# The CIO Guide to API Security: Enabling Innovation Without Enabling Attacks and Data Breaches

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# By 2022, API abuses will be the most frequent attack vector resulting in data breaches for enterprise web applications.

Source: “How to Build an Effective API Security Strategy” (G00342236)

# API Security

1. What exactly are the security problems with APIs?
2. What can be done about API security?
3. Where should you start?

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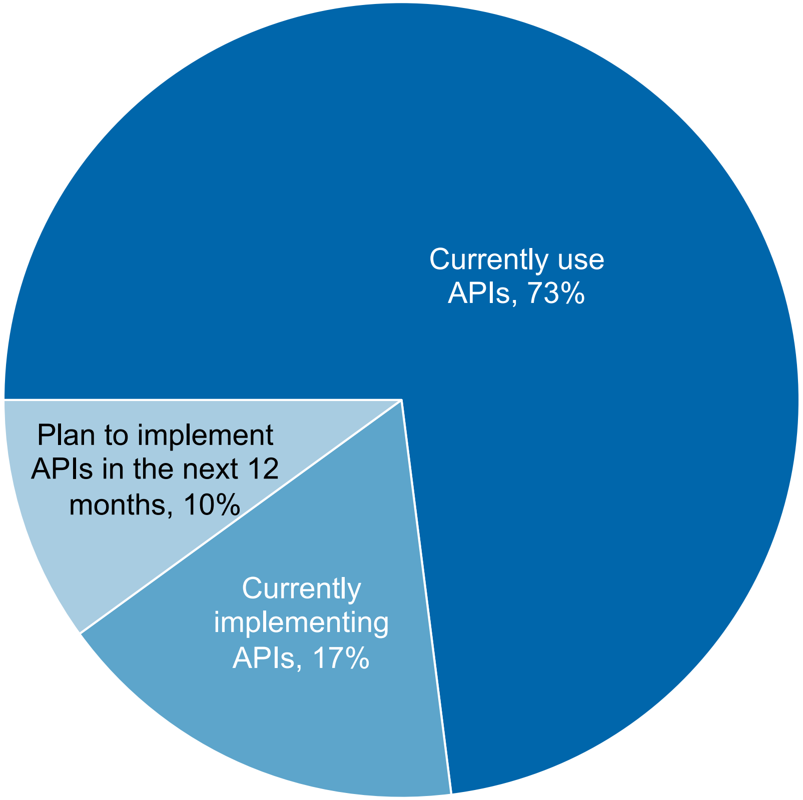
# APIs Are Intended to Be Easy to Use

- Commonly understood technologies:
  - JSON, web protocols, XML
- Typically published in a developer portal:
  - … or used “under the hood” in a web or mobile framework
- Emphasis is placed on “Quick time to Hello World”

# Most organizations currently use APIs

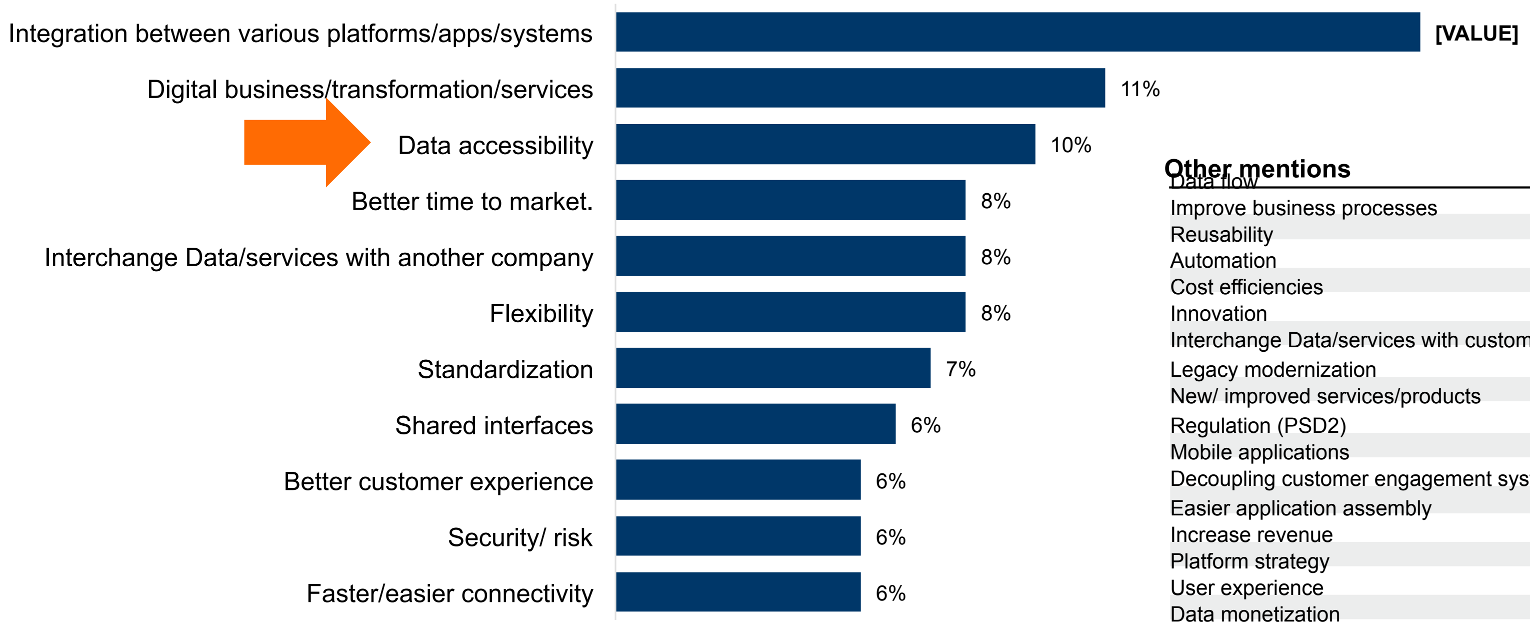


Source: Gartner Survey "API Usage and its Role in Digital Platform Growth Report" 2018

# APIs are often implemented to help with integration and data access but also digital business

## Top business goals or objectives organizations address with APIs (coded)

*Percent of respondents*



| Other mentions | |
|---|---|
| Data flow | 4% |
| Improve business processes | 4% |
| Reusability | 4% |
| Automation | 3% |
| Cost efficiencies | 3% |
| Innovation | 3% |
| Interchange Data/services with customer | 3% |
| Legacy modernization | 2% |
| New/ improved services/products | 2% |
| Regulation (PSD2) | 2% |
| Mobile applications | 2% |
| Decoupling customer engagement systems | 2% |
| Easier application assembly | 2% |
| Increase revenue | 2% |
| Platform strategy | 2% |
| User experience | 2% |
| Data monetization | 1% |
| Other | 2% |

# APIs are often implemented to help with integration and data access

**Business goal or objective organizations address with APIs (open-ended)**

APIs gives business **more agility** in their project, gives them the ability to **get more value from the information** that are no longer hidden in an application, but exposed with APIs.

Improve **integration** between new and legacy applications. **Standardize** how business functionality exposed by APIs is **governed, managed and consumed**.

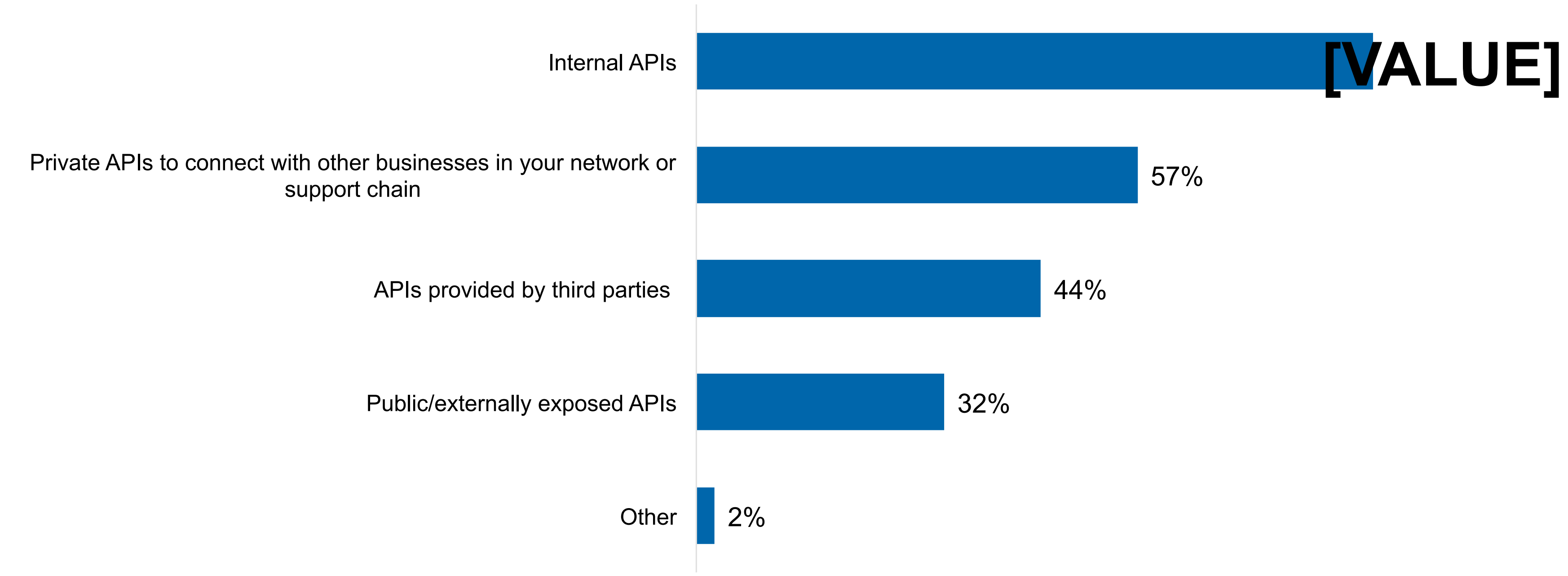
**Re-usable integration platform** in support of a **common information model**. Ability to increase the reuse of integration points. Ability to incorporate business rules within the API transactions for data/record validation.

**Standardize processes** for data access across teams and reuse where possible, manage through governance, monitor and manage response.

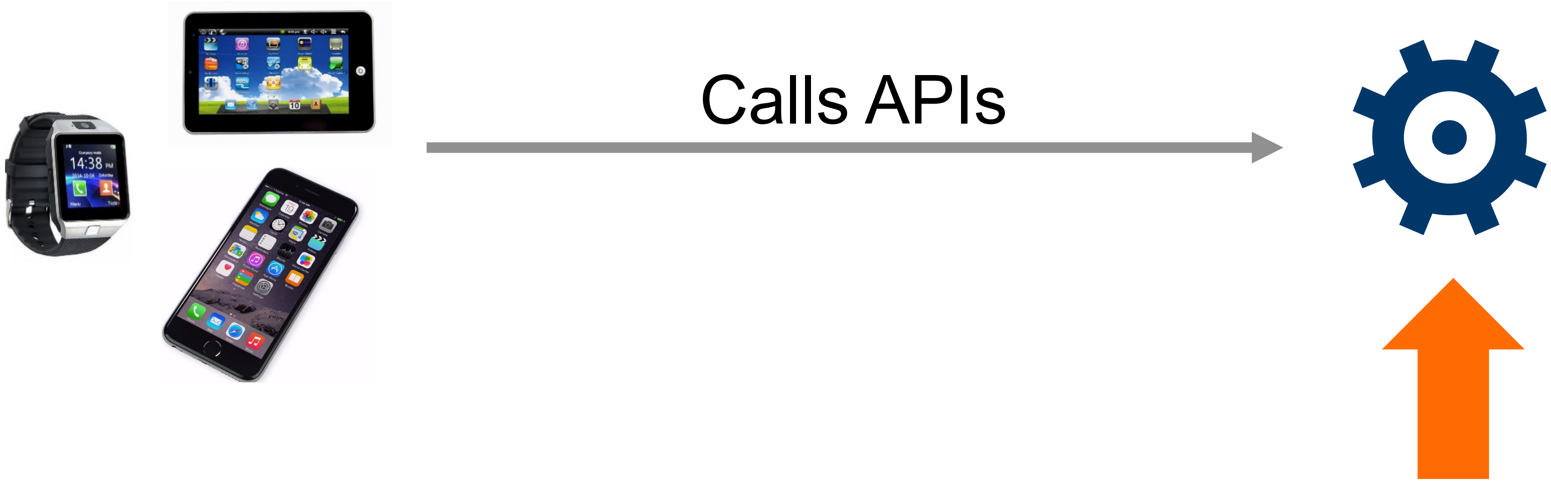
# Internal APIs are widespread; less than a third plan to deploy public / externally exposed APIs

## Types of API's organizations currently use/plan to use

*Percent of respondents*

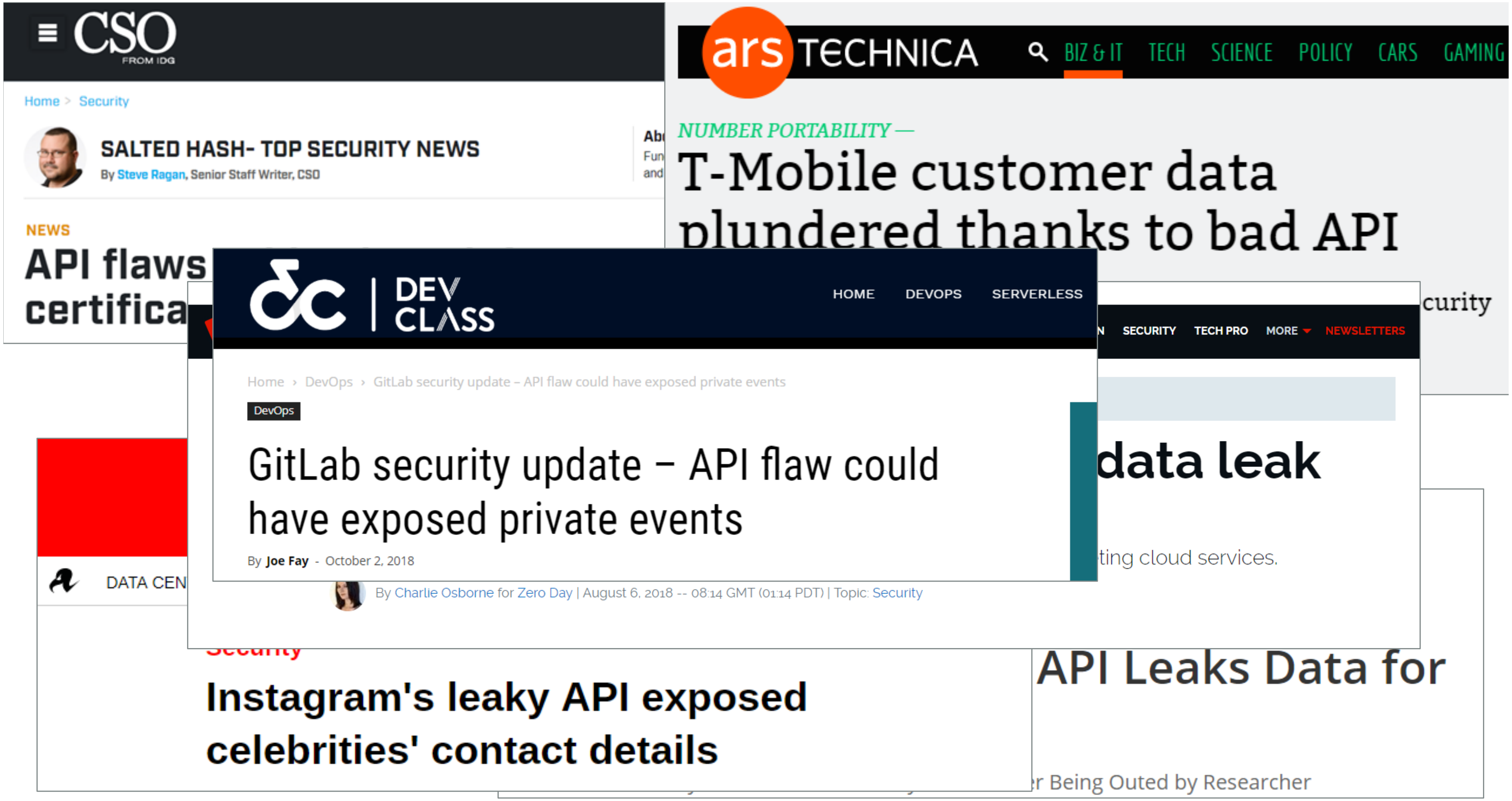


# Attackers Go After Targets That Are the Most Valuable



- Data breaches
- Denial of Service
- “Scraping” attacks

The data and applications are here



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By Steve Ragan, Senior Staff Writer, CSO

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API flaws
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DevOps

GitLab security update – API flaw could have exposed private events

By Joe Fay - October 2, 2018

data leak

ting cloud services.

By Charlie Osborne for Zero Day | August 6, 2018 -- 08:14 GMT (01:14 PDT) | Topic: Security

Security

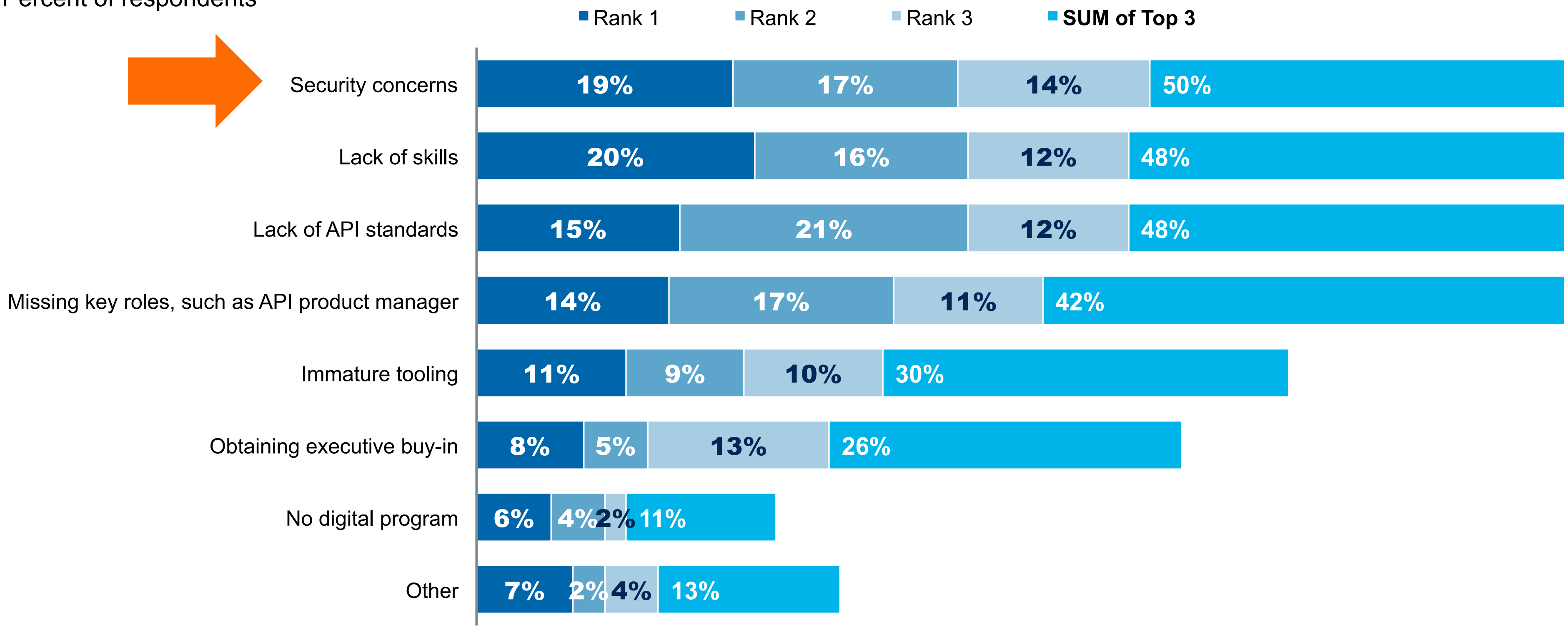
Instagram's leaky API exposed celebrities' contact details

API Leaks Data for

r Being Outed by Researcher

# Good News: There Is Awareness of the Problem

**The top 3 challenges to organizational API strategy**
Percent of respondents



# API Security

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# Follow These Three Steps

1. **Discover:** Inventory APIs that have been delivered, or are in the development process. APIs consumed from third-parties should also be included.

2. **Monitor:** Observe your API usage. Learn what “normal” is for API behavior.

3. **Secure:** Create a policy to secure your APIs.

# Designing an API Management and Security Policy

- Think about:
  - How your APIs will be used (Mobile clients? Application-to-application traffic?)
  - Expected API usage patterns
  - Internal vs. external usage
  - Where API gateways can be placed (Cloud/On-premises/Both?)
  - Potential threats to your APIs
  - Authentication of both end users and API clients
  - Data security

# Web Application Firewalls (WAFs) and API Gateways

## WAF: Threat Protection

- DDoS protection
- Bot mitigation
- Attack signatures (OWASP)
- Whitelist management
- Anomaly detection

## API Gateway: API Access Control

- Transformation/Orchestration
- Per-API authorization management
- Performance optimization (caching)
- Scope management — throttling

API gateway is the application delivery controller for APIs.
WAFs provide threat detection for public-facing web applications.

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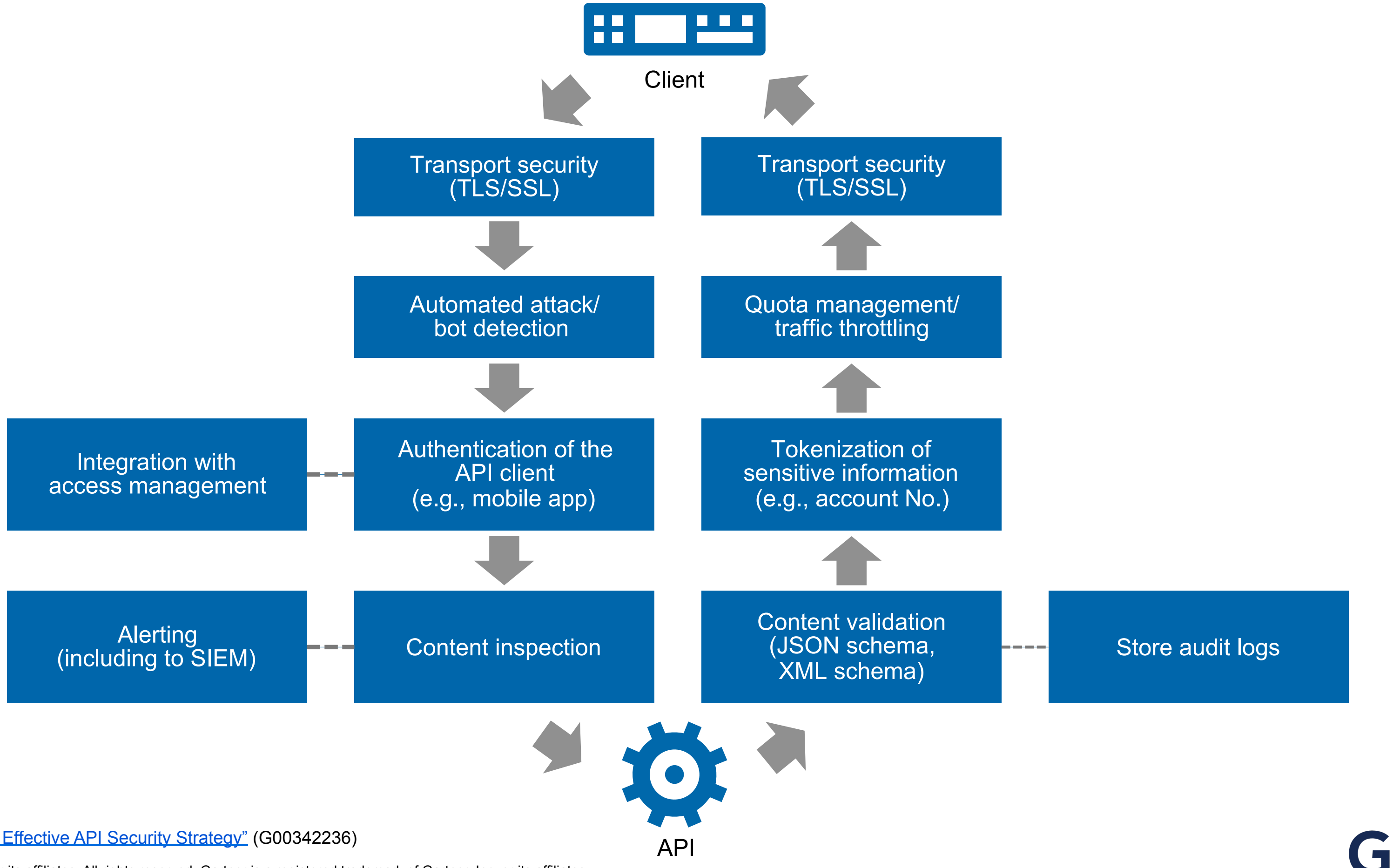
# Your API Security Building Blocks

| | | |
|---|---|---|
| Authentication of the API client (e.g., mobile app) | Authentication of the end user | Quota management/ traffic throttling |
| Content inspection | Content validation (JSON schema, XML schema) | Tokenization of sensitive information (e.g., account No.) |
| Automated attack/ bot detection | Transport security (TLS/SSL) | Content encryption/ decryption |
| Store audit logs | Signature validation | API key management |
| Token Issuance (OAuth 2.0, JWT Token) | Fine-grained authorization (e.g., on OAuth scopes) | Third-party identity provider (IdP) or social login |
| Integration with access management | XML/SOAP security (WS-security, etc.) | Alerting, including to security incident event management (SIEM) |

Source: “How to Build an Effective API Security Strategy” (G00342236)

# Creating an Effective API Security Policy



Client

Transport security (TLS/SSL)

Automated attack/ bot detection

Integration with access management

Authentication of the API client (e.g., mobile app)

Alerting (including to SIEM)

Content inspection

Transport security (TLS/SSL)

Quota management/ traffic throttling

Tokenization of sensitive information (e.g., account No.)

Content validation (JSON schema, XML schema)

Store audit logs

API

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# Recommendations

✓ Start and maintain an inventory of your APIs:

  – Discover the APIs you have built

  – Also inventory the APIs you consume from others

✓ Construct API security policies that include:

  – Authentication and authorization

  – Attack protection

  – Data security

# Recommended Gartner Research

- **How to Build an Effective API Security Strategy**
  Mark O’Neill, Dionisio Zumerle and Jeremy D’Hoinne (G00342236)
- **Selecting the Right API Gateway to Protect Your APIs and Microservices**
  Mary Ruddy and Michael Isbitski (G00349440)
- **Managing the Consumption of Third-Party APIs**
  Mark O’Neill (G00348312)
- **Magic Quadrant for Full Life Cycle API Management**
  Paolo Malinverno and Mark O’Neill (G00319327)
- **Critical Capabilities for Full Life Cycle API Management**
  Mark O’Neill and Paolo Malinverno (G00334223)

For information, please contact your Gartner representative.