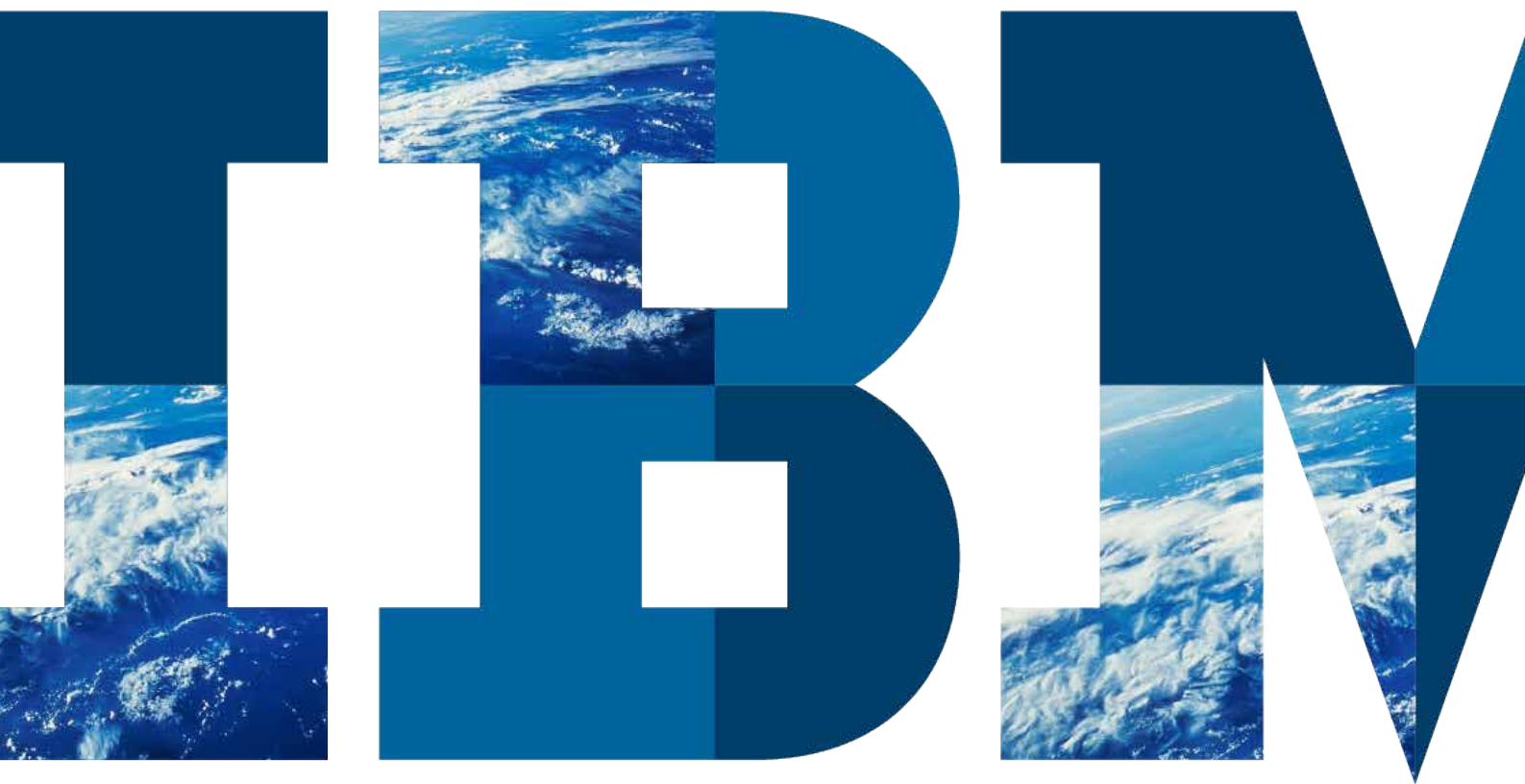


# IBM Cloud Brokerage Services

*Functional overview*





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As clients turn to a hybrid cloud environment to deliver applications and services with speed and at a manageable cost, they must unify consumption and delivery across a multisource environment that includes cloud and traditional IT. IBM Cloud Brokerage Services are focused on sourcing, provisioning, and managing IT services across virtually all cloud models with greater visibility, control, speed, and agility while enabling reduced costs and risk.

IBM Cloud Brokerage Services provide a single point of entry to manage multiple cloud services for business or technical purposes. The two important unique features are the ability to provide a single consistent interface to multiple differing cloud providers (catalog federation), and the clear visibility into who is providing the services in the background (aggregated visibility).

IBM Cloud Brokerage Services are delivered as a service, including software and managed services that enable organizations to broker (plan, buy, and manage) cloud services from multiple providers throughout hybrid clouds that use a single dashboard. To provide thorough integration into enterprise IT systems, (for example, private cloud, traditional IT, single sign-on, service management, and managed services), the service is being deployed for each client on IBM cloud in a dedicated instance.

This solution provides clients with the ability to make better informed decisions when moving to a hybrid cloud environment. Architects, consumers and operations can plan, provision, and manage IT resources across multiple cloud and traditional IT models. Cloud Brokerage gives greater visibility and control of the client's overall IT environment, enabling them to effectively manage costs and compliance.

Cloud brokerage addresses issues that the hybrid cloud introduced, including:

- Lack of visibility and control for a growing numbers of service providers
- Shadow IT environments with business units that use the cloud and that bypass central IT
- Non-compliant IT environments with multiple providers for IT services
- Complex integration of a multitude of cloud computing service models from cloud service providers, such as infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS)
- Complexity in supporting and managing a multi-sourced IT Infrastructure

## Regain control of hybrid cloud with cloud brokerage

IBM Cloud Brokerage Services provide the processes, technology, and expertise to run your IT as a business.

IBM Cloud Brokerage Services enable clients to adopt a new hybrid IT and multi-sourced operating model. IT service consumption can be personalized. The delivery of services is unified through the Cloud Brokerage Services capabilities for planning, self-service consumption, and financial management.



The services that are provided by IBM Cloud Brokerage bring hybrid cloud environments within an organization under the control of the central IT organization. By incorporating this solution with their existing IT services and tools, clients can unify all their technology resources and obtain the choice, agility, control, and compliance that they require.

In addition to resolving these issues, cloud brokerage provides value to the enterprise in the following ways:

- Enables unified self-service IT across environments and deployment models in a policy-driven model.
- Aggregates, compares, estimates, provisions, integrates, manages, and tracks cloud services and the associated costs for multiple providers.
- Reduces the cost and risk of cloud services by embracing shadow IT, providing visibility and control, and managing costs and implementation policies.

Think of cloud brokerage as a way of centralizing the IT supply chain throughout the cloud, while relying on the enterprise's policies and allowing IT teams to control where applications run, either on or off premises.



IBM Cloud Brokerage comes as a suite of applications to give clients choice to start with the most promising use cases. They provide service capabilities in the areas of service planning, service consumption, cost and asset management, day-2 operation functions (planned for the second half of 2018), and financial management (planned for the second half of 2018).

The IBM Cloud Brokerage applications are illustrated in the following diagram. The upper ones are the modules that one subscribes to in the service. The lower ones are either third-party or backend functions. This document outlines the functions of the three applications that are available today: Planning, Broker Store, and Cost and Asset Management.

## An integrated suite of applications designed to support the modern IT enterprise



Figure 1: The IBM Cloud Brokerage Suite of Applications

Subject to change at the sole discretion of IBM

## Planning

The Planning functions of IBM Cloud Brokerage helps clients and architects design services for specific workload or application needs by screening workloads, selecting the best target infrastructure, and comparing potential providers.

Planning contains two primary actions to help explore which cloud options are best:

- Application Screener – to identify the best target cloud model for a specific application
- Compare Cloud Providers – to compare public and private cloud providers on requirements coverage, cost and service quality against the specific requirements of a single application or workload.

### Application Screener

#### Key capabilities

- Interleaved decision tree based on 50+ questions to help explore potential deployment options, cloud benefit, and cloud readiness
- Preloaded answers based on an initial assessment of the workload type
- Questions addressing a wide area of topics and requirement, for example: architecture, risk and security, scalability, accessibility, performance, reliability, resiliency, organizational readiness
- Assessment overview dashboard
- Assessment report including scoring rational and recommendations

#### Customization capabilities

- Modify questions and weighting according to client-specific requirements

Application Screener provides metrics and recommendations for businesses that are moving to the cloud. By answering a series of questions, Application Screener provides a target deployment recommendation, cloud readiness scores, cloud benefit scores, and recommendations to facilitate a cloud migration.

The Application Screener allows clients to determine which of their applications are most suited for a cloud transition, and for which a cloud deployment brings the greatest potential return on investment. Clients can save time, money, and effort by optimizing cloud-buying strategies before provisioning.

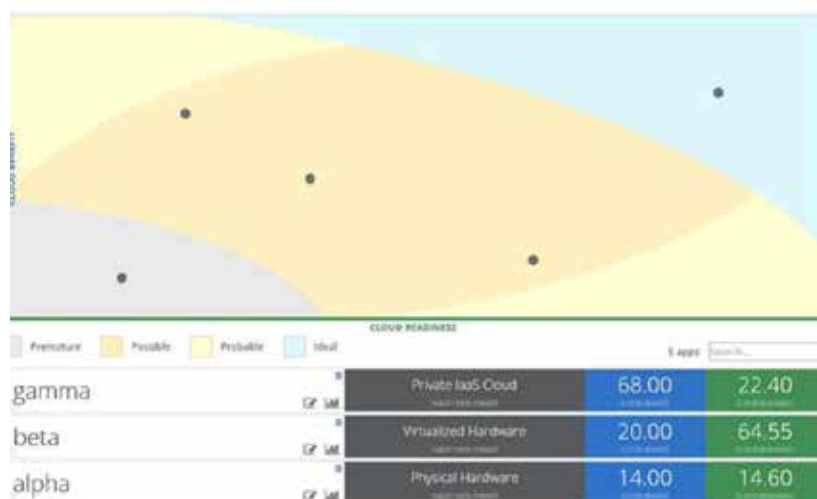


Figure 2: The application screener overview positions each application in relation to the others regarding cloud benefit and cloud readiness



This module of IBM Cloud Brokerage Services allows you to compare cloud provider packages to determine which provider to select, prior to further solution design. Comparison is done by mapping workload requirements to provider services and packages. You can start your journey with Compare Cloud Providers, or you can export the results of your Application Screener session and import them into Compare Cloud Providers, which will then preset some of the specifications used in the provider comparison.

After editing the configuration and features to match your specific needs, you can use Compare Cloud Providers. It will start a side-by-side comparison of features, performance, and price of the providers that are defined in your marketplace ability to meet the needs and specifications of your workload.

### Compare Cloud Providers

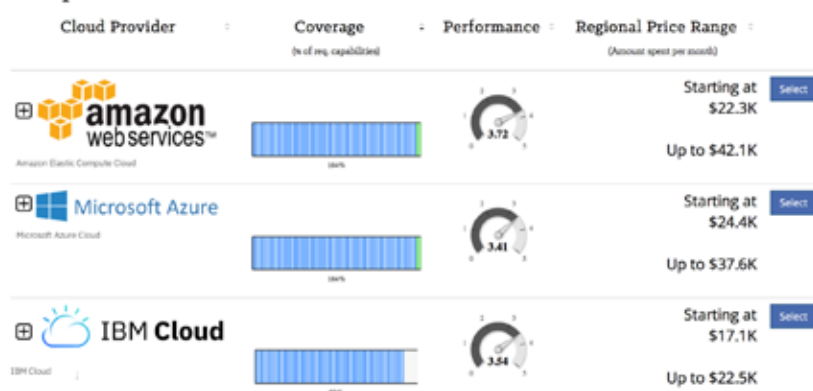


Figure 3: Compare Cloud Providers provides an application-specific like-to-like comparison of public and private clouds regarding requirements coverage, quality of service and cost.

## Compare Cloud Providers

### Key capabilities

- Comparison by application-specific requirements
- 70+ single requirements in the categories resource requirements (compute, storage network), type of environment (development, test, production), compliance, deployment method, IaaS service features, location, management, PaaS service features, pricing model, security options, support model
- Preloaded requirements based on workload type/architectural pattern
- “Fuzzy” requirements possible
- Save requirements patterns for future use
- Side-by-side comparison based on a normalized comparison algorithm, patented by IBM
- Quality of service comparison based on third-party benchmarking information
- Price comparison considering client-specific provider discounts
- Provider reports including providers’ detailed service bundles, full estimated bill of material, and detailed requirements mapping report

## Outlook for 2018

### Customization and integration capabilities

- Add and modify comparison criteria
- Integrate any public or private service provider

### Built-in integrations

- Amazon Web Services
- Microsoft Azure
- IBM Cloud

Application Screener will be refactored to a new application architecture and user interface with minor enhancements in 2018.

Compare Cloud Providers will be reengineered considerably in 2018, enabling an in-line comparison into the Broker Store application, and analyzing the output of the Cost and Asset Management application to take strategic sourcing decisions and provide rehosting recommendations.

## Broker Store

### Key capabilities

- Enables quick and agile access to many cloud and traditional IT solutions
- Implements a standard system for business units to purchase and modify IT services
- Defines a policy-based consumption model and automates service orchestration and provisioning

Broker Store is the newest module in the refactored IBM Cloud Brokerage Services suite of applications. It is a purpose-built application that enables a self-service ability to browse, search, order, and fulfill services that are powered by a comprehensive, curated ITaaS catalog across cloud and traditional IT providers.

The store application consists of the following functions:

- Service Catalog – to search, select, configure, and order services
- Order Engine – to fulfill the orders
- Service Inventory – to provide a detailed overview and basic management tasks on running services
- Account Management – to easily set up and management the provider accounts



Service Catalog is a federated catalog in which the services of a multi-provider ecosystem are made available for a unified consumption experience. Users can select services by filtering, for example, by provider or by service category. Users can then configure the services according to their specific requirements and see the associated costs prior to ordering.

The service catalog comes with the services of the connected public cloud providers, but can be modified and enhanced by the following options:

- Any additional service or service blueprint/template that had been selected and designed by the client
- Services from any other service providers (internal or external) for which fulfillment adapters are available (for example, for vRealize Private Cloud, ServiceNow) or have been specifically developed

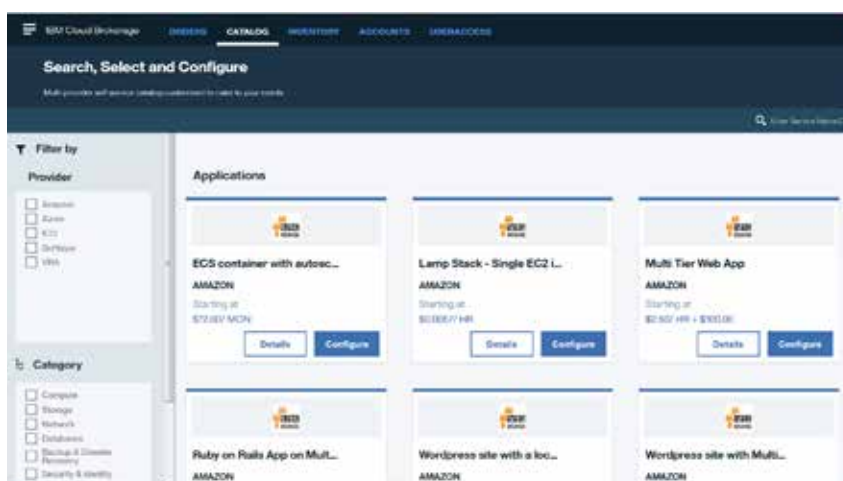


Figure 4: The catalog is compatible with most common template formats to display more comprehensive blueprints and solutions as visible catalog items.

## Service Catalog

### Key capabilities

- Easy-to-use federated catalog/marketplace
- Role/team-based controls to browse, search, filter, configure, and order services
- Automated ingest of services from provider templates by a generic content server
- UI for service onboarding
- Catalog visibility policies – to configure who has access to what
- Contract pricing rules
- Support for managed services in templates
- Global currency support (USD, GBP, EUR, NOK, ...)
- Multi-currency support
- Quickly repurpose a service for multiple roles (basic user vs advanced), or multiple contexts (production vs development and testing)

### Built-in integrations

- 33 public cloud services enabled
- Provider template integration
- AWS CloudFormation
- Azure ARM
- VMware vRealize
- Terraform
- ITSM Systems – IBM Control Desk and ServiceNow

## Outlook for 2018

### Planned capabilities (beyond June 2018):

- Shopping Cart
- Support for multiple services in vRA XaaS service offering
- Stand-alone managed service provisioning
- Generic content server updates for managed service content
- UI to set up contract pricing rules

### Currency certification in progress

- Australian/New Zealand Dollar
- Brazilian Real
- Canadian Dollar
- Danish Kroner
- Hong Kong Dollar
- Mexican Peso
- South African Rand
- Swiss Franc

Table 1: Planned capabilities for the Broker Store module

Capability	Feb	Mar	Apr	May	Jun
White label: logo support	X				
Multi-quantity ordering	X				
On-demand cost estimation	X				
Contextual online help		X			
Retrieve credentials (provider accounts) based on context		X			
Support XaaS blueprints			X		
Edit active services (change order)				X	
Integrated UI between Broker Store and CAM					X
UI to set up catalog visibility rules					X

### Public cloud service integration

- March 2018: ~48 (AWS, Azure, SL, some Google)
- April 2018: ~62 (AWS, Azure, SL, Google)
- May 2018: ~75 (AWS, Azure, SL, Google)
- later: ~107 (AWS, Azure, SL, Google)



After configuring and ordering a service, IBM Broker Store sends the order request to the service provider or orchestration engine that is associated with the selected service. The template behind each service describes the series of actions and service bundles that tells the order engine which information to send to which service providers interface. This practice also allows the bundling of several services of multiple service providers bundled in one orderable service.

Before ordering, Broker Store will fulfill a customizable and policy-based approval process – either through a simple built-in approval engine or by connecting to an established external approval engine (such as ServiceNow).

ORDER ID	CREATED DATE	UPDATED DATE	PLACED BY	ORDER TYPE	ORDER STATUS	AMOUNT	ACTIONS
ALP0195	Wed Feb 14 2018 08:16:54 GMT+0700 (ICT)	Wed Feb 14 2018 08:22:31 GMT+0700 (ICT)	synthussath@ibm.com	Cancel	Completed	\$0.00	
W0379558	Wed Feb 14 2018 08:14:10 GMT+0700 (ICT)	Wed Feb 14 2018 08:24:32 GMT+0700 (ICT)	synthussath@ibm.com	New	Completed	N/A	
W040540	Wed Feb 14 2018 07:41:59 GMT+0700 (ICT)	Wed Feb 14 2018 07:45:41 GMT+0700 (ICT)	synthussath@ibm.com	New	Failed	N/A	
W0379560	Wed Feb 14 2018 07:39:10 GMT+0700 (ICT)	Wed Feb 14 2018 07:39:24 GMT+0700 (ICT)	synthussath@ibm.com	New	Failed	N/A	
W0379565	Wed Feb 14 2018 06:46:28 GMT+0700 (ICT)	Wed Feb 14 2018 06:51:29 GMT+0700 (ICT)	synthussath@ibm.com	New	Completed	\$41,690.00	
TRU01418	Tue Feb 13 2018 22:07:10 GMT+0700 (ICT)	Tue Feb 13 2018 22:08:20 GMT+0700 (ICT)	Chen, Cathy	New	Failed	\$65,300.00	
QU140056	Tue Feb 13 2018 22:00:57 GMT+0700 (ICT)	Tue Feb 13 2018 22:01:54 GMT+0700 (ICT)	synthussath@ibm.com	New	Failed	\$44,690.00	
W0405591	Tue Feb 13 2018 22:00:27 GMT+0700 (ICT)	Tue Feb 13 2018 22:01:48 GMT+0700 (ICT)	Chen, Cathy	Cancel	Completed	\$0.00	
W0405594	Tue Feb 13 2018 21:48:27 GMT+0700 (ICT)	Tue Feb 13 2018 21:49:26 GMT+0700 (ICT)	Chen, Cathy	New	Completed	\$0.00	
W0405593	Mon Feb 12 2018 22:00:41 GMT+0700 (ICT)	Tue Feb 13 2018 22:01:10 GMT+0700 (ICT)	synthussath@ibm.com	Cancel	Completed	\$0.00	

Figure 5: Order status and approval actions are displayed in Broker Store's order dashboard.

## Order Management

### Key capabilities

- Configurable and Policy-based order approval workflow
- External order approval
- Integration with ITSM (ServiceNow) for complex approvals, ticketing, CMDB updates
- Fulfillment Exception (failures) management (lite)
- Alert & Notifications (Emails)
- Order APIs (status check, extract info)
- Dashboard to view all orders and status

### Built-in integrations

- Public cloud providers: AWS, Azure, IBM Cloud
- VmWare vRealize
- ServiceNow and IBM Control Desk (ICD) for ordering and approval workflow

## Outlook for 2018

### Planned capabilities (beyond June 2018):

- Policy driven managed service ordering
- vRA Integration: catalog sync automation
- SNOW Integration: change management workflows, additional day-2 operations, UI for catalog synchronization
- ICD Integration: additional day-2 operations
- Integration of IBM Cloud private
- Integration of IBM Cloud deployment services (orchestration services)

Table 2: Planned capabilities for the Order Platform, vRA Integration, SNOW Integration, and ICD Integration modules

Capability	Feb	Mar	Apr	May	Jun
<b>Order Platform</b>					
Support for order with multiple quantities		X			
Display data in order/ inventory UI based on team context				X	
Cost-based order approval policies				X	
Platform support for add-on managed service orders					X
Budget-based order approval policies					X
<b>vRA Integration</b>					
vRA multi-tenancy support	X				
Support for external pricing		X			
Edit service offering instance			X		
UI for catalog admin to pull vRA service offering and to onboard services in Broker			X		
<b>SNOW Integration</b>					
External approval workflow integration	X				
Service offering provisioning	X				
Order tracking		X			
Onboarding of service offerings through APIs from SNOW catalog		X			
<b>ICD Integration</b>					
Onboarding of service offerings through APIs from ICD catalog	X				
Service offering provisioning	X				
Order tracking integration	X				



The Inventory Dashboard allows users to view and manage the portfolio of running and active services. It provides aggregated service views and detailed views listing single resource services behind each service.

Service Offering Instance Inventory					
UPDATED 28 JUN 10:00AM					
Displaying all active Service Offering Instances					
<div>10 items per page   1-10 of 40 items</div> <div>VIEWING COLUMNS 1-7</div>					
<input type="checkbox"/> INSTANCE NAME	SERVICE ID	STATUS	PROVISIONED DATE	PROVIDER	PROVIDER
> <input type="checkbox"/> My Storage Unit	12345678	No pending action	01/03/2017	AWS	PCIM-AI
> <input type="checkbox"/> New Service 1	12345678	No pending action	01/03/2017	AWS	Dev-AI
> <input type="checkbox"/> New Service 2	12345678	No pending action	01/01/2017	AWS	PCIM-AI
> <input type="checkbox"/> Shahn's Storage	12345678	Edit in progress	06/27/2017	AWS	Dev-AI
> <input type="checkbox"/> Environment	12345678	Cancel in progress	06/23/2017	AWS	PCIM-AI

Figure 6: Besides displaying details on each service, the dashboard allows one to handle most of a user's typical service management requirements, reducing dependence on individual service provider portals.

Table 3: Planned capabilities for the Inventory module

Capability	Feb	Mar	Apr	May	Jun
Include estimated cost information in inventory extracts		X			
External APIs to enable cMDB integration		X			
Service inventory UI enhancements		X			
Ability to import externally created service offering instances in Broker		X			
Edit active service offering instance			X		

## Inventory Dashboard

### Key capabilities

- Service offering instance inventory view
- Extract API for service instances that are ordered from store
- Actions at service instance level (access, delete)
- Basic operations at service component level (VMs only - power on/off, reboot)

### Built-in integrations

- Integrate to ITSM systems, IBM Control Desk and ServiceNow for change management

## Outlook for 2018

### Planned capabilities

(beyond June 2018):

- Raise service requests on a specific service or multiple services
- Support change management workflows
- Display operations history and alerts
- Raise service requests for non-standard day-2 operations

## Other capabilities and core services

- Management of roles, teams and authorizations (current user types: buyers, support, admin, and operations)
- Key vault for provider credentials
- Enterprise SSO
- External authentication (ADFS, SAML, OpenID connect)
- ADFS integration - authorization
- Team-based account management on multiple providers
- Provider account mapping
- White-labeling support
- Audit logging
- Order/inventory export

## Outlook for 2018

### Planned capabilities (beyond June 2018):

- User management UI for external authorization
- Multi-currency N:N
- Admin capability to manage configuration
- Mutual authentication support for integration with external systems
- Support for external vault
- Policies-driven audit log archival

Table 3: Planned capabilities for the Inventory module

Capability	Feb	Mar	Apr	May	Jun
White label: support for customizing color scheme			X		
Provider account and credential management UI			X		
System account and credential management UI			X		
Budget management				X	
User on-boarding and management UI				X	
Notification and alert				X	
Admin UI to view audit logs					X



Cost and Asset Management is a purpose-built hybrid IT cost-and-asset-management application that provides a comprehensive, data-driven view for asset and cost visibility, spend tracking and allocation, and waste identification across cloud and traditional IT providers. The data is collected continuously and made available in dashboards but can also be extracted from the platform for further analysis.

Cost and Asset Management consists of

- Cost Dashboard
- Asset Dashboard
- Policies Dashboard

The Cost Dashboard is a powerful interactive analytical tool that provides actionable insight into the public and private cloud costs and budgetary units of the organization.

## Cost and Asset Management

### Cost Dashboard

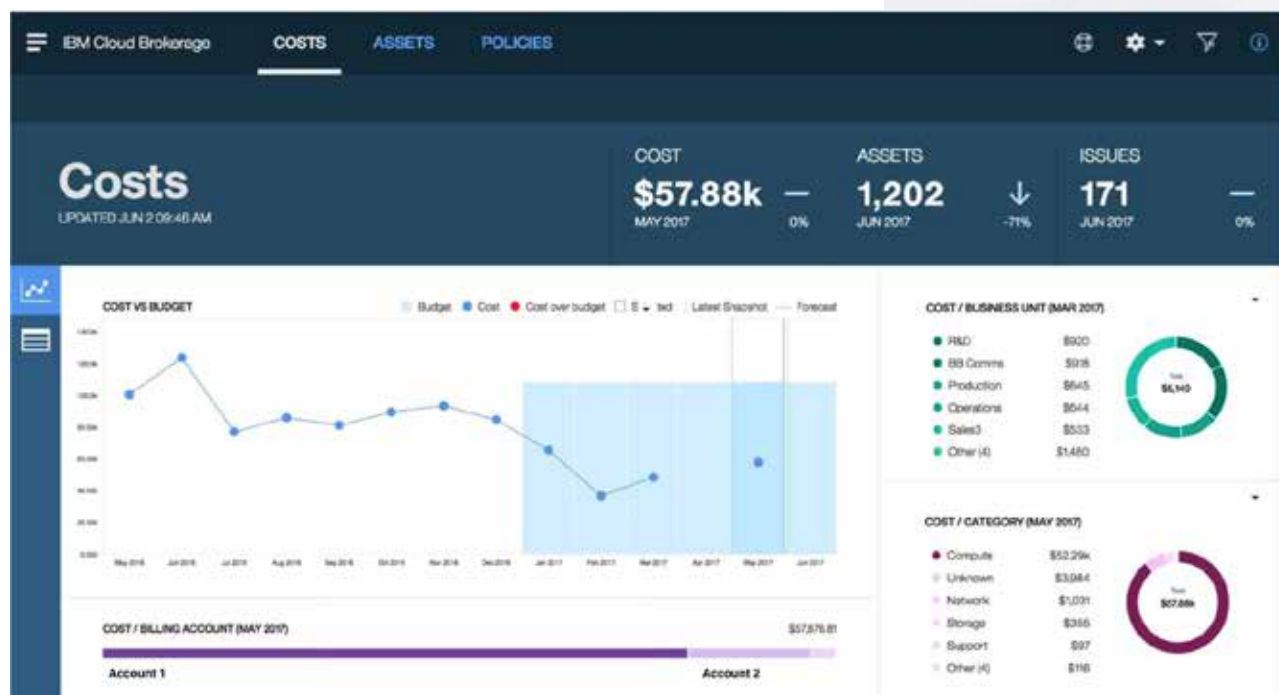


Figure 7: The user (typically CFO or IT financial controller user roles) can view all assets at a global level or view a smaller set of assets by selecting them, applying local filters on the visualizations and table within this dashboard.

## Asset Dashboard

The Assets Dashboard is an interactive visualization and analytical tool that allows to view assets from different perspectives to provide insight on how assets are being used and the cost of these assets.

The Assets Dashboard is useful for:

- Identifying over-provisioned resources and to right-size where appropriate
- Obtaining insights that identify ways to use resources more efficiently and more cost-effectively
- Viewing asset count, the location of assets, and costs of assets
- Viewing detailed information about an asset
- Determining whether assets are under- or over-utilized and, if so, whether a specific asset requires action or further investigation

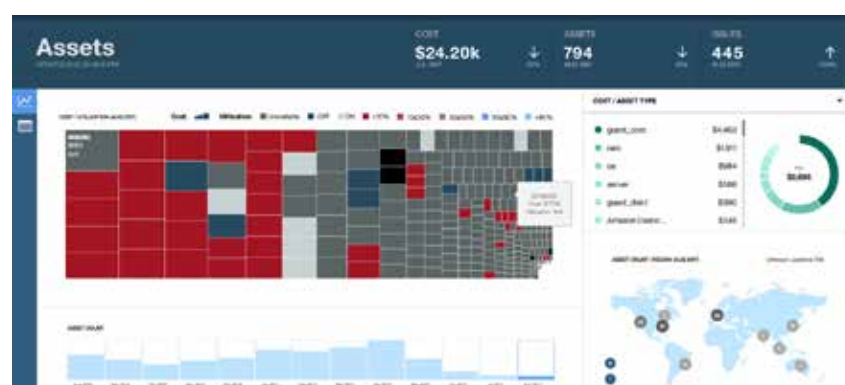


Figure 8: The user can view all assets at a global level or view a smaller set of assets by selecting them (applying local filters on the visualizations and table within this dashboard).

## Policies Dashboard

### Key capabilities

- Automated ingest of account, billing, and asset data from public and private cloud
- Dynamic, bulk, and custom tagging for information enrichment and in support of cost allocation use cases
- Define budgets and track spend against budget, based on provider or custom tags

Policies Dashboard is a dashboard for the visualization of the services/assets that fall into the parameters set in-policy filtering, such as utilization and age.



The Policies Dashboard is used to quickly identify trends, opportunities, and anomalies when key metrics cross critical thresholds that are defined by policy. The system uses four policy categories, which can be configured:

- Underutilized assets
- Overutilized assets
- Utilization drops for assets
- Aging of an asset
- Provider account mapping
- White-labeling support
- Audit logging
- Order/inventory export



Figure 9: Users can drill down in the dashboard to obtain more information about violated policies.

### Key capabilities (continued)

- Drill down and gain transparency of provider cost and asset data
- Advanced visualization and filtering, allowing queries, such as
- View current and projected costs
- Analyze cost variance and budget compliance
- Determine assets and services with the biggest impact on costs
- Discover the optimal path to contain and cut costs and their origin
- Discover spending and cost drivers
- Obtain insights on usage and identify ways to use resources more efficiently and more cost-effectively
- View bills and detailed information about the cost in the invoice line items table
- Establish financial and technical policies to receive and proactively respond to variances and deviations before they become problems - enables managing by exception vs. managing by inspection
- Four built-in policies (aging, under-utilized, over-utilized, utilization drop)
- Custom policy thresholds/dimensions
- Support for reserved instances
- Extracts for reconciliation

### Built-in integrations

- Amazon Web Services
- Microsoft Azure
- IBM Cloud
- Support for private clouds like VMWare (using generic provider format)

### Outlook for 2018

#### Planned capabilities (beyond June 2018):

- Policy driven managed service ordering
- vRA Integration: catalog sync automation
- SNOW Integration: change management workflows, additional day-2 operations, UI for catalog synchronization
- ICD Integration: additional day-2 operations
- Integration of IBM Cloud private
- Integration of IBM Cloud deployment services (orchestration services)

Table 5: Planned capabilities for the Platform Capabilities and Integrations modules

Capability	Feb	Mar	Apr	May	Jun
<b>Platform Capabilities</b>					
Private Cloud GPD upload	X				
AWS RI visibility	X				
Azure account management	X				
Provider (actuals) charges show back to teams and orgs (BCM-56)			X		
Email alerts				X	
Grooming recommendations					X
<b>Integrations</b>					
VMWare Private Cloud (upload support)	X				
VMWare Private Cloud Data Collector					X
Google alpha		X			
Google baseline				X	
Integrate Store and CAM					X



Please Note that any statements on future functionality should be viewed as aspirational and are not IBM commitments.

## Finance

Today's complex hybrid IT service environments provide a wide array of choice and capability to deliver technology to consumers. Tracking and reconciling charges and presenting invoices back to the users of these services is time-consuming, difficult to produce and often requires significant effort from the limited experts available.

Further complicating the problem is that most of today's enterprise financial systems have been designed to operate from capital expenditure models rather than from a metered services model, in which charges are consumption-based or operational expenses.

For the second half of 2018, IBM intends to provide a new set of capabilities to deliver a superior user experience for both consumers and the enterprise for:

- Quick and easy classification of costs
- Rapid allocation of costs for services in use
- Out-of-the-box integration with market-leading general ledger systems
- Charge-back/show-back by multiple dimensions, including business units

## AI Operation

With AI Operation (IT Operations Analytics for Hybrid Cloud), IBM intends to add a new set of capabilities to the IBM Cloud Brokerage Suite of Applications in order to provide a unified view across IBM Brokerage, operational services and platforms for visibility, operations and management of services in a hybrid IT environment.

AI Operation is to be gradually rolled out and will support IT operations managers, administrators and DevOps teams to:

- Obtain proactive detection and recommendation about infrastructure anomalies and anomaly patterns before a service fails
- Obtain system and strategic recommendations for optimized resource allocation to support the rightsizing of IT
- Proactively identify repeat patterns for operational efficiency and data management
- Proactively discover anomaly patterns, disruptions around incidents to reduce incident noise and Mean Time to Resolve (MTTR) incidents
- Obtain insights to analyze IT systems management tools and processes and get recommendations for advanced tooling, remediation tools or replacements
- Obtain recommendations on security events and remediation actions by detecting security anomalies and providing pattern-based predictions

## Outlook to future brokerage applications

Planned for the second half of 2018

