Where will we be in a year?

{FUTURE}STACK 16

VIA COMPU-FAX SATELLITE | THE NATION'S NEWSPAPER | 6 DOLLARS

INSIDE SPORTS

OSTEGUIN: Heads for hills after victory

SLAMBALL PLAYOFFS BEGIN

CUBS SWEEP SERIES IN 5

MARSHALL RUNS 3 MINUTE MILE

USA TODAY

NO. 1 IN THE USA....3 BILLION READERS EVERY DAY

HILL VALLEY EDITION

FROM THE CAPITOL

WASHINGTON PREPARES FOR QUEEN DIANA'S VISIT

SARRACINO: Could be contender for top

Thursday, OCTOBER 22, 2015

NEWSLINE

A QUICK READ ON THE NEWS

THUMB BANDITS STRIKE: after amputating thumbs of hospital patients.

MAN KILLED BY FALLING LITTER: thrown from a hovering vehicle.

TOKYO STOCKS UP: averaging a 3 point increase in early. Section C.

SWISS TERRORIST THREAT: may be real say CIA officials. WORLD page 5.

SHREDDING FOR CHARITY is a way to raise money and save trees. Section D.

PRESIDENT SAYS SHE'S TIRED of reporters asking the same questions. NATION, page 4.

MASTERPIECE: Art work increasing

QUEEN DIANA WILL VISIT WASHINGTON tomorrow said the capital prepares. WORLD, page 5.

KELP PRICE INCREASE is likely due pollution of the South Pacific. Section C.

PITCHER SUSPENDED FOR BIONIC ARM USE without calibration. Section B.

SLAMBALL PLAYOFFS BEGIN this evening in Denver, televised on TBS. Section B.

JAWS WITHOUT BITE is the review of *Jaws 17*. Section D.

CAR OWNERS REVOLT [illegible]

GANG JAILED

Hoverboard Rampage Destroys Courthouse

Gang Leader had Bionic Overloads

Gang Leader:

"I was framed."

By Compu-Fax, USA TODAY

Reckless Hoverboarders rampaged into Hill Valley's City Courthouse last yesterday afternoon, causing serious damage to the structure. The perpetrators received minor injuries and were immediately apprehended by Hill Valley Police. They are being held in the City lockup pending immediate trial. Jailed were Griff Tannen, 18, Leslie O'Malley, 18, Chester Noguera, 18, and Rafe Unger, 18, all of Hill Valley. Tannen claimed a Itch Hoverboarder had perpetrated the incident and escaped. The claim was dismissed by authorities upon learning that the arrested, whose name was withheld, was a repeated target of harrassment by the gang.

The incident occurred in the front of the courthouse when Tannen, on a "Pit Bull" powered model Hoverboard with his companions in tow, went speeding across the courthouse pond in violation of a local ordinance and apparently lost control of his hoverboard. All 4 Hoverboarders were thrown into the front office of the building, causing some serious damage to the edifice. No one else was injured.

The incident occurred in the front of the courthouse when Tannen, on a "Pit Bull" powered model Hoverboard with his companions in tow, went speeding across the courthouse pond in violation of a local ordinance and apparently lost control of his hoverboard.

1. CRITICAL TOOL FOR OPERATIONS TEAMS
2. EVENTS RULE EVERYTHING AROUND ME
3. MORE PRODUCTS, MORE FEATURES
4. MORE CUSTOMERS, BIGGER CUSTOMERS

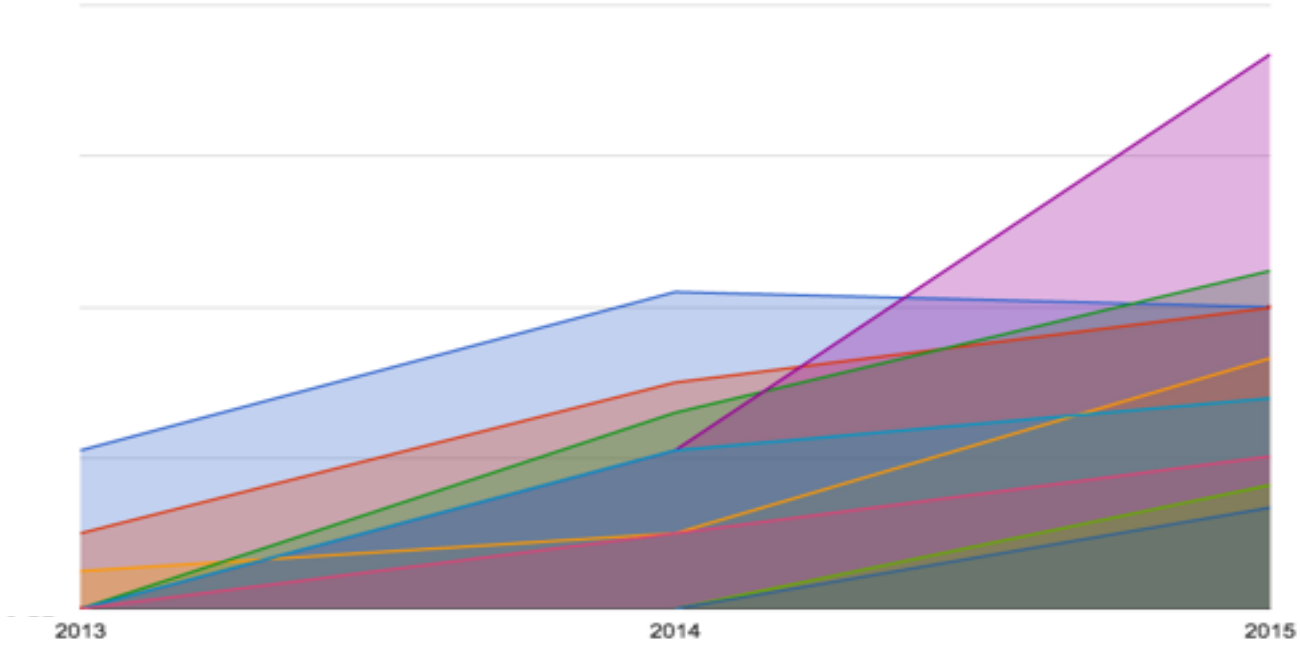
CRITICAL TOOL FOR OPERATIONS TEAMS

- They should feel like the product was built for them, speaks their language and solves their problems
- Alerting that people can rely on as their source of truth
- Opsmatic integrated with Server Monitoring as a new paid product
- Blammo!

EVENTS RULE EVERYTHING AROUND ME

- We will be differentiating ourselves around the concept of capturing “everything” as a contrast to “lossy” aggregates.
- We want to expose a consistent set of filtering and query tools. This means converting nearly all of today’s functionality to be event powered.
- This will be a ton of work.

BIG ACCOUNTS GET BIGGER



What do we need to get there?

- Developers (and users) need clarity between events and aggregates
- It must be easier and faster to try new ideas
- We must make inherently “safer” systems, so that mistakes do not become incidents
- We need to invest in our Data Tier

Events and Aggregates

Expanded role for events

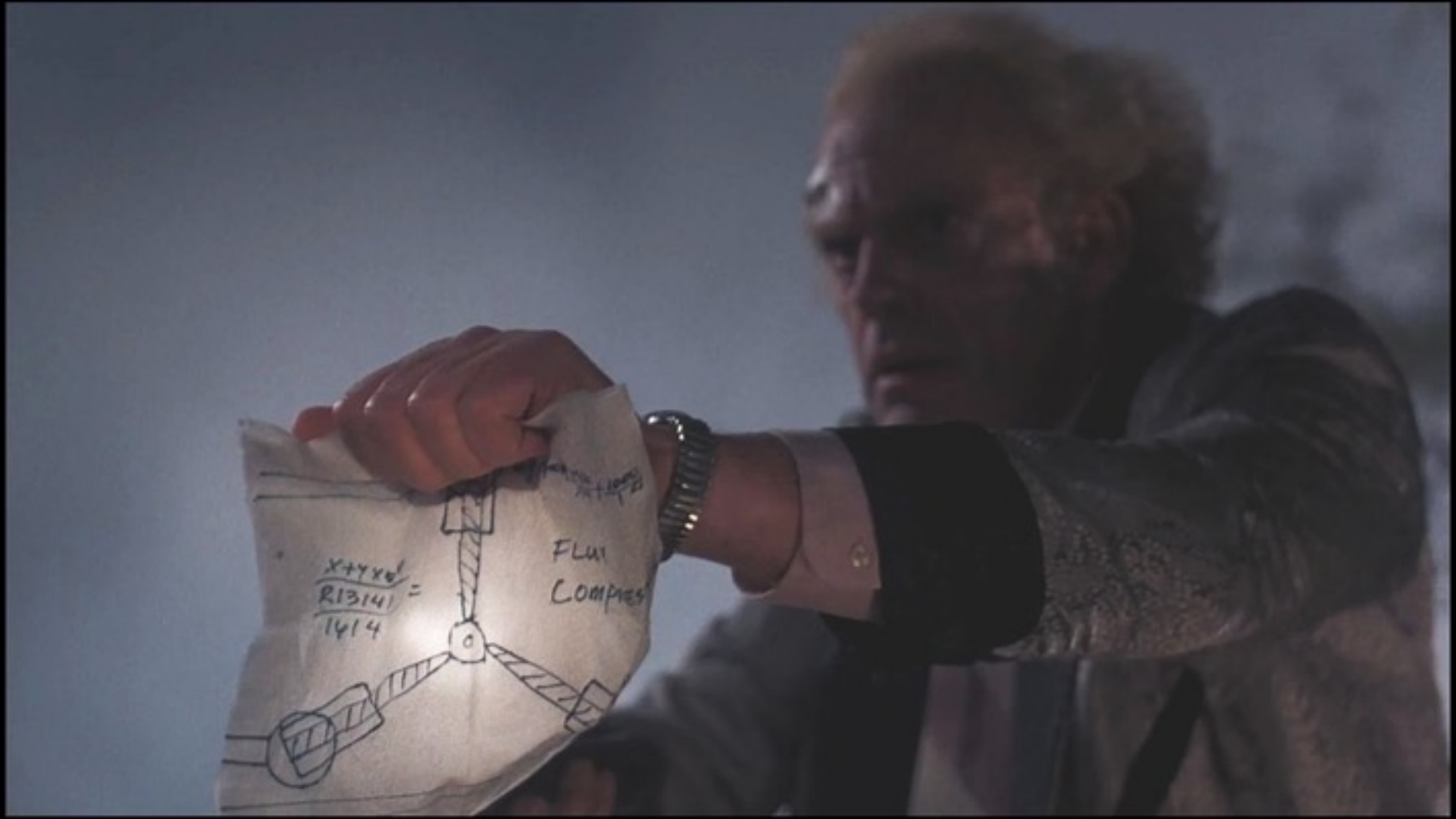
- Events will drive most use cases, allowing “slice and dice” for anything you want to investigate
- Increase retention over time as storage becomes cheaper

Aggregates for reporting

- Aggregated “metrics” will back a more powerful reporting and trending capability
- Customers should be able to see years of data and query it quickly.
- Keep less data, keep it longer. By moving most use cases to events, we may be able to streamline the metric space so that we can keep 1-hour, or even 1-minute, data forever. We certainly want years, not months, of data.

Bridge from events to aggregates

- Customers are going to want to define their own reports and trends based on their filter expressions. That means we need a path for event data to be rolled up into aggregated metrics.
- Just reading the data in bulk once a day probably won’t work. This is likely to require some cleverness.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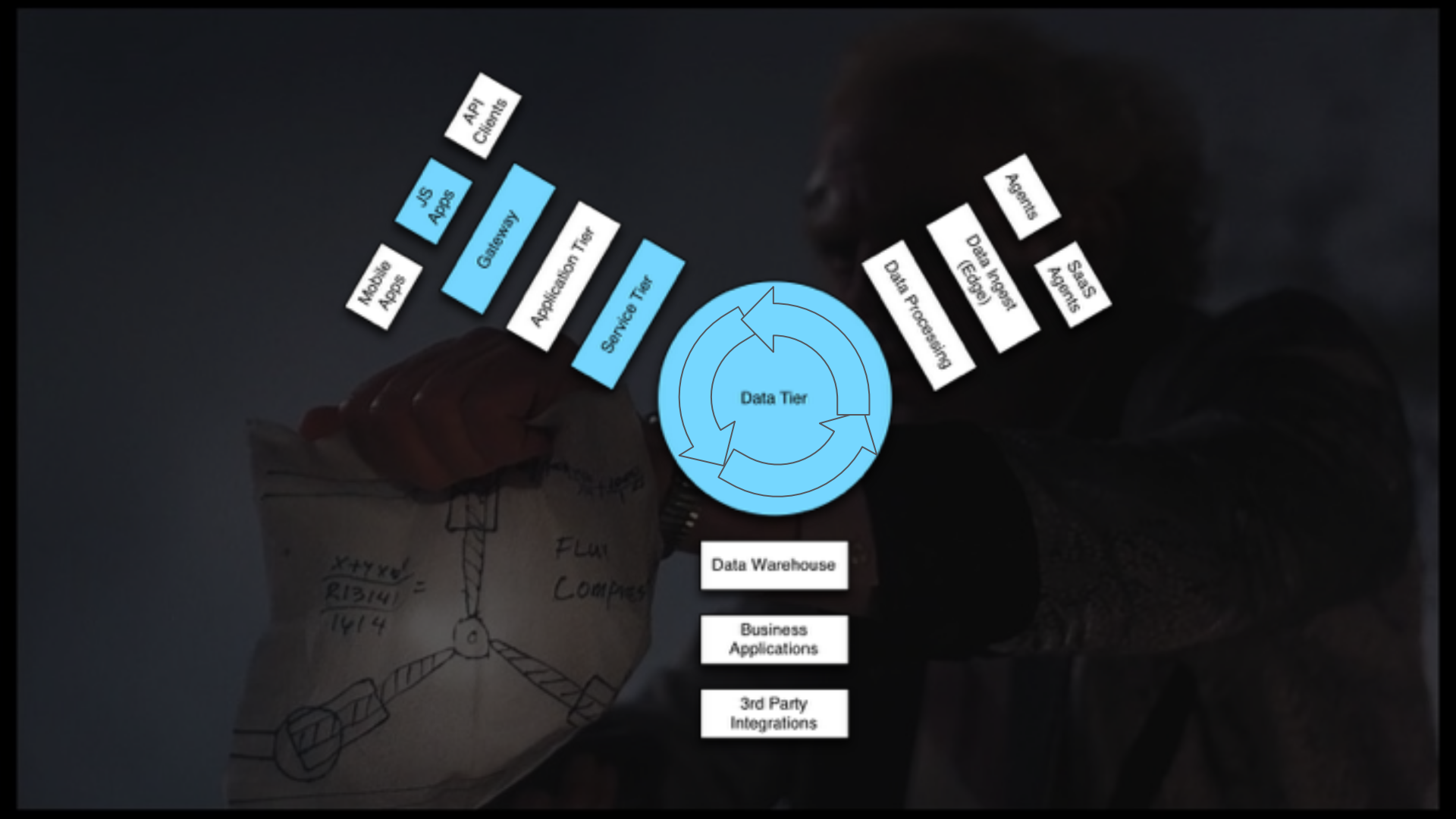
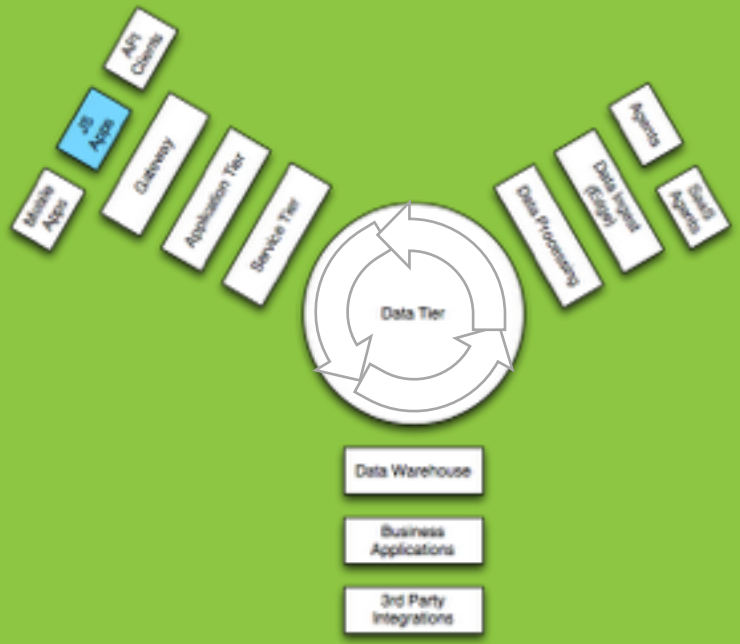

API Clients
JS Apps
Mobile Apps
Gateway
Application Tier
Service Tier
Data Tier
Data Processing
Data Ingest (Edge)
Agents
SaaS Agents
Data Warehouse
Business Applications
3rd Party Integrations

Already doing it!

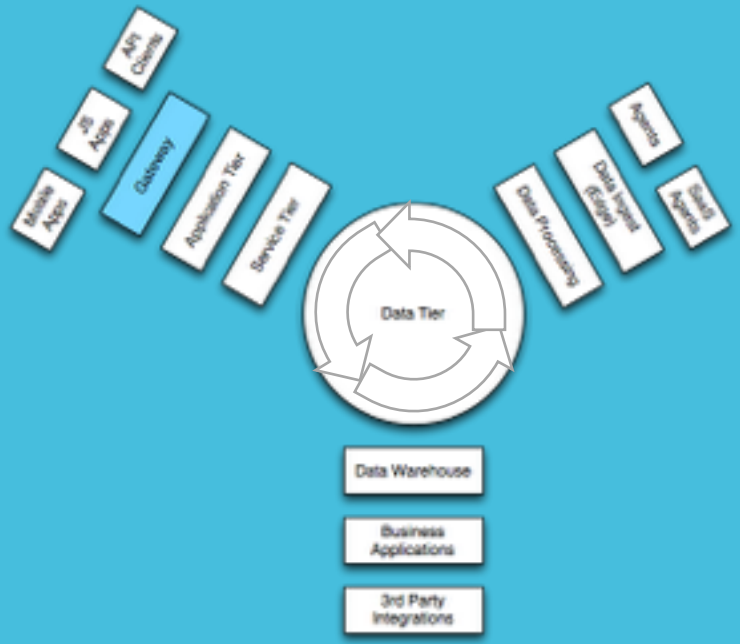
JavaScript is the web UI

- Treat JavaScript as their own applications, built and deployed independently of the server-side apps.
- Proven out by Insights, Browser, Service Maps, Filterable Errors, etc.
- JS will follow the same pattern as Mobile Apps, but doesn't need to call the exact same APIs.



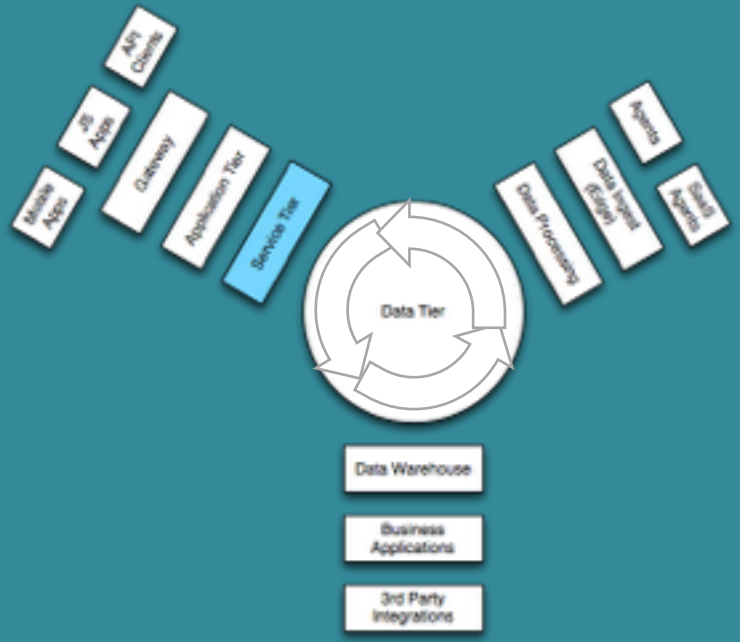
App & API Gateway

- Today we have many independent gateways for individual projects. We can standardize this.
- Service Routing under a single hostname avoids CORS issues and provides flexibility.
- Rate Limiting close to the edge for most impact
- Login Service integration will make it much easier for service authors to get auth right.



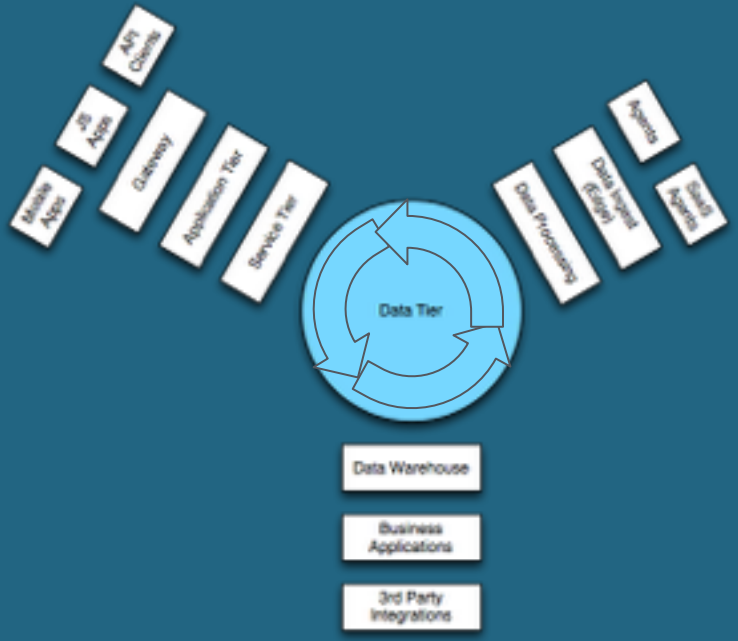
Catalog of platform components

- What is out there AND ready to use AND supported by a team?
- What each piece does and how to use it?
- Favor docs and APIs over human-human interaction. Building software at NR should be like building software on the outside, but better.



Data Tier

- Many components will have their own databases. The Data Tier is where shared data lives.
- Dirac for event data
- Timeslice store for aggregates
- A place for “blob” data like traces, errors and crashes
- A “Data Bus” where systems can publish live data asynchronously



Dirac

- Alert evaluation on events is a must
- Streaming results to get data to browsers fast and cheaply
- Storage efficiency to be able to handle all this data

In Progress!

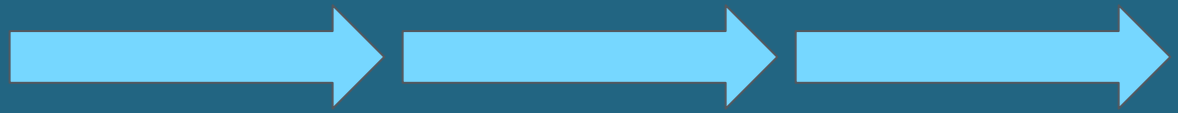
Timeslice Store

- Replace our legacy MySQL based Timeslice storage
- Fault tolerance and data replication. Loss of a system should not cause any customer impact.
- Must allow the storage and rapid scanning of years of data

Scalable Database

- Used for shared data that is not Events or Timeslices
- Tolerant of node failures
- Easy to maintain

Data Bus between orgs



- Kafka is the leading candidate, since we're already investing heavily in it
- Improve velocity by allowing teams to discover and use data that already exists
- Improve safety and reliability by encouraging async interactions

Kafka

- Significant increase in scale. We're betting big on Kafka and our data volumes keep going up.
- When Kafka is down, we're down. So we need to invest in a more reliable architecture. This will likely involve redundant clusters of some form.
- Introduction of a Message Envelope needed for things like de-duping of messages and better flexibility around message formats.

The Future

Hosting Infrastructure

- International or other “regions” will be used for isolation, with no customer data flowing from one to another
- Multiple datacenters in a metro area can provide “zones” for reliability