Managing Your APIs in a Manufacturing Environment

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What is an API?

An API, strictly speaking, is defined as an access method to a service (or a service interface, according to SOA terminology)

Gartner-Magic Quadrant for Application Services Governance
Where do APIs Exist in the Manufacturing World?
How and when they are accessed is changing
This additional interaction brings challenges

**Forbes**  
Android App Takes Down Heart of National Weather Service

**SPIEGEL ONLINE**  
Cyber-Attack Warning: Could Hackers Bring Down a Plane?

**FLIGHT INTERNATIONAL**  
USMC finds workaround for vulnerability on F-35 logistics system
What are some strategies to address these issues?

- API Lifecycle Management
- API Virtualization
- Utilize a Gateway Reverse Proxy
- API Consumption (Onboarding and Discovery)
- API Throttling
- API Monitoring
- Caching for Scale
API Lifecycle Management

- Lifecycle Models represents the distinct phases from conception to retirement of an Asset
- Use Lifecycle Models to
  - Foster stakeholder collaboration by approvals and notifications
  - Steer asset visibility throughout the lifecycle
  - Enforce policies according to the lifecycle state
- CentraSite allows free definition of Lifecycle models
  - Per individual Asset Type
  - Per Organization
  - Globally
Managing the lifecycle of your API

Salesforce:
/services/data/v20.0/sobjects/Account

Intuit:
/api/v1/app/BillingStatus/<appid>

Dependencies & impact analysis
API versioning
Provisioning, deprecation & retirement

Lifecycle Management ensures involvement of key stakeholders in the SDLC
API Virtualization

- Creation of a new virtual service without the need for coding to
  - Establish inbound protocol
  - Set security protocol and authentication mechanisms
  - Schema Validation & Timestamps
  - Define API Key management

- Advantages
  - Consumers of APIs only interact with the façade, never the real services
  - Do not need to rewrite REST APIs for legacy SOA APIs
  - Ability to add transformation for additional capabilities without coding
  - Avoid vendor lock in with loosely coupled interface without coding
  - Common security framework
  - Centralized registration and onboarding
Utilize a Gateway Reverse Proxy

Gateway

Mediator

HTTP, HTTPS

No inbound ports open
API Consumption (Onboarding and Discovery)

1. Find API & Request API Key
2. Approve Request
3. Send Key by e-mail
4. Provision Key
5. Call API
6. Validate Key & Enforce Policies
7. Invoke API
API Throttling

- Traffic Management Use Cases
  - Protect your backend services by constraining the traffic
  - Establish classes of services for consumers
- Use the Throttling Traffic Policy
  - Choose soft and hard limits
  - Choose the consumers (all or specific ones)
  - Configure the alerting mechanisms
API Monitoring

Leverage Analytics

- QoS
- Support
- Traffic
- Marketing
- Trends
- Business

“You can't manage what you can't measure”

- Peter Drucker
Caching for Scale

- Sensors will generate significantly more data than you plan for
- IOT will connect more devices than you anticipate
- Service requests to your resources will outpace your systems
- Utilize caching to remove those bottlenecks while also improving performance
APIs in Action - Large Logistics Company

“Freight should be as simple as shipping parcels”

API to access 140+ procurement & logistics services for sea, air, road & rail freight

Customer is not a public reference.
Transforming Proactive Maintenance
Through near real-time streaming analytics

OPPORTUNITY:
- Jenbacher engines provide onsite generation for power, heating, and cooling
- Support additional revenue stream through contracted engine maintenance
- Requirement to meet SLAs for uptime across multiple customers and locations
- Preventative maintenance avoids unplanned downtime and reduces costs

SOLUTION:
- Advance maintenance deployment before outage saves GE ~1K/engine/year
- 3,400+ engines are monitored using machine-to-machine feeds
- 250 data points every 30 seconds
- With 10 second latency, Presto combines engine service diagnostics and engine application performance statistics into consolidated dashboard

RESULT:

PROACTIVE MAINTENANCE
Deployment and Performance Diagnostics
SAVES $3.4+M PER YEAR

3,400+ engines monitored using machine-to-machine feeds