



# DDS G-Sphere Procurement & Provisioning Portal

Giving Government CIOs control over 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.

All DDS support and development staff are security cleared and accredited to support IL3 rated solutions.

DDS was a founder partner of the Savvis hosted pan-Government Government Wide Service network (GWS) and can supply SaaS services to all government agencies through the GWS which is a Crown-wide framework contract.

### Contact Details

DDS Ltd.  
Gaston House  
Gaston Street  
East Bergholt  
Colchester  
CO7 6SD

Web Site: [www.dds-labs.com](http://www.dds-labs.com)  
Email: [info@daemonlabs.co.uk](mailto:info@daemonlabs.co.uk)  
Tel: 01206 299288

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 DDS G-Sphere® Procurement & Provisioning 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.

DDS G-Sphere is operated on the Government Wide Service (GWS) network with connectivity to all secure Government networks over GSi, GCSx and CJX.

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"<sup>1</sup>.

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"<sup>2</sup>.

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 G-Sphere Provisioning Portal comes in; it's a system providing SaaS application management for Government.

G-Sphere 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 G-Sphere to specify, order, and procure and pay for SaaS services. The supplier uses G-Sphere to catalogue its products, fulfil its orders, meter service usage & produce bills.

1. [Microsoft quotes Francis Maude as ICT transformation leader](http://PublicTechnology.net), 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.

### Where G-Sphere comes in

How G-Sphere 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.

These requirements are explained in more detail here:

### 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.

### Metering Usage (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

## The Single Supplier Solution

Many suppliers are very keen to get customers 'locked in' to their product suite and don't have a business incentive to offer other suppliers' products. Of course sensible customers will always try to retain their independence 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:

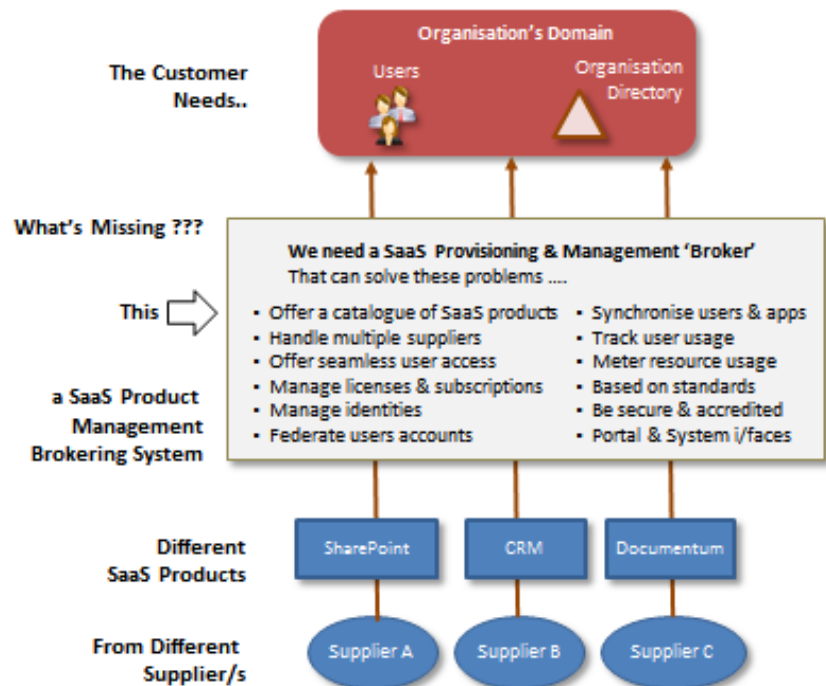


Figure 1 – The need for a SaaS provisioning broker

process.

## Introducing DDS G-Sphere®

DDS G-Sphere provides an elegant solution to these challenges. G-Sphere is a brokering portal that automates the provisioning of SaaS services and integrates 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 will see DDS G-Sphere as a portal through which they can 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. DDS G-Sphere provides standard workflow functions for automating this dialogue, expediting the process and cutting the costs of specifying, ordering and commissioning a SaaS service.

DDS G-Sphere 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 DDS G-Sphere'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. DDS G-Sphere 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 G-Sphere 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 DDS G-Sphere provides a wider market place and automates their interaction with the customer.

Suppliers load their SaaS product and tariff information into the DDS G-Sphere Catalogue from which customers will select and order.

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

DDS G-Sphere 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), DDS G-Sphere makes usage-based calculations to ensure that each supplier in the supply chain gets the right fees.

### An Example

To understand how this works consider a supplier offering SaaS *MS SharePoint* sites on a pay-as-you-go basis. *MS SharePoint* sites are offered on a monthly tariff, based on per-site disk storage and per-user usage of the site. That tariff requires a system capable of having information on the on-going usage figures in order to produce the monthly bills.

The customer will be responsible for adding users to their site and DDS G-Sphere records all this, tracking which of the organisation's federated user accounts have been allocated that site. DDS G-Sphere then makes this data available to the metering system for monthly billing.

### 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.

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

DDS G-Sphere manages these automatically; upstream service suppliers register their services and tariffs and charges are then calculated and apportioned automatically across the entire supply chain.

DDS G-Sphere thus delivers on its prime objective - to ensure that the SaaS industry can deliver real value to the customer.

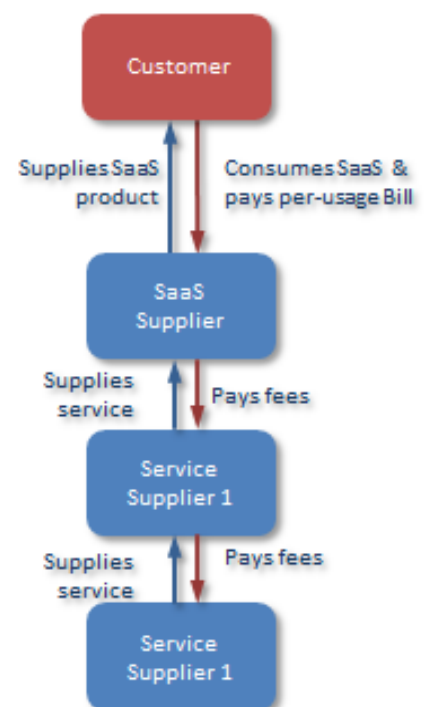


Figure 2 – The Supply Chain

## The DDS G-Sphere Solution –How it Works

DDS G-Sphere is a ‘middleware’ application that operates as a ‘broker’ between customers and the network of SaaS service 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 G-Sphere’s Directory Federated Identity Management system [5a]. This is done using the secure SAML

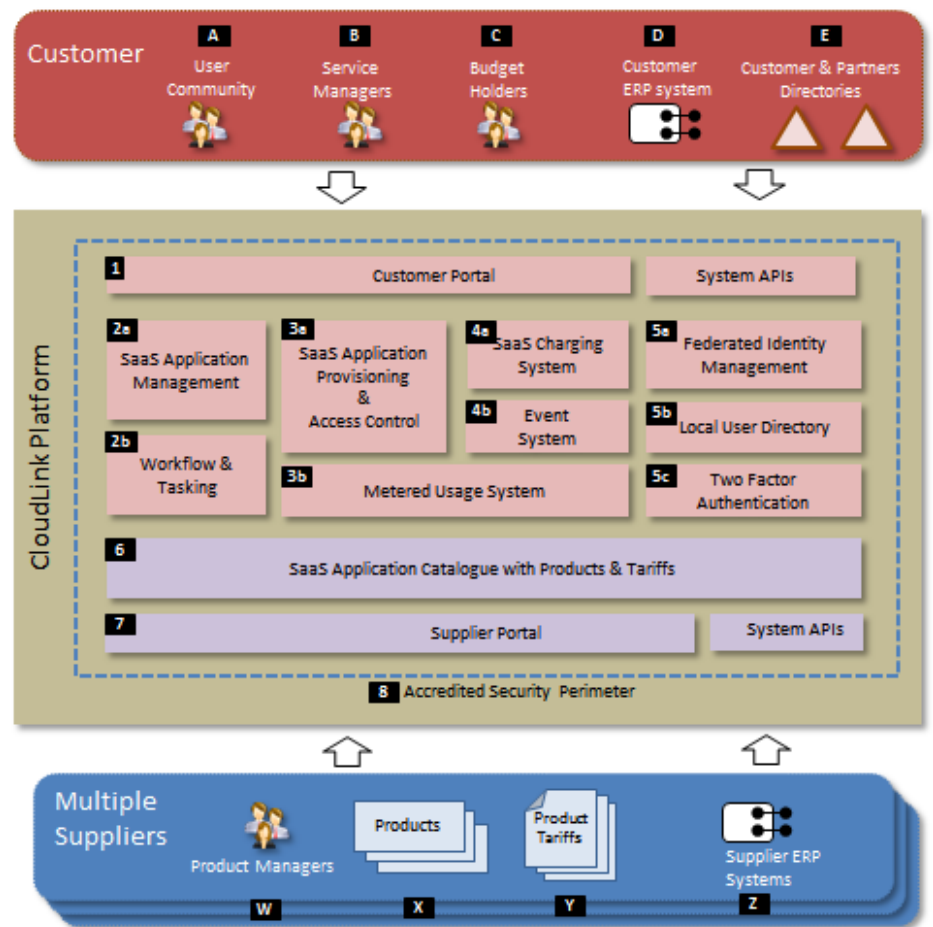


Figure 3 – Secure CloudLink application architecture

interface which creates a one-way trust between G-Sphere and the customer’s directory. User accessing a G-Sphere-managed service have their login requests redirected back to their own directory service for authentication. G-Sphere provides a ‘pass-through’ mechanism so no customer user account or information needs to be remembered in G-Sphere 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 G-Sphere 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, G-Sphere 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

G-Sphere keeps a list of the SaaS services used by a customer and their users that have access to those sites. This enables service owners to 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 G-Sphere 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 G-Sphere 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 G-Sphere Product Tariff section; this would automatically create a URL entry point into G-Sphere’s metering system that the application would be expected to call. To make this last stage as easy as possible, G-Sphere 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.

## 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 G-Sphere 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 G-Sphere workflow and tasking system handles that, using external email links to alter the people that G-Sphere tasks await them.

When the request is approved G-Sphere advises the Supplier to fulfil the order. This may be a manual or automated step; e.g.: the supplier can identify in the product tariff an external URL protocols to be called when fulfilment is required if such an automated facility is available.

When the Supplier fulfils the order G-Sphere 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.

## Metering Usage and Billing

Once a SaaS product has been activated G-Sphere 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. G-Sphere 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 G-Sphere 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 (RESTRICTED) level [8].

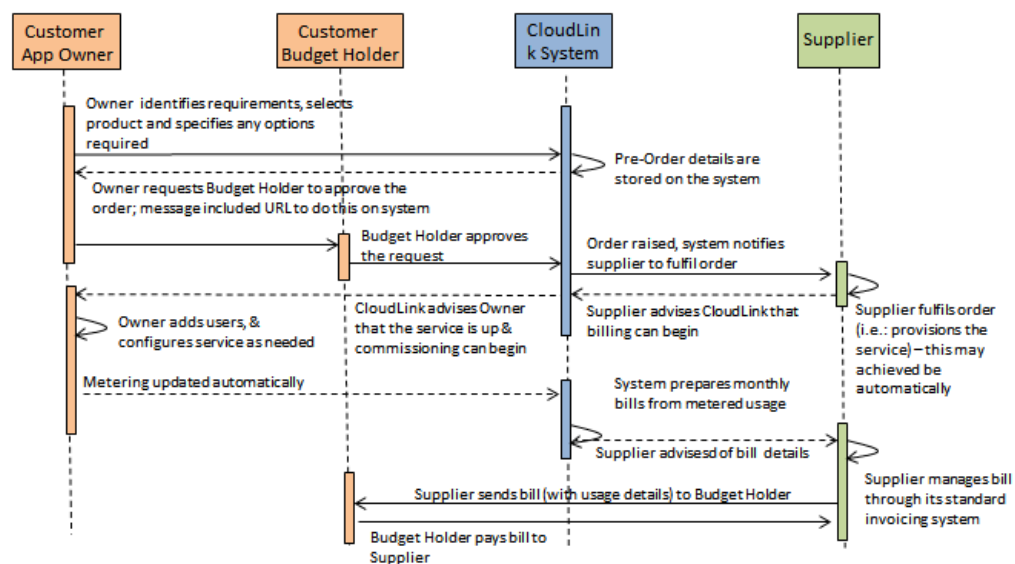


Figure 4 – G-Sphere order and fulfilment process

## Summary of G-Sphere Functions

G-Sphere was built to provide the strong management and flexibility that a cloud broker will need to successfully deploy SaaS Applications. The G-Sphere 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 G-Sphere are as follows:

### Business Functions

SaaS Procurement	The G-Sphere portal provides a catalogue through which customers can specify, order and pay for SaaS applications from 3 <sup>rd</sup> party suppliers
SaaS Subscription tracking	G-Sphere 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	G-Sphere 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	G-Sphere 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	G-Sphere 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	G-Sphere is fully integrated into a User Directory that tracks every user's access to the SaaS applications
User Portal	G-Sphere 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 G-Sphere 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	G-Sphere 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	G-Sphere 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	G-Sphere 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 G-Sphere team by telephone or email
- Ask for a demonstration
- Discuss the business implications or talk through the technical architecture

**daemon**  
DIRECTORY SERVICES

Gaston House  
Gaston Street  
East Bergholt  
Colchester  
CO7 6SD  
01206 299288  
[info@daemonlabs.co.uk](mailto:info@daemonlabs.co.uk)