HOW TO BUILD AN ENTERPRISE API PLATFORM

20 WAYS TO BETTER DELIVER, MANAGE & SECURE APIs

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Powering The API Economy

Mobile & Cloud Computing

have fundamentally changed the way we interact with companies we do business with. Today's consumer and business interactions span different applications, devices, and network channels. Customers, partners, and employees demand access to business services and data anytime, anywhere, on any device, from any source. API (application programming interface) is the key to agile and consistent delivery of business services. Instead of building large monolithic applications, enterprises are taking an "API First" approach to building applications.
An enterprise needs a unified platform for the delivery, management, and security of APIs.

This book will outline 20 different ways an enterprise API platform can help your enterprise deliver new business services in the new API economy.

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#1 Modernize Old Application Interfaces

The Challenges

Most enterprise applications were deployed before the age of Cloud and mobile computing. These systems rely on interface standards such as SOAP, XML, JMS, and PL/SOL.

Cloud and mobile applications use lightweight, web oriented architecture, requiring interfaces powered by REST, JSON, and OAuth protocols. These web oriented standards are still evolving and maturing.

Backend applications are often complex systems that are expensive and slow to change, and in some cases too fragile to change.

The Solution

Utilize the API platform as an abstraction and intermediary layer to perform real-time transformations such as SOAP-to-REST and XML-to-JSON.

Keep existing SOA (Service Oriented Architecture) interfaces as an internal interface standard to minimize changes to backend systems.

Let the API platform mediate interface requirements from different platforms such as iOS, Android, Force.com, and Google.

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Did You Know?
The REST APIs provided by your ERP vendors come with no security, audit, and management support.

Did You Know?
It is your responsibility to make those APIs usable in an operational environment.

#2 Create Mash-Up APIs/Applications

The Challenges

The Web is no longer just a vast information resource, it is a platform: the "Programmable Web". Enterprises and service providers make available rich APIs that you can leverage to deliver business services faster and better.

Your backend SOA services are granular and transaction centric. They need to be re-factored to create new user-centric and device-specific business applications.

API is the new application. You need to create new APIs quickly by combining available internal and third party resources.

The Solution

Use the API platform to orchestrate internal and third-party APIs to create new mash-up APIs that can power new business services and applications.

Use the API platform to refactor backend API services and data sets to be more user centric.

Leverage 3rd party Open APIs to create APIs with rich user experience. Do not reinvent the wheel.

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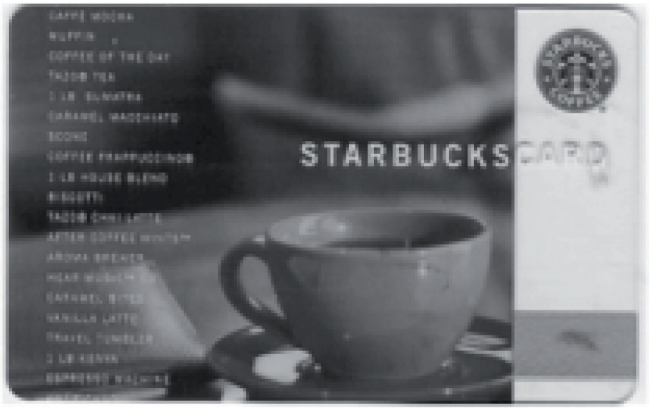
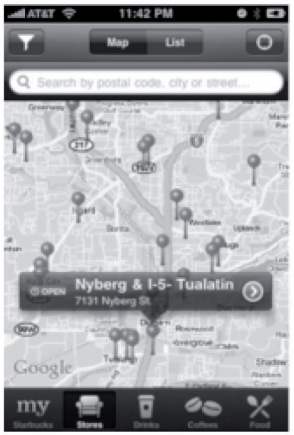


Electronic Payment Services

Point of Sale System



Google Maps

#3 Broker Third-Party APIs

The Challenges

Each Open API provider, Cloud service provider, and B2B partner specifies their own API protocol and security requirement.

Existing B2B integrations are already deployed with trust relationships, certificates, and security tokens.

REST is a style, not a standard. OAuth is a loosely defined standard. Not all APIs coded using REST-JSON-OAuth scheme are exactly the same.

The Solution

Use the API platform to broker partner and Open APIs. Mediate both protocols and security requirements.

Create internal or customer facing APIs to abstract away differences and isolate changes from API partners.

Take API security out of the hands of your developers. Manage third-party API keys and tokens centrally.

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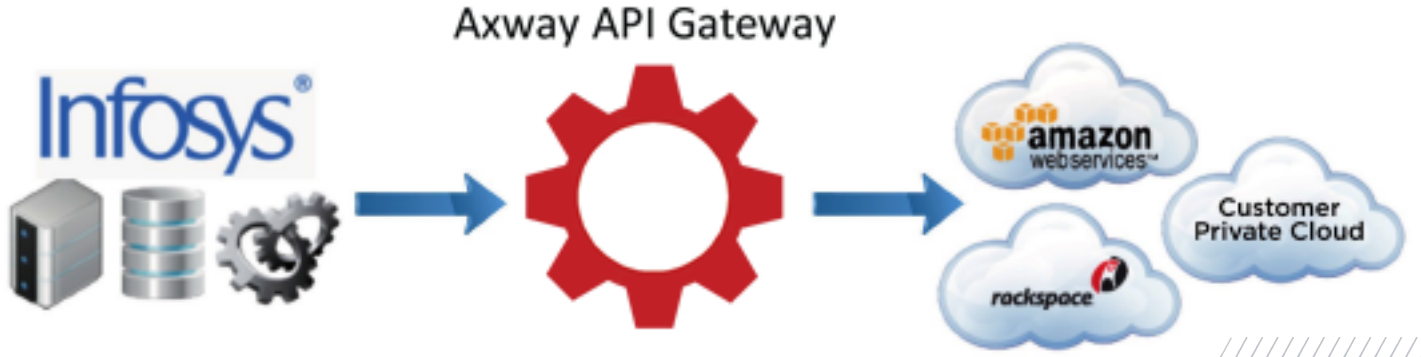
Case Study - Broker, Monitor, and Control Cloud Based Service Usage

- Route and broker API calls to Cloud IaaS providers.
- Broker and secure API keys from Cloud based services.
- Broker Cloud billing APIs to enable near-real-time account-wise billing queries and charting of usage trends.
- Broker Cloud monitoring APIs to enable account-wise alerting based on cost thresholds.
- Broker Cloud provisioning APIs to automate provisioning and shutdown of instances to ensure compliance to cost policies.



#4 Prevent Attacks and Threats

The Challenges

Cyber attacks are increasing in volume and sophistication. Attackers are now backed by organized crime and nation states.

All systems are at risk, but especially externally exposed APIs and web interfaces.

Mobile devices are inherently less secure because they run lightweight operating systems, operate over public networks, and are easily lost or stolen.

The Solution

Use the API platform to firewall all APIs, block known exploits such as injections and cross-site scripting. Scan payloads for viruses.

Virtualize all APIs to prevent direct access to backend system APIs. Enforce a white list of allowable API verbs (GET, POST, DELETE).

Limit acceptable QueryString parameters to only expected values.

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Hacker's Shopping List

- Username
- Password / PIN Code
- Account Number
- Social Security Number
- Intellectual Property
- Personal Identifiable Information

- Organizational Information
- Open Ports
- Unprotected APIs
- Tokens
- Non-SSL Connection

#5 Provide the Right Level of Access

The Challenges

Users access business services via different applications and devices, including more than one mobile device.

User's access level may depend on the context of device, application, location, and network.

Multiple authentication and authorization technologies are used across different business units, user populations, and applications.

The Solution

Use the API platform to create a single policy enforcement point (PEP) for authentication and authorization, covering all browser, mobile, API, and B2B traffic.

Extend existing identity and access management technologies to handle complex authentication schemes involving user, device, and application identities.

Authenticate and control access of Cloud based services to on-premise resources.

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Case Study – Unified Access Control Across Mobile, Web, Cloud, & On-premise

One of The Largest Asset Management Institutions in The World

- Unified access control of all mobile and web traffic through the Axway API Gateway, consolidating security policies and management of security tokens and certificates.
- Extended CA SiteMinder to handle authentication of mobile devices, enabling 20,000 BYOD (bring-your-own-device) iOS, Android, and Blackberry devices to access corporate intranet resources.
- Control access of Salesforce.com and other Cloud-based services to corporate data and resources.

#6 Simplify Access Across Business Systems

The Challenges

Security silos are still widely prevalent, across vendors such as Oracle, IBM, and Microsoft. New Cloud based services create additional security silos.

User experience is now across multiple devices and platforms. Single sign-on (SSO) needs to extend to Cloud based services and mobile devices.

Mash-up applications and Cloud based services use third-party APIs. How can identities be propagated safely across the network boundaries?

The Solution

The API platform can facilitate SSO across different security silos by mediating security tokens of all types. A flexible Security Token Service can cover different standards such as OAuth and SAML, or vendor technologies such as Kerberos, CA, and Oracle.

Securely encapsulate user identities in encrypted tokens to safeguard federation of identity across business partners.

Integrate with third-party identity providers such as Google, Facebook, and Linkedin.

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Case Study - Single Sign-on (SSO) Across Global Research & Development Resources

A Big Pharmaceutical Company With R&D Centers Across the Globe

- Enabled research scientists to seamlessly use SSO from Oracle Access Manager to a large population of Microsoft SharePoint sites and applications scattered across the globe.
- The Axway API Gateway provided an integrated policy enforcement point for all Oracle Access Management Suite products. This included Oracle Access Manager for authentication and SSO, Oracle Entitlements Server for fine grained authorization, and Oracle Adaptive Access Manager for strong and contextual authentication.
- Over 5 million secured web and API transactions across the intranet on a daily basis.

#7 Protect Data and Safeguard Privacy

The Challenges

Enable access to sensitive data via Web, Cloud, and mobile devices, for only users with appropriate access rights.

Meet stringent compliance and privacy requirements to ensure proper control and monitoring of data security.

Legacy backend systems cannot enforce data security policies due to lack of attribute/ role/ daim based access control.

The Solution

Leverage the API platform to monitor for sensitive data in the header, message, or attachment in all Cloud and mobile traffic.

Redact sensitive data on-the-wire in accordance with need-to-know policies.

Implement audit, monitoring, and alerts to detect non-compliance situations for remediation.

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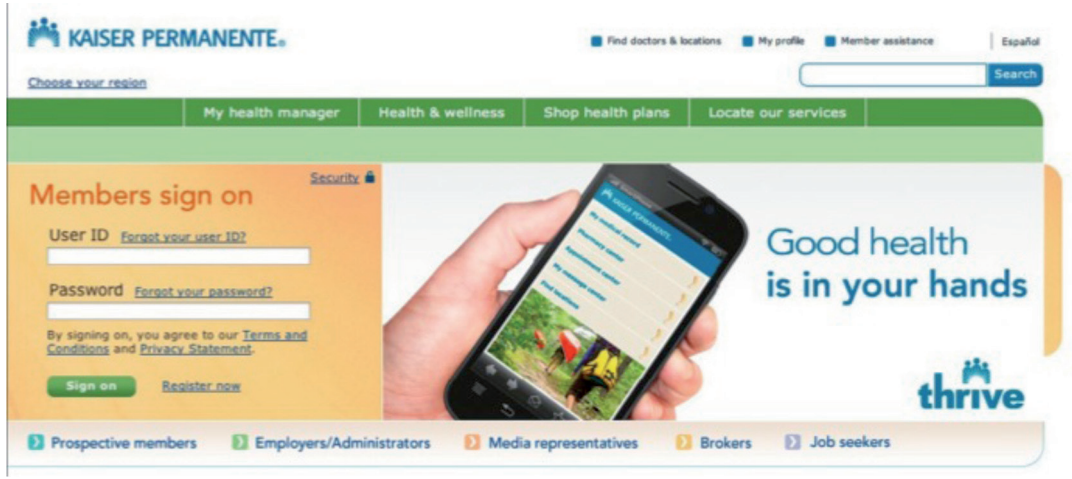
The Axway API Gateway protects the privacy of 9 million Kaiser Permanente members, including 5 million mobile users.



#8 Simplify OAuth Implementation

The Challenges

OAuth is rapidly becoming the default authorization protocol for all Cloud and mobile platforms, supported by major Cloud service providers.

Consumers want to log in to services using their existing social and business identities from Google, Facebook, and PayPal.

Existing identity and access management platforms have poor to no OAuth support.

The Solution

Leverage the API platform to provide consistent OAuth implementation across all Open APIs.

Deploy Security Token Service (STS) to mediate existing tokens / cookies /certificates used in backend applications.

Leverage OAuth and JSON Web Token to simplify legacy access management technologies.

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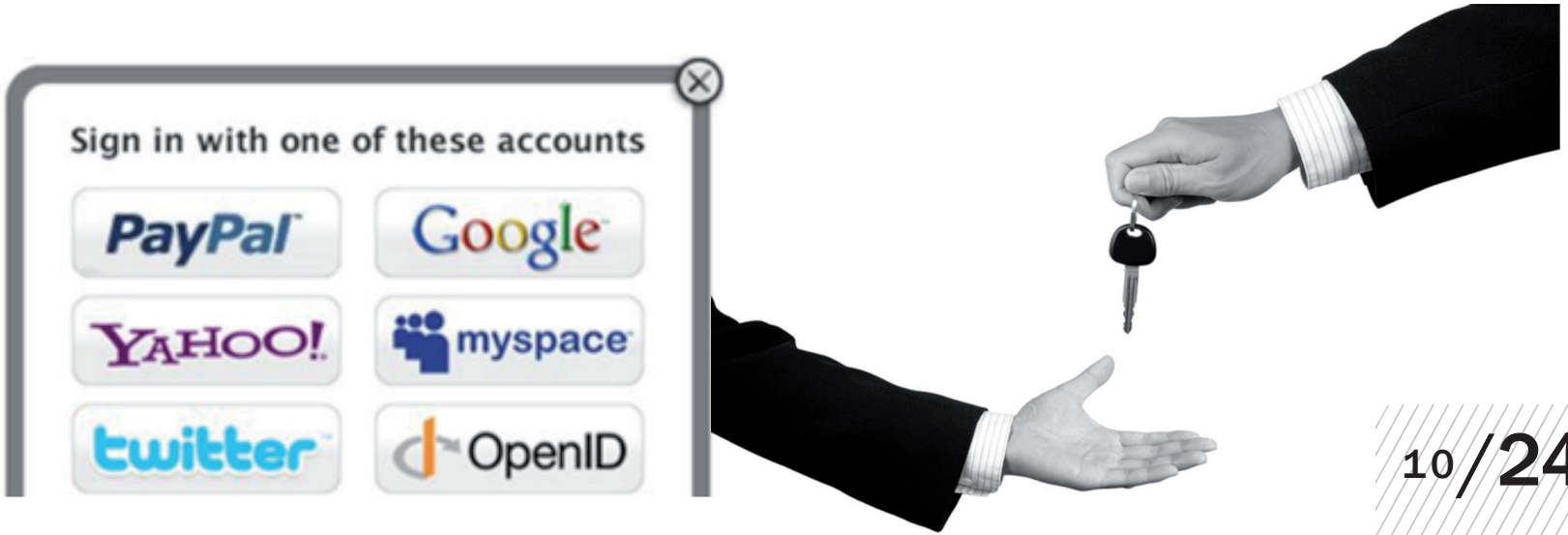
Authorization Server

Resource Server

Client



#9 Create Targeted Service Offerings

The Challenges

One-size-fits-all is no longer an option. Customer and partners have choices and the barrier to switch is lower than ever.

Business services must be differentiated and targeted. Customers buy only what they need whenever they need it.

Good user experience is mandatory. Users expect application interactions to be optimized for the device and platform of their choice.

The Solution

Build APIs that are optimized for different platforms, channels, and application types, but leverage the same backend services.

Use the API platform to control service delivery and offer differentiated services by service level and options.

Monitor and analyze API usage to measure service adoption and identify business opportunities

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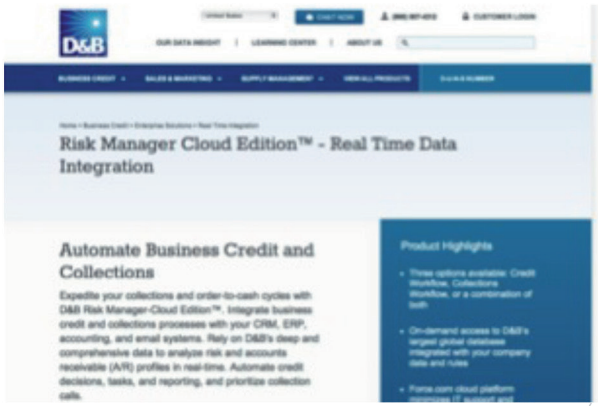
Services For Different User Roles

Different Service Levels



Services Via Different Channels

#10 Monitor, Track, and Debug Transactions

The Challenges

Monitor and track every API call and transaction. Raise alert when exceptions are detected.

Quickly debug exceptions to keep business flowing and meet service level agreements.

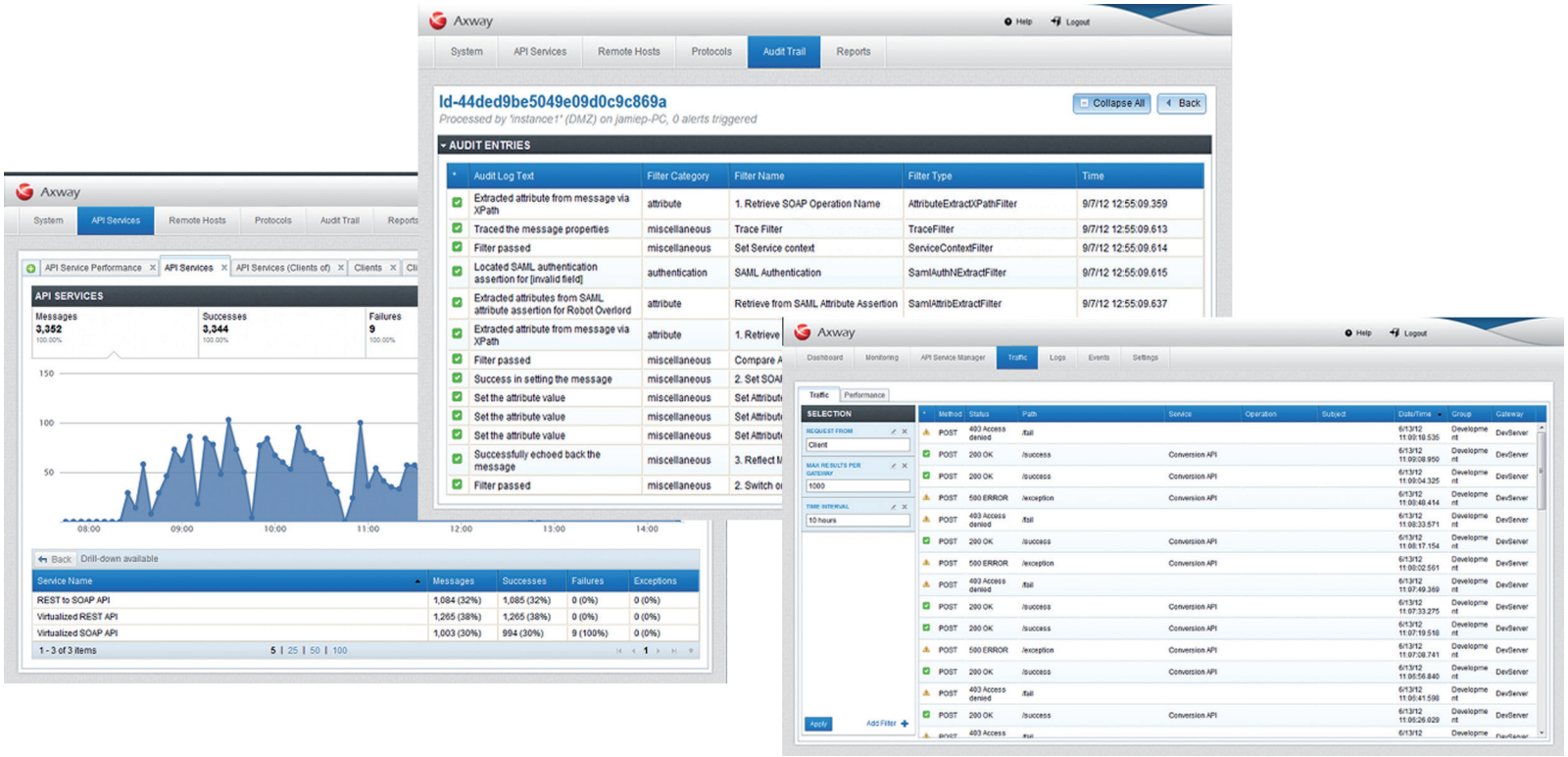
Perform testing and monitor system responses in real-time.

The Solution

Leverage the API platform to track and record every transaction for auditing and debugging.

Make available drill-down information to quickly perform root cause analysis. Capture drill-down data in accordance with policy steps.

Enable real-time monitoring to diagnose system performance and transaction issues.



#11 Ensure Quality of Service

The Challenges

While Cloud and mobile services are mainstream, there are still considerable concerns about reliability, security, and performance.

Services that become unavailable or slow can result in loss of business and damage to the brand.

APIs can go down from not only malicious attacks, but also from “friendly fire” from poorly designed API clients.

The Solution

Measure and monitor quality of service at the point of service delivery.The API platform can monitor quality of service and raise alerts.

The API platform can take real-time preventive or corrective actions to uphold quality of service, including traffic routing and throttling, as weil as provisioning additional API Gateway bandwidth.

Service quality data collected by the API platform can help the enterprise analyze API usage patterns and trends, thus helping to improve infrastructure planning and sizing.

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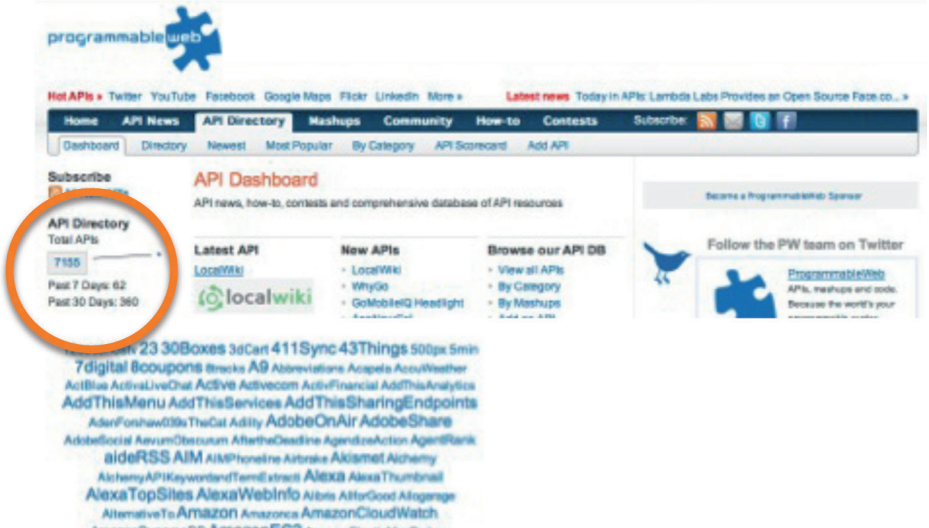

#12 Enforce Contract and SLA Terms

The Challenges

Differentiated service offerings can be a powerful go-to-market strategy. How do you enforce the terms of the contract/service level agreement?

Freemium is a powerful sales model for Cloud based services. How do you ensure free customers do not overpower your Cloud delivery infrastructure and cause service deterioration for paying customers?

Short-term promotions can be a powerful tool to let customers try new services or higher level of services. Can your Cloud delivery platform keep pace with marketing programs?

The Solution

Use the API platform to enforce quota and meter usage of services, whether it is usage over a specific time period, concurrent connections, or number of allowable devices.

Use configurable policies to manage quota and thresholds. Delegate management of quote variables to the business users through simple web interfaces.

Provide different options to take when a quota is reached or neared. Should the request be blocked or slowed, or just generate an alert?.

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#13 Audit, Measure Usage and Compliance

The Challenges

Perform quantitative analysis to understand the usage behaviors of business services.

Measure and report on quality of service and compliance to service level agreements (SLA).

Capture end-to-end audit data across different access points to meet compliance requirements.

The Solution

Use the API platform to audit any required information at any point in the transaction, across all Web, Mobile, API, and B2B access points.

Use an API Gateway to measure service response at the point of service delivery. Attest to SLA compliance with real data.

Provide business level analytics to business users on what services are being used, who are using the service, when the services are being used, and how the services are being accessed.

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#14 Manage API Lifecycle

The Challenges

API is the new application, thus rigorous lifecycle management practice must be applied.

An API's lifecycle is independent from the underlying applications. APIs often change more frequently than applications to keep pace with business requirements and client platforms.

Migration of APIs and policies between development, testing, staging, to sandbox and production environments are handled by different teams and subject to rigorous data center change management policies.

The Solution

Leverage the API platform to centrally manage all API artifacts, including versions, change logs, meta-data, policies, and environmental variables.

Use the API Gateway to create API and policy packages to facilitate promotion and migration process.

Support distributed development of APIs and policies, but manage API lifecycles via a centralized platform.

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BNSF RAILWAY

#15 Simplify API Adoption

The Challenges

More often than not, backend APIs have names that are too long, too cryptic, and too ambiguous.

Most backend APIs and Web Services were designed for a few B2B integration developers, not for a broader community of developers

Existing APIs are likely designed with many options. Not all options should be exposed externally, especially for Open APIs.

The Solution

Use the API platform to rewrite APIs with short, easy-to-remember, and intuitive names.

Restrict API options to only what is relevant for each API developer community.

Deploy different versions of APIs, each optimized for specific business scenarios and developer communities.

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Public API

Backend API

#16 Enable Community Developer Self-Service

The Challenges

Encourage open community developers to explore your APIs to create new customer touch points and sources of revenue.

Optimize developer experience and provide instant satisfaction with access to API resources.

Let community developers experiment with your APIs simply and efficiently.

The Solution

Deploy developer API portal to recruit community developers and enable self-service to your API resources.

Use the API Gateway to ensure the API adoption experience is highly positive, with good API performance, availability, security, and ease-of-use.

Set up a sandbox environment where community developers can self-register new applications, acquire authentication credential, and test APIs using pre-populated test data.

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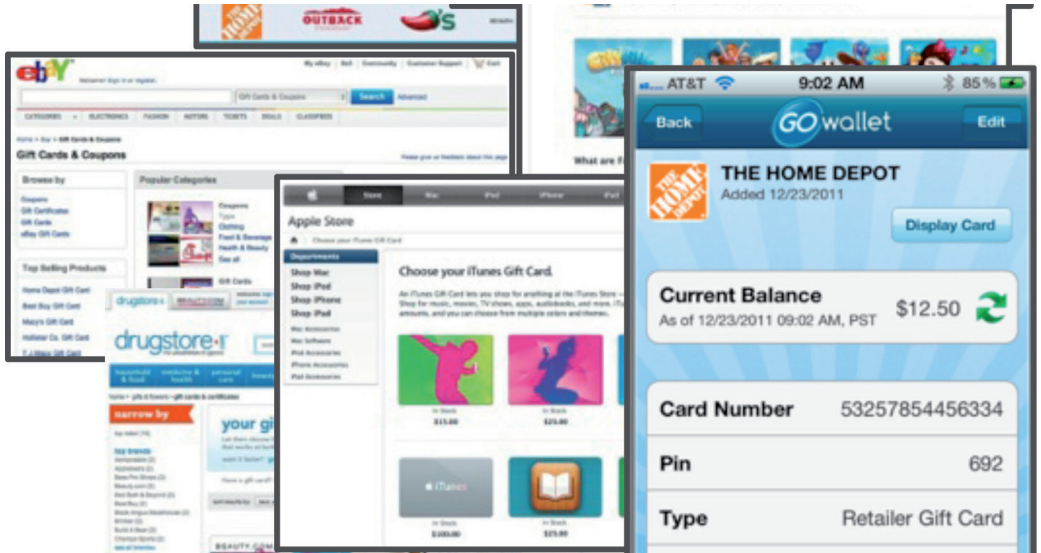
BLACKHAWK NETWORK

SELL GIFT CARDS DIRECT, VIA CHANNELS, VIA MOBILE: 350 BRANDS,
Current Balance



#17 Supercharge Internal Development

The Challenges

Create a “hacking” culture for internal development teams to spur technology and business innovation.

Enable developers simple access to backend capabilities that are ready for mash-up and experimentation.

Provide developers with technology that can meet the latest Cloud and mobile platform requirements.

The Solution

Deploy internal developer portals to enable access to core business capabilities and promote collaboration.

Use the API Gateway to package up backend services and data into granular API packages that can serve as building blocks to innovative business services.

Use the API platform to provide all required supporting services such as security, lifecycle management, and testing, so developers spend more time on innovation and less time on reinventing the wheel.

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Case Study - Enable Your Development Teams To Create Innovative Solutions

First Utility leverages the Axway API Gateway to create cutting edge energy analysis and management solutions for consumer and business markets.

#18 Scale Vendor Partner Network

The Challenges

No business is a silo. Every business relies on vendor partners to enrich its product and service offerings.

How do you deliver value to the vendor partners so you become a preferred partner over your competitors?

How to efficiently scale IT integration across a large network of vendors?

The Solution

Deploy a vendor partner portal so vendors can track transactions, get reports and analytics, and self-administer.

Use the API platform to broker vendor APIs to simplify adoption, enhance security, and manage changes.

Provide vendor facing APIs for your internal resources. These APIs can help you improve data integration and process automation.

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#19 Manage API Client Lifecycle

The Challenges

Not all API clients are created equal. Clients can range from public mobile apps, to partner B2B systems, to internal applications.

API client lifecycle needs to be carefully managed from on-boarding, to production, to end-of-life.

API client access and service level need to be controlled in accordance with policy and business terms.

The Solution

Use the API platform as an API client registry, including organization, user, application, and device entities.

Define authentication, authorization, and service level policies for each class of API clients.

Define lifecycle events and automate transitions between lifecycle stages. This ensures the appropriate level of access and support is provided to each API client throughout its lifecycle.

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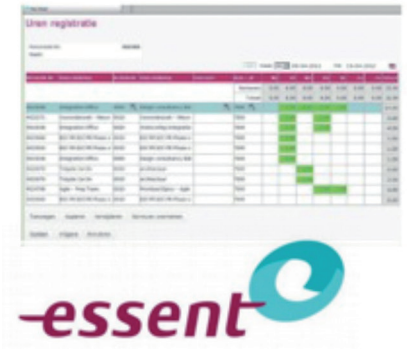
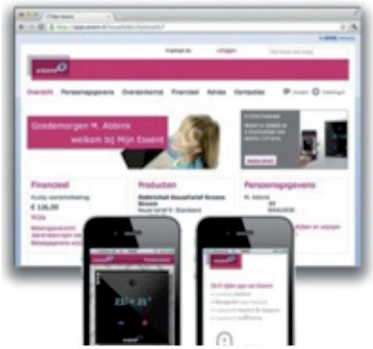
Case Study - A Single API Delivery Platform For All API Clients

The largest energy utility company in the Netherlands leveraged the Axway API Gateway to build a flexible application delivery platform capable of serving different user communities and API clients.

Employee Facing Applications



Customer Facing Applications



Public Facing Applications

#20 Automate Partner/Application Promotion

The Challenges

Onboarding a partner can be a lengthy process that involves many non-IT related steps.

Once a community developer is ready to become a partner, a process must be initiated and followed to compete the onboarding/promotion process.

Onboarding processes are typically implemented in CRM applications such as Saleforce.com and Siebel.

The Solution

Use the API platform to automate the initiation of the promotion and onboarding process.

Configure the API Gateway to call the CRM APIs to initiate the task flow and provide the necessary data. Extract process updates and report progress on the partner portal.
Once the CRM process is completed, automate the transition of the new partner and application from the open sandbox environment to the production environment.

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Partner Onboarding Checklist

- ✓ Non-disclosure agreement
- ✓ Intellectual property protection
- ✓ Dunn & Bradstreet report
- ✓ Credit reports
- ✓ Master agreement
- ✓ Contract
- ✓ Vendor risk assessment
- ✓ Security audit
- ✓ Business approval
- ✓ Finance approval
- ✓ IT approval
- ✓ Billing integration

20 Ways to Accelerate Your API Delivery

1. Modernize old application interfaces
2. Create mash-up APIs/applications
3. Broker third-party APIs
4. Prevent attacks and threats
5. Provide the right level of access
6. Simplify access across business systems
7. Protect data and safeguard privacy
8. Simplify OAuth implementation
9. Create targeted service offerings
10. Monitor, track, and debug transactions
11. Ensure quality of service
12. Enforce contract and service level agreement terms
13. Audit, measure usage and compliance
14. Manage API lifecycle
15. Simplify API adoption
16. Enable community developer self-service
17. Supercharge internal development
18. Scale vendor partner network
19. Manage API client lifecycle
20. Automate partner/application promotion

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About Axway

Axway (NYSE Euronext: AXW.PA), a market leader in governing the flow of data, is a global software company with more than 11,000 public- and private-sector customers in 100 countries. For more than a decade, Axway has empowered leading organizations around the world with proven solutions that help manage business-critical interactions through the exchange of data flowing across the enterprise, among B2B communities, cloud and mobile devices. Our award-winning solutions span business-to-business integration, managed file transfer, API and identity management, and email security– offered on premise and in the Cloud with professional and managed services.

The Axway (formerly Vordel) API Gateway is a unified API operating platform to manage, deliver and secure APIs. Global enterprises rely on the API Gateway to deploy mission-critical APIs and extend IT infrastructure to keep up with the rapid change in mobile and cloud computing technologies.

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