



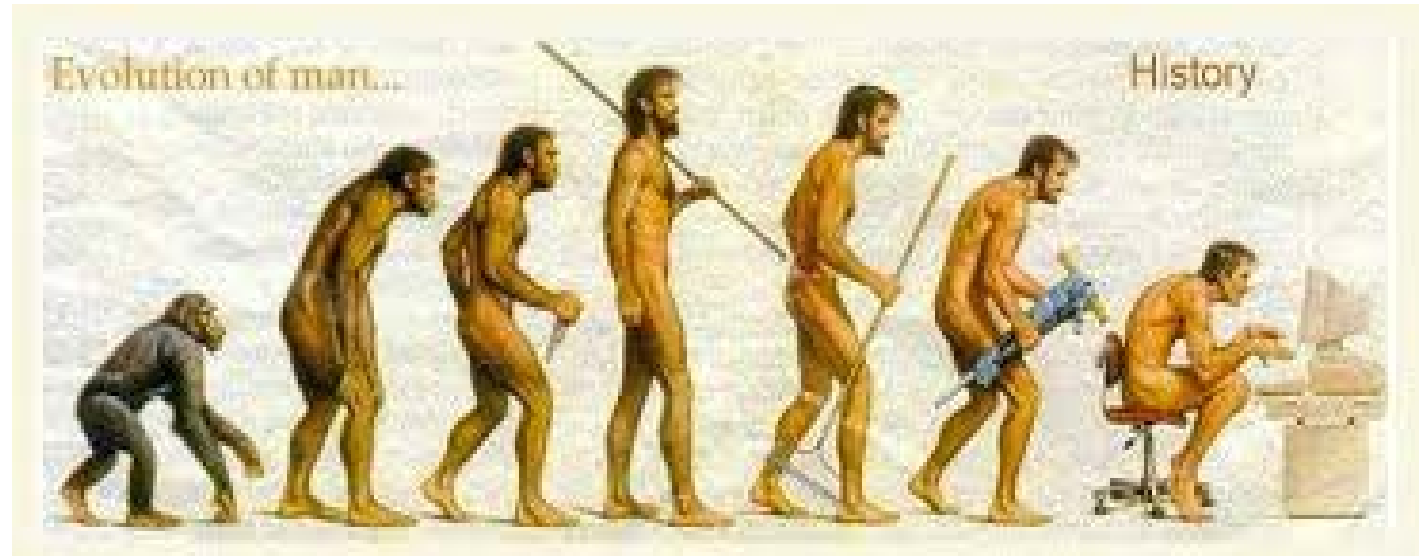
# Beyond REST

Yogeshwar Srikrishnan



# API Evolution

- EDI
- CORBA
- DCOM
- Java RMI
- XML RPC
- SOAP

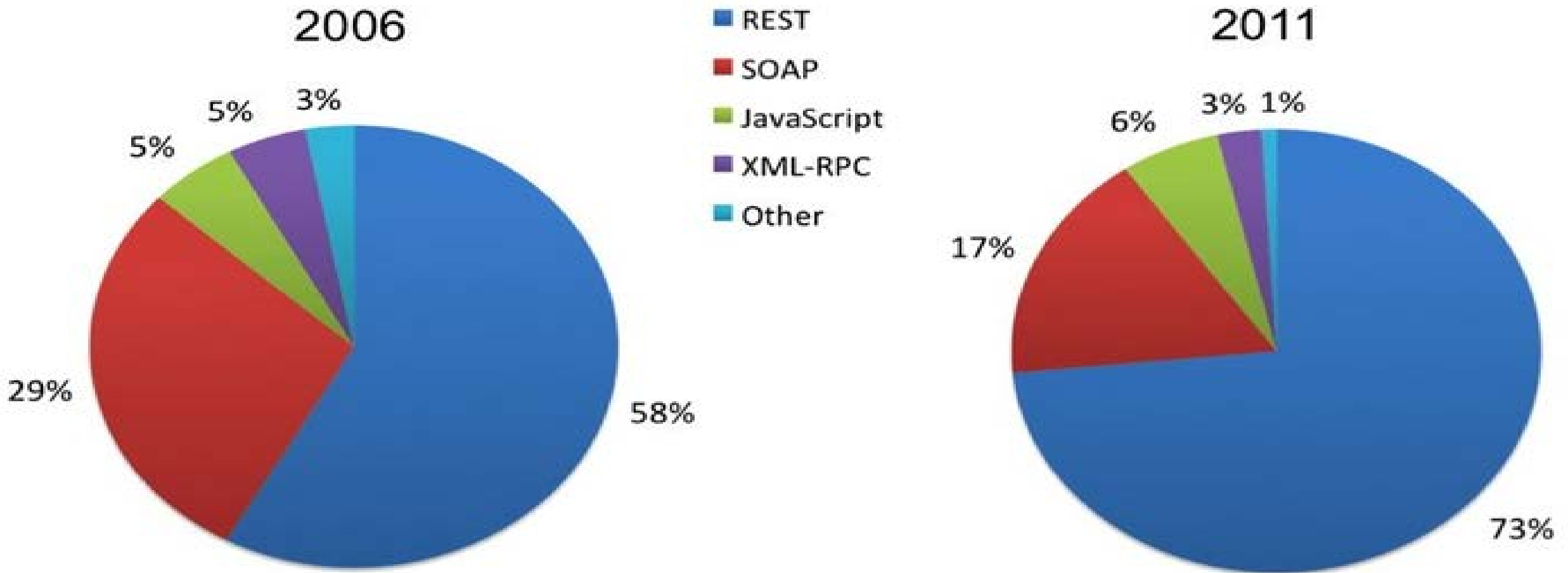


# REST

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- Client-Server: Separation of concerns
- Client/Stateless-Server: Visibility, scalability
- Caching: Performance improvements
- Uniform Interface: Consistent interactions and better visibility of interactions. Ease of adoption.
- Layered System: Simplified components and improved scalability
- Code-On-Demand: Allows extensibility.

# REST vs. SOAP: Simplicity wins again



*Distribution of API protocols and styles*

*Based on directory of 3,200 web APIs listed at ProgrammableWeb, May 2011*

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A *presumptive architecture* is a software architecture (or a family of architectures) that is dominant in a particular domain. Rather than justifying their choice to use it, developers in that domain may have to justify a choice that differs from the presumptive architecture.

George Fairbanks

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"Those who cannot remember the past are condemned to repeat it,"

Philosopher "George Santayana"

# REST - Challenges

- OSFA
- Multiple Round Trips
- Versioning
- Style Versus Standard
- Primitive Tools
- REST endpoints are usually weakly-typed and lack machine-readable metadata
- Additional Use Cases



# Orchestration/Experience API

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- LSUD versus SSKD
- Device-specific Wrappers
- Query-based APIs
- Experience Based APIs





Network Border

Network Border

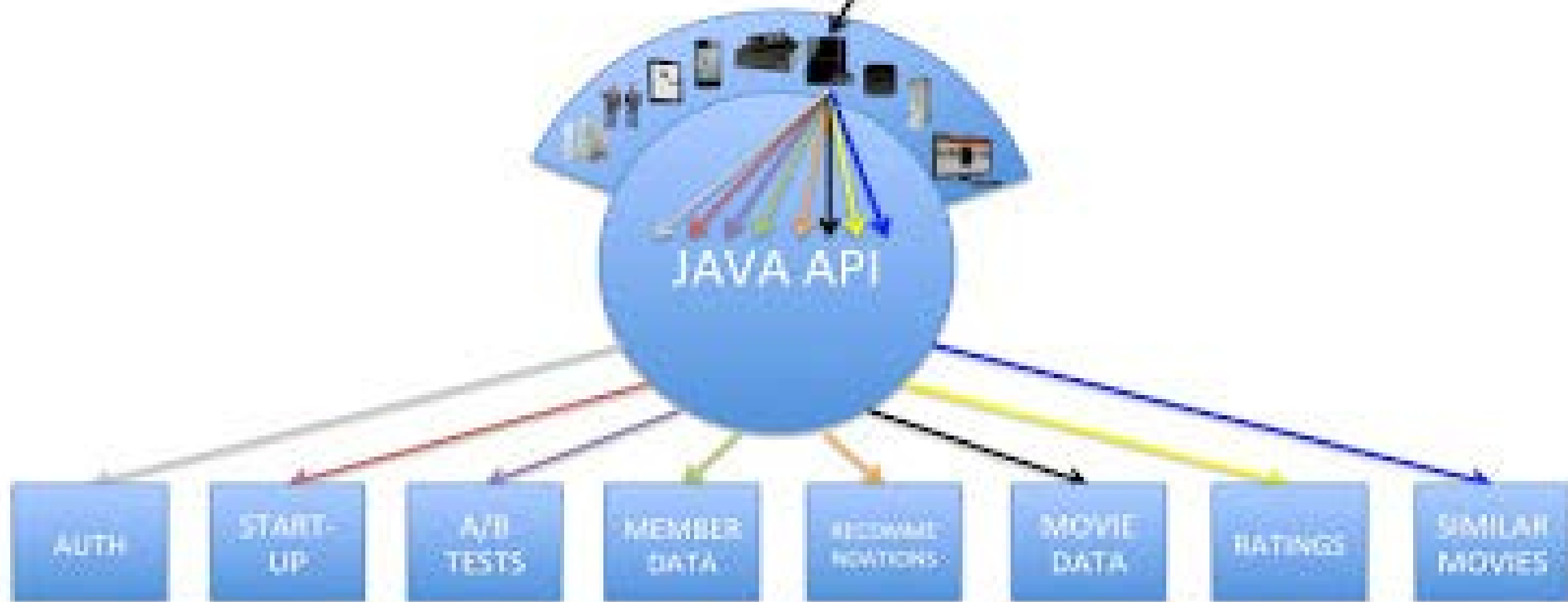


- AUTH
- START-UP
- A/B TESTS
- MEMBER DATA
- RECOMMENDATIONS
- MOVIE DATA
- RATINGS
- SIMILAR MOVIES



Network Border

Network Border



# GraphQL

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- GraphQL Query
- Hierarchical
- Strongly typed
- Introspective
- Version Free
- powers hundreds of billions of API calls a day

GraphQL



```
{
  user(id: 4802170) {
    id
    name
    isViewerFriend
    profilePicture(size: 50) {
      uri
      width
      height
    }
    friendConnection(first: 5) {
      totalCount
      friends {
        id
        name
      }
    }
  }
}
```

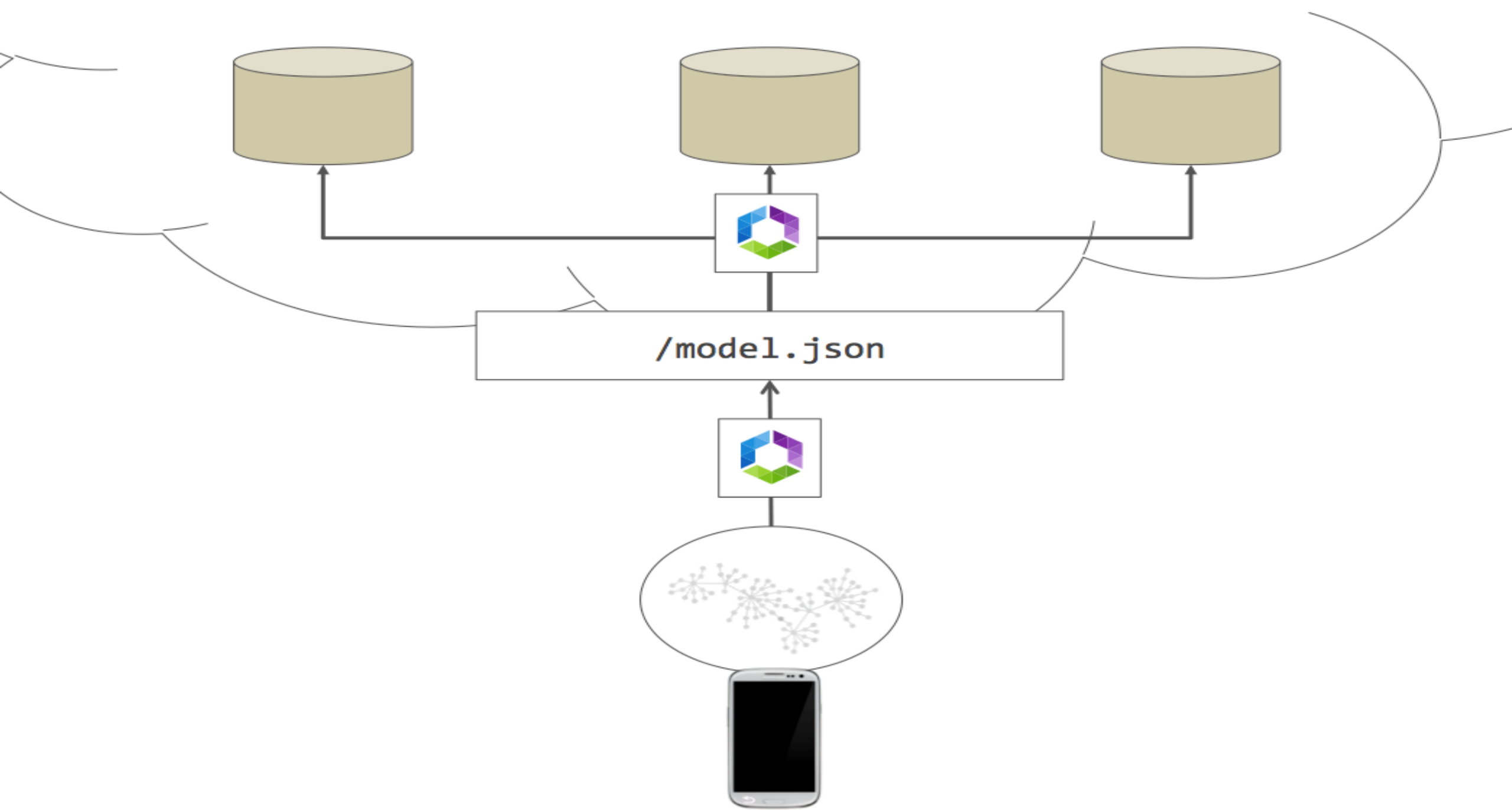
```
{
  "data": {
    "user": {
      "id": "4802170",
      "name": "Lee Byron",
      "isViewerFriend": true,
      "profilePicture": {
        "uri": "cdn://pic/4802170/50",
        "width": 50,
        "height": 50
      },
      "friendConnection": {
        "totalCount": 13,
        "friends": [
          {
            "id": "305249",
            "name": "Stephen Schwink"
          },
          {
            "id": "3108935",
            "name": "Nathaniel Roman"
          }
        ]
      }
    }
  }
}
```

# FALCOR

- A JavaScript library for efficient data fetching.
- Data is the API
- Falcor Model/ Asynchronous API.
- Caching
- Batching
- Request Deduping



**NETFLIX**



# Binary Protocols

- Efficient
- Speed of Transmission and Interpretation.
- Native bindings
- Ease and Speed Of Development
- Better Versioning Support
- IDL – Interface Description Language
- Non – Browser/UI Consumption
- Less Boilerplate Code





# Apache Thrift™



Protocol buffers are a language-neutral, platform-neutral extensible mechanism for serializing structured data

Thrift is a software library and set of code-generation tools developed at Facebook to expedite development and implementation of efficient and scalable backend services.

Apache Avro™ is a data serialization system.



Google 2008  
BSD License  
stable Well tested.  
gRPC

Facebook 2007  
Apache License  
IDL  
Cleaner RPC  
Entire integrated RPC framework  
and many choices

Data Stored along with Schema  
Apache JSON Format  
RPC

Google  
Active MQ

Facebook  
Evernote

[Pig load/store function](#)  
[Apache HBase gateway server](#)



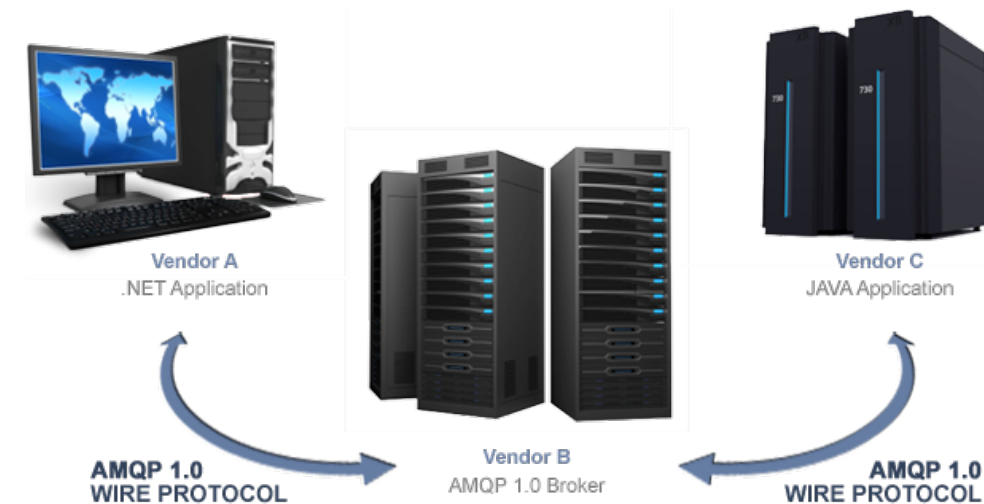
# Asynchronous API

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- Loosely Coupled
- Well Distributed
- Event-driven architecture (EDA)
- IOT – Internet of Things
- MOM/Message Broker

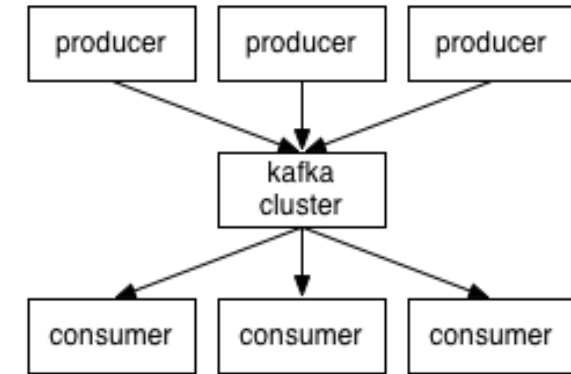
# AMQP

- AMQP 1.0 is an international standard, approved by ISO and IEC
- To become the standard protocol for interoperability between all messaging middleware
- AMQP is a efficient, reliable, wire-level messaging protocol
- [Apache Qpid RabbitMQ Windows Azure Service Bus](#)

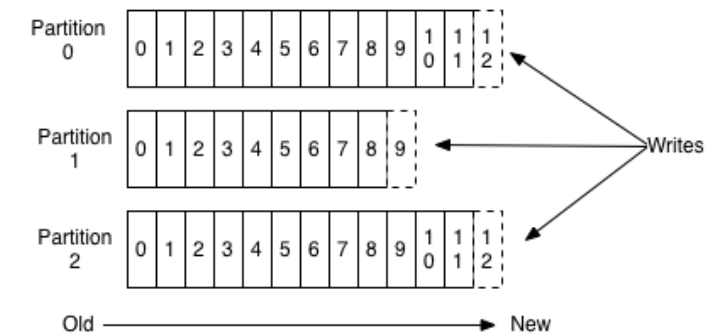


# Apache KAFKA

- Apache Kafka is publish-subscribe messaging rethought as a distributed commit log.
- Simple, high-performance, language agnostic [TCP protocol](#).
- Fast
- Scalable
- Durable
- Distributed by Design



## Anatomy of a Topic



# REST Standards

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- Internal Standards
- <http://www.odata.org/getting-started/> OASIS
- Open API - Swagger

# Prepare For Change

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- Build awareness around new set of Technologies.
- Be early adopters.
- Standards and Choices

# References

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# Thank you



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