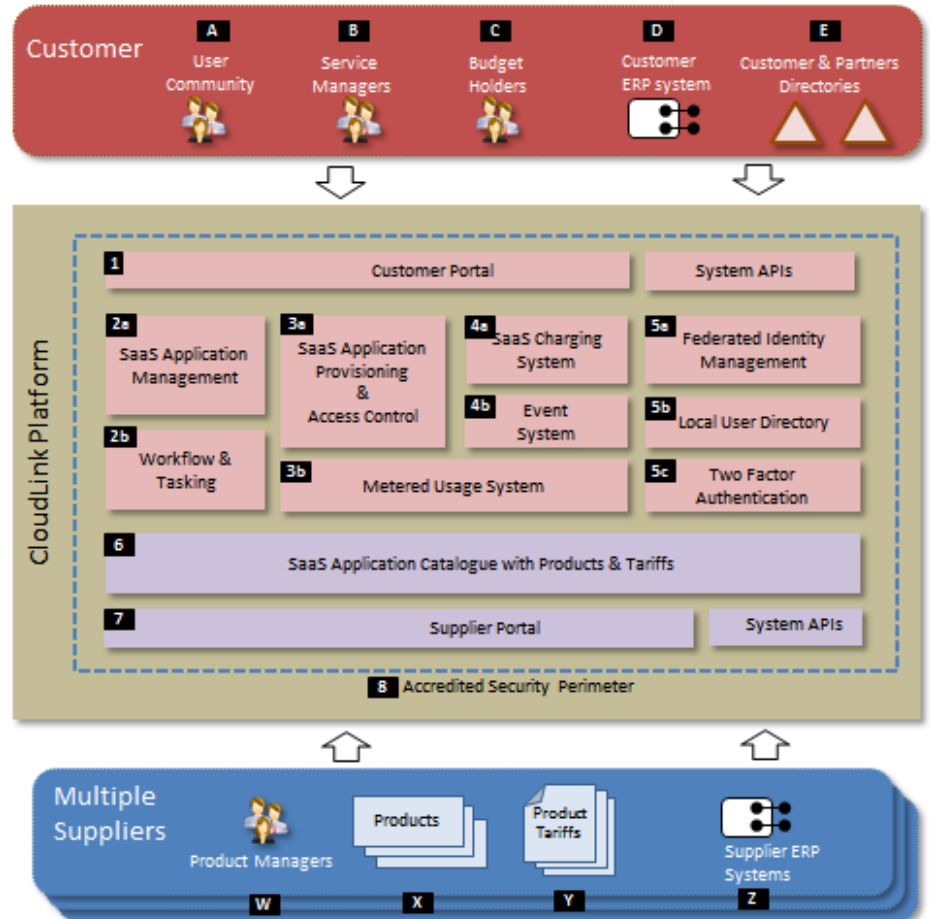


Figure 3 – Secure CloudLink application architecture

Management system [5a]. This is done using the secure SAML interface which creates a one-way trust between the Portal and the customer’s directory. User accessing a Cloud User Portal managed service have their login requests redirected back to their own directory service for authentication. The Portal provides a ‘pass-through’ mechanism so no customer user account or information needs to be remembered in the Portal or the service.

Where an organisation has only a few users requiring external SaaS services federating their entire home directory may not be worthwhile. Such users can be added to the local Portal Directory

system [5b] from where they will be prompted with a separate user name and password for login to their SaaS service.

For services that require increased security, the Portal includes a “two factor authentication” service [5c] so that locally managed users can use “chip’and’pin” tokens for extra assurance of their login identities.

Site Management

The Portal records the SaaS services used by a customer and their users that use it . Service owners can therefore track their users’ usage and thus control their access. It also provides a catalogue of services that users may request access to through its Customer Portal [1].

Supplier Functions

Supplier organisations access the Cloud User Portal system through the Supplier Portal [7] which gives them access to their section of the SaaS Product Catalogue [6].

Suppliers have Product Managers user accounts [W] dealing with different products families. These accounts holders will load their Product specifications [X] and tariffs [Y] into the catalogue. This can be done through the portal or through a system interface for uploading product information in XML format.

Product Tariffs

Product Tariff information has to be highly configurable to cater for the number of variations of chargeable attributes that different suppliers might need. Product charges can be applied at any of three different 'charge points': at contract start-up; at contract close-down; or at monthly period-bill-points.

Charges can be based on any of a number of fixed or usage-variable values, i.e.: per-user; per-disk-usage; usage access time; or by product-defined event.

The 'Product Defined Event' system [4b] adds useful flexibility to the supplier's billing options.

Using this mechanism a supplier can define a unique 'event' on a product so that whenever it is triggered the Portal will ratchet a meter count for that product. As an example consider a SharePoint case management application where it is decided that rather than billing the site by the number of users accessing it the site will be billed each time the event of "opening a case" occurs. The supplier would define this event in the Portal's Product Tariff section; this would automatically create a URL entry point into the Portal's metering system that the application would be expected to call. To make this last stage as easy as possible, the Portal would export to the supplier a sample snippet of code (in SharePoint's case in the form of a "WebPart") which the supplier would integrate into the SharePoint site "template" at the appropriate point.

Summary of the DDS Cloud

Ordering and Order Fulfilment

When a customer selects a SaaS product they will open the supplier's tariff and choose from the offered product and billing options. The results of this are left on the Cloud User Portal as 'pre-order' requirement (i.e.: specified but not yet ordered).

In most large organisations the person specifying the system will not be the person paying for it; so before the order can be formalised it needs approval from a budget holder within the customer's organisation. The Portal workflow and tasking system handles that, using external email links to alter the people that Cloud User Portal tasks await them.

When the request is approved the Portal advises the Supplier to fulfil the order. This may be a manual or automated step.

When the Supplier fulfils the order the Portal is updated and notifies the relevant customer bodies that the SaaS application is now active. Different products will require different reactions; e.g.: In the case of a SharePoint site the owner would be responsible for adding users to the site and configuring its appearance.

Once a SaaS product has been activated the Portal monitors its usage of the parameters identified in the product tariff. At the end of billing period (i.e.: the month), a metered usage report is generated and used to produce a customer invoice that can be sent either directly to the customer or to the supplier for them to forward. The Cloud User Portal also computes any service fees payable to other suppliers in the product supply chain and forwards fee reports to them.

Security Accreditation

It is important that in its role as a product broker the Cloud User Portal is a secure platform for both customers and suppliers.

Strong security was built into the design from the outset; e.g.: using modular construction; encrypted HTTPS connections customer and suppliers' data isolated; user account and password systems following best practice security management rule, and so on.

To prove its security capabilities the product has been put through a full security accreditation process, (including penetration testing, to enable it to be used in Government networks handling data up to IL3 (OFFICIAL SENSITIVE) level.[8].

Metering Usage and Billing

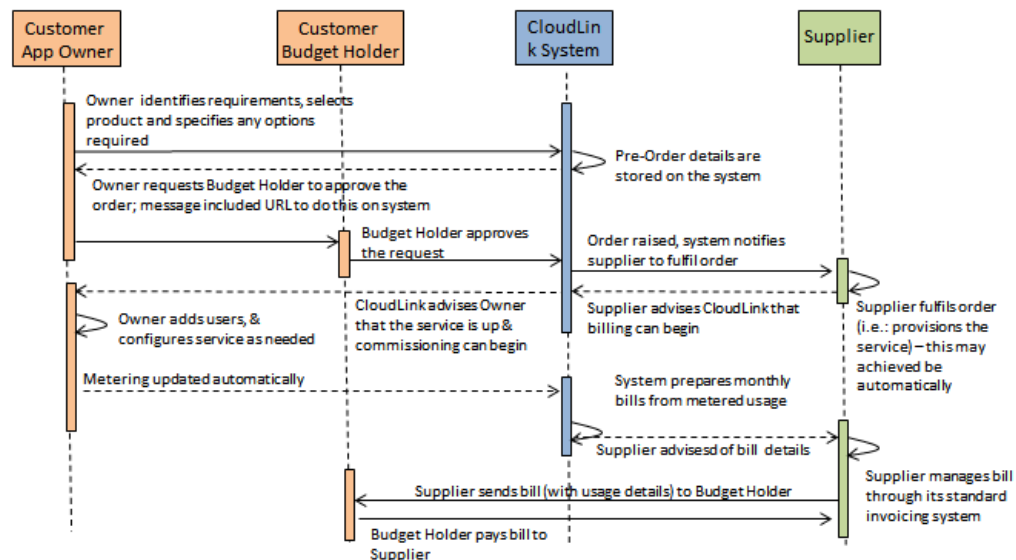


Figure 4 – AAM order and fulfilment process

User Portal Functions

The Cloud User Portal was built to provide the strong management and flexibility that a cloud broker will need to successfully deploy SaaS Applications. The Portal allows customer project managers and budget holders to choose what services they need to do their job, and only pay for what they use. At the same time, the portal gives management the information they need to monitor and control usage.

The major capabilities of the Cloud User Portal are as follows:

Business Functions

SaaS Procurement	The Portal provides a catalogue through which customers can specify, order and pay for SaaS applications from 3 rd party suppliers
SaaS Subscription tracking	The Portal tracks usage of SaaS applications and maximises usage of the license subscription purchased; you only need to buy what you actually use
SaaS Metered Billing	The Portal manages the entire billing and payments cycle its usage tracking system enables it to calculate customer bills and suppliers fees across the entire product supply chain
SaaS Management Information	The Portal maintains management information about SaaS application usage, such as – who is registered for what app, what apps are being used and how often, how much storage is being actually used, which apps are being paid for but are dormant
SaaS Application Management	The Portal controls who can sign up to what SaaS applications, and with what authority, using configurable authorisation. This includes workflow to manage dependencies and dialog between application owners and budget holders
User Management	The Portal is fully integrated into a User Directory that tracks every user’s access to the SaaS applications
User Portal	The Portal tracks users and the SaaS applications they have access to. It provides each user with their own portal showing what they can access
User Workflow	The Portal includes workflow to manage business dependencies between application owners and budget holders
Service Catalogue	There is a full searchable listing of all services, enabling staff and management to see what is being used

Multi-Agency / Multi-Network

Partnership Working	The Cloud User Portal allows users from different partners agencies and different networks to be authorised users of the same services, providing a fully integrated service for the partner group
Federated Authentication	The Portal provides a federated identity management system for seamlessly authenticating users who come from different organisations.
Simplified User Management	Federation means user authentication is passed through to the host organisations network removing the need for separate user management (adding & removing users, etc.) on the SaaS application
Accredited Security	The Portal has been accredited up to Government IL3 level (RESTRICTED), accessible via the GSi network

What Next?

You may want to

- Visit <http://www.dds-labs.com/products/g-sphere-application-manager>
- Contact the DDS Cloud User Portal team by telephone or email
- Ask for a demonstration
- Discuss the business implications or talk through the technical architecture