DDS Cloud User Portal (the "CUP")

Overview of Functionality

Extending the Government's electronic Marketplace (GeM)
for SaaS Procurement, Provisioning and Application Management

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Related DDS documents:

1. DDS CUP White Paper http://.dds-labs.com/products
2. DDS CUP Service Description http://www.dds-labs.com/g-cloud-services/
3. DDS Identity Federation Service http://.dds-labs.com/products

Related Government Documents:

1. Government ICT Strategy http://www.cabinetoffice.gov.uk/content/government-ict-strategy
2. G-Cloud Strategy Implementation Plan http://www.cabinetoffice.gov.uk/content/government-ict-strategy-strategic-implementation-plan
3. Related Government G-Cloud Procurement Strategies http://www.cabinetoffice.gov.uk/resource-library/uk-government-ict-strategy-resources
4. Version 1 of Government Cloud Store http://www.govstore.net/

Introduction

The new DDS Cloud User Portal (or CUP) provides an eCommerce solution for government for procuring and provisioning the Infrastructure, Platform and Software as a Service (IaaS, PaaS and SaaS) services that are core to the new G-Cloud Programme.

The first set of G-Cloud service are catalogued in the Government Cloud Store http://www.govstore.net

The CUP is open to any supplier to use to deliver their service to government customers.

The CUP is open to any government customer and can be reached directly through the Internet (there's a test version on https://portal.dds-labs.com) and is also integrated into the Government eMarketplace (GeM).

The CUP has some important features such as automated provisioning which enables suppliers to commission service without manual interaction. It has account management functions that handle the repeated billing cycle including usage based charging, and management functions enabling users to automate their access to the cloud delivered services.

The DDS CUP is a registered G-Cloud SaaS service and is open to all G-Cloud suppliers.

It is been accredited at IL2 and IL3 and is ready for service now.

See http://www.dds-labs.com/g-cloud-services/ for Service Description details

Scope of this Document

This document describes, at a business level, the functions performed by the CUP and how it can be used to optimise government procurement of IaaS, PaaS and SaaS .

The document is in three part, describing the

- Context of the system - challenges of service procurement , etc.;
- Operation of the system - how it works, how users use it, etc.
- Architecture - a brief account of its internals, information flow, interfaces, etc. ;

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- G-Cloud – the Procurement Challenge
- The Government Electronic Marketplace (GeM)
- Extra Functions for IaaS/PaaS/SaaS Procurement
- Extra Procurement Processes Needed

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SUMMARY

Challenge for G-Cloud Service Procurement

The current government electronic procurement solution is based on the Government eMarketplace (GeM) .

This works well but is designed for handling direct orders, i.e.: where products are offered at known prices, and can be ordered, delivered and paid for as a part of a simple 'closed' process.

The new range of Government G-Cloud services; Infrastructure, Platform, and Software as a Service (IaaS, PaaS and SaaS) don't fall into this category – they require procurement processes similar to buying a utility service like electricity or a mobile phone contract.

What's different about the new G-Cloud IaaS, PaaS and SaaS services is that they add the following to the GeM functionality:

- On-going billing - e.g.: monthly bills on a single order with typically variable amounts
- Ability to changes an active order – e.g.: extending, cancelling or crediting an order
- Charges based on usage – e.g.: the user-count, or storage used needs to be known to generate a bill
- Supply chain management - where one service consumes others (e.g.: a per-user software license with downstream payments to the service provider calculated on a per-user basis)

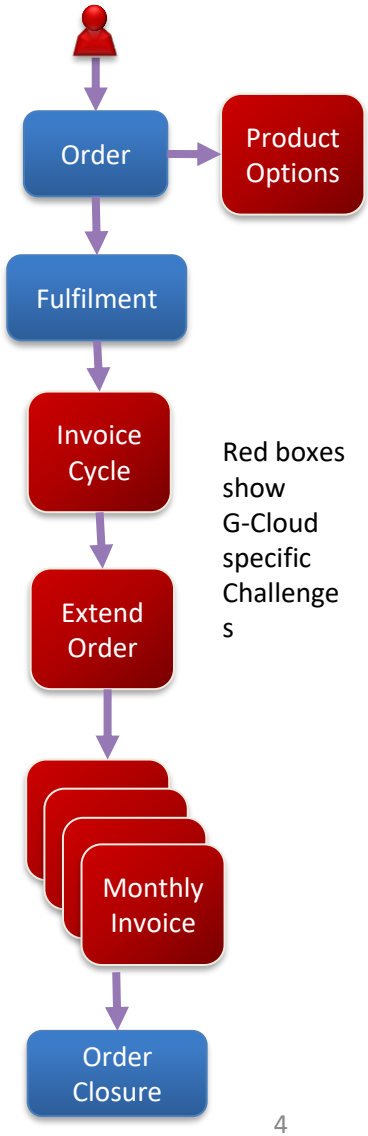
Without these basic procurement procurement services being made available G-Cloud suppliers will have to manage their sales manually (lots of spread-sheets?) or build their own systems for service ordering and procurement.

Not automating the above processes will be important for the G-Cloud initiative, - many of the cost savings predicted will depend on the customer being able to pay only for what they consume. So being able to efficiently and accurately calculate pay-as-you-go billing variable pay-as-you-grow charging is vital.

There's a need for a central service for efficient procurement and efficient service provisioning – i.e.: something that allows the customer to order, configure and start using the product quickly, and ideally through a single self-service operation.

The DDS CUP provides a full provisioning and management service – from catalogue searching, comparing, and ordering – through to service commissioning where users launch their new applications directly from the CUP "launch-pad".

Order Process



Red boxes show G-Cloud specific Challenges

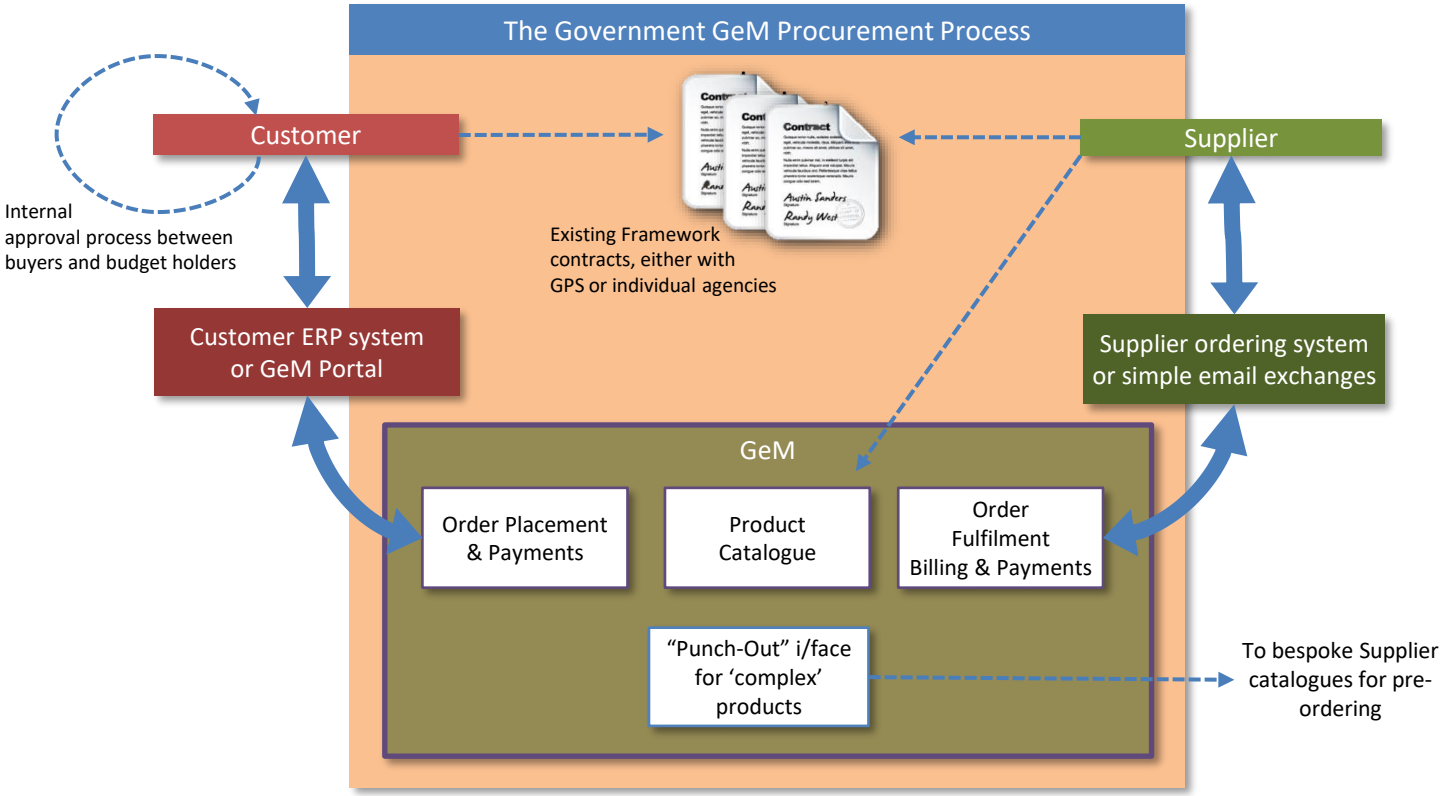
The Government Electronic Marketplace (GeM)

- Government has provided the GeM portal for government customers to order products from suppliers.
- GeM allows suppliers to create catalogue entries for their products

GeM is the government's strategic product for automating product s from the marketplace

GeM assumes contract management – i.e.: products are only allowed on the GeM catalogue if a suitable contract between the government (and maybe a specific department) and a supplier is in place.

- GeM has been designed for government agencies to place orders for variable quantities of fixed items – i.e.: orders are closed after order is fulfilled and the customer billed
- Ordering, fulfilling and paying for SaaS services is more complicated than that – and the CUP provides additional functions to GeM which government agencies can use via GeM for SaaS products from the G-Cloud market



NB, an important feature of GeM is the "Punch-Out"– (used for pre-ordering complex products where there are many options) - This allows customers to select options from the supplier's product web site, return 'pre-order' details into GeM, get approvals

Extra Functions for IaaS/PaaS/SaaS Procurement

G-Cloud services changes the nature of the procurement problem, adding six new levels of complexity:

- Catalogue items are no longer simple, - products now have many options
- The order process is no longer simple - orders are opened, fulfilled, invoiced, paid and closed
- The amount to bill is unknown at the point the order is placed
- Orders don't close after being billed - they can be extended or cancelled
- Items need any provisioning after being delivered
- Products can consume others - there a need for 'supply chain' management

The CUP provides for these needs

It also goes beyond that and provides automation functions for provisioning SaaS applications, i.e.: functions for

- Workflow between processes and key users
- Review feedback on apps
- Partnerships between different customers
- Desktop app launcher that users can use to see all apps in their organisation and launch their own apps
- Event Triggered Billing allowing apps to be billed by 'events' as well as user-count - e.g.: a CRM system might want to charge on 'cases raised each month' rather than no of users

The CUP boosts the GeM functions noted above as follows

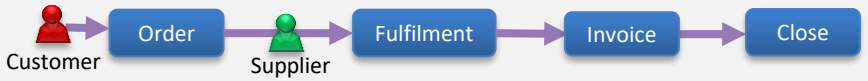
The functional limitations for the current GeM process ..

What's needed to extend the automated procurement process for pay-as-you-go services such as IaaS, PaaS and SaaS

	Current GeM Processing Model	SaaS Services Procurement Requirements
1	Catalogue items are simple, e.g.: products don't have options	SaaS services are software applications – and they usually will have options, *e.g.: SaaS Email – will have options like: No. of Users, Storage , Interface options, Backup Options etc.*
2	The order process is simple - orders are opened, fulfilled, invoiced, paid and closed	SaaS services are usually subscriptions – which don't close until they are cancelled and are billed monthly
3	The amount to bill is known at the point the order is placed	Monthly bills for SaaS services won't be the same each month – the bill will typically depend on the number of users on the service, the disk storage used, etc.
4	Orders close automatically after the bill have been generated, they do not need to be extended or changed	Customers need to be able to change their order over time; e.g.: to extend the service, reduce it, add users to it or cancel it. The impact of the change needs to be visible in the next monthly bill
5	Once delivered items don't need any financial management or planning	Because SaaS bills can be different each month some budgetary forecasting is helpful for both customers and suppliers
6	Products on GeM don't need to consume other products; i.e.: there is no need for 'supply chain' management	SaaS services for end users typically consume other services also dependent on monthly variables like user count, e.g.: a SharePoint service would also consumes Microsoft user licenses, hosting supplier disk storage etc. It would be helpful if the bill generator could also work out the bills and payments for suppliers in the supply chain

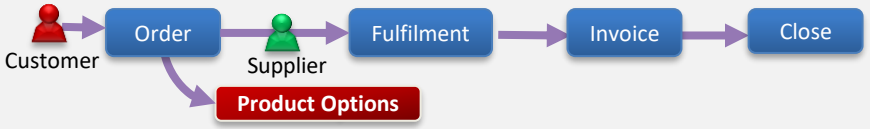
Implications for Procurement Processes

GeM Direct Order Process



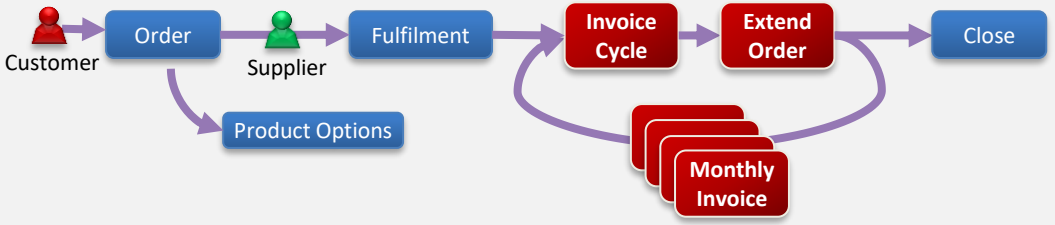
Standard **GeM** is designed for direct catalogue items – where products don't have options and once fulfilled orders can be billed and closed

CUP Product Options



The **CUP** adds **Product Options** – apps usually will have options, *e.g.: SaaS Email – will have options like: User Count, Storage , Interface options, Backup Options etc*

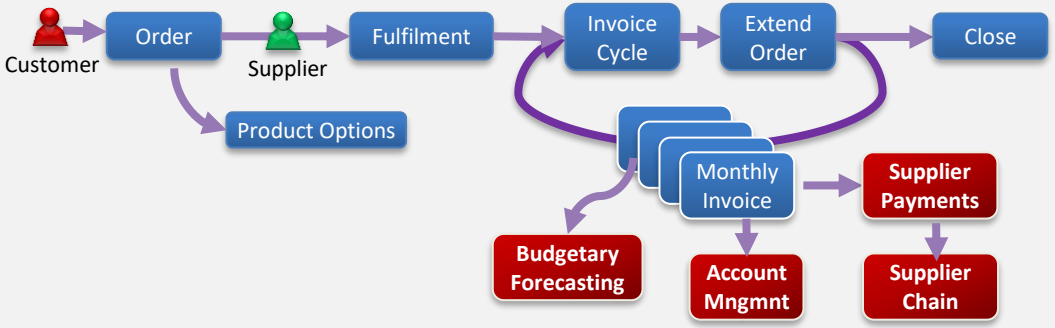
CUP Monthly Invoicing services



SaaS services are like utilities – the **CUP** adds an **Invoice Cycle** with the ability to **Extend/Cancel the Order**

- Monthly bills for SaaS services won't be the same each month – the bill will typically depend on the number of users on the service, the disk storage used, etc.
- Customers need to be able to change their order over time; e.g.: to extend the service, reduce it, add users to it or cancel it. Change needs to be visible in the next monthly bill

CUP Accounting & Supplier services



- Service bills can be different each month so the **CUP** adds **Budgetary Forecast**ing & **Account Managemen**t for both customers and suppliers and for suppliers **Supply Chain Management**
- SaaS services for end users typically consume other services also dependent on monthly variables like user count, e.g.: a SharePoint service would also consumes Microsoft user licenses, hosting supplier disk storage etc. It would be helpful if the bill generator could also work out the bills and payments for suppliers in the supply chain

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- The CUP - Basic Functionality

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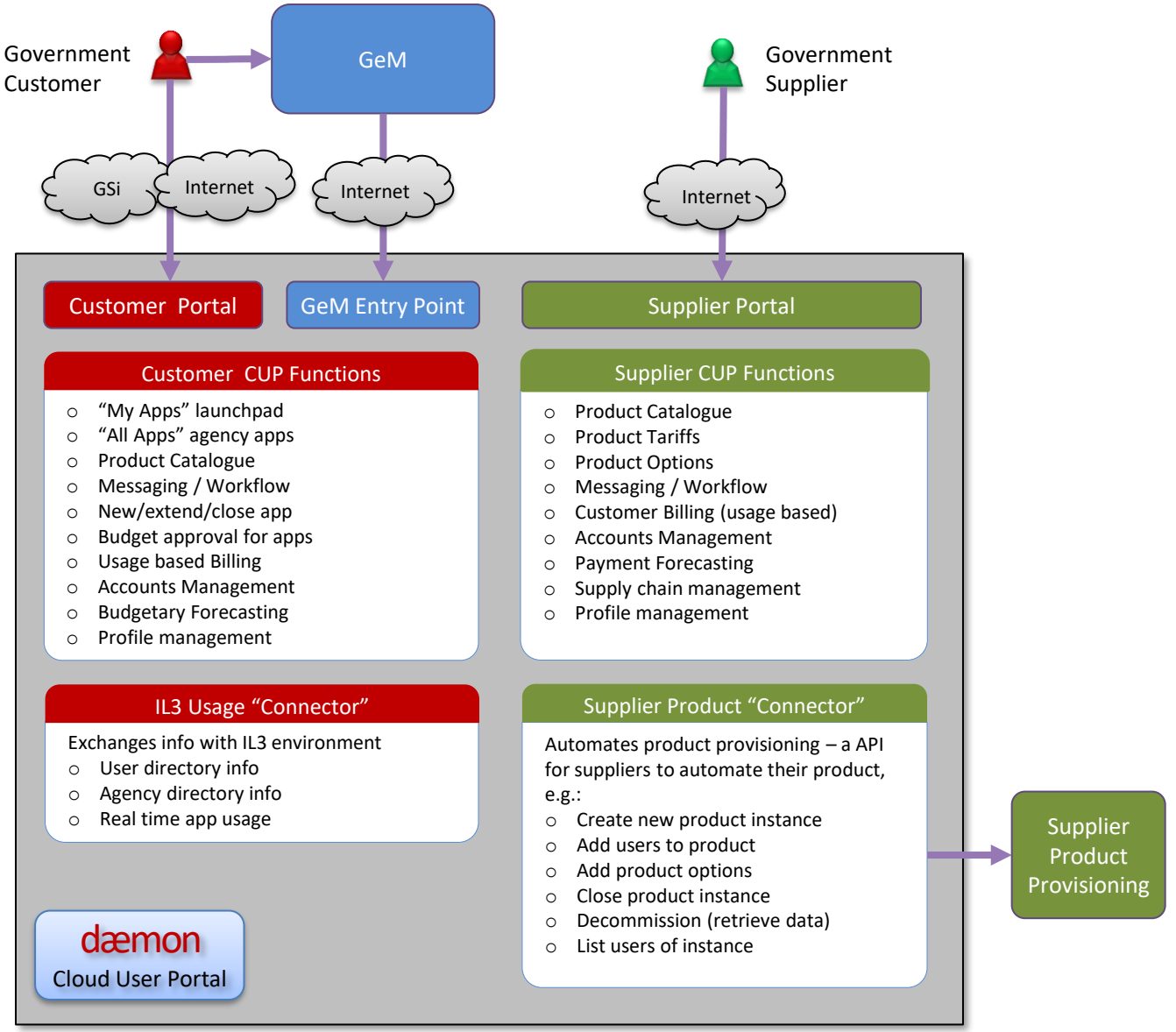
The CUP Basic Functionality

- The Daemon "Cloud User Portal" (or CUP) automates procurement and provisioning by providing end-to-end management
- The CUP has 4 important attributes that will "SAVE" government time and money:
  - **S** Self Service Customer administrators, service owners, users and suppliers use it as a self service portal
  - **A** Automation, i.e.: integrated workflow, so tying together processes across customers and suppliers
  - **V** Virtualisation Runs in the cloud; accessible to all, fully accredited at IL2 and IL3
  - **E** End-to-End Provides a full service procurement, provisioning and management role
- The CUP has been 12 months in development in expectation of the Government's G-Cloud programme
- It has been security accredited and is ready for use now
- It is operated from the Savvis GWS environment – as is ProcServe's GeM (Zanzibar) portal
- It is being offered to government as a utility to extend the functions of GeM to better manage G-Cloud SaaS service procurement
- Like GeM, the CUP will be used by suppliers and customers – there are portal entry points for each
- GeM is an open system and the CUP has an interface into it. The CUP also has interfaces for other systems to use



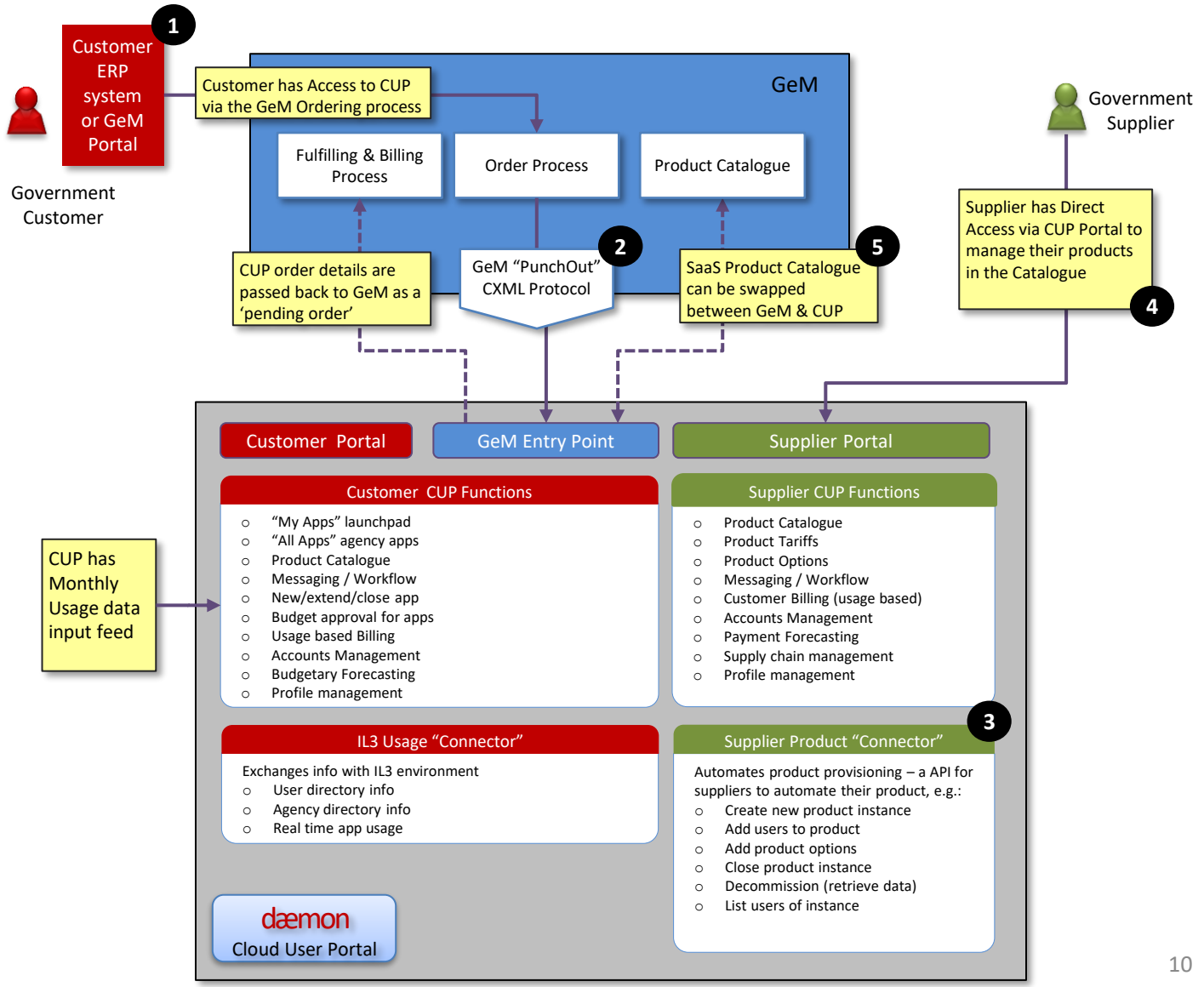
The CUP and GeM Interworking

The CUP and GeM together provide an end-to-end procurement solution for G-Cloud services

1. Like GeM, the CUP will be used by suppliers and customers – there are portal entry points for each and customers can come in via their local SAP or Oracle Financials buying systems
2. GeM is an open system and the CUP has an interface into it – notably the GeM "punch-out" capability which uses the industry standards CXML (Commerce XML standard)
3. The CUP also has interfaces for other systems to use – notably the CUP Connector Interface for suppliers to auto-provision their products
4. The product catalogue in the CUP is flexible and is compatible with the G-Cloud supplier-product spread-sheets
5. The product catalogue in GeM is less flexible but the CUP can pass back to GeM an abridged catalogue

Both GeM and the CUP are operated from the Savvis secure hosting environment and are security accredited

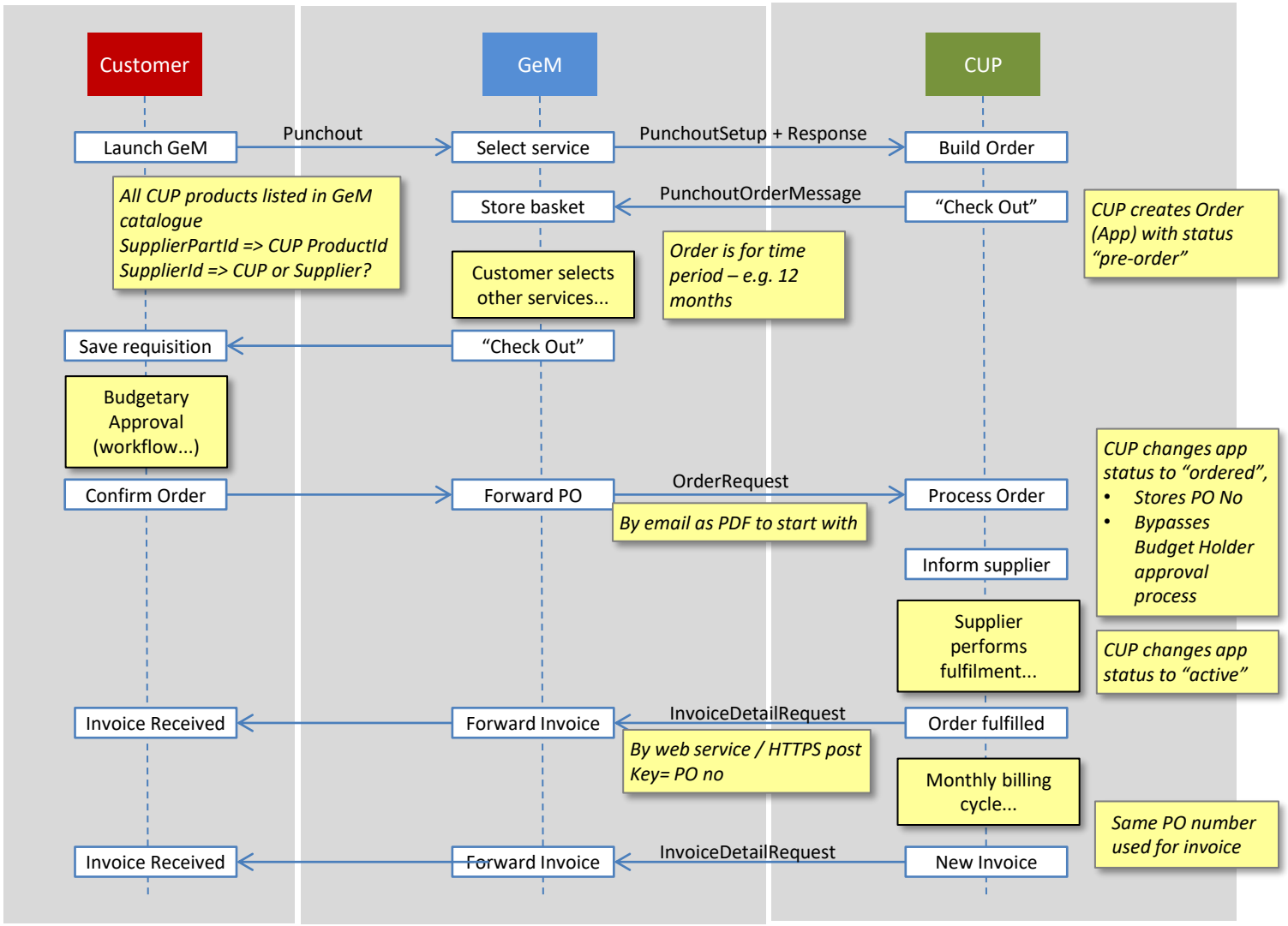
The functionality the CUP adds to GeM is summarised here – NB, the CUP links to GeM through GeM's standard cXML "Punch Out" Interface



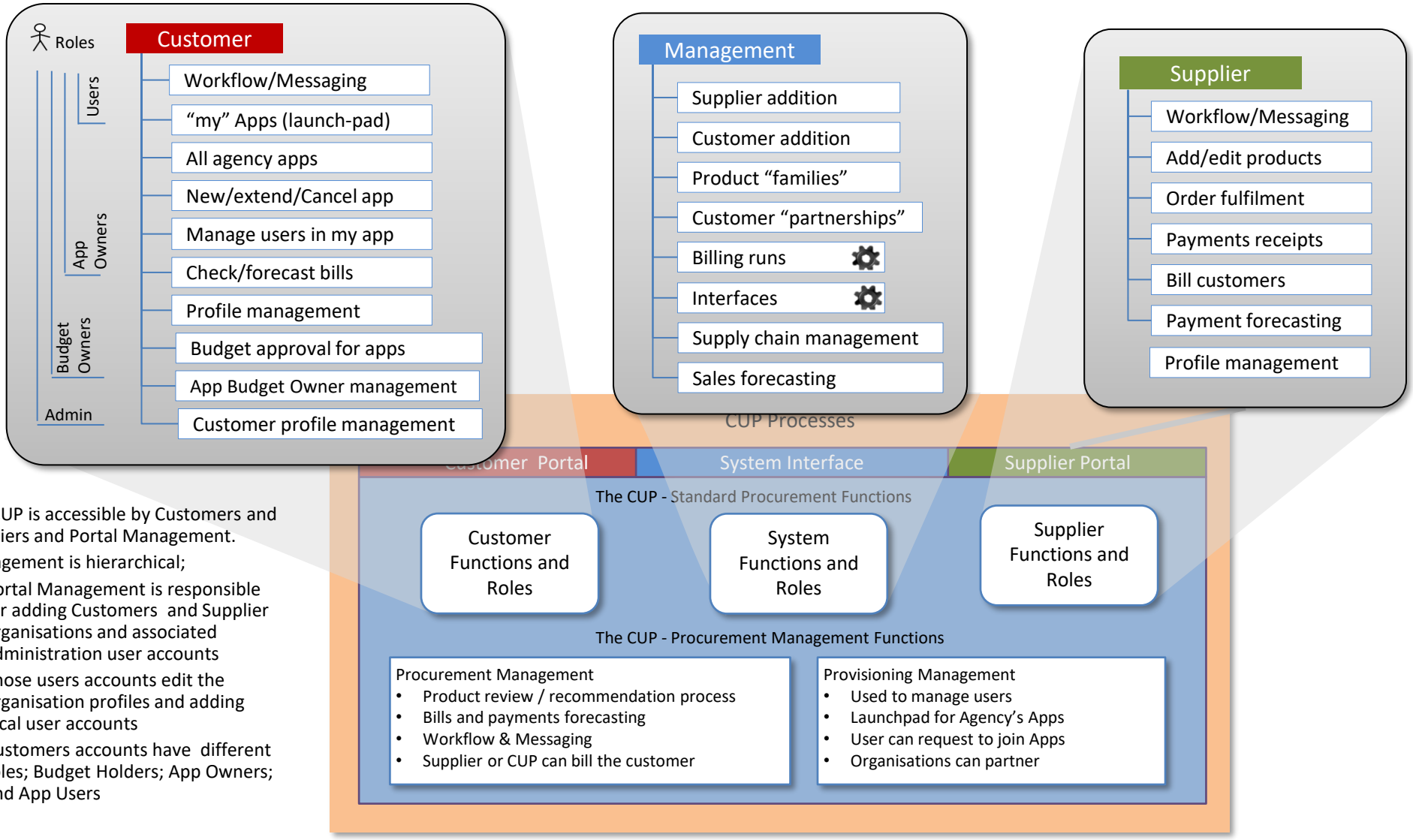
CUP and GeM – the Combined Order Process

- When placing a G-Cloud order the customer invokes a call from GeM to the CUP(the GeM "punch-out").
- They are then in the CUP
- From the CUP they can view the G-Cloud catalogue; and compare products to select the best product
- They order an instance of the product; completing the supplier's order form; selecting product options and subscription tariffs
- The completed order is returned to GeM as a 'pre-order'
- The order is usually submitted for budgetary approval (internal dialogue)
- The approved order is confirmed in GeM and the supplier informed
- The product is auto-provisioned and the customer informed
- The customer can begin using the product
- The nominated budget holder will start getting bills at the end of each billing cycle (e.g.: monthly) through the GeM portal, directly into their financial system

The GeM – CUP Order Process as a sequence diagram



User Functions and Roles

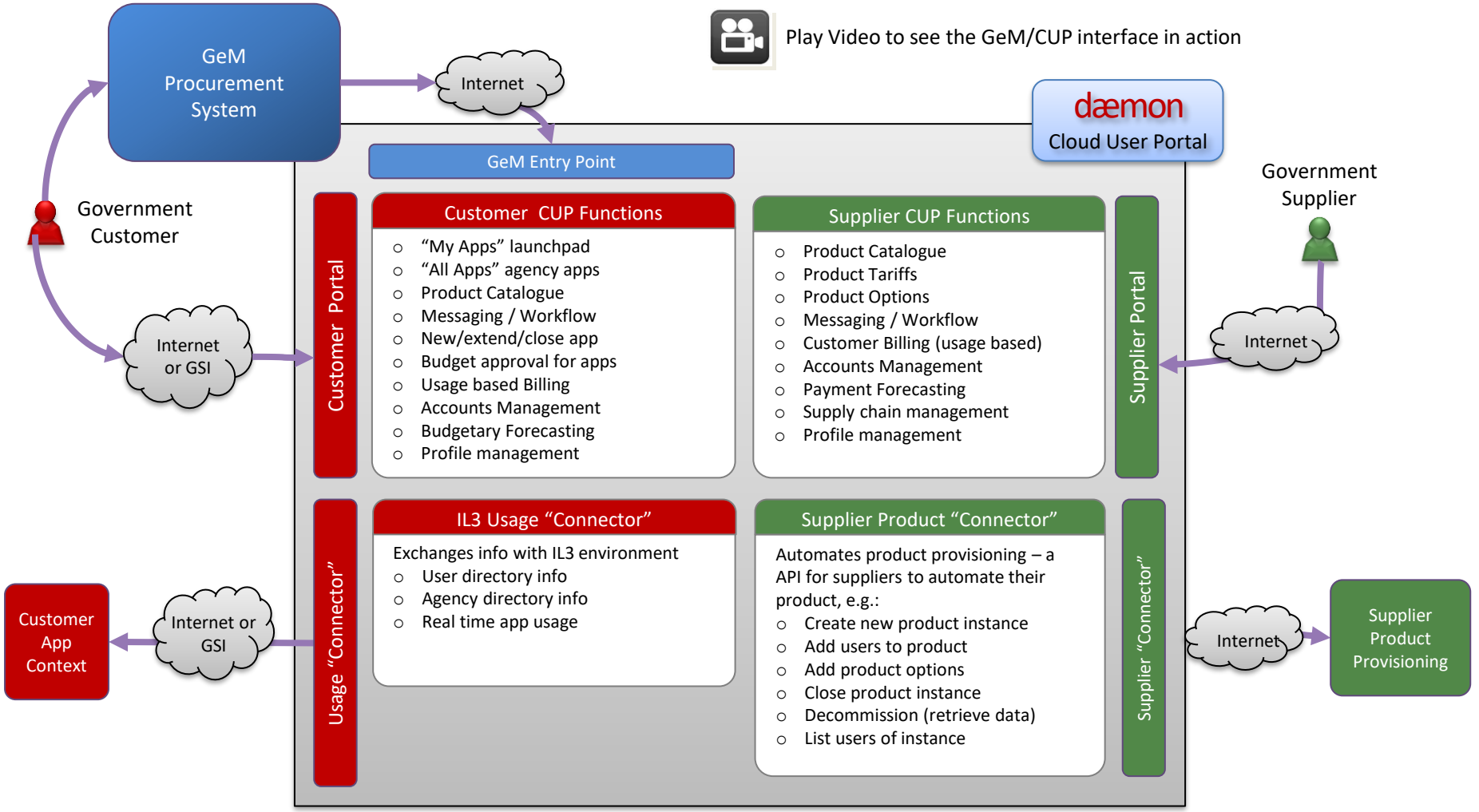


The CUP is accessible by Customers and Suppliers and Portal Management.

Management is hierarchical;

- Portal Management is responsible for adding Customers and Supplier organisations and associated administration user accounts
- Those users accounts edit the organisation profiles and adding local user accounts
- Customers accounts have different roles; Budget Holders; App Owners; and App Users

User Functions and Roles



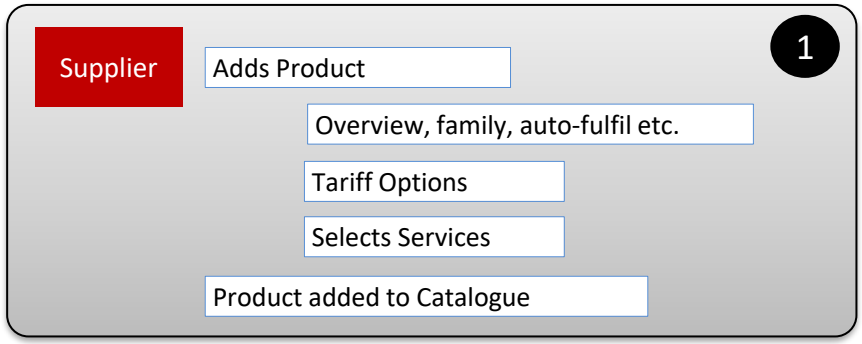
Product Catalogue

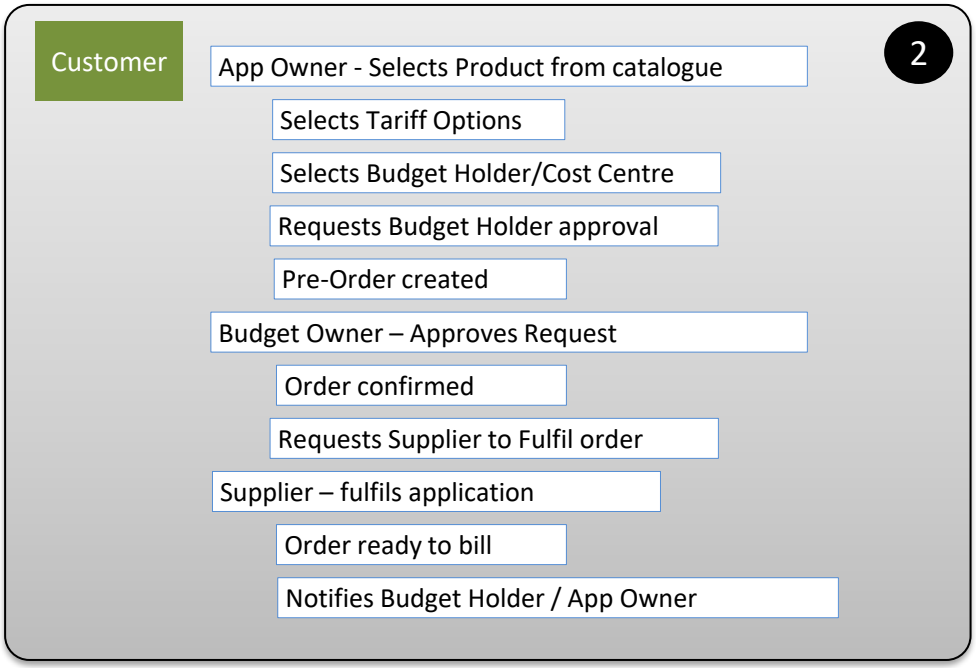
- Suppliers lodge their products in the CUP Product Catalogue
- Customers select 'applications' (instances of the product) from the catalogue
- Suppliers add to each product listed the following details
  - Description – brief details of the product, inc. icon, T&Cs etc.
  - Product family – categories the product will be listed din
  - Tariff – charges for main services and options
  - Services – links to any services consumed in delivering the product, e.g.:
  - Provisioning – links to

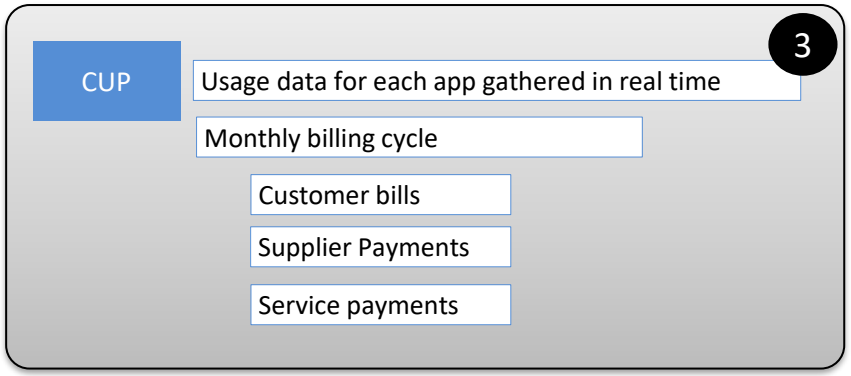
There are three functional areas of the system – Portal Customer and Supplier

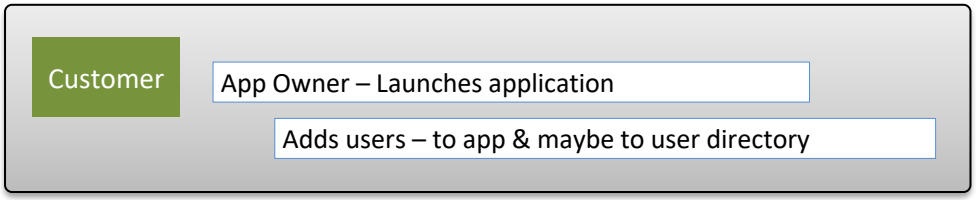
Order Process

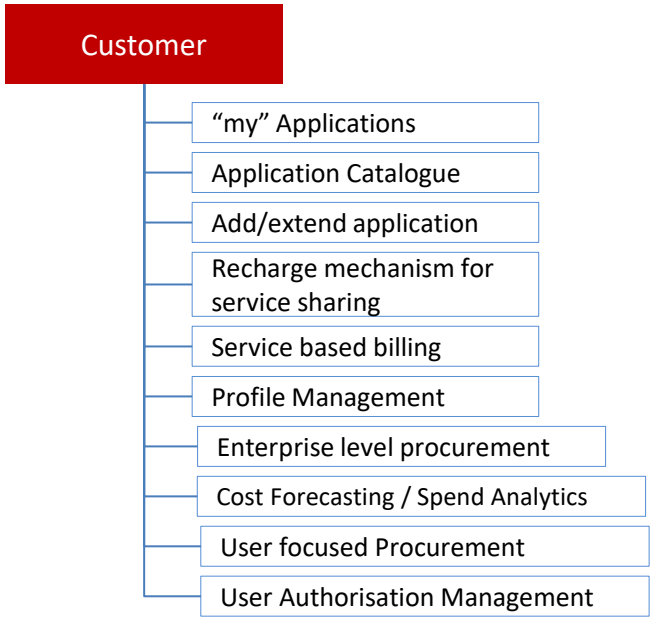
- The order process can be summarised as follows
  1. Supplier creates product in catalogue
  2. Customer orders instance of product (ie application) with internal workflow
  3. System monitors usage and bills at end of month







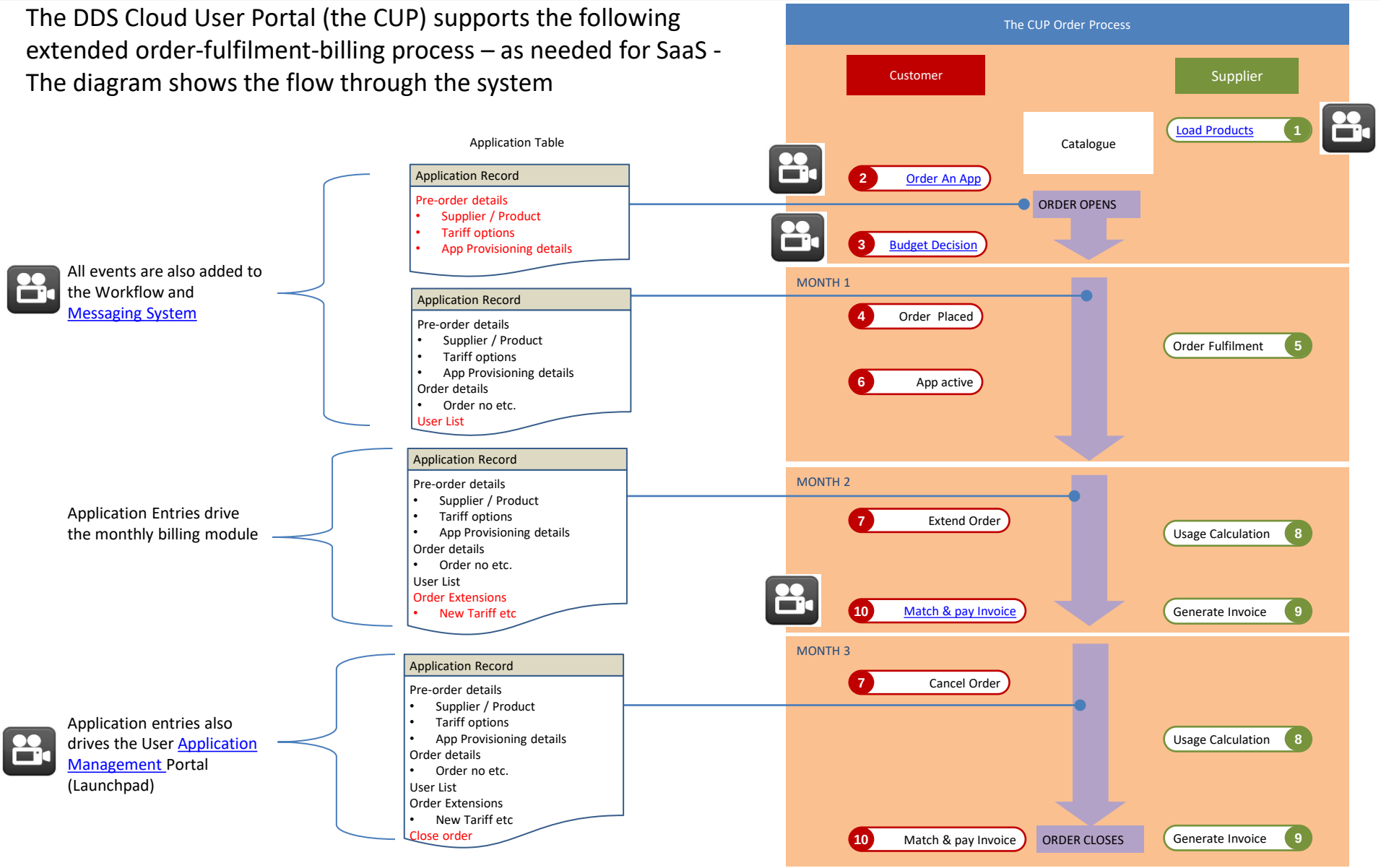



Customer
“my” Applications
Application Catalogue
Add/extend application
Recharge mechanism for service sharing
Service based billing
Profile Management
Enterprise level procurement
Cost Forecasting / Spend Analytics
User focused Procurement
User Authorisation Management

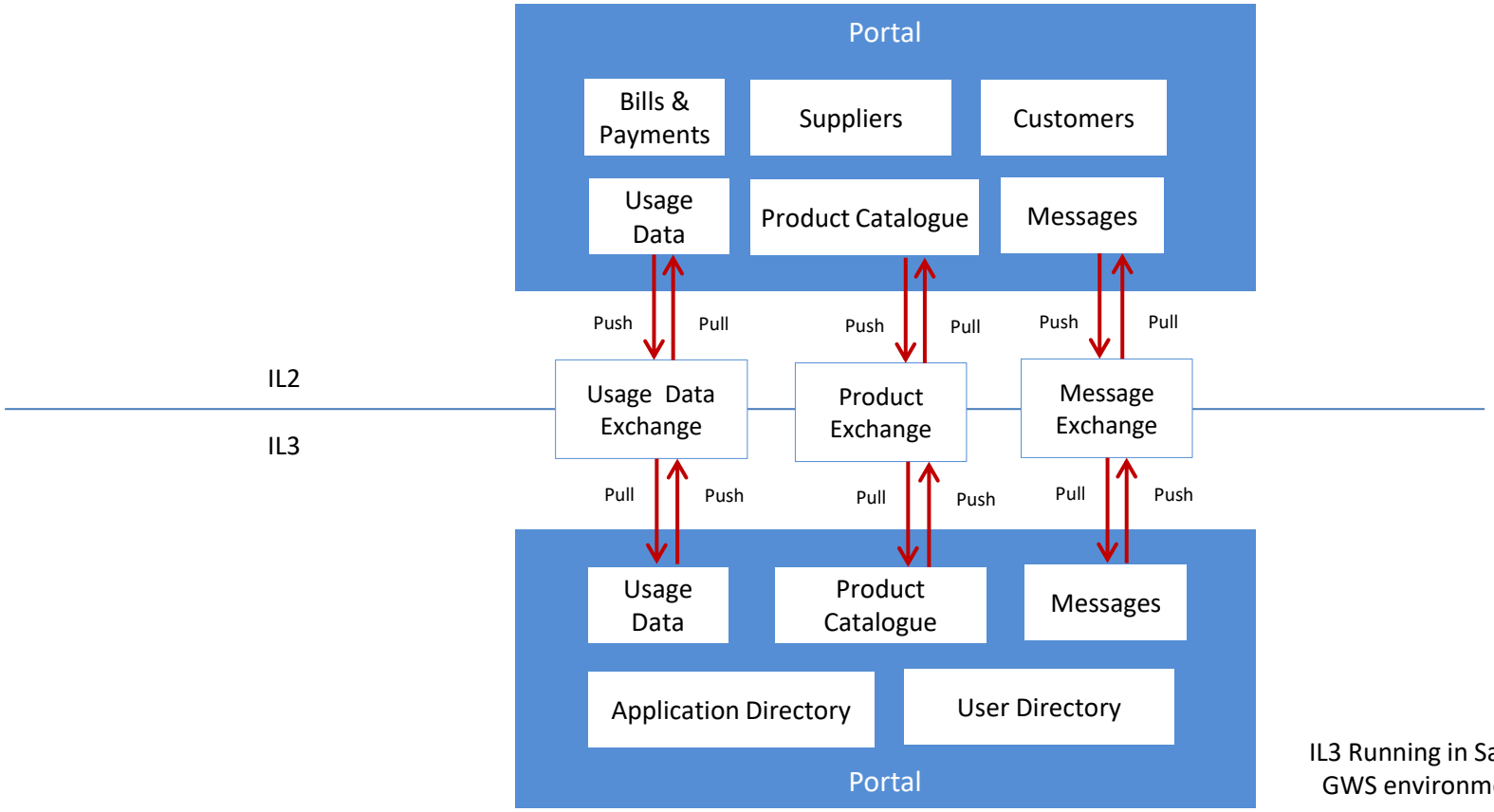
- To illustrate the CUP in action we have these 6 video scenarios
  1. Supplier – adds new product
  2. Customer – adds new application
  3. System – Messaging
  4. System – billing and payments run
  5. Customer – User provisioning
- Each scenario illustrates the way the function of the CUP
- Each user will only ever see the part of the CUP that their role allows

Following the CUP Ordering Process

The DDS Cloud User Portal (the CUP) supports the following extended order-fulfilment-billing process – as needed for SaaS - The diagram shows the flow through the system



- The CUP can be used by IL2 and IL3 users – it uses quarantine 'staging servers' to move necessary information between images of itself



IL3 Running in Savvis GWS environment

CUP Workflow – Ordering a Product

Supplier
Product Manager

Adds a SaaS Product to Catalogue

Items can be added by:
Manual Entry
Upload S/Sheet
Download from GeM

Customer
App Owner

Orders a SaaS Application

SharePoint 2010 Team Working

Enters App Details
- Title, Description, Icon etc.
- Select from Tariff options
- Identifies Cost Centre & Budget Holder
- Completes Cost Estimate
- Sends Request to Budget Holder
- Order PROVISIONAL

Request to Approve Order sent to Budget Holder

Response back to App Owner

Customer
Budget Holder

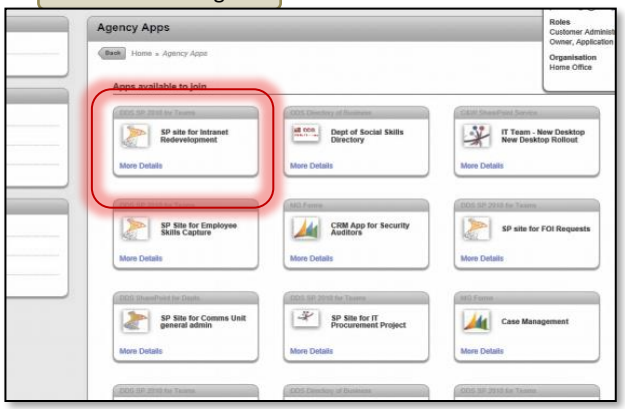
Approves the Order

Request to Provision the App to Supplier

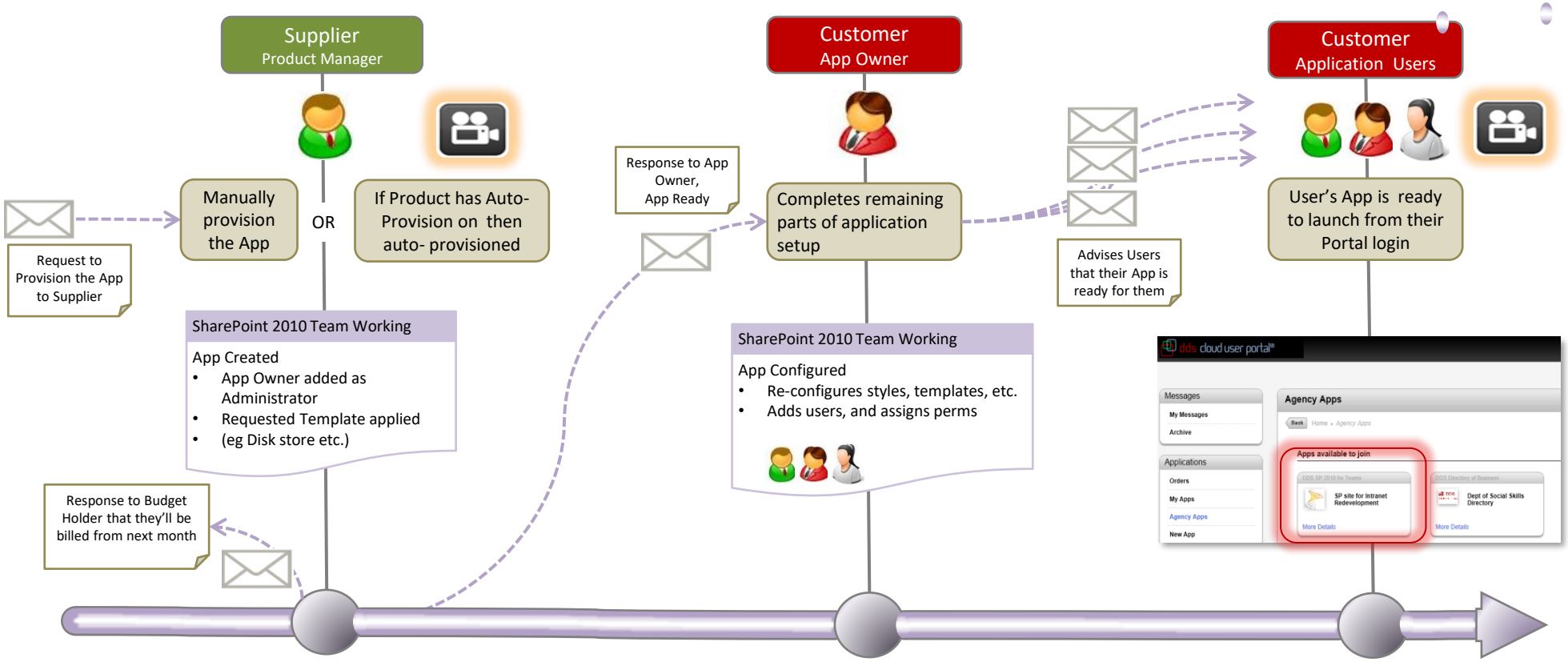
SharePoint 2010 Team Working

Enters App Details
- Title, Description, Icon etc.
- Select from Tariff options
- Identifies Cost Centre & Budget Holder
- Completes Cost Estimate
- Sends Request to Budget Holder
- Order APPROVED

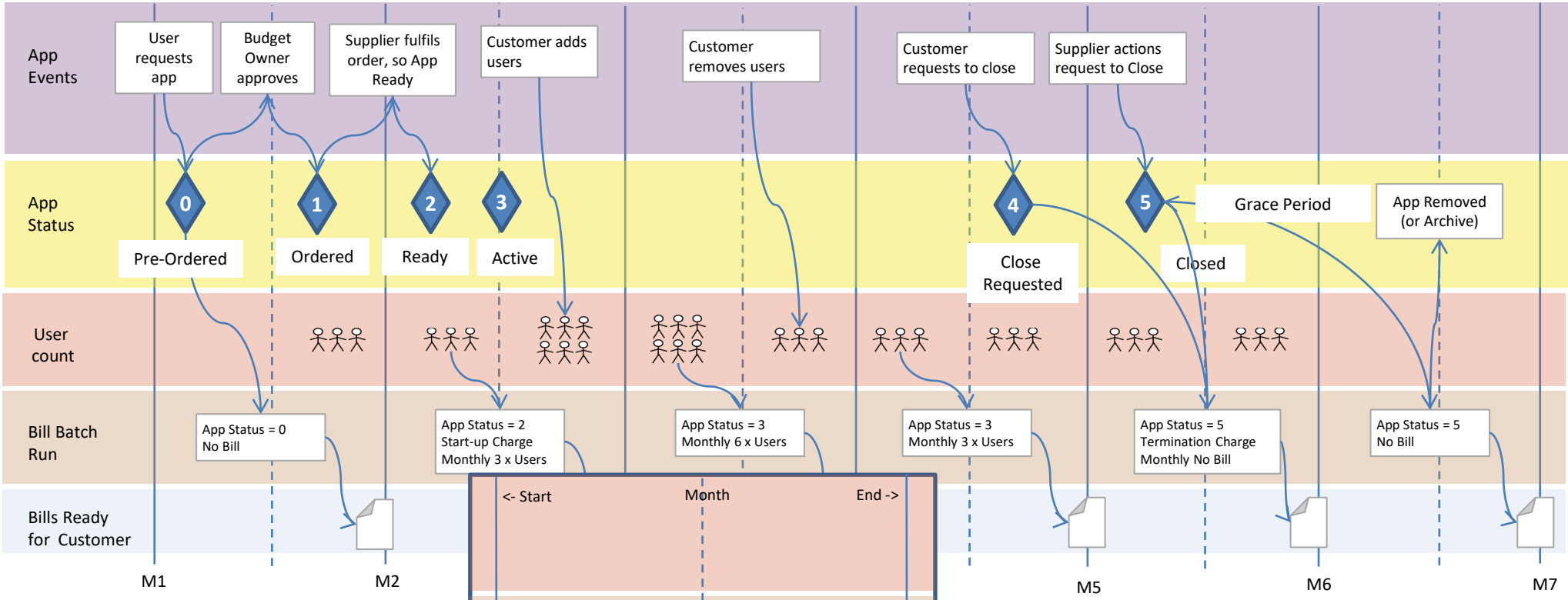
Product Catalogue



CUP Workflow – Fulfilling an Order



Application Life Cycle – from Pre-Order raised to App Retirement



The contractual requirements that this process supports are

1. Any event occurring before 15th. of the month shows up in month's bill
2. Any event occurring after 15th. Of the month shows up in th
3. month's bills

Events in an application life cycle are

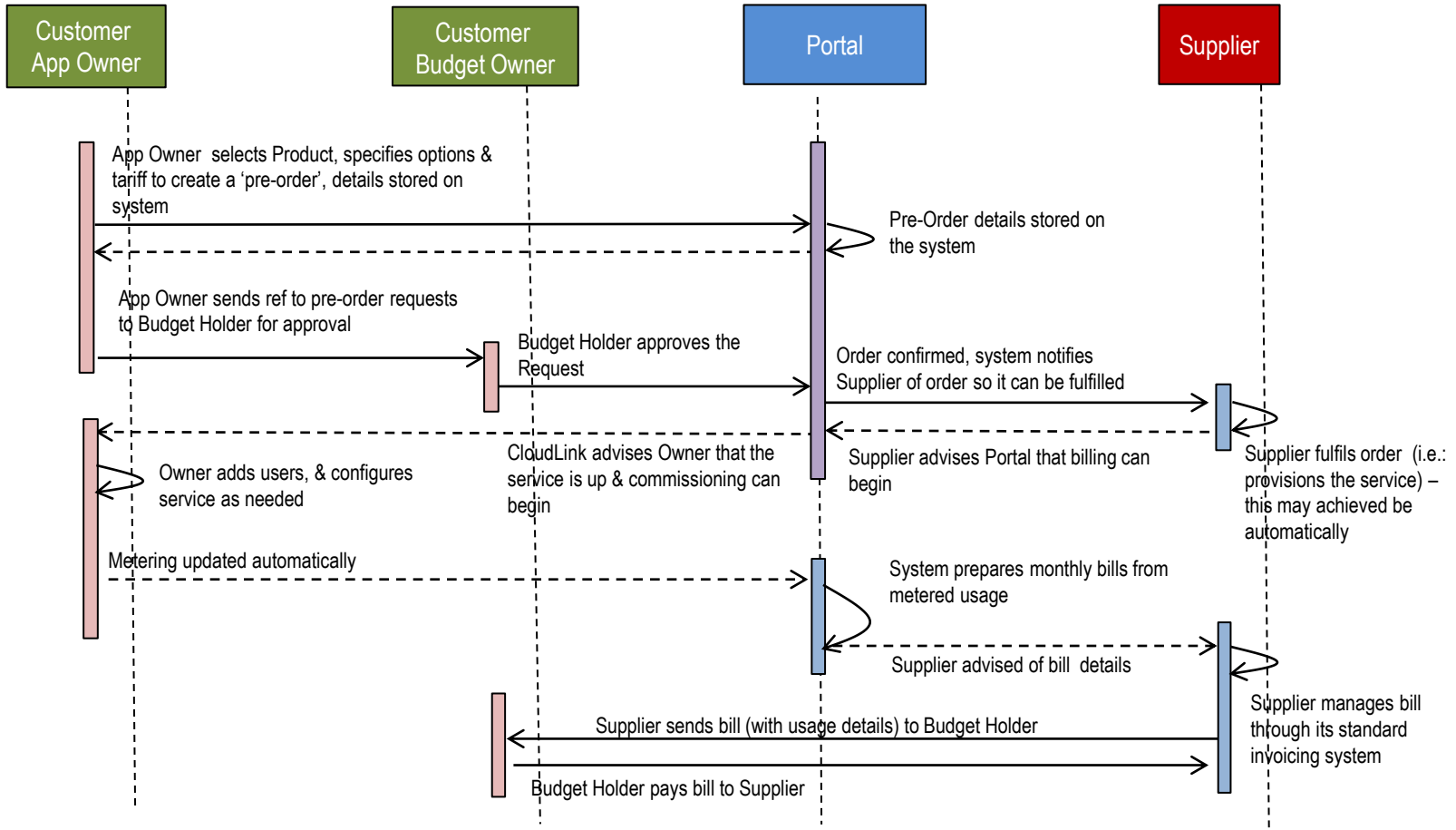
1. App being created;
2. App being cancelled
3. Users joining/leaving an App,
4. App extended – e.g.: Adding storage, usersetc.

n 15th. Month run does the following

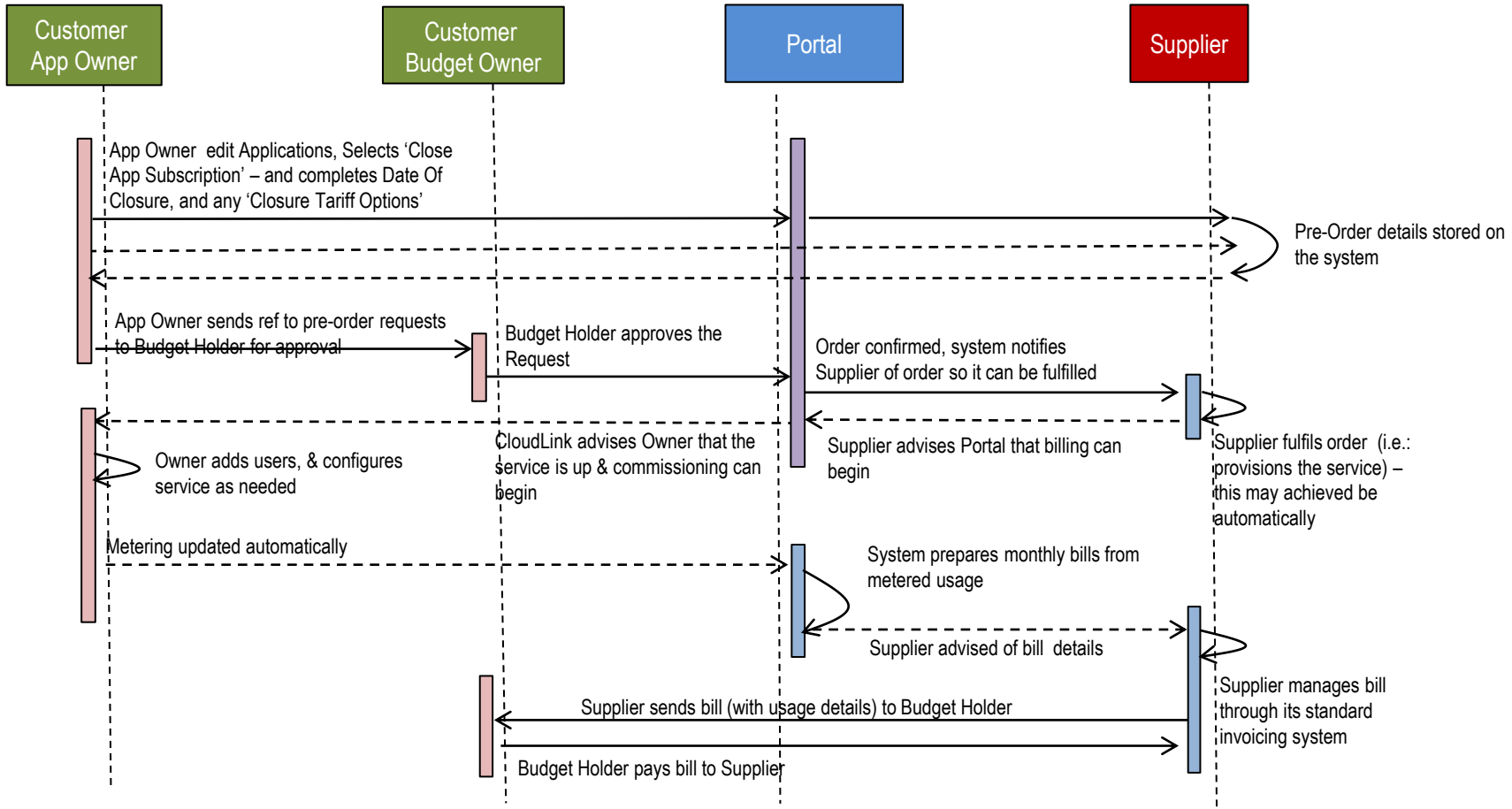
upplier payment for anything that's billable (Start-Up, Monthly, Terminations etc.)
ed to each of App's Tariffs
rges = Start-Up + Monthly Fixed + Monthly /user * user-count
rges = Monthly Fixed + Monthly /user * user-count
rges = Contract-End + Monthly Fixed + Monthly /user * user-count

2. Advances the App Status (remembers App. Status in App.StatusOld so we can undo the EoM operation)as follows:
   IF App.Status = 2 THEN App.Status = 3
   IF App.Status = 4 THEN App.Status = 5
   IF App.Status = 5 THEN Archive & Delete App

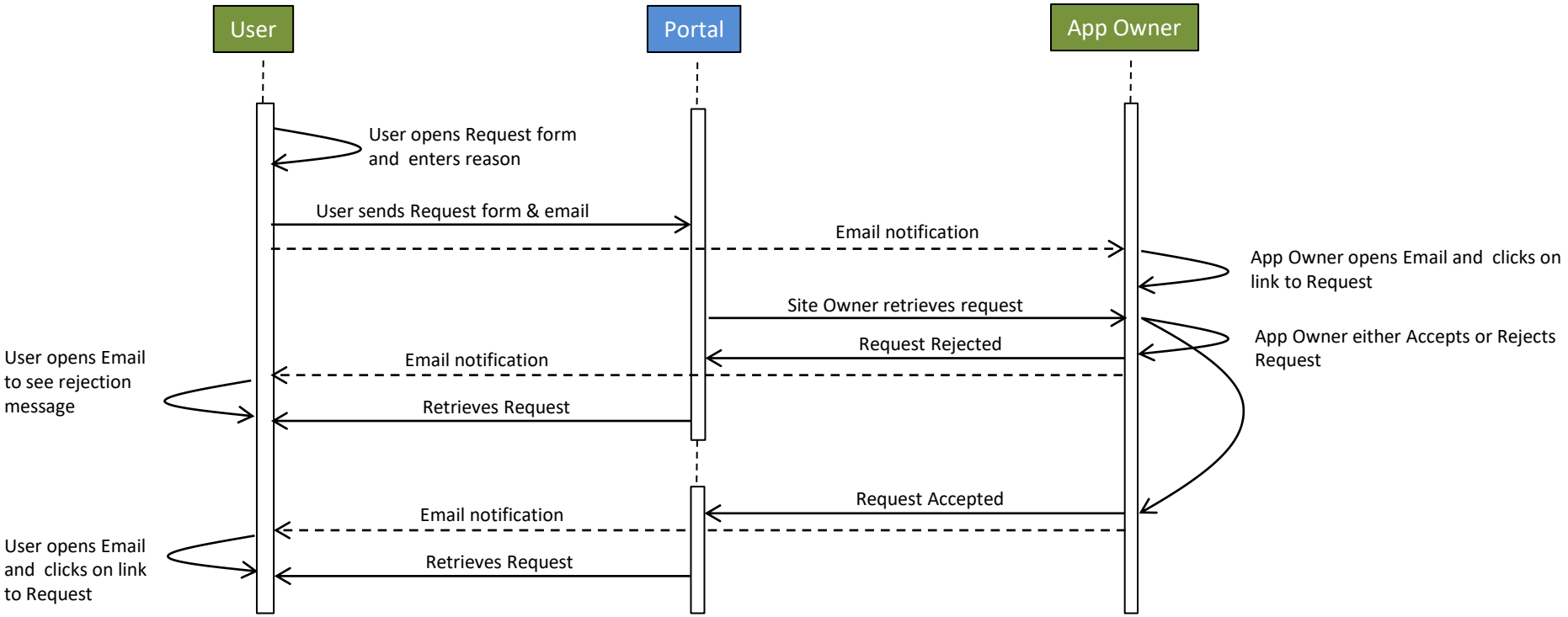
Sequence Diagram - Illustration of "Add new App" process



Sequence Diagram - Illustration of "Close App Subscription" process

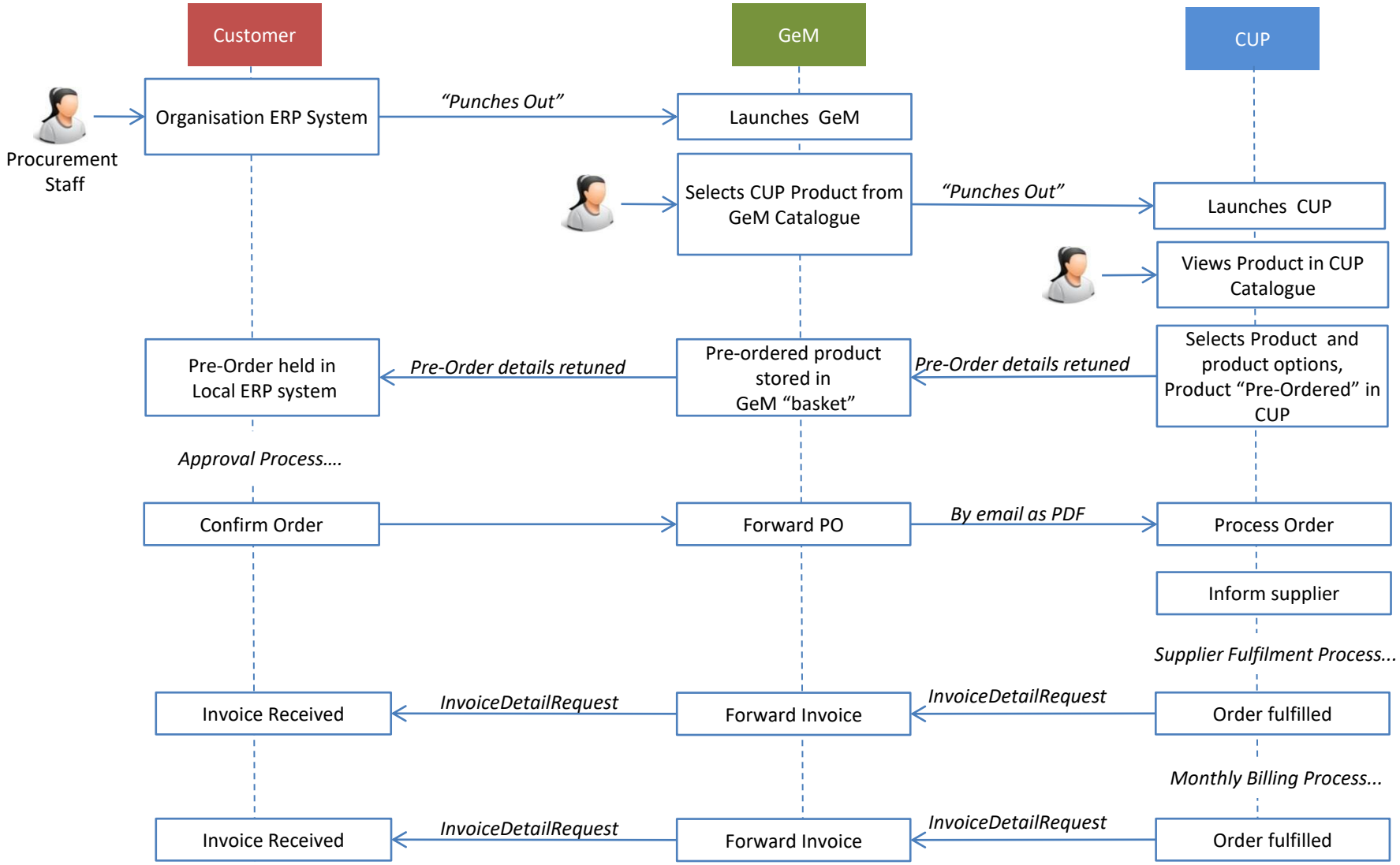


Sequence Diagram – Illustration of "User Requests to Join App" process

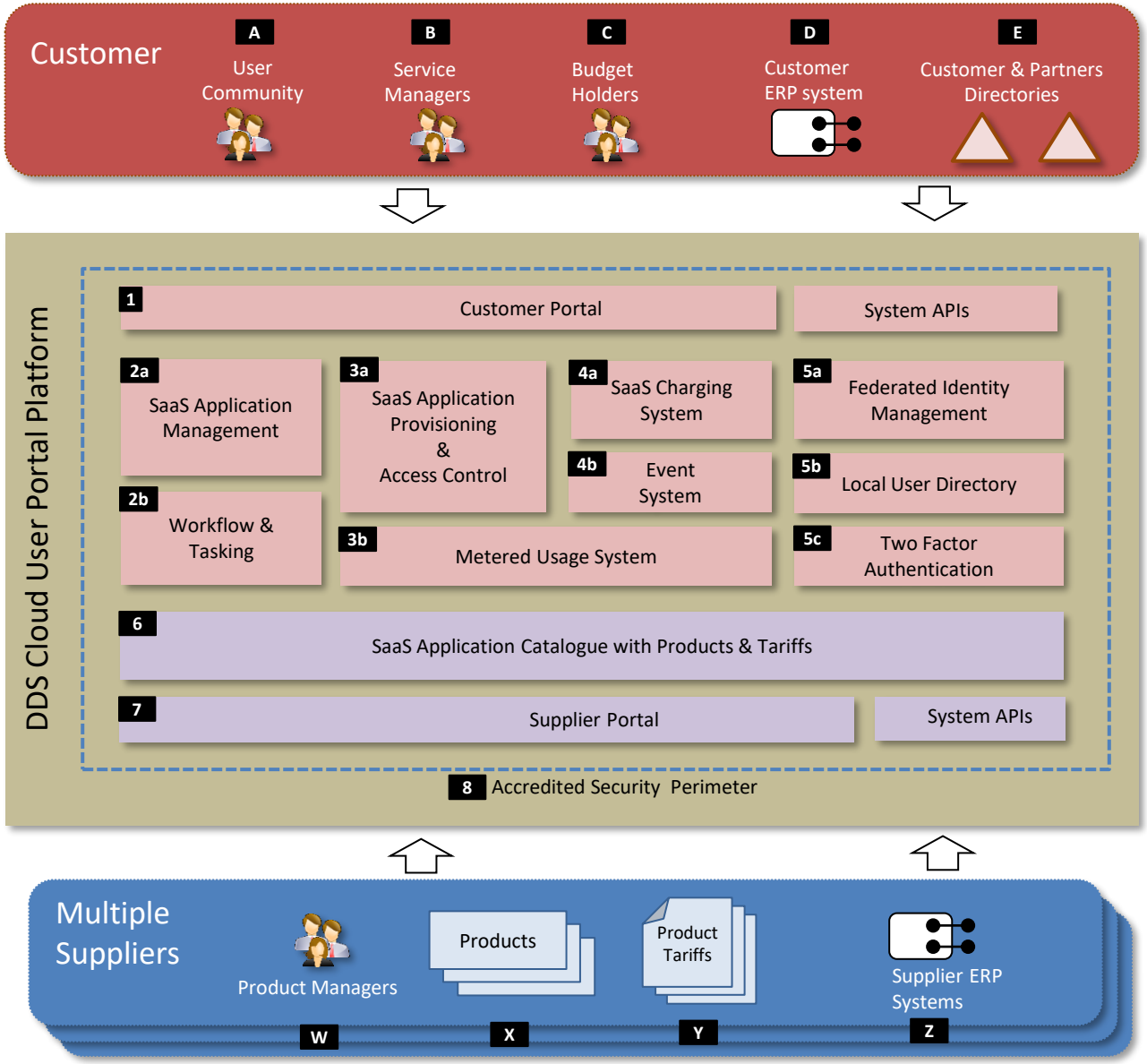


Interface between the CUP and GeM

The CUP talks to GeM via its "Punch-Out" open interface standard (cXML) – summarised below:



Functional Overview of CUP



This describes how the DDS Cloud user Portal Service was be built. It was designed against a set of multi-agency business requirements conceptual architecture of the service gave the logical and physical scalability necessary to support a broader Government wide application store ("G-App Store"). The analysis and design created a well thought out and performant solution. The design and implementation followed industry

Service-Oriented Design
Various applications and information sources are used and connected as Services.

Messaging Architecture
Systems communicate with each other using inbuilt messaging system

Multi-Agency Support
Support for multiple agencies has been built in from scratch. This allows users, administrators and budget holders to work seamlessly together on GWS and broader GSi hosted resources.

Beyond Perimeter Security
Use of an accredited Redaction Engine enforces security policies at the object level. Allows objects to be secures in transit and at rest. Augments the security offered by the GWS and GSI boundaries

DESIGN PRINCIPLES

- Designed to meet G-Cloud SaaS business needs
- Multi-Agency so not derived from any specific agency requirements
- Supplier funded development & deployment
- Implements new principles for procurement and IA in the cloud
- Designed for scale and expansion

ARCHITECTURE

- Re-uses proven GWS Core Services and templates
- Based on established COTS products (e.g.: SP2010, ADFS2 etc.)
- Designed to support GSi and Internet connected users

IMPLEMENTATION

- Implemented in accreditable Savvis Secure Environment
- Designed to make best use of virtualisation
- Creating Business Rules for Services
- Created using standard tools

SERVICE WRAP

- Hardware & OS Managed by Savvis specialists
- Applications managed by DDS specialists
- Shared Service Support Desk
- Application Configuration Service
- User Self Service and 'self provisioning' functions

About Daemon Directory Systems (DDS)

- Development background, working with open source and MS products, operating services in Internet and secure domain for last 5 years
- Extensive track record with central government – 15 years
- Extensive experience with criminal justice and law enforcement agencies
- Many consultancy projects undertaken in central government, e.g.: HO, NAO, Cab Off., DH, MOJ, DfE, DEFRA, DECC, etc.
- All support and development staff cleared to SC level, premises inspected and compliant with IL3 rated systems (not data)

See http://www.dds-labs.com for details

Relevant Systems

- Home Office
  - GWS, developed Single Sign On capability
  - Developed and implemented Directory of Business,
  - Developed Skills Directory for Core Competency Framework
- DWP (90,000+ users)
  - Developed and implemented Staff Directory for all staff, integrated into b/ground systems (with HPES)
  - Office Database,
  - Managed Directory interfaces to external call centres, passing office and staff details
- MOJ
  - Developed SharePoint based solution, delivered as SaaS to securely share offender details between multiple agencies (NOMS and YJB)
  - Pilot version of Virtual Courts implementation
- Police
  - Worked with NPIA to open GSi services to Police Forces
  - Pilot SaaS services in Forces
- G-Cloud Framework
  - Submitted 10 SaaS services for Framework, all at IL3, and all operative immediately