

IBM API Management

Product Details

December 2014



@ibmapimgt

Real API Success = API externalization + realization



API externalization

API exploration

Self-service sign up

Interactive API testing

App key provisioning

API usage analytics

Rate limit notification

Multiple dev communities

API realization

Multi-tenancy

Rate limiting

Runtime policy enforcement

API deployment

OAuth security management

Data transformation/redaction

Backend service discovery

Version management

Analytics support

Role-based access control

Environment management

Monitoring and notification

IBM API Management provides a single solution for both API externalization & API realization

Businesses are transforming themselves to participate in the API economy

How do you rapidly and securely expose your business to this developer ecosystem?







IBM API Management

Expose business services securely as APIs to developer communities, and analyze API usage

Provide self-service API portals to external/internal app developers

Manage & monitor the entire API platform

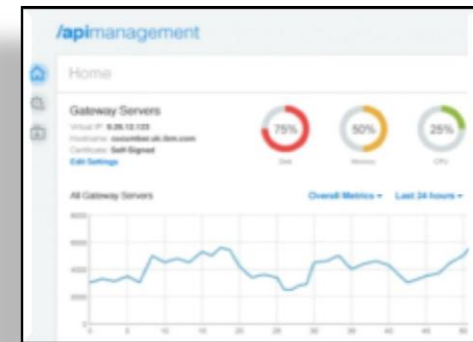
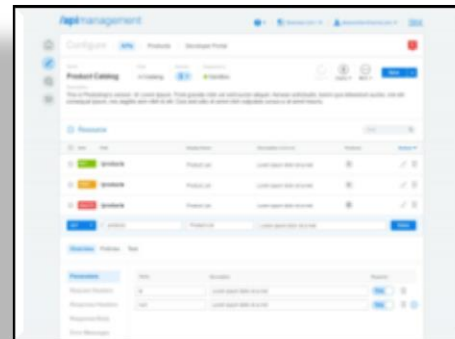


-  Off-premise SaaS
-  On-premise private
-  Off-premise private
-  Hybrid

A single, comprehensive solution to design, secure, control, publish, monitor & manage APIs

IBM API Management

Fully on-premise, multi-tenant solution,
for API providers

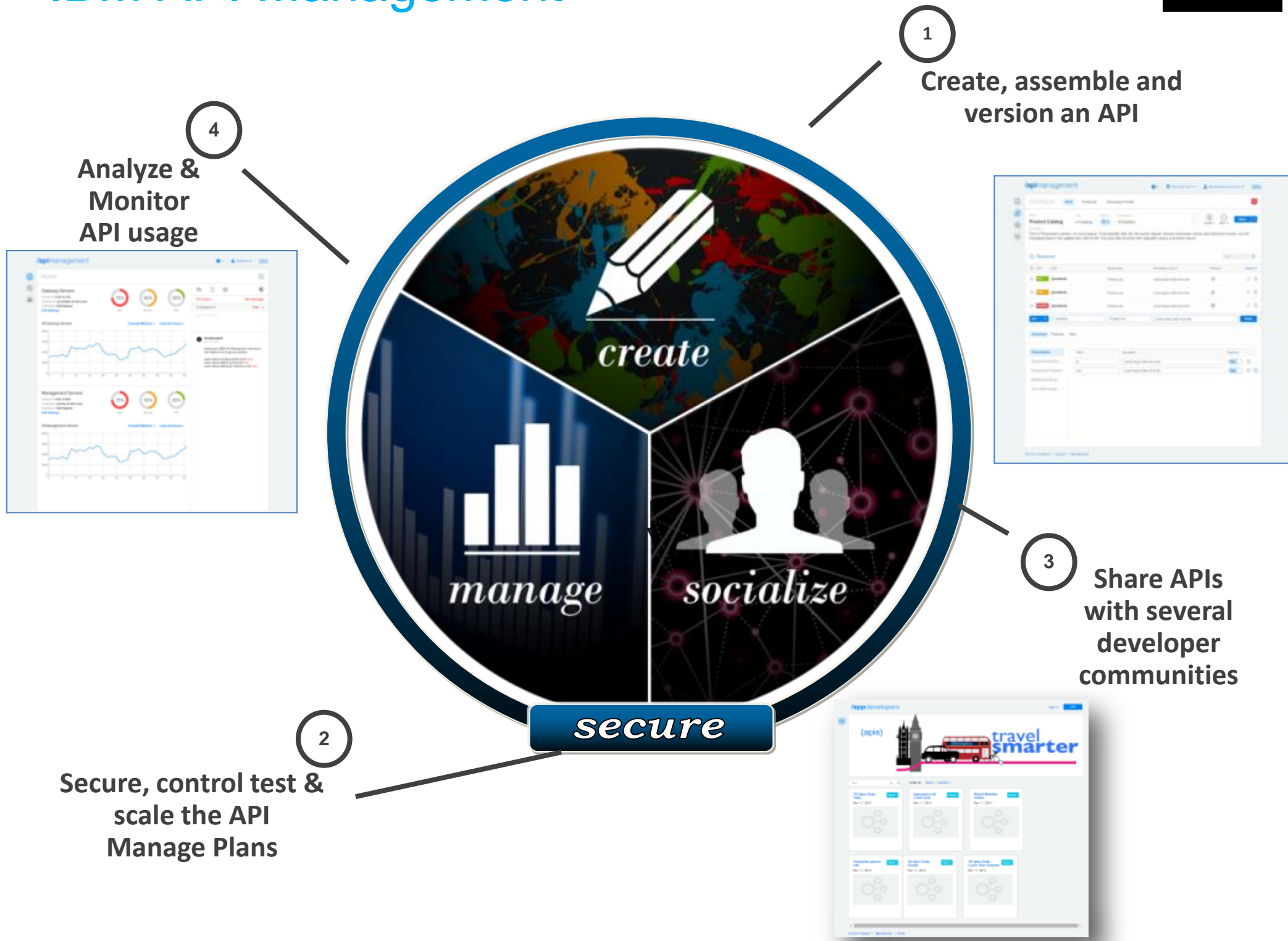


IBM DataPower

API Gateway for security, control, integration &
optimized access to a full range of Mobile, Web, API,
SOA, B2B & Cloud workloads

Over a decade of innovation, 10,000+ units sold,
2000+ customer installations worldwide

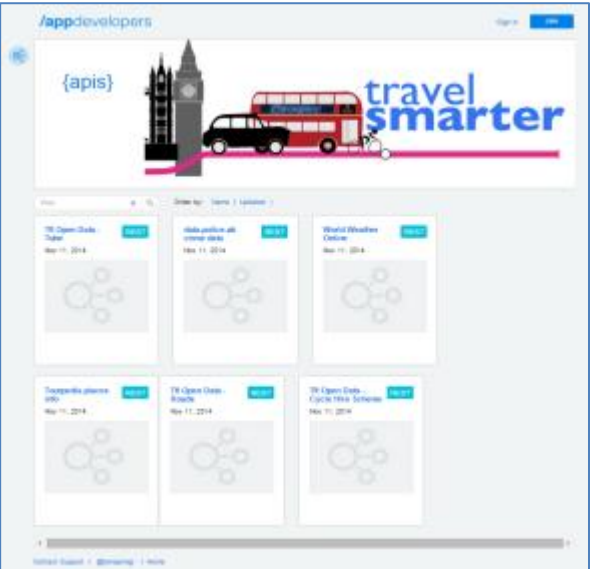
IBM API Management



Easily manage your APIs, in your private environment

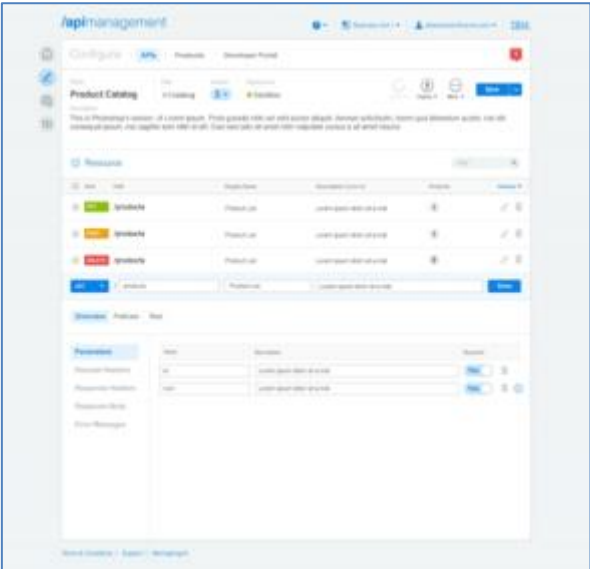
design, secure, control, publish, monitor & manage

Developer Portal



Explore API documentation
Provision application keys
Self-service experience

API Manager



Define and manage APIs
Explore API usage with analytics
Manage API user communities

Management Console



Provision system resources
Monitor runtime health
Scale the environment



API Gateway (IBM DataPower)

Enforce runtime policies to control API traffic



What's New in IBM API Mgmt

API Management solution

Product APIs



Product APIs allow customers to interact with the API Management solution, and extend/customize

Management layer



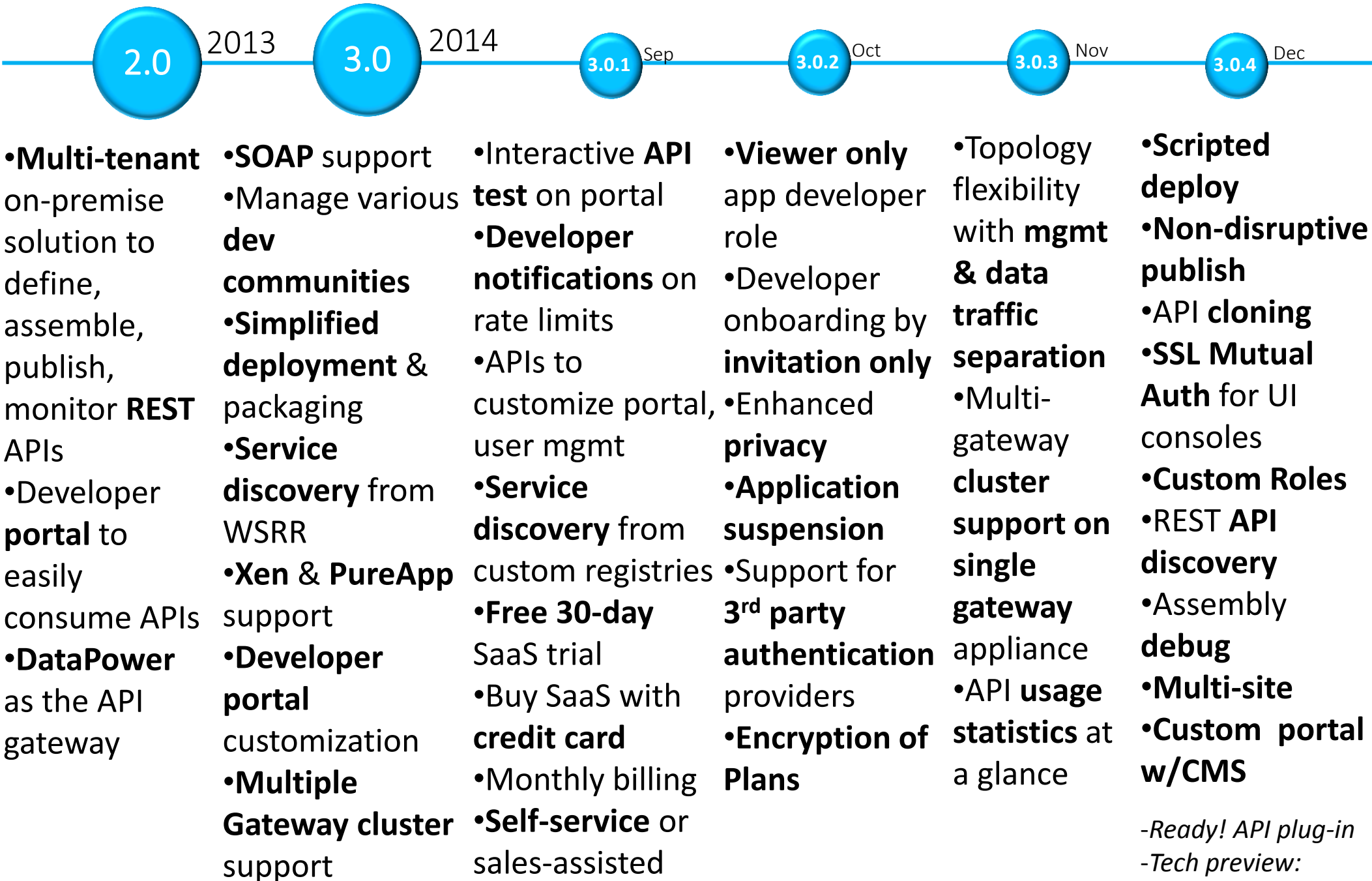
The management layer embodies the capability for organizations to define, manage, expose and control APIs. Provides API Manager, Developer Portal and Management Console.
(API Mgmt virtual appliance)

Gateway layer



API configurations are deployed to the gateway, which provides the enforcement point for runtime policies to control API traffic
(DataPower physical or virtual appliance)

IBM API Management product updates



-Ready! API plug-in
 -Tech preview:
 Swagger import

Join the API Economy

IBM API Management, for on-premise

- Assemble business APIs easily
- Provide Secure or Open APIs
- Control APIs at a fine-grained level
- Analyze API usage
- Manage private, partner, public app developers
- Provide self-service app developer onboarding



What's new in IBM API Management , for on-premise

- ✓ *Single console to manage REST & SOAP services and publish to various app developer communities*
- ✓ *Role-based access control and simple deployment architecture*
- ✓ *OAuth 2.0 support for secure APIs and web service discovery from WSRR*
- ✓ *Policy-driven API control & visibility across various environments*
- ✓ *Out of the box Developer Portal customization & Multiple Gateway Clusters*

Embrace the API Economy on the Cloud

IBM API Management Service (SaaS)

- Design & Secure APIs, Publish to developer portals, Analyze API usage & performance
- A resilient and highly available API runtime infrastructure with built-in failover, redundancy, & dynamic scaling
- Seamlessly move APIs & Plans from public to private cloud or on-prem for complete flexibility
- Identical capabilities of on-premise
- 30-day full feature trial, self-service pay with credit card
- Grow as you need: Pricing based on API calls & developer accounts with optional logging of API payload
- Now in U.S., Japan & Singapore data centers



SOFTLAYER

Unlimited

APIs
API versions
Plans
Plan versions
API developers
Environments
Portals

Starting from
\$99.00
per month



Calculate
your price

ibm.biz/apimsaas

IBM API Management - Full control & deployment flexibility



Off-premise SaaS

- IBM-managed infrastructure
- Low entry cost
- Pay-per-use
- Highly elastic
- API Provider has full control to create APIs & Plans, customize developer portals, publish to developer communities



On-premise Private

- Customer-managed infrastructure
- API Provider has full control to manage & scale the on-premise infrastructure
- Create APIs & Plans, customize developer portals, publish to developer communities



Off-premise Private

- API Provider-managed on IBM-hosted cloud
- API Provider has full control to manage & scale the off-premise infrastructure
- Create APIs & Plans, customize developer portals, publish to developer communities



Hybrid

- Best of both worlds
- Meet seasonal capacity without CapEx
- Move APIs & Plans between public & private clouds
- Create APIs & Plans, customize developer portals, publish to developer communities

IBM API Management Service - Unlimited possibilities

Unlimited



APIs

API versions

Plans

Plan versions

API developers

Environments

Portals



IBM API Management v.3.0.1*

API Development

- **OAuth2 Refresh/Revocation**: API Developer can enable OAuth2 token refresh and/or revocation
- **API Properties**: API Developer can create custom properties enabling seamless transition between environments (e.g. environmentally dependent service endpoints)
- **Pluggable SOAP Discovery**: API Provider can develop a discovery agent to enable SOAP discovery from custom registries for exposure as REST/SOAP APIs
- **Cross Origin Resource Sharing (CORS)**: CORS support enabling easy cross site API requests

Developer Portal enhancements

- **Live Docs**: App Developer can invoke/test an API within the documentation to accelerate their API comprehension
- **Rate Limit Notifications**: App Developer can receive notification when near or exceeding their subscribed rate limit to make informed and timely adjustments
- **WSDL Download**: App Developer can download the WSDL for a SOAP API to be used for testing and client development
- **Catalog APIs**: Script application creation or develop a custom Developer Portal

Analytics & Reporting

- **90 Day Visualization**: API Provider UI dashboards can display up to 90 days for instant analysis
- **Fine Grained Export**: API Provider can export fine grained analytics via API Manager for integration with 3rd party business intelligence systems, monetization and billing, or reporting

SaaS Offering

- **Try & Buy**: Self service signup for 30 day free trial, Pay with credit card or contact Sales
- **Usage based pricing**: API volume and application developer based + optional detailed usage logging

* released Sep 26, 2014 for on-premise & applied to SaaS

Details at www-01.ibm.com/support/docview.wss?uid=swg21685516

IBM API Management v3.0.2*

Developer Engagement

- **By invitation only:** Enable app developer onboarding by invitation only
- **Viewer Role:** Enable a view-only app developer role
- **Client ID / secret confidentiality:** Enhanced privacy in the Developer Portal to get client secret; Deferred retrieval of client secret

Provider Productivity

- **Authentication URL:** API Provider can configure non-LDAP based IDPs by using Authentication URL. For example, enabling integration with third-party authentication providers.
- **Application suspension:** Individual apps can be suspended by the API Provider. Block the app from invoking APIs and prevent blocked apps from registering with Plans
- **Encrypted Plan:** API Provider can export/import Plans as an encrypted package for secure handling between disconnected environments.

* released Oct 20, 2014 for on-premise & applied to SaaS

IBM API Management v3.0.3*

Topology Flexibility

- **Dual NICs on Management Server:** Enhanced networking/topology flexibility on the management appliance to separate management & data traffic.
- **Multiple gateway clusters per DataPower appliance:** Scale with ease for increased gateway utilization through multiple clusters within a single DataPower appliance

Analytics & Reporting

- **Usage summary statistics:** Aggregated quick view usage statistics of number of API calls across environments, number of developer account & storage against payload logging

* released Nov 21, 2014 for on-premise

IBM API Management v3.0.4*

API Lifecycle & Governance

- **Scripted Deployment:** Deploy Plans from outside API Manager using a script for operational integration. Support for deploy, undeploy, publish, unpublish, suspend, resume
- **Non-disruptive Publish:** Deploy changes to rate limits, minor API revisions in a plan without any outage while also providing auto subscriber migration
- **API Cloning:** Create a new copy of an API with a single click to accelerate API development

Security

- **Secure UI access:** SSL Mutual Authentication support for secure UI traffic to Cloud Management Console , API Manager UI and Developer portal
- **Custom Roles:** Create unique roles across the API provider organization, each with view/modify access to Plans, APIs, environments, etc.

API Provider Productivity

- **API Discovery:** Easily find & expose REST services, by discovering them from custom registries such as those on z/OS. This is in addition to already available SOAP service discovery from custom registries
- **Assembly Debugging:** Debug API assembly flow with ease from within the API Manager UI

Topology Flexibility

- **High performance multi-site configuration:** Optimize and load balance communications between gateway servers and management servers in a multi-site configuration

Tech Preview

- **Swagger Import:** Accelerate API development & reuse existing API definitions through import of Swagger 2.0 representation

A closer look

API Success Requires Addressing Needs of Multiple Stakeholders



API Product Manager

- How can I rapidly release & update my APIs?
- How do I publicize my API?
- How do I measure success?

App Developer

- Where do I access APIs?
- How do I understand the APIs?
- How do I measure success?



API Developer

- How do I assemble APIs?
- How do I manage security?
- Will the infrastructure scale?
- How do I measure performance?

Operations Lead*

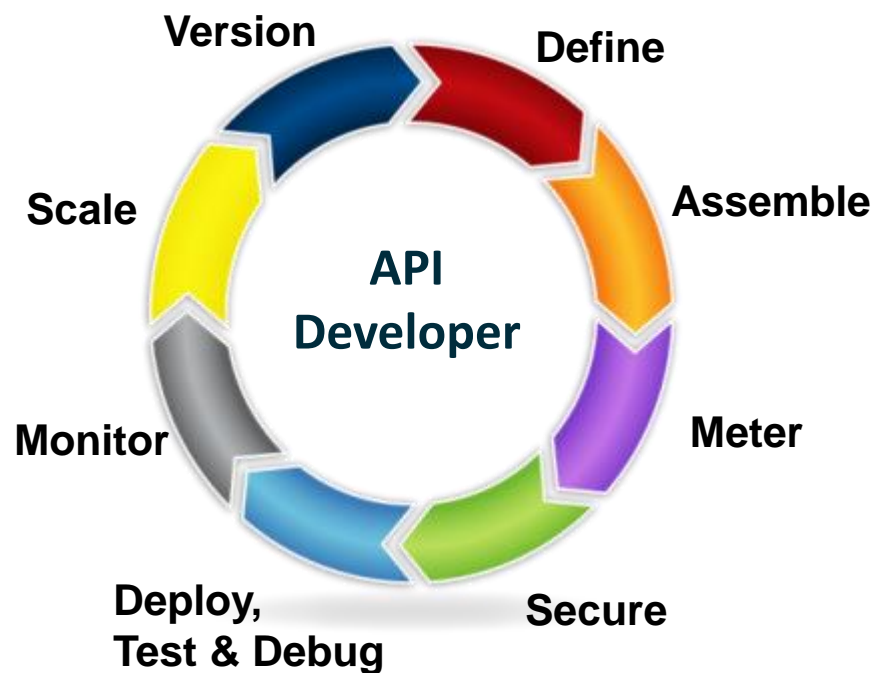
- How do I manage all the API Environments that are being requested?
- How can I scale each environment?
- How can I easily find and fix issues?



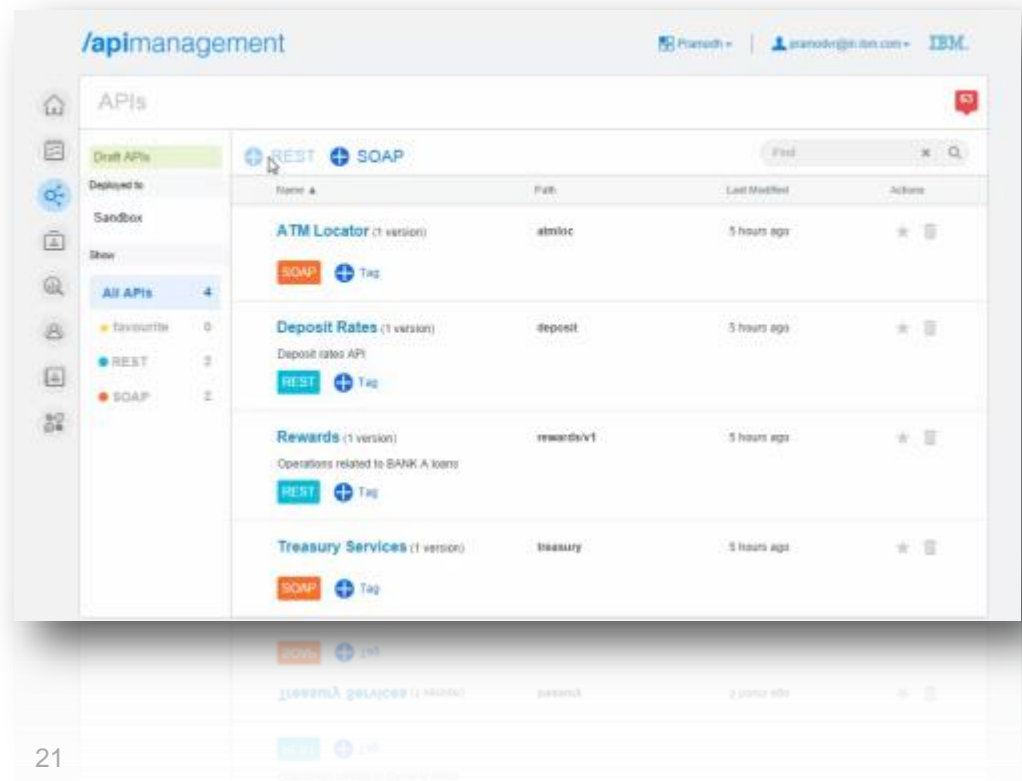
* Not applicable to SaaS

API Developer: Create, Secure & Version APIs

Simple interface accelerates iterative API development & deployment



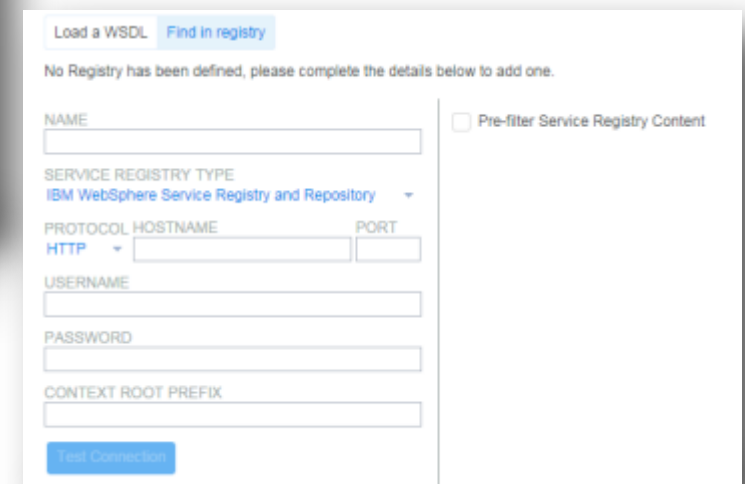
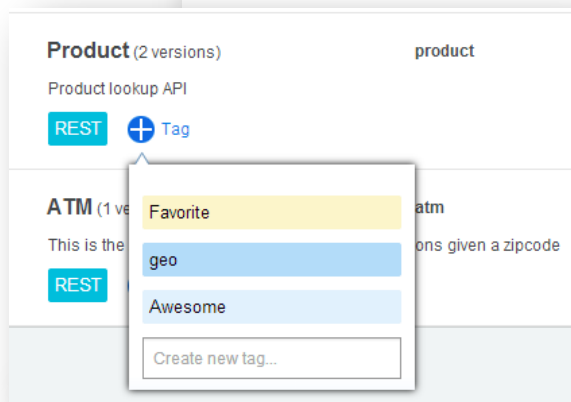
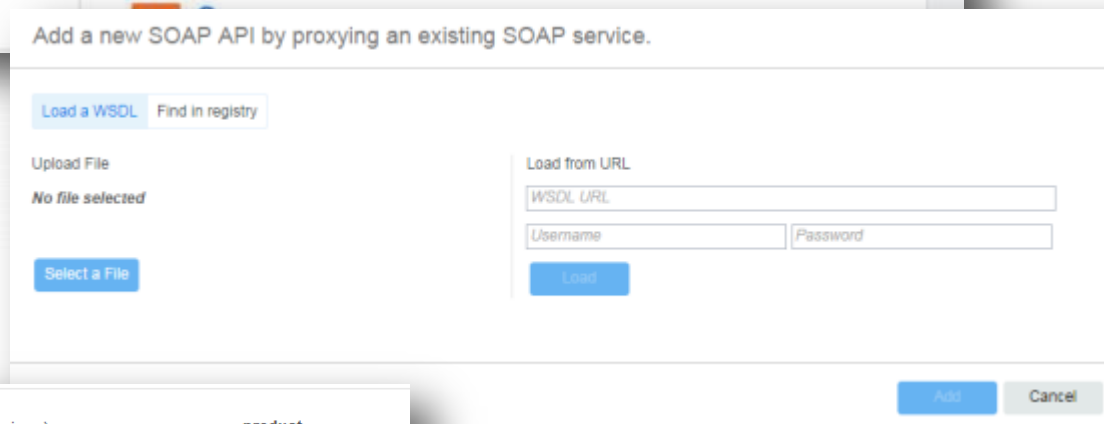
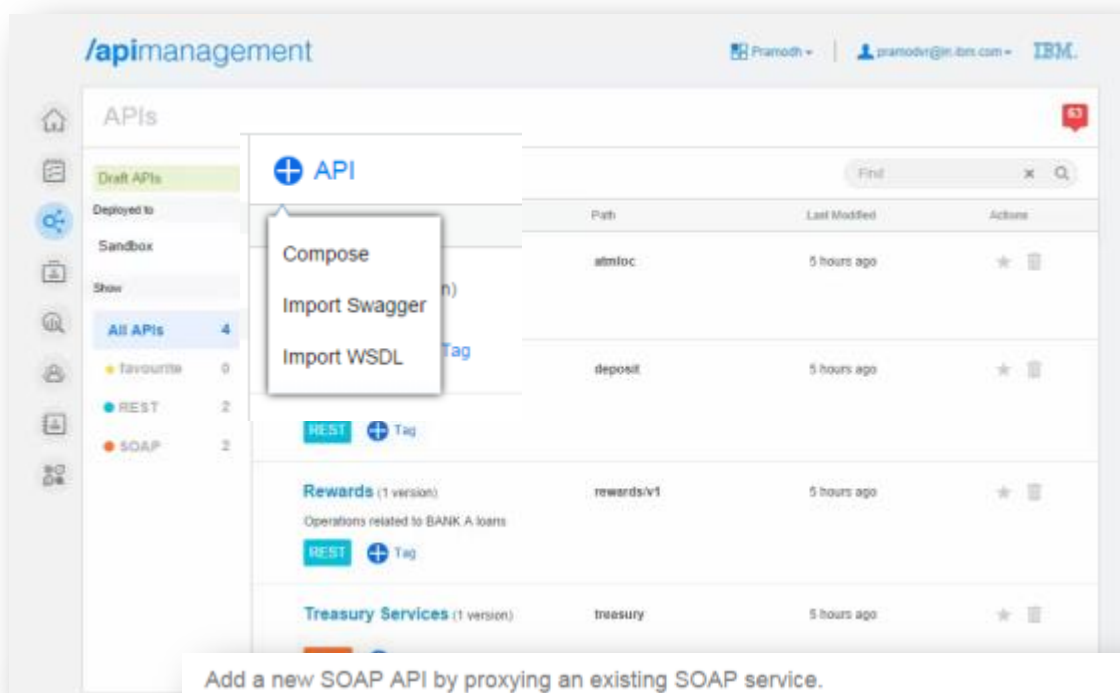
- ▶ Intuitively and iteratively **define** APIs and associated policies
- ▶ Rapidly **assemble** APIs via configuration, not coding
- ▶ Minimize risk with industry leading **security & scalability**



API Developer: Easily find & create REST and SOAP APIs



- Define the **REST** or **SOAP API** you wish to expose
- **Import** WSDL, Swagger or REST/SOAP APIs from a registry
- **Search** for, add custom **tags** to, and mark **favorite** APIs for easier discovery



API Developer: Assemble New APIs Through Configuration



Proxy Assemble

REQUEST

HTTP GET OPERATION 2

ACTIVITY LOG 3

WEB SERVICE INVOKE OPERATION 6

RESPONSE

Return...

No Map Select Values Map Values

Available values

Field Sample

- ★ HTTP GET Operation 2
- ★ body
- ★ JSON
- xy customerType Gold
- ★ Web Service Invoke Operation 6
- ★ Response
- ★ body
- ★ retrieveRatesResponse
- xy interestRate
- xy monthlyInstallment
- xy processingFee
- xy amount
- 4.3:term
- [] ★ header

Transformation

String

Input variables

Field Sample

- ★ body
- ★ JSON
- xy amount 1000
- xy term 12
- xy interestRate 1.2
- xy monthlyInstallment 99
- xy processingFee 10

String Mathematical Boolean Date Utility

Concatenate Absolute Value Boolean Date Time Composite

Length Mean Not Date to String

Lowercase Ceiling Adjust to Timezone

Uppercase Divide

Replace Floor

Starts With Format

String Maximum

Substring Minimum

Trim Modulo

Multiply

Number

Round

Subtract

Sum

HTTP

- GET Operation
- PUT Operation
- POST Operation
- DELETE Operation

Web Service

- Invoke Operation

Policies

- Activity Log
- Proxy
- Redaction

- Assemble a new API by combining multiple REST or SOAP services into a **composite API**
- Provide examples** of the request and response messages, headers and parameters
- Drag and connect** linking the request and response messages
- Transform** the message elements with a click

API Developer: Secure the API



/apimanagement betagroup1 | sid.bhatia@us.ibm.com | IBM

APIs

5

| Name | Path | Version | Deployed To | Clone | Delete Version | Save API |
|------|------|---------|-------------|-------|----------------|----------|
| ATM | atm | 1 | prod test | | | |

Description
This is the ATM API that returns nearest ATM locations given a zipcode

Resources **Security** Properties Documentation

Identify Application Using

Client ID *i*

- Client ID
- Client ID and Client Secret
- None

None Basic OAuth *i*

You have chosen not to authenticate this API. There is no further configuration needed.

Authenticate Application Users Using

None Basic OAuth *i*

You have chosen to use basic authentication. Please configure the details below:

☐ Authenticate using a user registry *Select*

☒ Authenticate using an authentication URL *\$*

- Identify application with **Client ID & Secret**
- Authenticate using **LDAP** or **Authentication URL**
- Authorize using **OAuth 2.0** support with implicit grant type, authorization code, resource owner, client credentials
- Set **configuration properties**

None Basic **OAuth** ** i*

You have chosen to use OAuth. Please configure the details below:

Client Type Grant Type (Select at least 1) Token Refresh and Revocation

☐ Public ☒ Authorization Code ☐ Resource Owner

☒ Confidential ☐ Client Credentials

☐ Authenticate using a user registry *Select*

☒ Authenticate using an authentication URL *\$*

☐ Enable Refresh Tokens

☐ Enable Token Revocation URL *\$*

Resources **Security** **Properties** Documentation

+ Property Find x

| Name | Default Value | Hide | Description | Add |
|------|---------------|--------------------------|-------------|-----|
| Name | Default Value | <input type="checkbox"/> | Description | x |

API Developer: Version & Clone an API for iterative development



The screenshot shows the IBM API Management console interface. At the top, the breadcrumb is **/apimanagement**. The user is logged in as **sid.bhatia@us.ibm.com**. The main section is titled **APIs** and shows a table with columns: Name, Path, Version, and Deployed To. The API **ATM** is selected, with path **atm** and 4 versions. A dropdown menu for the version is open, showing a list of versions and a 'New Version' button.

| Version | Last Modified |
|-----------|-------------------|
| Version 1 | 8 days ago |
| Version 2 | a minute ago |
| Version 3 | a minute ago |
| Version 4 | a few seconds ago |

Buttons: Clone, Delete Version, Save API.

- **Version** the API configuration in just one click
- **Revert** to prior version
- Create an API by **copying** a specific version of an existing API

The 'Clone API' dialog box prompts the user to provide a name and context path for the new API. It contains three input fields: Name, Path, and Description. The Name field is pre-filled with 'API1_1'. The Path field is pre-filled with '/api1_1'. The Description field is pre-filled with 'API description'. At the bottom, there are 'Clone' and 'Cancel' buttons.

Please provide a name and context path for the new API

Name:

Path:

Description:

Buttons: Clone, Cancel

API Developer: Test the API



Resources Security Properties Documentation

+ Resource Find x

| Method | Path ▲ | Display name (optional) | Description (optional) | Identification | Authentication | Actions |
|--------|-------------------|-------------------------|------------------------|--------------------------|--------------------------|---------|
| GET | /quote?loanAmount | Loan | Loan calculator | <input type="checkbox"/> | <input type="checkbox"/> | x |

Overview Implementation **Test**

Environment Plan

Sandbox ▾ Public plan (Version 1) ▾

Invoke

| Name | Description | Required | Value |
|--------------------|-------------|--------------------------|---------|
| loanAmount | | <input type="checkbox"/> | 1000000 |
| annualInterestRate | | <input type="checkbox"/> | 3 |
| termInMonths | | <input type="checkbox"/> | 36 |

Parameters

Response

- **Interactive test** of an API resource in just one click
- Provide parameters and receive response
- Allows quick, iterative develop / deploy / test cycles

Overview Implementation **Test**

Environment Plan

Sandbox ▾ Public plan (Version 1) ▾

Invoke

Parameters

Response

200 OK

```
X-Global-Transaction-ID: 3329938
Access-Control-Allow-Origin: *
Date: Thu, 16 Oct 2014 01:18:36 GMT
Transfer-Encoding: chunked
X-Backside-Transport: OK OK
AFIN-Debug-Filename: temporary:///apimdebug.json
Access-Control-Allow-Methods: GET
Content-Type: application/json
Connection: Keep-Alive
X-Powered-By: Servlet/3.0
```

```
{
  "loanAmount": 1000000,
  "annualInterestRate": 3,
  "termInMonths": 36,
  "monthlyPaymentAmount": 29081.21
}
```


API Providers & Consumers:

Test API readiness with Ready! API plugin



API Consumers

Import:

- Use Ready! API testing platform to **Import** SOAP & REST API definitions directly from IBM API Mgmt Dev portal for unit/functional testing, load testing, service virtualization & more
- Select any API from Dev Portal
 - Auto-generate test suite
 - Validate functionality and resiliency
 - Virtualize for application testing



API Providers

Export:

Define new APIs in Ready! API product by uploading Swagger, WADL, RAML, WSDL, etc., and then test the API.

- Commit to a full range of tests – functional, load, security
- When ready, click a button to **Export** API to insert the tested API into API Manager UI

API Provider: Customize each API Portal



Customize Portal (qa1) <https://developer.apim.ibmcloud.com/sid-bhatias-company/qa1>


Company Logo (215 x 30) **/appdevelopers**

Default | [Change](#)

Browser Tab Icon (16 x 16)

Default | [Change](#)

Marketing Image (420 x 260)



Default | [Change](#)

Marketing Text

Welcome to the \${org} Developer Center

Button and Link Color Page Background Color Font Family

Terms and Conditions

Support URL / Contact Email Twitter ID Website

[Cancel](#) [Save](#)

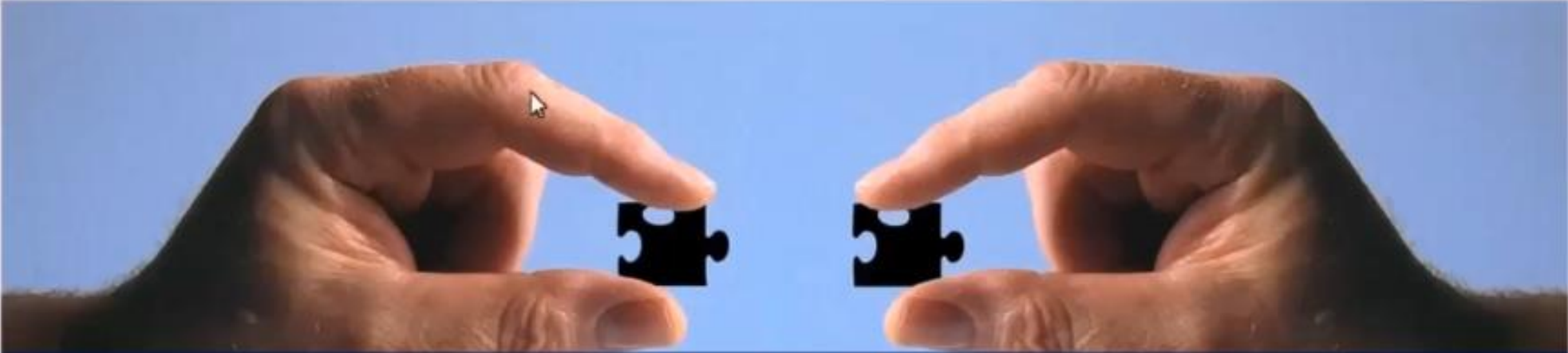
Tailor the look and feel of each Developer Portal and create many Portals

- Company Logo
- Browser icon
- Marketing Image
- Background Color
- Font
- Terms of Service URL
- Support Link
- Twitter ID
- Website URL

Custom API Portal using IBM API Mgmt & Drupal CMS

[/api](#) [DEV](#)[Create new account](#)[Login](#)

[Home](#)[Getting Started](#)[APIs](#)[Blog](#)[Forums](#)[Support](#)[Q](#)



See what our APIs can do for you >

New forum topics

- Authoritatively deploy leveraged users through redominate standards compliant best practices via ubiquitous technology
- Anyone seen this?
- Possible to extend this
- Please explain
- Out-of-the-box

[More](#)

Active forum topics

- Anyone seen this?
- Authoritatively deploy leveraged users through redominate standards compliant best practices via ubiquitous technology
- Possible to extend this
- Please explain
- Out-of-the-box

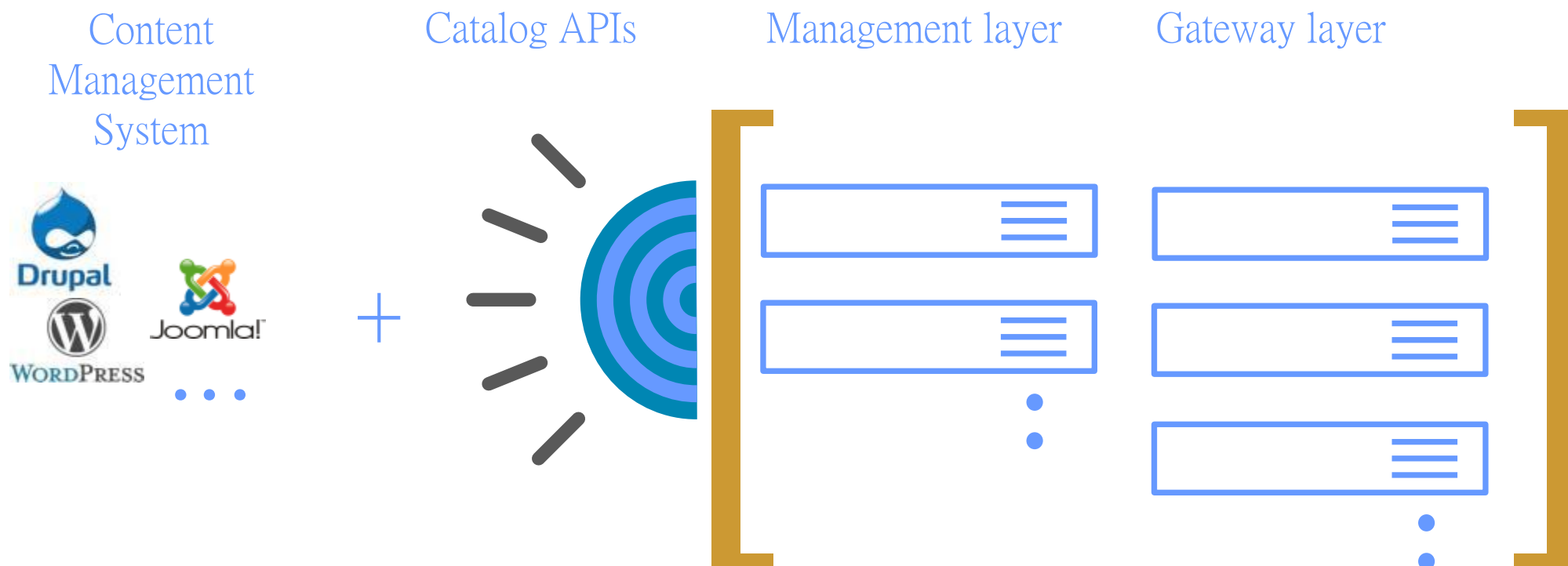
[More](#)

Recent comments

- Nice view! 18 hours 14 min ago
- Uniquely monetize distributed communities 2 days 18 hours ago
- Dynamic delivery apps and speedy uploads. 2 days 18 hours ago
- This is really helpful 2 days 18 hours ago
- Prototyping 2 days 18 hours ago

[Terms of use](#)[Privacy policy](#)

Build a Custom API Portal



Custom API Portal



API Provider can

- manage community content, blogs, forums

API User can

- view & interact with published APIs on API portal
- manage their apps
- report a problem
- participate in forums

API Provider: Create Custom Roles & Manage Role Access



/apimanagement TempOrg | sid.bhatia@us.ibm.com ? IBM

Users | Roles 20

+ Role


| Owner | Role Name | Description | |
|---|---|--|--|
| Administrative owner for the API provider organization | COE Team Manager | View All & Approve Subscription Requests | <button>Discard</button> <button>Save</button> |
| | Select None All View All | | |
| Administrator Administers users and environment configuration | Roles: View and edit user roles | <input checked="" type="checkbox"/> View <input type="checkbox"/> Edit | |
| | Users: View and edit users and user accounts | <input checked="" type="checkbox"/> View <input type="checkbox"/> Edit | |
| Product Manager Manages API plans | User Registries: View and edit user registries | <input checked="" type="checkbox"/> View <input type="checkbox"/> Edit | |
| | Draft APIs: View and edit draft APIs | <input checked="" type="checkbox"/> View <input type="checkbox"/> Edit | |
| API Developer Configures API definitions | Draft Plans: View and edit draft plans | <input checked="" type="checkbox"/> View <input type="checkbox"/> Edit | |
| Deployment Manager Deployment Manager | Deployment: View, deploy and publish plans | <input checked="" type="checkbox"/> View <input type="checkbox"/> Deploy <input type="checkbox"/> Publish <input type="checkbox"/> Restricted Deploy <input type="checkbox"/> Restricted Publish | |
| COE Team Manager View All & Approve Subscription Requests | Subscriptions: View and approve subscription requests | <input checked="" type="checkbox"/> View <input checked="" type="checkbox"/> Approve | |
| | Environments: View and edit environments | <input checked="" type="checkbox"/> View <input type="checkbox"/> Edit | |
| | Developers: View and manage developer accounts | <input checked="" type="checkbox"/> View <input type="checkbox"/> Manage | |
| | Analytics: View environment analytics | <input checked="" type="checkbox"/> View | |

- As the owner or administrator, you can create your own **custom roles** that reflect your unique organizational needs
- Specify which **permissions** are to be assigned for each role

API Provider: Control App & Portal access




myapp



Client ID:


Description:

Show


Suspend

This application is currently suspended. The client id is blocked from accessing APIs


myapp



Client ID:

Description:

Show


Resume

| Name ▲ | URL Path Segment | Cluster Name | User Registry | Restricted | Default | Sandbox |
|--------|------------------|-----------------|---------------|--------------------------|--------------------------|--------------------------|
| prod | acmeprod1 | APIMGMT_GATEWAY | Sandbox | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Default Developer Portal URL:
<https://developer.apim.ibmcloud.com/sid-bhatias-company/acmeprod1>
[Customize Portal](#)

Default API Gateway URL:
<https://api.apim.ibmcloud.com/sid-bhatias-company/acmeprod1>

☒ Developers can invite collaborators

Enable the following collaborator roles

☐ Viewer
Viewers can only view applications and application activity.

☒ Developer
Developers can create and edit applications, manage client keys and subscribe to plans.

☐ Viewer and Developer

☒ Self-service onboarding

•Suspend/Resume App

- Block/allow App from invoking APIs

•Viewer Role

- Enable a view-only app developer role

•By invitation only

- Enable app developer onboarding by invitation only

API Provider: “Productize” APIs using Plans



Create a new plan

Partner ☒ Subscription requires approval

A partner plan, requiring approval for access.

/apimanagement

Marriott | bygravec@uk.ibm.com | IBM

Plans

22

| | | | | | | |
|---|---------|---|--|--------|----------------|------|
| Name | Version | Restricted | Deployed to | Deploy | Delete Version | Save |
| Free | 1 ▼ | <input type="checkbox"/> Subscription does not require approval | ● Sandbox | | | |
| Description A free plan, open to all | | | | | | |
| Rate limit 100 requests per hour | | | | | | |

+ Resource

Find

| Method | Path ▲ | Display name (optional) | Description (optional) | Rate limit | Actions |
|--|------------------|-------------------------|---|------------|---------|
| Availability API (Version 1) - /availability | | | | | |
| GET | /hotel/{hotelId} | Room availability | Check the availability of the rooms in t... | | |

- Introduce **API Trial Use**
- **Free**, limited plans can be made available alongside **premium** plans
- For example, a free plan could be **unrestricted**, and a premium plan **restricted**

API Provider: “Productize” APIs using Plans



Booking API
Oct 15, 2014

Description
Create and manage room bookings

Select a plan ▼
Select a plan
Premium
Free

Identify your application using
Client ID - You must always provide your application's client ID in order to access this API

Authenticate using
None - You can access this API without authentication

| Resources | | | | | | Plans | |
|-------------|--|-----------------|----------------|----------------|---------|-----------|--------|
| Verb | Path ▲ | Name | Identification | Authentication | Details | Premium ▼ | Free ▼ |
| POST | https://ci-op-15.hursley.ibm.com/marriott/sb/bookin... | Manage booki... | Client ID | None | + | ✓ | |
| GET | https://ci-op-15.hursley.ibm.com/marriott/sb/bookin... | Manage booki... | Client ID | None | + | ✓ | ✓ |

- **Quick and easy** for developers to register for the free plan and start testing APIs
- **Multiple available plans** presented to developers for comparison

API Provider: “Productize” APIs using Plans



Add resources

GeolPSERVICE

Product

ATM

| <input type="checkbox"/> | Method | Path ▲ | Display Name | Description (optional) |
|--------------------------|--------|---------|--------------|-------------------------|
| <input type="checkbox"/> | PUT | product | Product Info | This is the description |
| <input type="checkbox"/> | DELETE | product | Product Info | This is the description |
| <input type="checkbox"/> | POST | product | Product Info | This is the description |
| <input type="checkbox"/> | GET | product | Product Info | This is the description |

Add Cancel

- Include multiple **APIs** and **Resources** per Plan
- **Version** your Plans
- Apply **Rate Limit** by Plan or Resource
- Reject calls when limit reached

/apimanagement

betagroup1 | kelmatt@us.ibm.com | IBM.

Plans

9

| Name | Version | Deployed To |
|--------|---------|---------------|
| Public | 1 ▼ | ● test ● prod |

Description

Rate Limit

Unlimited

+ Resource

| Method | Path ▲ | Display Name | Description (optional) | Rate Li |
|---|--------|--------------|------------------------|---------|
| There are currently no resources included in this plan. | | | | |

Switch to

| Versions | Last Modified |
|-----------|---------------|
| Version 1 | 6 hours ago |

+ New Version

Deploy Delete Version Save

Rate limit

Number of Requests 100

Time Interval 1 Minutes ▼

Reject calls when limit is reached ☒

Apply

Contact Support | @ibmapimgt

Contact Support | @ibmapimgt

API Provider: Centrally manage all Plans

/apimanagement TempOrg | sid.bhatia@us.ibm.com ? IBM

Management

18

Sandbox

Show

All Plans 2

★ Favorite 0

2 Plans

Find

Free Plan 1 version deployed Tag

Premium Plan 1 version published Tag

| Name | State | Available To | Actions |
|------------------------|-----------------------|--------------|---------|
| Premium Plan Version 3 | Published 5 hours ago | All | Up Up X |
| Premium Plan Version 2 | Deployed 5 hours ago | None | Up Up X |
| Premium Plan Version 1 | Deployed | | Up Up X |

Subscription Approval Requests

There are no pending subscription approval requests.

Performance

View Metrics for: Last 24 hours

| Developers | Active Apps | Total Calls |
|------------|-------------|-------------|
| 0 | 0 | 0 |

Total number of calls

Analytics

API Resources

| Method | Path | Display name (optional) | Total Calls |
|--------|------|-------------------------|-------------|
|--------|------|-------------------------|-------------|

Developers

| Developer organization | Total Calls |
|------------------------|-------------|
|------------------------|-------------|



- Easily **publish, republish, unpublish, undeploy** Plans
- View subscription approval requests
- View the analytics details for each Plan version
- View developer organization API usage

API Provider: Publish plans to select developer communities or portals



Deploy Delete Version Save

Deploy to

- ☒ Sandbox
Modified 39 minutes ago by mystuffinator@gmail.com, deployed and running
- ☒ qa1
Modified 27 minutes ago by mystuffinator@gmail.com, deployed and running
- ☐ prod

Disconnected Cloud

Export as a package for deployment in another cloud

Set Availability

☐ Public users (anyone can see this plan, but need to sign up as a developer to make use of it)

☒ Select group of developer organizations

Developers

Developer organization ▼

Communities

☐ Favorite

- **Fine grained control** over plan deployment
- Decide which environments or portals to deploy Plans to
- Determine visibility for developer communities
- **Non-disruptive Publish:** Replace a currently published version of a Plan without any disruption in API availability

Publish Plan 1 / 2

I want to...

☒ Publish this version
Allow me to select who it is available to

☐ Replace a currently published version
Return the currently published version to deployed state and migrate all subscribers

Next Cancel

API Provider: Publish your APIs to multiple developer portals

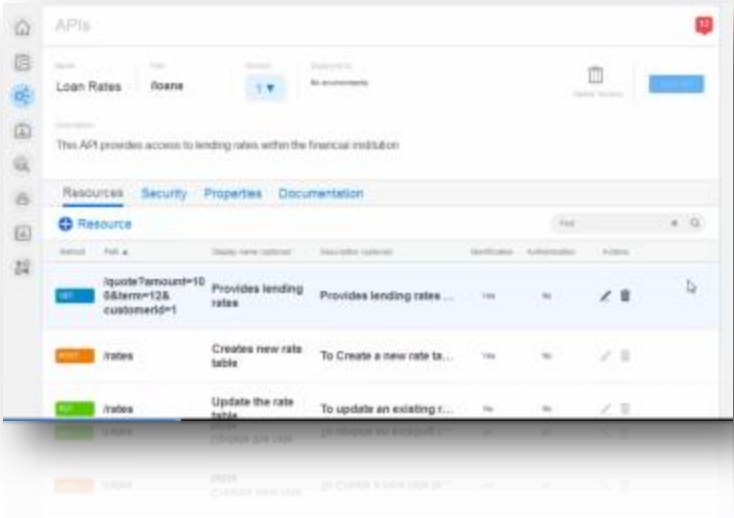


Multiple Developer Portals

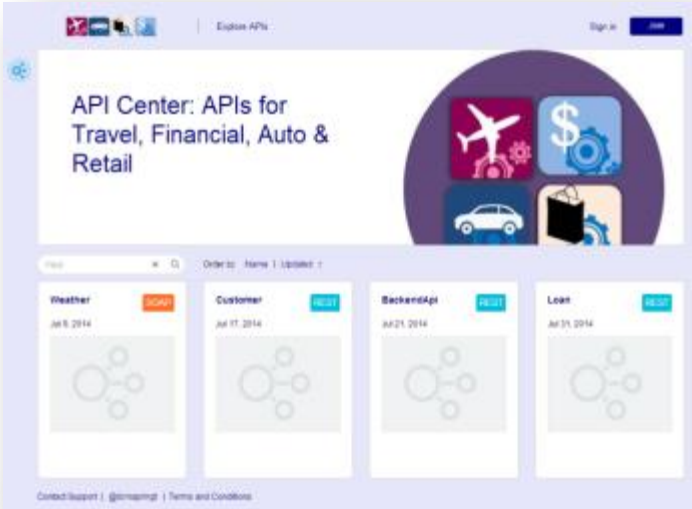
API Manager



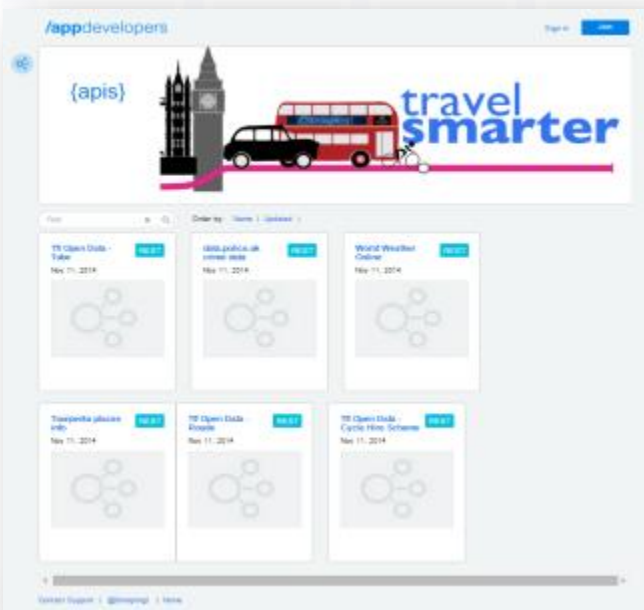
API Provider



Publish



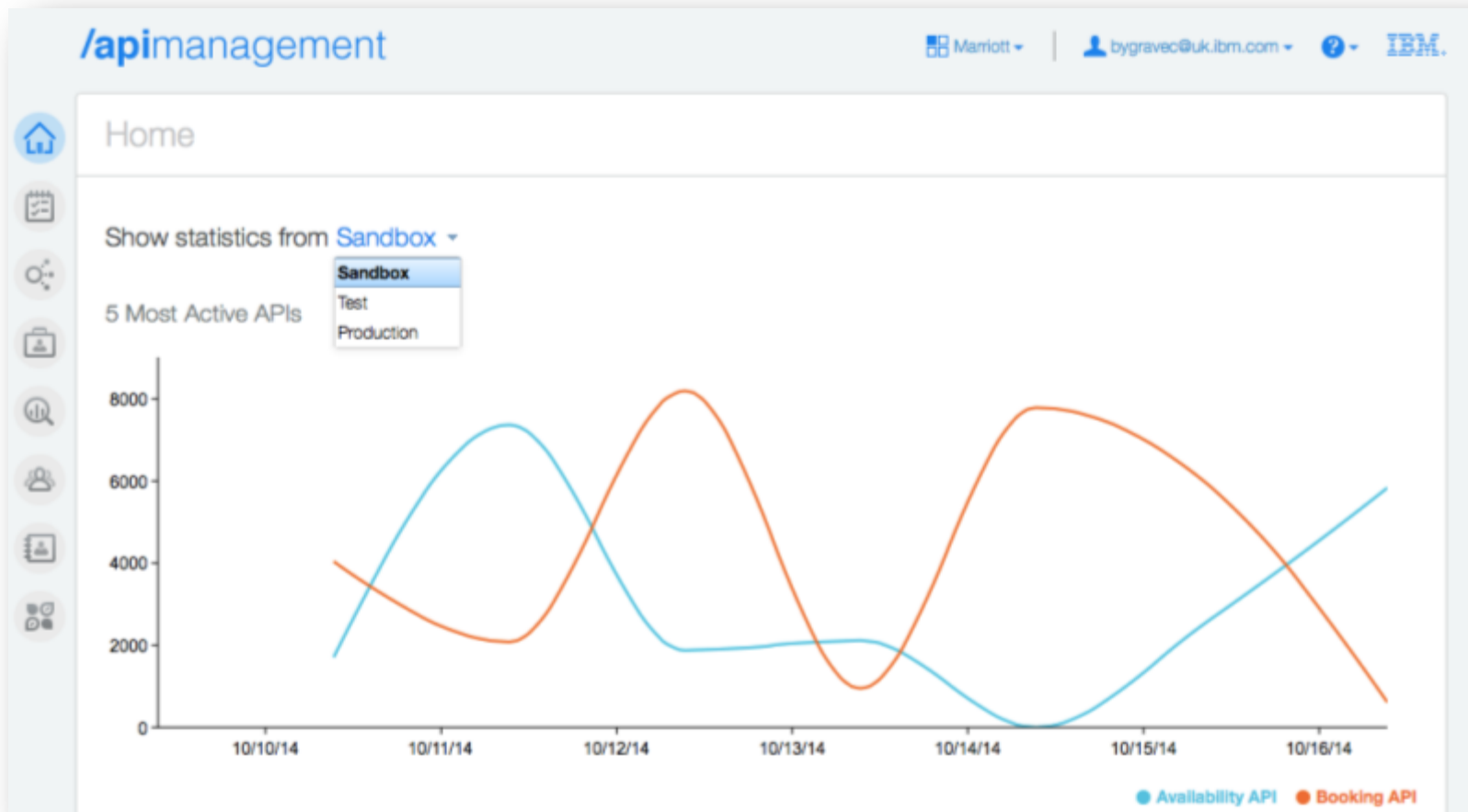
App Developers
In group 1



App Developers
in group 2

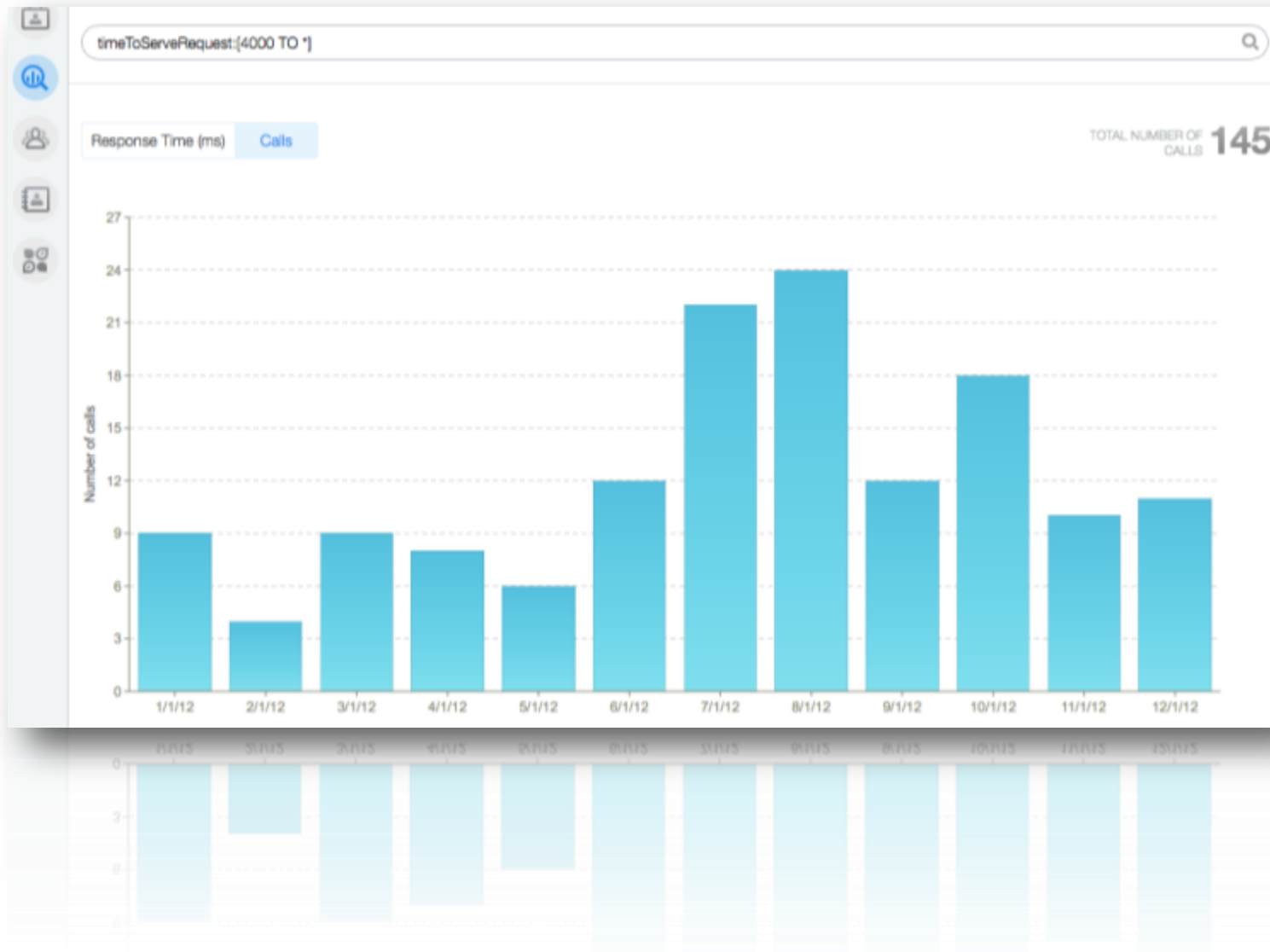
Securely share APIs/Plans with various select developer communities

API Provider: Gain Business Insights



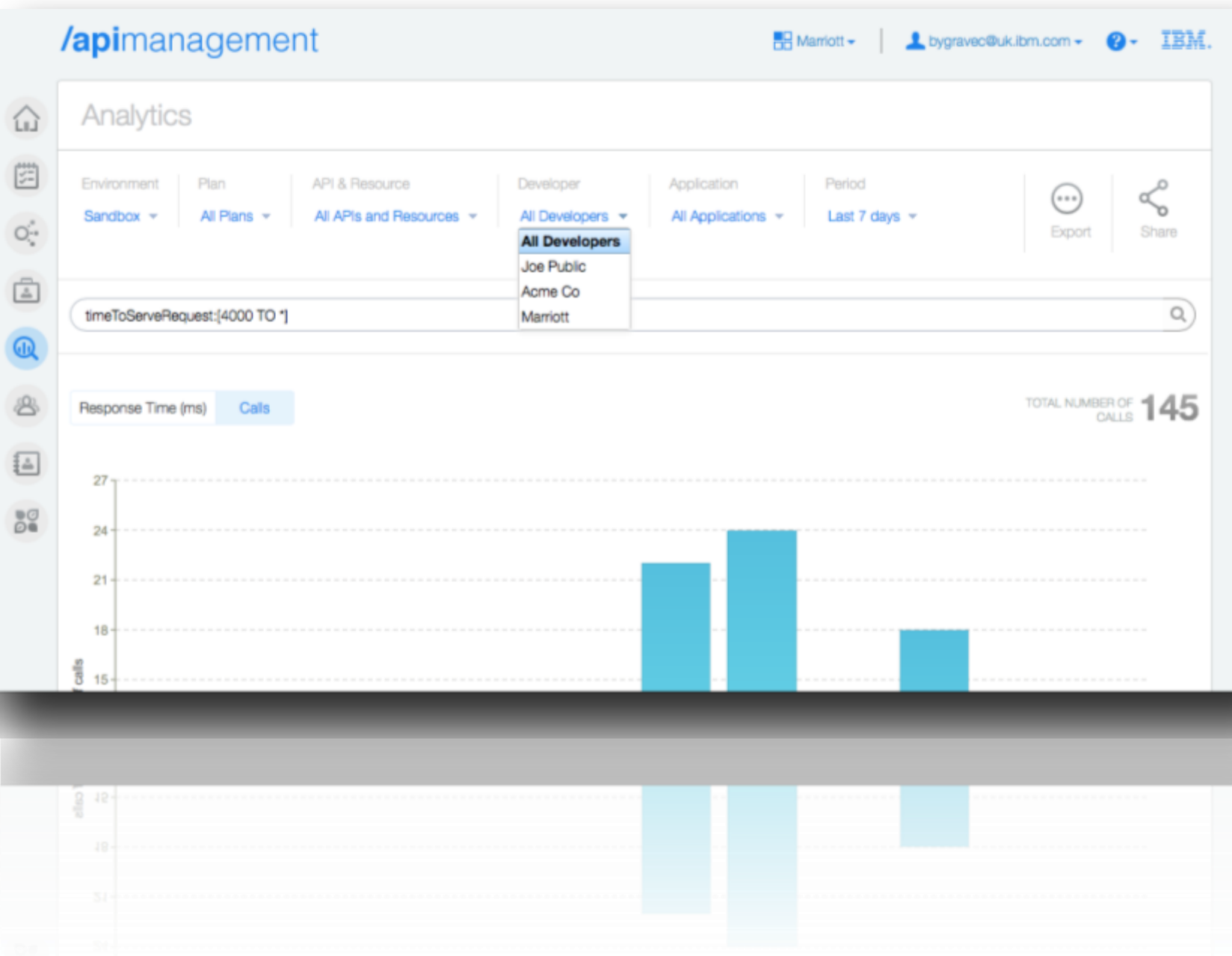
- Pinpoint **key market fluctuations and find correlations** related to your business
- Business **Analytics** for both API provider and application developer:
 - **Top traffic** producing API ,
 - **Top application** producing traffic

API Provider: Optimize / Analyze API Performance



- **Analyze performance** of APIs with full lucene query syntax
- **Structured Filtered Search** across analytics for example
 - country:USA, color:red
- **Saved Searches** and Filters for easy and consistent retrieval
- **Bookmarkable queries**

API Provider: Optimize / Analyze API Performance

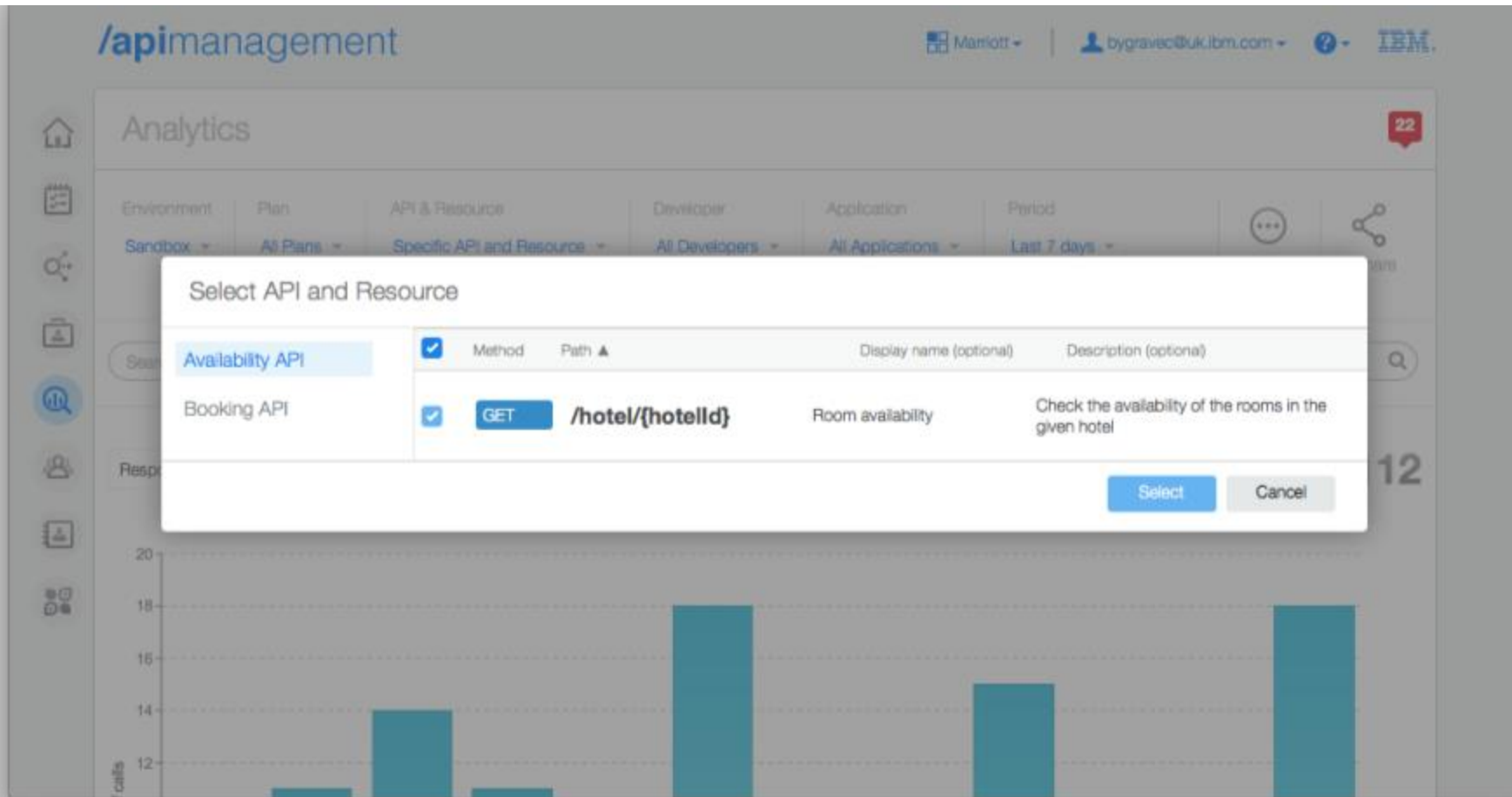


- **Scope queries** by environment, plan, API, developer, application, time period
- Example queries for response times and response codes
- Enables **chargeback or billing** for API consumption by developers through export of activity as .csv file

API Provider: Optimize / Analyze Highly-used APIs



- Dig deeper into the high-use APIs by **scoping the Analytics view**
- Focus on just an API, or **individual resource** within an API



App Developer: Interactive developer portals



/appdevelopers Sign in Join

ACME developer portal

Find x Q Order by: Name | Updated |

Loancalculator REST Oct 15, 2014

/appdevelopers siddevorg - sid.bhatia@gmail.com -

Loancalculator

Oct 15, 2014

Description: This is the loan calculator API that can determine the amount of ...

Select a plan

Identify your application using
Client ID - You must always provide your application's client ID in order to access this API

Authenticate using
None - You can access this API without authentication

Resources

| Verb | Path | Name | Identification | Authentication | Details |
|------|------|------|----------------|----------------|---------|
|------|------|------|----------------|----------------|---------|

Plans

Public plan

| | | | | | |
|-----|--|------|------|------|---|
| GET | /loancalc/quote?loanAmount=20000&annualIntere... | Loan | None | None | — |
|-----|--|------|------|------|---|

URL: https://api.apim.ibmcloud.com/sid-bhatias-company/qat/loancalc/quote?loanAmount=20000&annualInterestRate=0.95&termInMonths=52

Loan calculator

| Type | Name | Description | Required |
|------|--------------------|-------------|----------|
| ? | loanAmount | | No |
| ? | annualInterestRate | | No |
| ? | termInMonths | | No |

Parameters

Response Body

Test

- Create **unlimited self-service** developer portals to explore APIs
- Browse API **documentation**
- **Role-based access** for viewing APIs

App Developer: Try out APIs with liveDocs



- **Call API** resource with just one click
- Provide parameters and receive response
- **generate cURL** commands to run outside of the Developer Portal

Resources

| Verb | Path | Name | Identification | Authentication | Details |
|------|--|-----------------|----------------|----------------|---------|
| POST | https://ci-op-15.hursley.ibm.com/marriott/sb/bookin... | Manage booki... | Client ID | None | + |
| GET | https://ci-op-15.hursley.ibm.com/marriott/sb/bookin... | Manage booki... | Client ID | None | - |

URL: https://ci-op-15.hursley.ibm.com/marriott/sb/booking/hotel/{hotelId}?client_id=<client_id>

Manage bookings for the given hotel

Parameters

Response Body

Test

Application: My iPhone App

Invoke

Generate cURL

Parameters

| Name | Required | Value |
|---------|-------------------------------------|-------------|
| hotelId | <input checked="" type="checkbox"/> | my_hotel_id |

Response

200 OK

Content-Type: application/json

```
{
  "loanAmount": 250000,
  "annualInterestRate": 3,
  "termInMonths": 60,
  "monthlyPaymentAmount": 4492.17
}
```

Generate cURL

☐ Verbose output

☐ Allow insecure SSL connections

☒ Include client ID and secret in generated command

```
curl --include --request GET 'https://ci-op-15.hursley.ibm.com/marriott/sb/booking/hotel/my_hotel_id?client_id=e21a86e7-6dfb-41f2-ala9-1d19777e1a8f'
```

Done

App Developer: Register application



/appdevelopers



siddevorg

sid.bhatia@gmail.com

+ Application

MyMobileApp1

MyMobileApp1



Client ID:

.....

Show

Reset

Client Secret:

Click show to retrieve the client secret

Show

Reset

Subscribed Plans: None

Redirection URL for OAuth (optional):

https://localhost

Description:

Awesome app

- Register new application
- Request security keys with enhanced privacy
- Deferred retrieval of client secret

Contact Support | @acmedev | Home

Client ID:

908badcf-5d7f-4654-9119-aacc39c4d3f

Hide

Reset

Client Secret:

P3gE3wX4uE6pP6uC1fN5bP4uA4iN3p

Dismiss

Reset

The client secret will only be shown one time. Please make a note of it as it cannot be retrieved; only verified or reset. Click 'Dismiss' to clear the secret from the screen.

App Developer: Browse Plans



/appdevelopers

2

siddevorg ▾

sid.bhatia@gmail.com ▾

Public plan

Oct 21, 2014

Not restricted

This plan is available to use without approval

Use this plan

Description
Loan quote

APIs included

Loancalculator

| Verb | Path | Name | Description | Identification | Authentication | Rate Limit |
|------|---------------------------------|------|-----------------|----------------|----------------|-----------------------|
| GET | /loancalc/quote?loanAmount=2... | Loan | Loan calculator | None | None | 5 requests per minute |

Select application

Select the application to use with this plan



MyMobileApp1

Use this plan

Cancel

- **Browse** available Plans with limits and choose from available plans
- Request access to Plans
- Use Plan & Select application


App Developer: Use Plan with Application



Home Applications APIs Users

Application

MyMobileApp1



Client ID: [Show](#) [Reset](#)

Client Secret: [Verify](#) [Reset](#)


Subscribed Plans: [Public plan](#) [X](#) [i](#)

Redirection URL for OAuth (optional): [i](#)

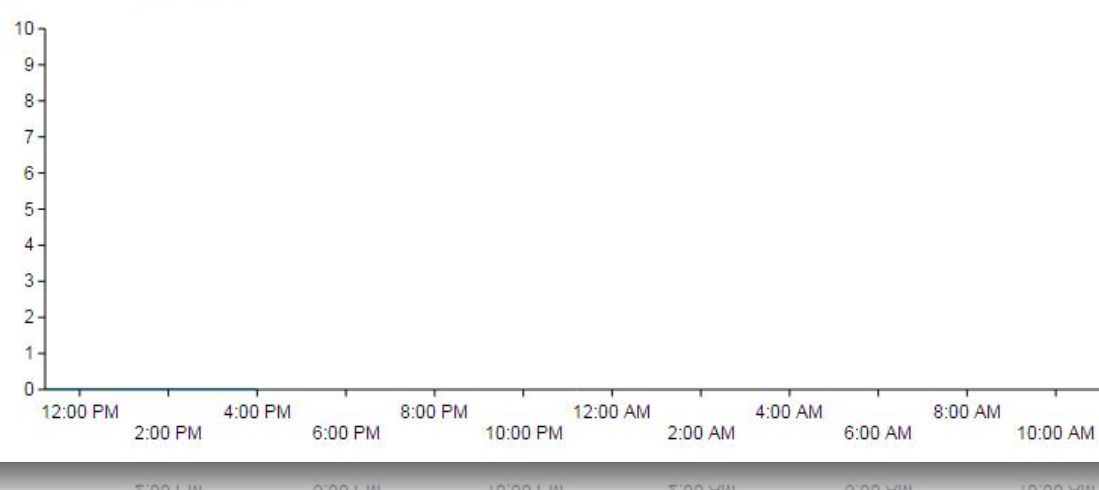
[https://localhost](#)

Description: Awesome app

Loancalculator Public plan

| Method | Path | Average Calls / Quota Limit (last 24 hours) | Full Activity Charts |
|---------------------|--|---|---|
| GET | /quote? loanAmount=20000&annualInterestRate=0.9&termInMonths=52 | 0.0 (Unlimited) |  |

Activity [Last 24 hours](#)

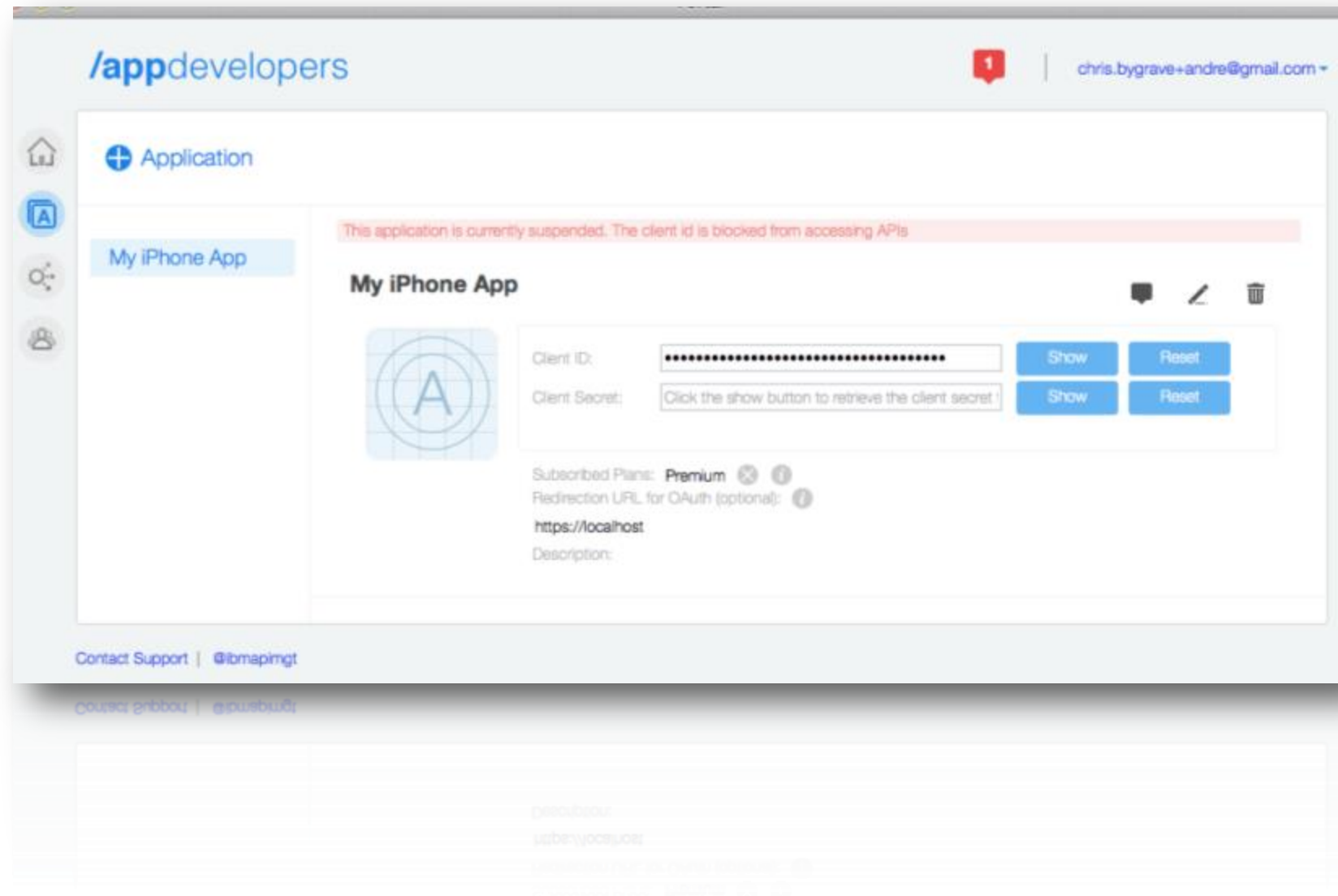


- **Register** new application
- Request **security keys**
- **Analyze** Application usage of APIs

App Developer: Client Application Authorization Revocation



Developers will be **notified by email** when their application is **suspended** and/or **resumed**, and the Portal will also make this clear



App Developer: Upgrade Plan



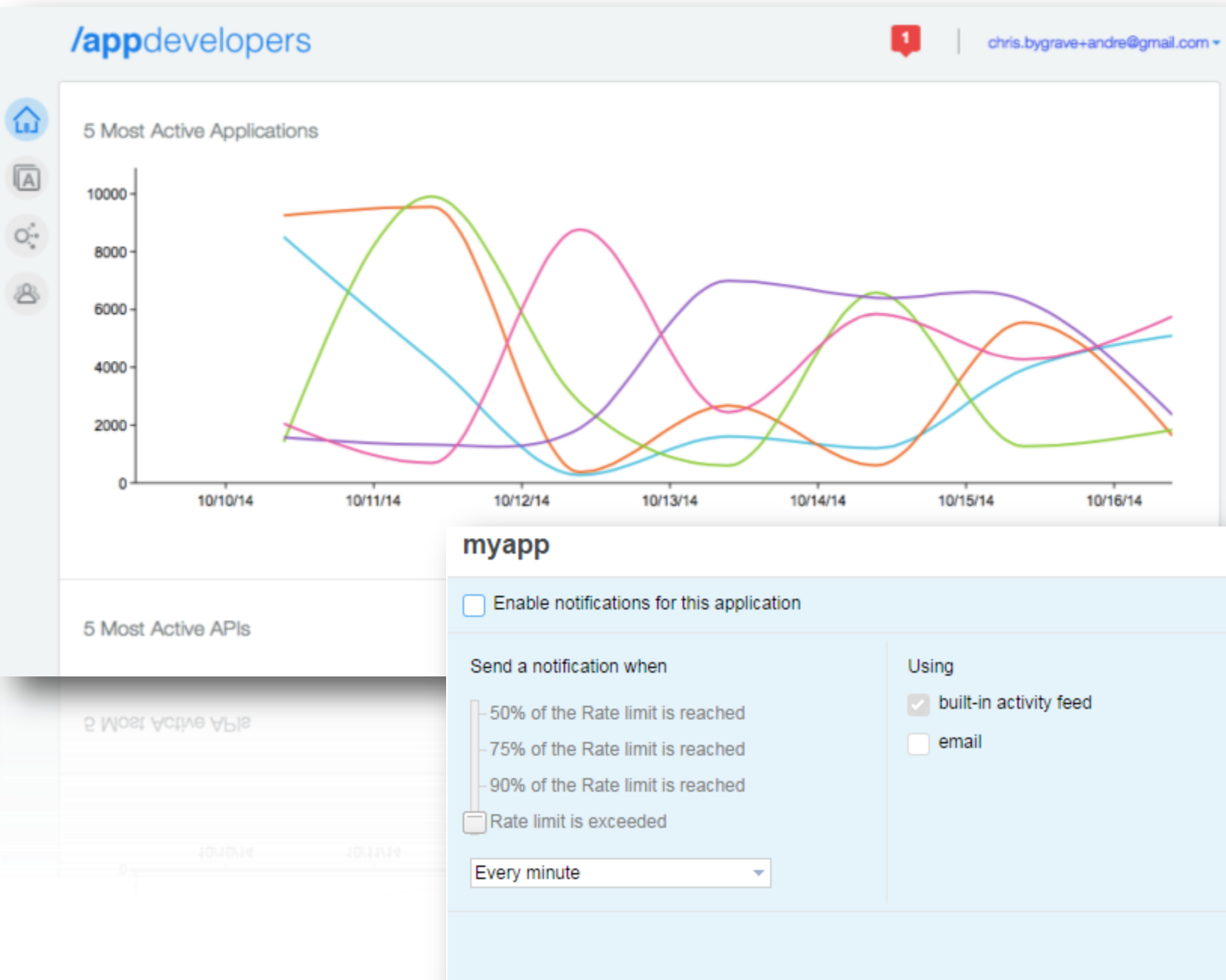
The screenshot shows the IBM App Developer Portal interface. At the top, the URL is `/appdevelopers`. The user's email, `chris.bygrave+andre@gmail.com`, is displayed in the top right corner. A red notification badge with the number '1' is visible. The main content area features two tabs: 'Premium' (selected) and 'Restricted'. The 'Premium' tab shows the date 'Oct 15, 2014' and a description: 'A premium plan offering improved rate limits'. A blue button labeled 'Request this plan' is located in the top right of the plan details section. Below the plan details, there is a section titled 'APIs included'. It lists two APIs: 'Availability API' with a '+' icon and 'Booking API' with a '-' icon. Below these, a table lists the details of the 'Booking API' endpoints.

| Verb | Path | Name | Description | Identification | Authentication | Rate Limit |
|------|--|-----------------|------------------------------------|----------------|----------------|------------------------|
| GET | <code>https://ci-op-15.hursley.ibm.com...</code> | Manage booki... | Manage bookings for the given h... | Client ID | None | Unlimited |
| POST | <code>https://ci-op-15.hursley.ibm.com...</code> | Manage booki... | Manage bookings for the given h... | Client ID | None | 10 requests per minute |




At the bottom of the page, there is a link to 'Contact Support' and a Twitter handle '@ibmapimgt'.

When developer outgrows the free plan, they can simply **upgrade to the premium plan** via the Portal – pending an approval process if desired

App Developer: Analyze App Performance, Get notified



- Monitor **most active** applications and APIs
- Rate limit **developer notifications**

myapp   


☐ Enable notifications for this application

Send a notification when

- ☐ 50% of the Rate limit is reached
- ☐ 75% of the Rate limit is reached
- ☐ 90% of the Rate limit is reached
- ☐ Rate limit is exceeded

Using

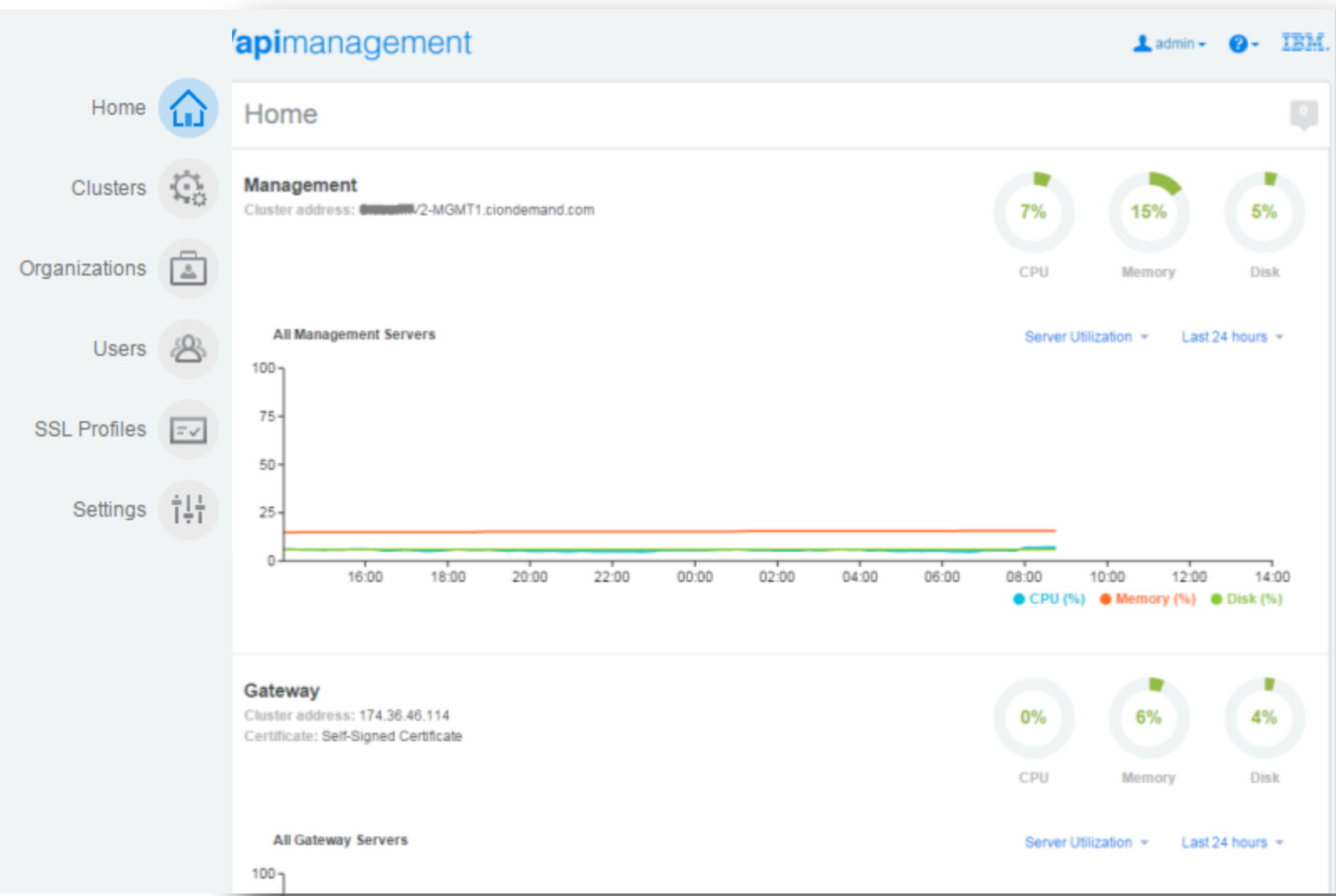
- ☒ built-in activity feed
- ☐ email

Every minute 

Save



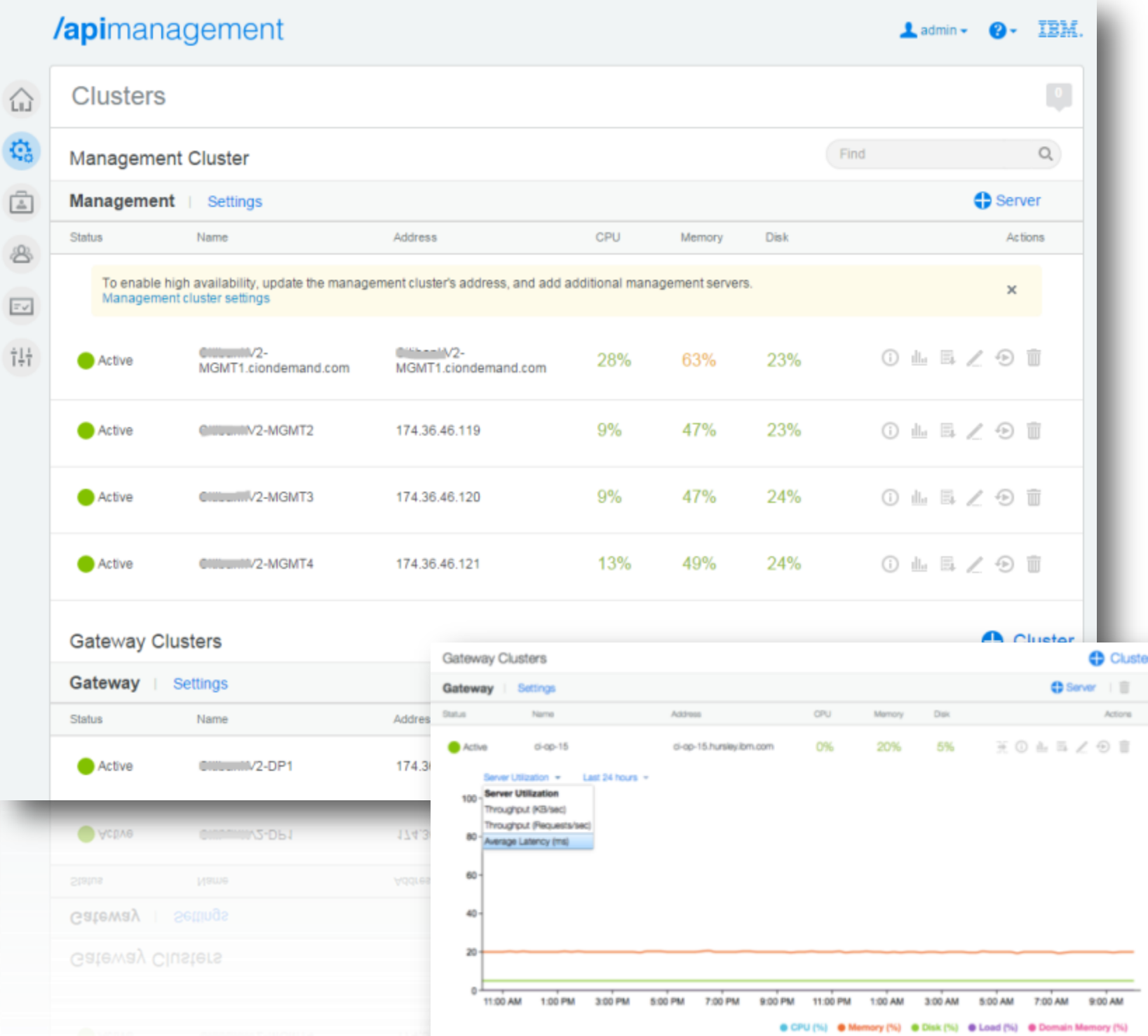
IT Admin: Manage Overall Environment



- At-a-glance server utilization metrics
- Management & Gateway Server utilization - CPU, Memory, Disk
- Usage over time available by drilling down

* Not applicable to SaaS

IT Admin: Optimize / Analyze API Runtime Monitoring



- At-a-glance server **utilization metrics**
- Log file export functionality
- **Usage over time** available by drilling down
- **Server utilization**, throughput (KB/s and requests/s), average latency
- Multiple **Gateway Cluster** support

* Not applicable to SaaS

IT Admin: Support many organizations with one solution



/apimanagement sysadmin **IBM**

Manage User Accounts

Identity Provider and E-mail Settings 1

Organization

Owner: **Select** Account Name: Type: **API Provider** **Activate**

| Owner | Account Name | Type | Status | Actions |
|------------------|----------------------|------------------------------------|--|---------|
| Steve Smith | Acme Business Unit 1 | API Provider | Active last login: 2 hours ago | |
| Steve Smith | Acme Business Unit 2 | API Provider | Invitation Pending... Resend invitation | |
| Steve Smith | Acme Business Unit 3 | API Provider | | |
| Andre Adams | Andre Inc. | Consumer | | |
| Sam Takahashi | Toyota | Consumer | | |
| Kris Knoll | Krispy Inc. | Consumer | | |
| Chris Casper | Cucumber Smith | Consumer Upgrade | Active last login: 2 hours ago | |
| Lillian Lawrence | Lycheelicious | Consumer Upgrade | Active last login: 2 hours ago | |

Send Message

Message:
Send

- **Multi-tenant** support for multi-provider organizations
- Provider and Consumer **organization Visibility**
- **Alerts &** notifications
- Send **email** directly through console

* Not applicable to SaaS

IT Admin: Manage SSL profiles



/apimanagement admin ? IBM.

SSL Profiles

+ SSL Profile

Default SSL Profile Save 🗑️

Name **Description**

Present Certificate

Upload Certificate Select File **Password** Upload Certificate

| Name | Issued By | Expires On |
|-------------|----------------|-------------|
| Certificate | API Management | 2019 Nov 23 |

Mutual Auth ☐

Trust Store

Upload Certificate Select File **Password** Upload Certificate

| Name | Issued By | Expires On |
|----------------------|----------------|-------------|
| Client Certificate 1 | API Management | 2033 May 05 |

Protocols +

- Use SSL profiles to manage SSL certificates for secure transmission of data
- Add certificates, SSL version and cipher suite to API Manager

* Not applicable to SaaS

IT Admin: Setup in minutes



/apimanagement admin ? IBM

Settings

Select DNS Scheme
Please select the DNS Scheme you would like to use for this cloud.

☒ Do not use Dynamic DNS
`https://<host>/<org>/<env>/...`

☐ Use Dynamic DNS
`https://api.<env>.<org>.<host>/...`

Save

Sandbox Gateway Cluster
A Sandbox environment is automatically created with each organization. Please select which gateway cluster you would like to use for this environment.

Default Gateway Cluster for Sandbox Environments

Gateway

User Registries
Add one or more user registries that can be used to authenticate users of the API Manager and Developer Portals.

+ User Registry

| Name | Public | Actions |
|---------------------|--------|---------|
| API Manager | | |
| Local User Registry | | |

- Easy out of the box setup
- LDAP or internal **identity provider support**
- Add new user registries to securely authenticate your environments and APIs

* Not applicable to SaaS

IT Admin: Setup in minutes



- Choose the connection method to each of the consoles
- Provide the details of an existing SMTP server and configure API Management to generate emails, where required



Cloud Management Console

Configure the connection used to connect to Cloud Management Console

Port

443

Save

SSL Profile

Default SSL Profile



API Manager

Configure the connection used to connect to API Manager

Port

443

Save

SSL Profile

Default SSL Profile



Development Portals

Configure the connection used to connect to Developer Portals

Port

443

Save

SSL Profile

Default SSL Profile



Email

Select a SMTP server to use for email communication with users.

Hostname

smtp.sendgrid.net

Test configuration

Save

Port

25

Username (Optional)

ibmapi@us.ibm.com

Password (Optional)

Sender Address

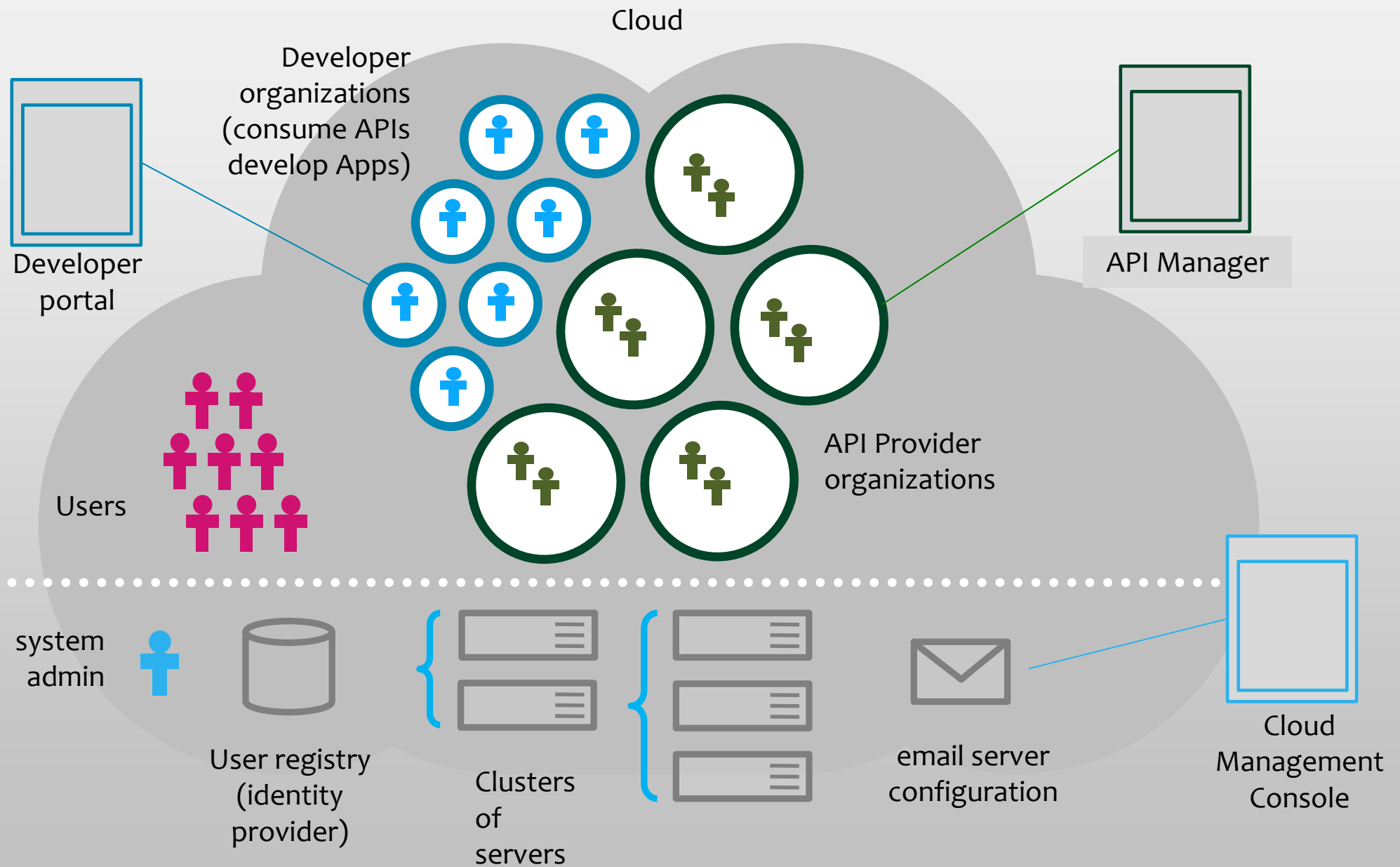
ibmapi@us.ibm.com

Sender Descriptive Name

IBM API

* Not applicable to SaaS

Anatomy of API Management



Additional reference

Pricing model

Free Trial

Unlimited API calls
Unlimited developers
Unlimited number of APIs
Unlimited plans
Unlimited environments
Unlimited portals
Unlimited detailed logging

Price: Free for 30 days

Self-service trial signup

Move to paid edition
via self-service
or via IBM Sales

Community forum support

Powered by IBM SoftLayer cloud
infrastructure

Get Started

1 million API calls/month
25 developers
Unlimited number of APIs
Unlimited plans
Unlimited environments
Unlimited portals

Price: US\$99/month

+ detailed logging option available

Monthly or Annual commitment
No Auto-renewal

Billing: Monthly or Annual

Overage & pro-rating, if applicable

Self-service signup with credit card
or via IBM Sales

IBM Support

Powered by IBM SoftLayer cloud
infrastructure

Build Your Own

You choose:
API calls/month (in millions)
Number of developers (in units of 25)

Unlimited number of APIs
Unlimited plans
Unlimited environments
Unlimited portals

+ detailed logging option available

Build your own plan
based on your needs
and attain greater flexibility

Self-service signup with credit card or via
IBM Sales

IBM Support

Powered by IBM SoftLayer cloud
infrastructure

SoftLayer's expanding global footprint



Improved global reach & performance
13 data centers (40 additional planned)
+ 17 points of presence



- **Key markets for expansion in 2014:** Hong Kong, London, Canada, Japan, India, China, Mexico, Washington, D.C., and Dallas¹
- Geographically dispersed points of presence (PoPs) bring **connectivity to our carrier-grade network backbone closer to the end user**
- These PoPs, combined with over **2,000 Gbps connectivity between our data centers** around the world, can deliver exceptional bandwidth and connectivity



¹Plans are subject to change without notice.

API assembly and policy control

The screenshot displays the API Manager interface. At the top, there's a 'Resource' section with a table listing resources. Below this, there's a 'Policy' section with tabs for 'Overview', 'Assembly', and 'Test'. The 'Assembly' tab is active, showing a 'Request' section with 'Invoke Policy' and 'Response' buttons. The 'Properties' section contains fields for 'Number of Requests' (20), 'Units Per Interval' (1), and 'Interval Size' (Seconds). The 'Error Handling' section is also visible.

| Verb | Path | Display Name | Description (Optional) | Plan | Authentication | Actions |
|--------|-----------|--------------|----------------------------|------|----------------|-----------------|
| PUT | /products | Product List | Lorem ipsum dolor sit amet | 0 | OAuth | [Edit] [Delete] |
| POST | /products | Product List | Lorem ipsum dolor sit amet | 1 | OAuth | [Edit] [Delete] |
| DELETE | /products | Product List | Lorem ipsum dolor sit amet | 0 | OAuth | [Edit] [Delete] |

GET + / products Product List Lorem ipsum dolor sit amet [Toggle] OAuth [Done] X

Overview Assembly Test

Request

Invoke Policy

Response

Properties

Name Value

Number of Requests
Number of requests permitted per specified interval 20

Units Per Interval
Number of interval units in specified interval 1

Interval Size
Unit of measurement for the specified interval Seconds

Error Handling

Error Handling UI we have in v2 for all other types of tasks

Example policy types

- API quota control
- Rate limiting
- Data field redaction
- JSON-XML conversion
- Caching control
- Backend system integration
- App user authentication
- Conditional routing

Flexible

Policies are applied as assembly flow steps, acting on broad or specific conditions.

Policies are automatically enforced in the gateway.

Simple

Assembly flows and policy steps allow simple configuration in the API Manager UI, and offer a simple JSON syntax for direct authoring.

Extensible

Policies are open and extensible enabling project specific customizations that can fully tap into the breadth and depth of DataPower capability.

IBM DataPower Gateway Appliance



- **Security**

- OAuth, SAML, XACML, WS-Security, LTPA, Kerberos, etc
- Authentication & authorization
- Security token translation
- Message & transport protection

- **Resilience**

- Operation admission control
- Failure re-routing
- XML threat protection
- JSON threat protection
- Schema validation
- Messages filtering

- **Control**

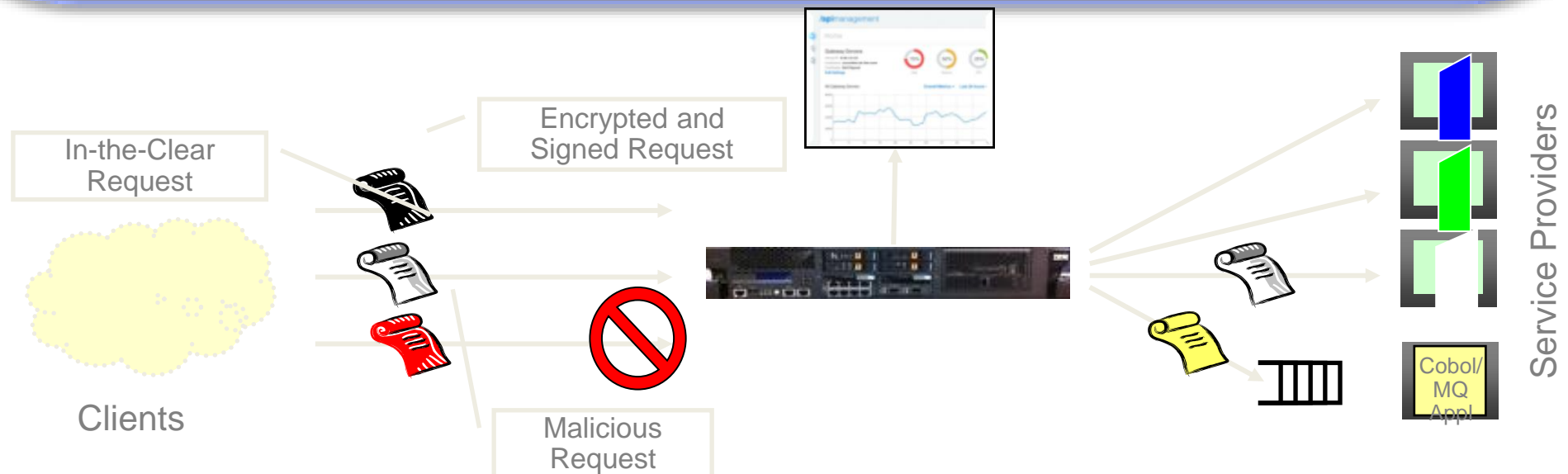
- Service-level agreements
- Traffic control
- Message accounting
- Content-based routing
- Governance & management

- **Integration**

- Convert payloads (JSON, XML, CSV, Cobol, binary, etc)
- Bridge transports (HTTP, MQ, FTP, WAS JMS, TIBCO EMS, etc)
- Database connectivity (DB2, IMS, Oracle, MS SQL, Sybase)
- Mainframe integration (IMS Connect, IMS Callout, CICS, etc)
- B2B integration (AS1, AS2, AS3, etc)

- **Optimization**

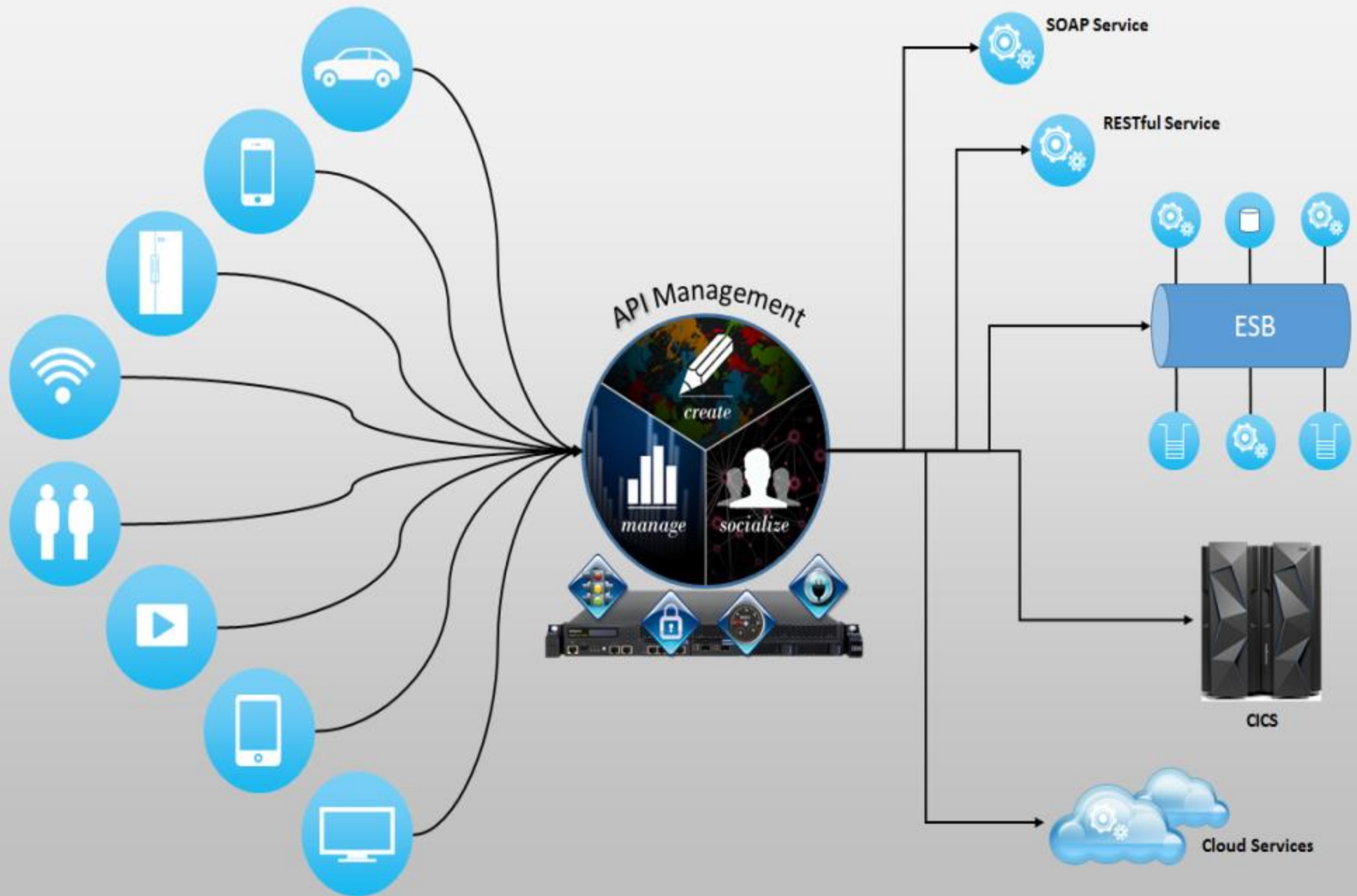
- SSL & TLS offload
- Hardware accelerated crypto ops
- XSLT & XQuery acceleration
- JavaScript & JSONiq acceleration
- Connection pooling, offload
- Intelligent load distribution
- Caching: Local & external (XC10)



DataPower Gateway: Supported standards & protocols

- **Data format & language**
 - JavaScript
 - JSON
 - JSON Schema
 - JSONiq
 - REST
 - SOAP 1.1, 1.2
 - WSDL 1.1
 - XML 1.0
 - XML Schema 1.0
 - XPath 1.0
 - XPath 2.0 (XQuery only)
 - XSLT 1.0
 - XQuery 1.0
- **Security policy enforcement**
 - OAuth 2.0
 - SAML 1.0, 1.1 and 2.0, SAML Token Profile, SAML queries
 - XACML 2.0
 - Kerberos, SPNEGO
 - RADIUS
 - RSA SecurID OTP using RADIUS
 - LDAP versions 2 and 3
 - Lightweight Third-Party Authentication (LTPA)
 - Microsoft Active Directory
 - FIPS 140-2 Level 3 (w/ optional HSM)
 - FIPS 140-2 Level 1 (w/ certified crypto module)
 - SAF & IBM RACF® integration with z/OS
 - Internet Content Adaptation Protocol
 - W3C XML Encryption
 - W3C XML Signature
 - S/MIME encryption and digital signature
 - WS-Security 1.0, 1.1
 - WS-I Basic Security Profile 1.0, 1.1
 - WS-SecurityPolicy
 - WS-SecureConversation 1.3
- **Transport & connectivity**
 - HTTP, HTTPS, WebSocket Proxy
 - FTP, FTPS, SFTP
 - WebSphere MQ
 - WebSphere MQ File Transfer Edition (MQFTE)
 - TIBCO EMS
 - WebSphere Java Message Service (JMS)
 - IBM IMS Connect, & IMS Callout
 - NFS
 - AS1, AS2, AS3, ebMS 2.0, CPPA 2.0, POP, SMTP (XB62)
 - DB2, Microsoft SQL Server, Oracle, Sybase, IMS
- **Transport Layer Security**
 - SSL versions 2 and 3
 - TLS versions 1.0, 1.1, and 1.2
- **Public key infrastructure (PKI)**
 - RSA, 3DES, DES, AES, SHA, X.509, CRLs, OCSP
 - PKCS#1, PKCS#5, PKCS#7, PKCS#8, PKCS#10, PKCS#12
 - XKMS for integration with Tivoli Security Policy Manager (TSPM)
- **Management**
 - Simple Network Management Protocol (SNMP)
 - SYSLOG
 - IPv4, IPv6
- **Open File Formats**
 - Distributed Management Task Force (DMTF) Open Virtualization Format (OVF)
 - Virtual Machine Disk Format (VMDK)
 - Virtual Hard Disk (VHD)
- **Web services**
 - WS-I Basic Profile 1.0, 1.1
 - WS-I Simple SOAP Basic Profile
 - WS-Policy Framework
 - WS-Policy 1.2, 1.5
 - WS-Trust 1.3
 - WS-Addressing
 - WS-Enumeration
 - WS-Eventing
 - WS-Notification
 - Web Services Distributed Management (WSDM)
 - WS-Management
 - WS-I Attachments Profile
 - SOAP Attachment Feature 1.2
 - SOAP with Attachments (SwA)
 - Direct Internet Message Encapsulation (DIME)
 - Multipurpose Internet Mail Extensions (MIME)
 - XML-binary Optimized Packaging (XOP)
 - Message Transmission Optimization Mechanism (MTOM)
 - WS-MediationPolicy (IBM standard)
 - Universal Description, Discovery, and Integration (UDDI versions 2 and 3), UDDI version 3 subscription
 - WebSphere Service Registry and Repository (WSRR)

Where does API Management fit?



Why IBM?

- **Leverage a robust API Gateway to launch your API platform**

- An API Management platform needs a robust, secure and scalable API Gateway for runtime enforcement
- IBM API Management has optimized integration with IBM DataPower gateway appliances
- Single pane of glass to manage APIs, Plans, Users, Clusters to provide a unified operational view
- DataPower is the industry leading security & integration gateway for a range of workloads, with over 2200 customers and 10,000 units deployed worldwide

- ▶ **Flexible deployment options**

- IBM API Management is available as on-premise, hosted, and SaaS

- ▶ **Thought Leadership & Active developer community**

- Free access to experts to help with API strategy
- Discussion forums, blog posts, events at developer.ibm.com/api
- 1M+ participants on IBM developerWorks

- ▶ **Access to a worldwide marketplace**

- IBM Bluemix and IBM Cloud marketplace represent a unique broad developer audience, building apps

- ▶ **Choose the API Mgmt vendor strategically**

- IBM is investing heavily in API Mgmt, Mobile, Cloud, Analytics, IoT & Big Data

API Management Resources

▶ Product Page

- ibm.com/apimanagement

▶ API developer community

- developer.ibm.com/api

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