THE EVENT-DRIVEN UI BRIDGING THE GAP

KEVIN BADER



LIVE UPDATES!

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Inbox (6) Starred Seet Mail Drafts		• *		Google+	Peter Harbison added you on Google* - Follow and share with Peter by adding him to a cir	Sep 16
				YouTube	Your Personal YouTube Digest - Sep 16, 2011 - Change Email Preferences YouTube Logo	Sep 16
				Sara Goetz	Best of Yosemite - Need to pick your brainf My sisters and I are taking a quick weekend trip t	Sep 15
 Hiking 	•			Phil Sharp	Assignment M - Did you get the assignment for last Friday's project? I couldn't make it to cla	Sep 15
Home Receipts To Do Usgent! More •				Michael, me (2)	congratulations! - Thanks! On Thu, Sep 15, 2011 at 8:39 AM, Michael Bolognino wrote: Hey	Sep 15
				Mex Gawley	Dinner this evening? - having some folks over for dinner tonight, do you want to join us? If I b	Sep 15
		•		Meredith Blackwell	birthday plans - Hey guysl fm turning 25 a week from today. Since my birthday falls on a We	Sep 14
				Meredith Blackwell	oli heyyy - HiTT just wanted to say drop a line and say hello since we haven't talked in a while	Sep 14
Chat	•			Susanne, me (2)	hiking on weekend? - Peter On Thu, Mar 6, 2008 at 1:12 AM, Susanne Nagy wrote: Uhm, s	Sep 14
Search, chat, or SMS			D	me Phil, Meredith (5)	Hile this weekend! - 1. great ideal I call shotgun in Peter's car. On Wed, Sep 14, 2011 at 3.2	Sep 14
 Jason Hiking Set status here 				Kathleen Chen	Costume party - I'm thinking of dressing up as a big pine tree for the party on Friday. Do you	Sep 12
📞 Call phone				Paul McDonald	Fun Hike Yusterday! - Thanks for the great hike yesterday, it was assessmed Paul Paul Mc	Sep 12
Merodith Peter				Arielle Reinstein	July 4th weekend - Hi there: I heard you'll be around this weekend and fd izve to go for a hike	Sep 12
o Emily ax Michael ax Paul		•	٠	JS Bach	Tonhalle concert Friday - Hey man, there's a great concert this Friday evening. It'd be great i	Sep 12
		•		Yan Tseytlin	Hey there! - I heard you found a great place to go hiking. Let me know when we're meeting up.	Sep 12







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LIVE UPDATES

Example: Conference Registration

- Allow people to register to the conference
- When someone has registered:
 - send an email to the organizing team
 - send an email to the new participant
- Assign a mentor to the participant
 - It might take a while to find a good match..



One backend, one frontend:

one source of data and events.



Event-driven microservices.

Still one frontend.



Event-driven microservices.

Still one frontend.



Event-driven microservices.

Still one frontend.

Microservice: How do I know if someone is currently online?

Frontend:

How to subscribe to events?

Microservices emit events.

Frontends consume and produce events the same way other microservices do.

Frontends not aware how events are stored.

Only open standards.

Enable the frontend to participate in choreography:

- Frontends subscribe to events
- Microservice emit events and don't target specific frontends
- Enhances decoupling!

Microservices emit events.

Frontends consume and produce events the same way other microservices do.

Frontends not aware how events are stored.

Only open standards.

Frontends communicates the user's actions.

Microservices can react:

- start a (long-running) process
- analyze a user's behavior
- notify the support staff

• ...

Microservices emit events.

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Frontends not aware how events are stored.

Only open standards.

- Decouples teams
- Topic partitioning should not be part of the interface

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REACTIVE INTERACTION GATEWAY (RIG)



CHALLENGES

- 1. Scaling out: number of users, rate of events
- 2. Event sources: Kafka, Amazon Kinesis
- 3. Synchronous request, asynchronous processing
- 4. Authorization



Many users, ۲ few online

Events from all microservices



2. EVENT SOURCES

- Kafka as the de-facto standard for implementing event-driven architecture:
 - Confluent Kafka platform
 - Confluent Cloud on GCP
 - Azure Event Hubs has Kafka-compatible API
 - Amazon Managed Streaming for Kafka (MSK)
- Publish via HTTP
 - Easier to setup and use during dev and test
 - Used when decrypting data on-the-fly



3. SYNC REQUEST, ASYNC PROCESSING

- Asynchronous, event-driven processing is the new default
 - Decoupling: easy to add/remove microservices
 - Deployment: easy to deal with upgrades/rollbacks/downtime
- But: frontend and 3rd party clients often expect immediate response
 - Requires "conversion" of asynchronously processed result into synchronous request-response

3. SYNC REQUEST, ASYNC PROCESSING



4. AUTHORIZATION

- Is ESSENTIAL: any event may be subscribed to
- As little business logic at possible
- As pluggable as possible

4. AUTHORIZATION



subscribing to events publishing events

authorized by

JWT validation or calling a service

REACTIVE INTERACTION GATEWAY

Microservices should

- not handle long-lived connections
- not publish "special" events for frontend consumption

Frontends should

- be agnostic of event partitioning on the backend
- not rely on proprietary formats
- be able to publish events
- be able to control what events they are subscribed to



REACTIVE INTERACTION GATEWAY

- Free Software, Apache 2.0 License, on GitHub
- Open standards:
 - CNCF CloudEvents
 - HTTP/1.1 and HTTP/2
 - Server-Sent Events (SSE)
 - WebSocket
 - Kafka

REACTIVE INTERACTION GATEWAY

- No external dependencies
- Configuration using environment variables
- Available on Docker Hub

\$ docker pull accenture/reactive-interaction-gateway

• Scales like a stateless service

\$ kubectl scale deployment rig --replicas=10



CONCLUSION

- Real-time UI for great user experience
- Extending event-driven architecture to the frontend decouples frontend and backend
- The Reactive Interaction Gateway enables this in a scalable way, using open standards



Check out the Reactive Interaction Gateway and let us know what you think!

github.com/Accenture/reactive-interaction-gateway

accenturetechnology

Thanks to:

- Dominik Wagenknecht <- had the idea
- Mario Macai <- long-term core team member
- Accenture's Software Innovation team

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