THE KEY TO DESIGNING RELIABLE SYSTEMS

AUTONOMY & ASYNCHRONY

UNISYS | Securing Your Tomorrow®

Application Services Cloud Architect

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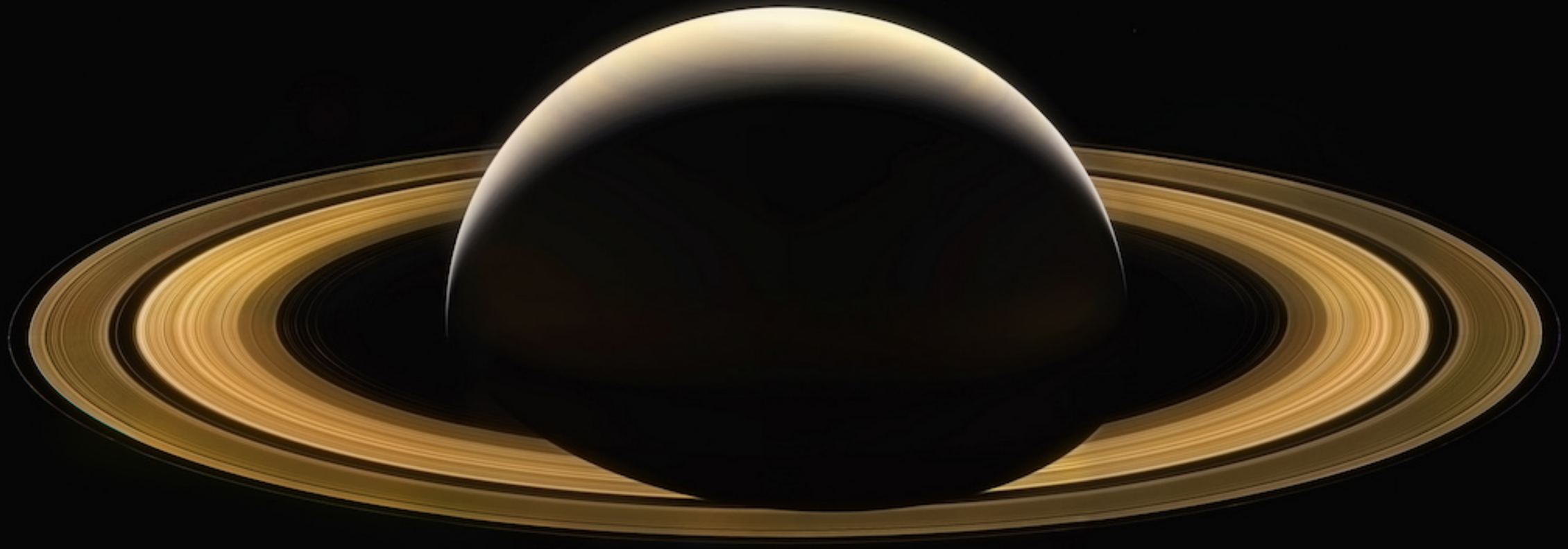

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Asynchrony

```
// Create a client object
CalculatorClient calcClient = new
            CalculatorClient("CalculatorEndpoint");
// Call the Add service operation.
double value1 = 100.00D;
double value2 = 15.99D;
double result = calcClient.Add(value1, value2);
```

Making a synchronous call

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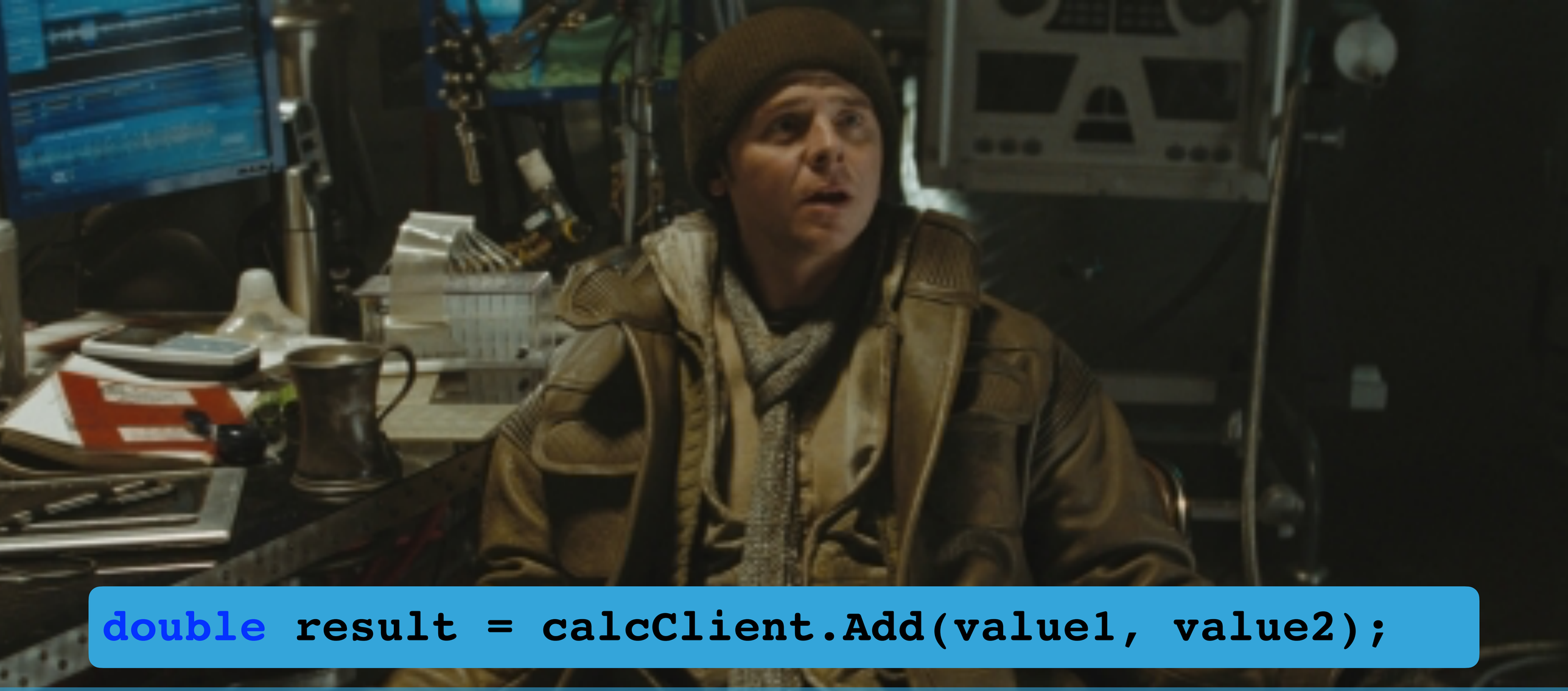


```
double result = calcClient.Add(value1, value2);
```

LATENCY IS ZERO ?!

Source: http://trekmovie.com/2009/04/09/star-trek-soundtrack-cover-tracklist-new-movie-images-amc-promo-video/

```
double result = calcClient.Add(value1, value2);
```

NETWORK IS RELIABLE ?!

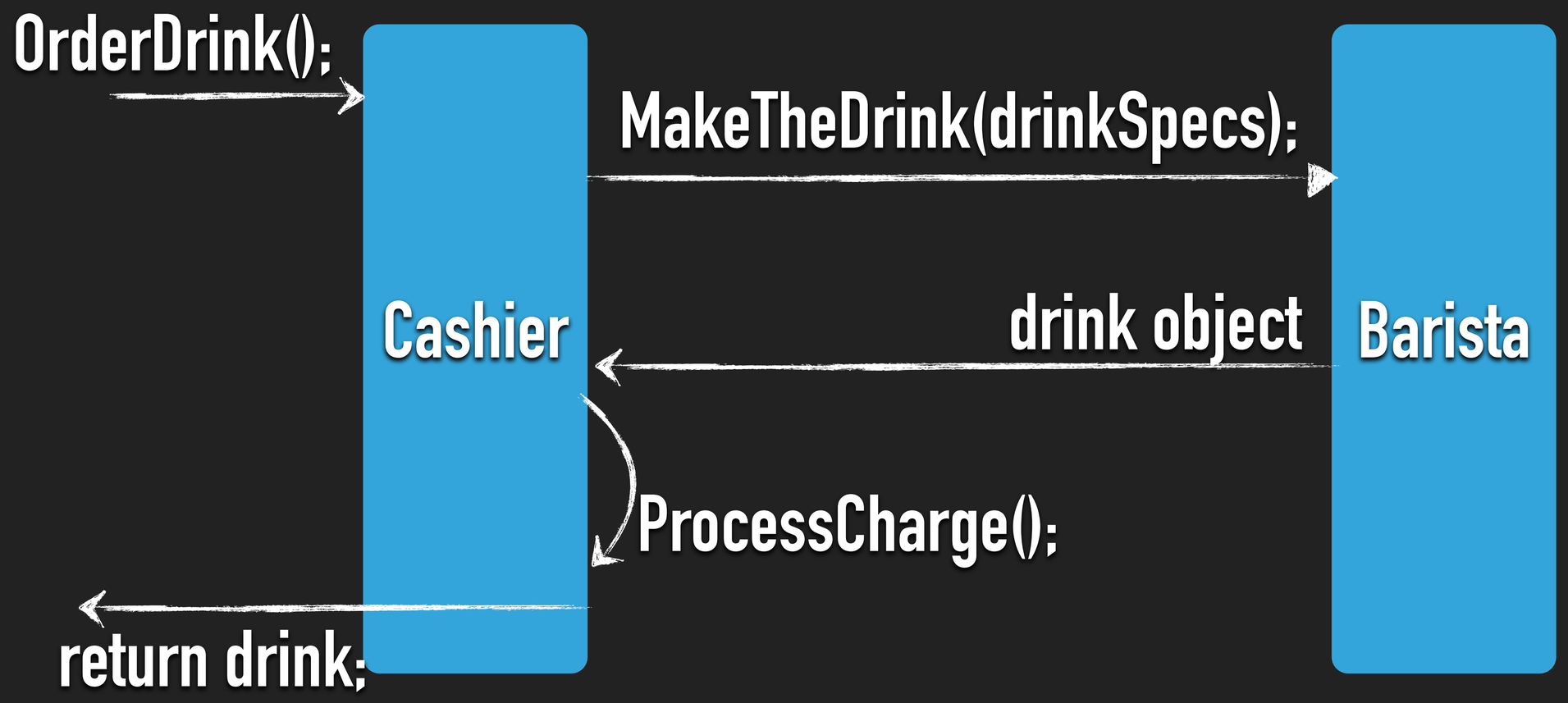
Source: http://trekmovie.com/2009/04/09/star-trek-soundtrack-cover-tracklist-new-movie-images-amc-promo-video/

COUPLING

Source: http://www.themost10.com/interesting-facts-about-starbucks/

Source: https://www.theatlantic.com/business/archive/2015/01/the-logic-of-long-lines/384870/

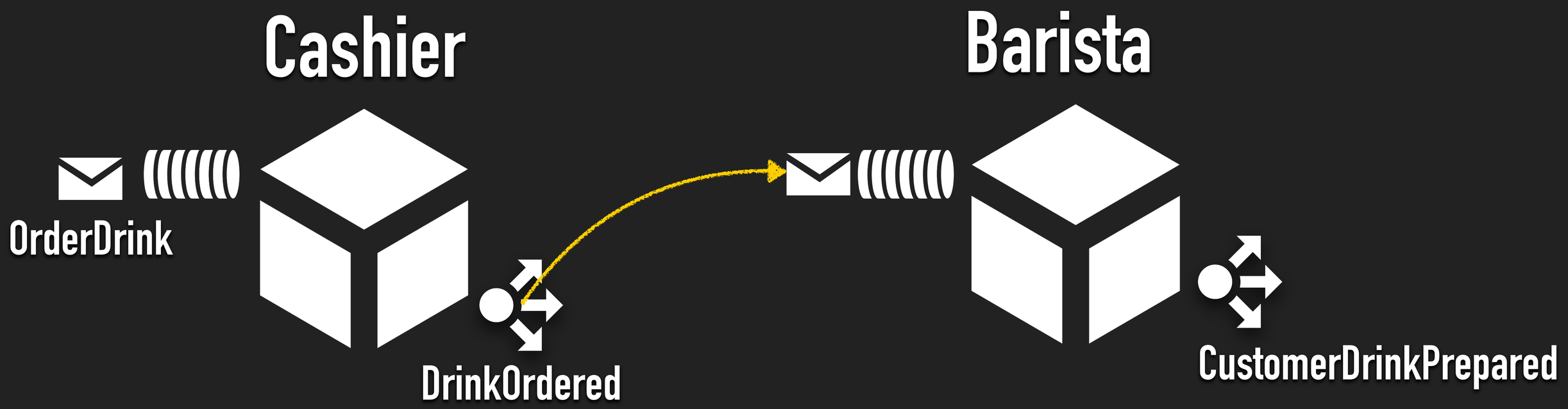
Source: http://www.huffingtonpost.com/2015/04/11/peter-dinklage-game-of-thrones-scene-secret-meaning_n_7046990.html



Temporal Coupling

Source: http://ihateworkinginretail.ooid.com/wp-content/uploads/2014/09/BARISTA1.jpg

Source: http://www.holytaco.com/9-most-annoying-people-starbucks/



Publish - Subscribe

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EVENT-DRIVEN ARCHITECTURE

Source: http://www.iainclaridge.co.uk/blog/wp-content/uploads/2013/01/snow_bus.jpg

QUEUES

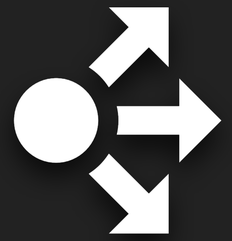
Source: http://www.planetmountain.com/img/1/12182.jpg

Do something

Something of importance happened

Command

Domain Event



Commands & Events

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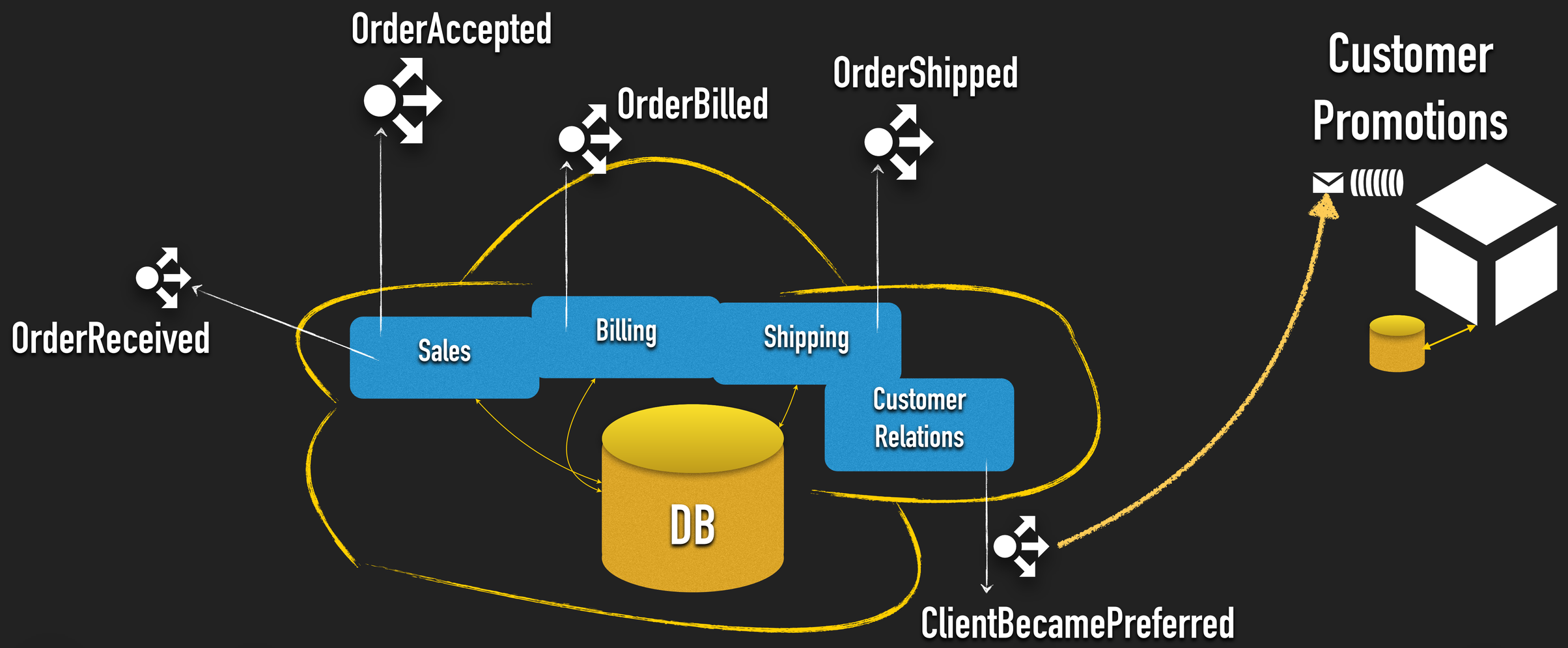
DEALING WITH MONOLITHS?

Source: http://mashable.com/2015/02/10/everything-you-ever-wanted-to-know-about-jaba-the-hut/#RKHP6gUZzEqu



Instrument with Events

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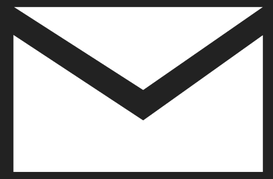
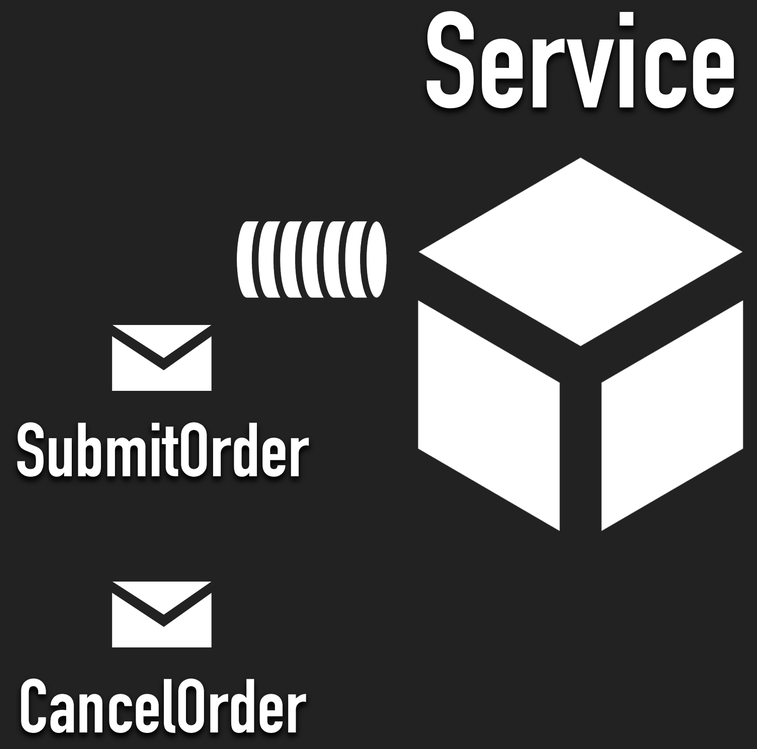
ORDER OF OUT

CancelOrder



SubmitOrder




```
class SubmitOrderHandler :
IHandleMessages <SubmitOrder>
{
  public void
  Handle(SubmitOrder msg)
  {
   //  Save the order
   CreateOrder(msg.Id, msg.Data);
  }
}
```

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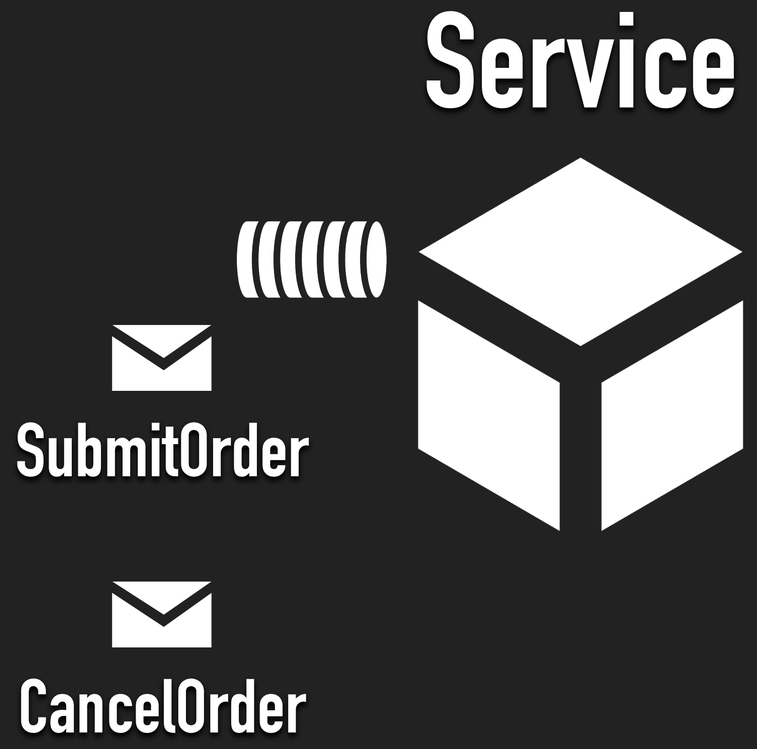


```
class CancelOrderHandler :
IHandleMessages <CancelOrder>
{
  public void
  Handle(CancelOrder msg){
     // Get the order object
      var order = GetOrder(msg.Id);
      if (order != null)
          CancelOrder(order);
  }
}
```

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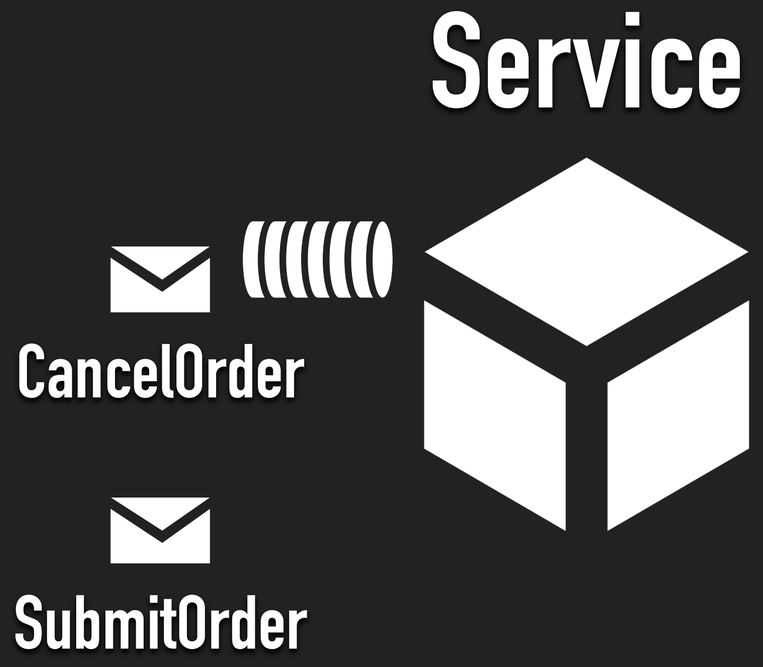
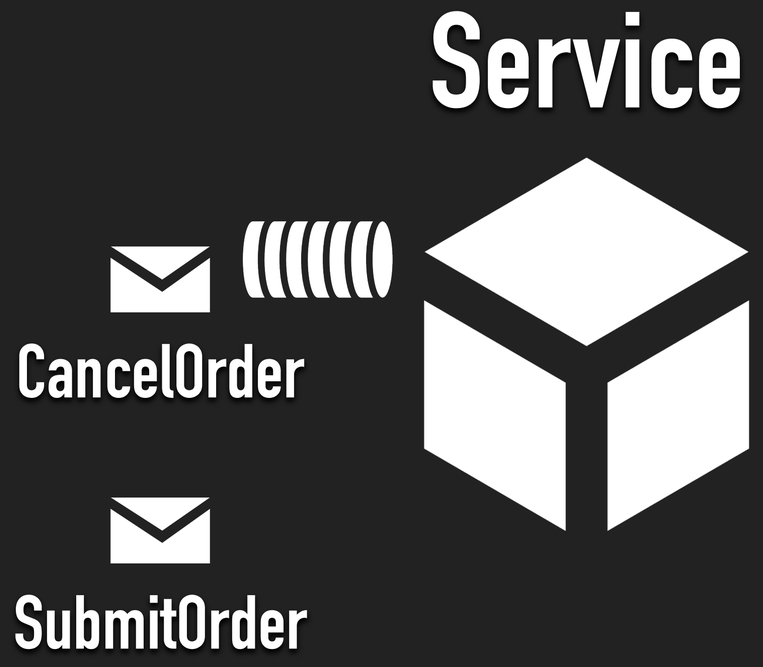
```
public void
  Handle(SubmitOrder msg)
  {
   CreateOrder(msg.Id,
   msg.Data);
  }
```

```
public void
Handle(CancelOrder msg)
{
 var order = GetOrder(msg.Id);
 // Get the order object
 if (order != null)
   CancelOrder(order);
}
```




```
class CancelOrderHandler :
IHandleMessages <CancelOrder>
{
  public void
  Handle(CancelOrder msg)
  {   // Get the order object
      var order = GetOrder(msg.Id);
      if (order != null)
          CancelOrder(order);
  }
}
```




```
public class RefundPolicy :
   Saga<OrderData>,
        IAmStartedByMessages<SubmitOrder>,
        IAmStartedByMessages<CancelOrder>,
        IHandleTimeouts<BuyersRemorseIsOver>
    {
     public void Handle(SubmitOrder message) { ...}

     public void Handle(CancelOrder message) { ...}

     public void Handle(BuyersRemorseIsOver msg)
     {
        ...
     }

    }
```

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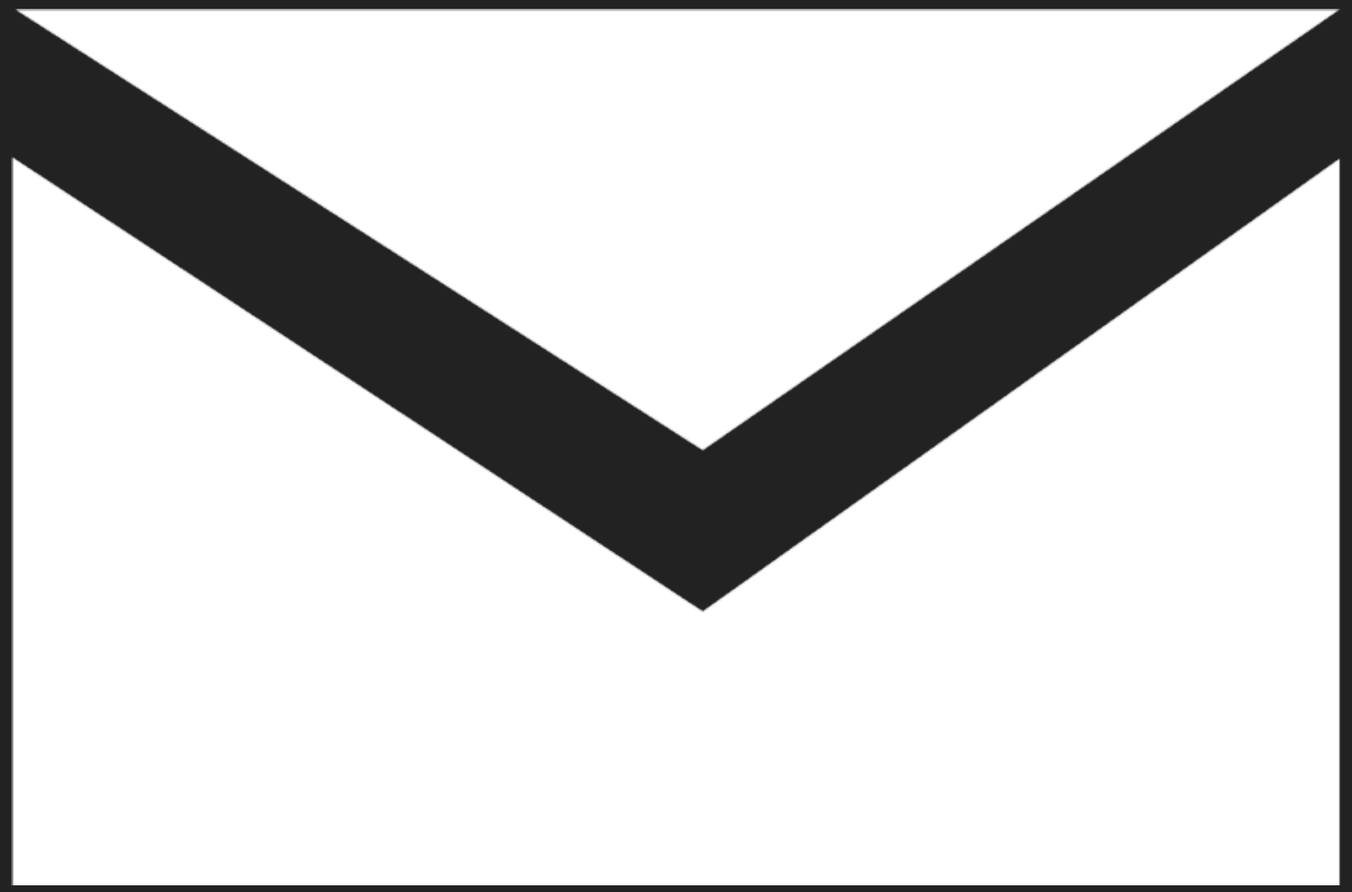

Vs

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MAKE THE IMPLICIT EXPLICIT

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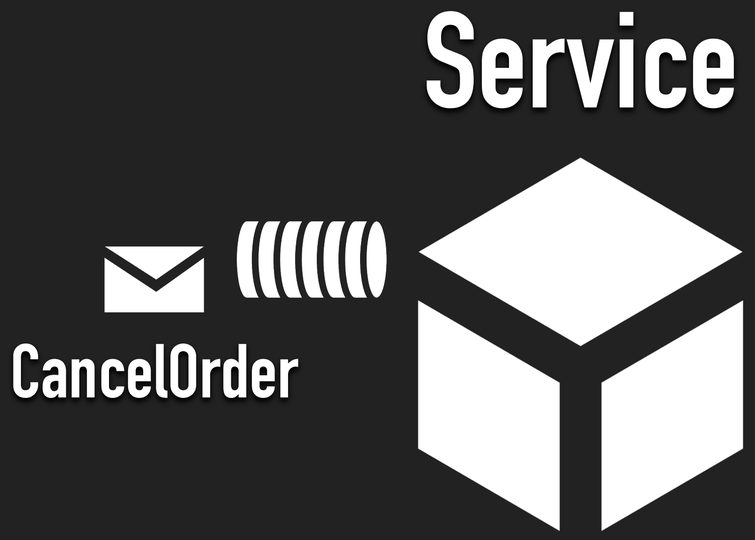

IDEMPOTENT
IDEMPOTENT
IDEMPOTENT

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WHERE'S MY MESSAGE?

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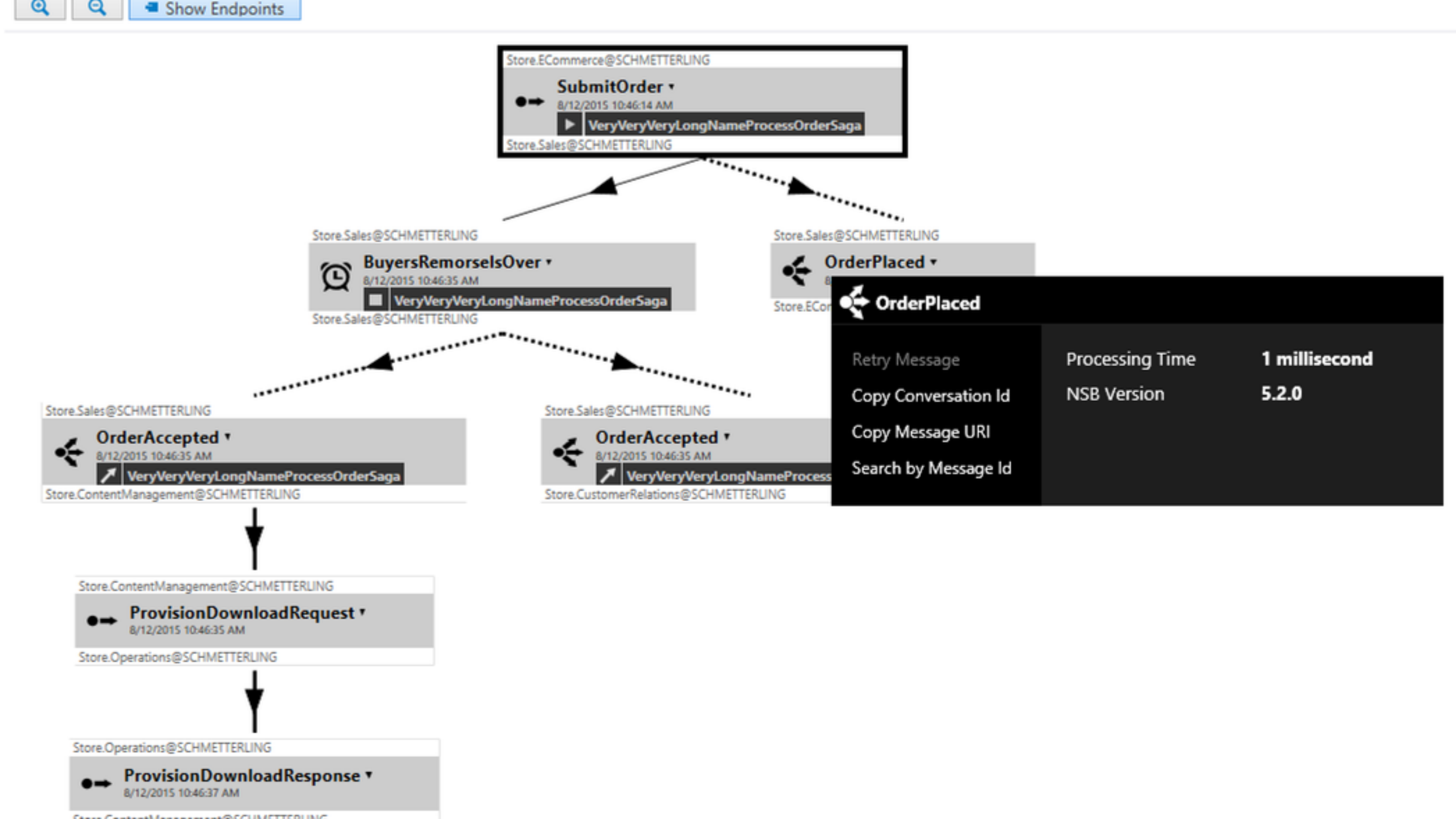

Show Endpoints
Store.ECommerce@SCHMETTERLING
SubmitOrder
8/12/2015 10:46:14 AM
VeryVeryVeryLongNameProcessOrderSaga
Store.Sales@SCHMETTERLING
Store.Sales@SCHMETTERLING
BuyersRemorselsOver
8/12/2015 10:46:35 AM
VeryVeryVeryLongNameProcessOrderSaga
Store.Sales@SCHMETTERLING
Store.Sales@SCHMETTERLING
OrderPlaced
OrderPlaced
Retry Message
Copy Conversation Id
Copy Message URI
Search by Message Id
Processing Time
1 millisecond
NSB Version
5.2.0
Store.Sales@SCHMETTERLING
OrderAccepted
8/12/2015 10:46:35 AM
VeryVeryVeryLongNameProcessOrderSaga
Store.ContentManagement@SCHMETTERLING
Store.Sales@SCHMETTERLING
OrderAccepted
8/12/2015 10:46:35 AM
Store.CustomerRelations@SCHMETTERLING
Store.ContentManagement@SCHMETTERLING
ProvisionDownloadRequest
8/12/2015 10:46:35 AM
Store.Operations@SCHMETTERLING
Store.Operations@SCHMETTERLING
ProvisionDownloadResponse
8/12/2015 10:46:37 AM

Show Message Data

← Back to Message View

OrderAcceptedProcessor

guid cdd976bd-c174-4358-aead-a2f4001c9e3a

OrderAccepted
3/20/2014 1:44:07 AM

OrderID = 208
CustomerName = Joe
PaymentInfo = 4111111111111111
TotalAmount = 25.00

Saga Initiated 3/20/2014 1:44:11 AM

Properties: All / **Updated**

OrderAccepted (new) = {
"OrderID": "208",
"CustomerName": "Joe"
"PaymentInfo": "411111
"TotalAmount": 25.0
}

SubmitPayment
3/20/2014 1:44:11 AM

BillingName = Joe
Amount = 25.00
PaymentInstrument = 4111111111111111

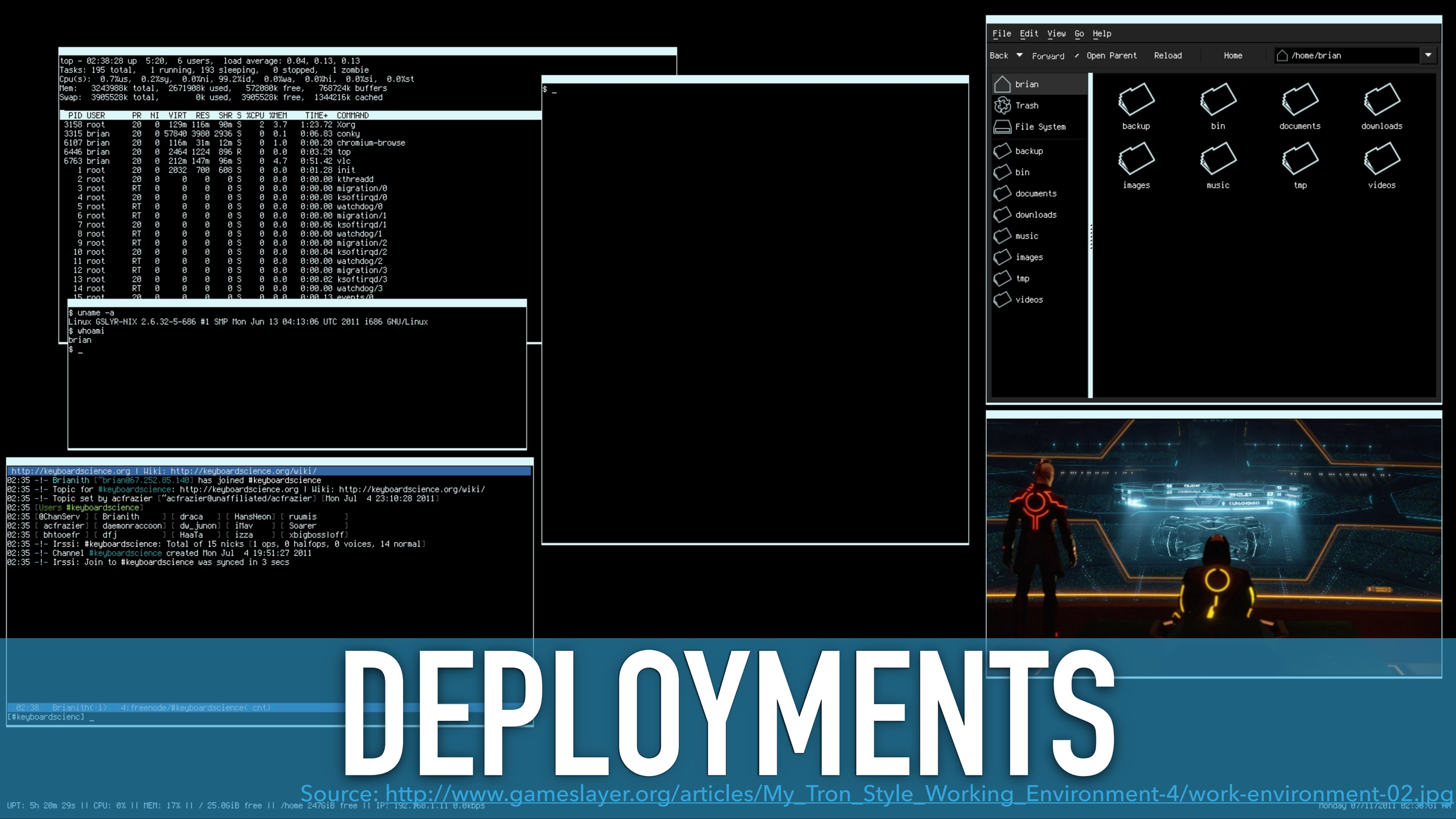
SubmitPaymentResponse
3/20/2014 1:44:17 AM

AuthCode = OK

Saga Updated 3/20/2014 1:44:18 AM

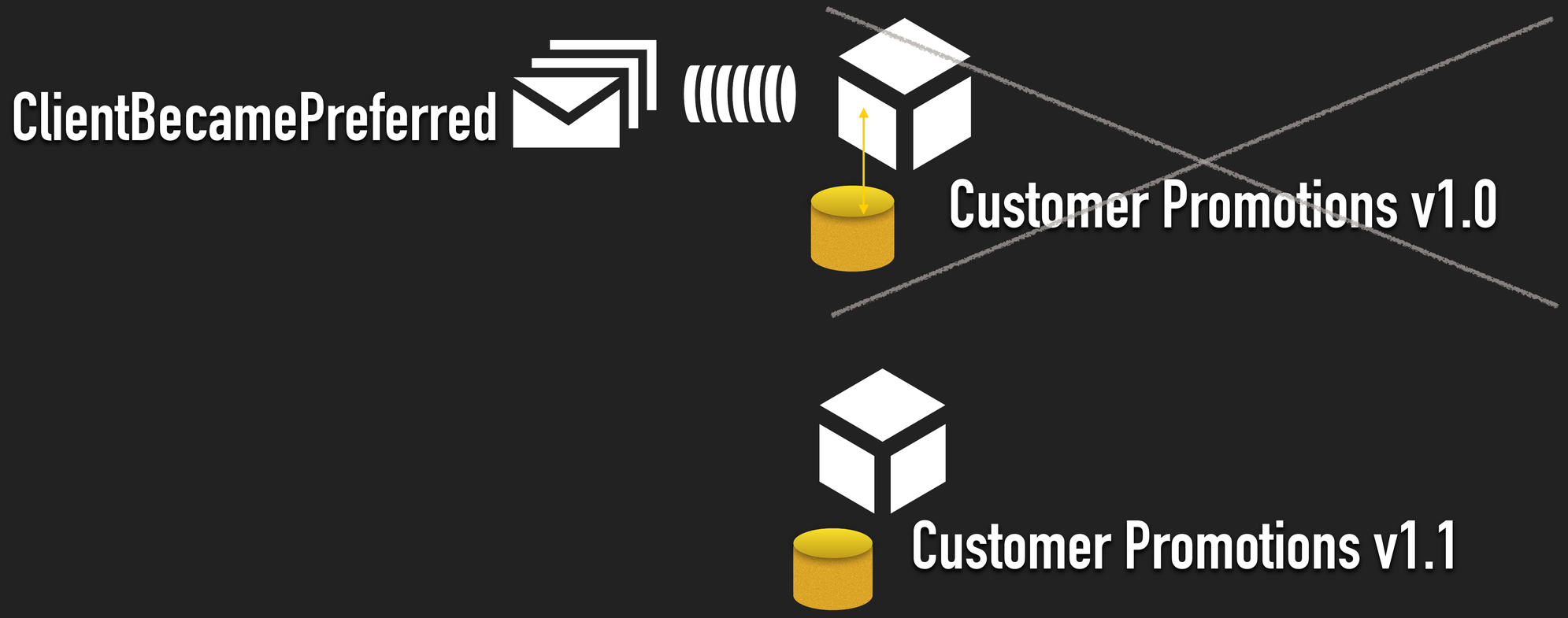
Properties: All / **Updated**

Saga Complete
3/20/2014 1:44:18 AM



DEPLOYMENTS

Source: http://www.gameslayer.org/articles/My_Tron_Style_Working_Environment-4/work-environment-02.jpg



SIDE BY SIDE

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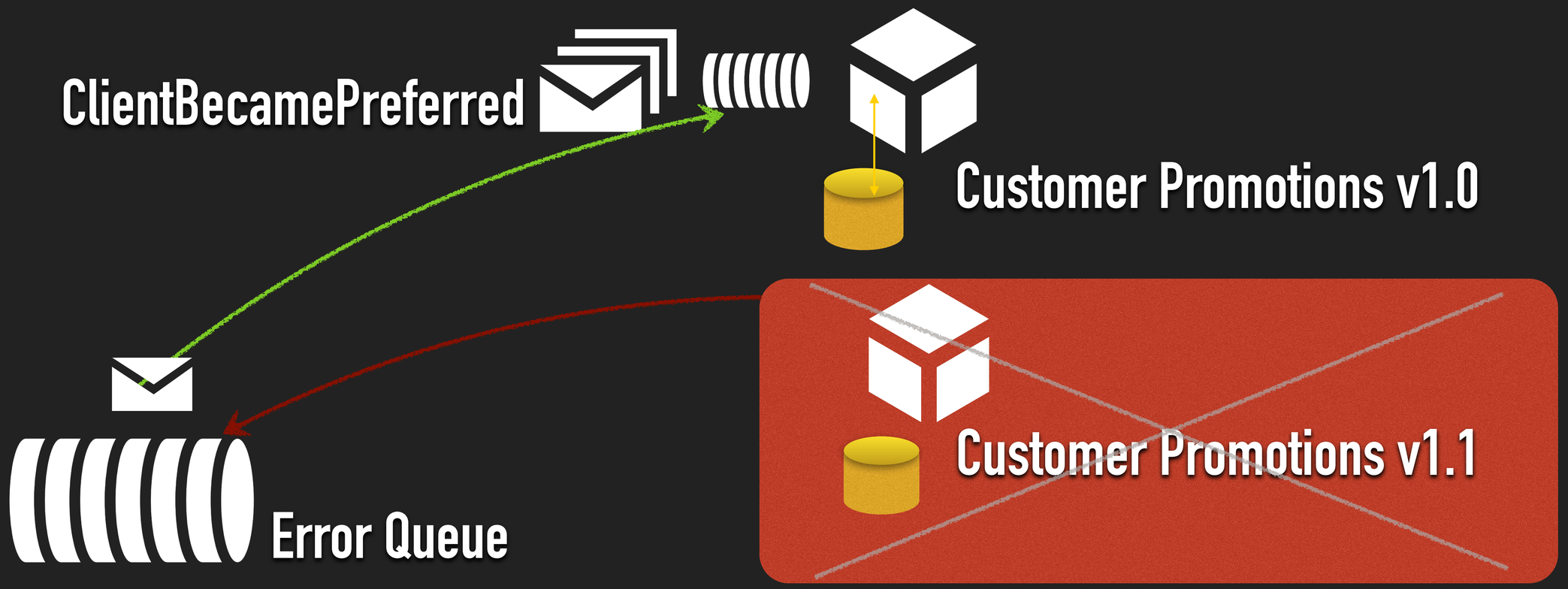

ROLLBACKS

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MONITORING

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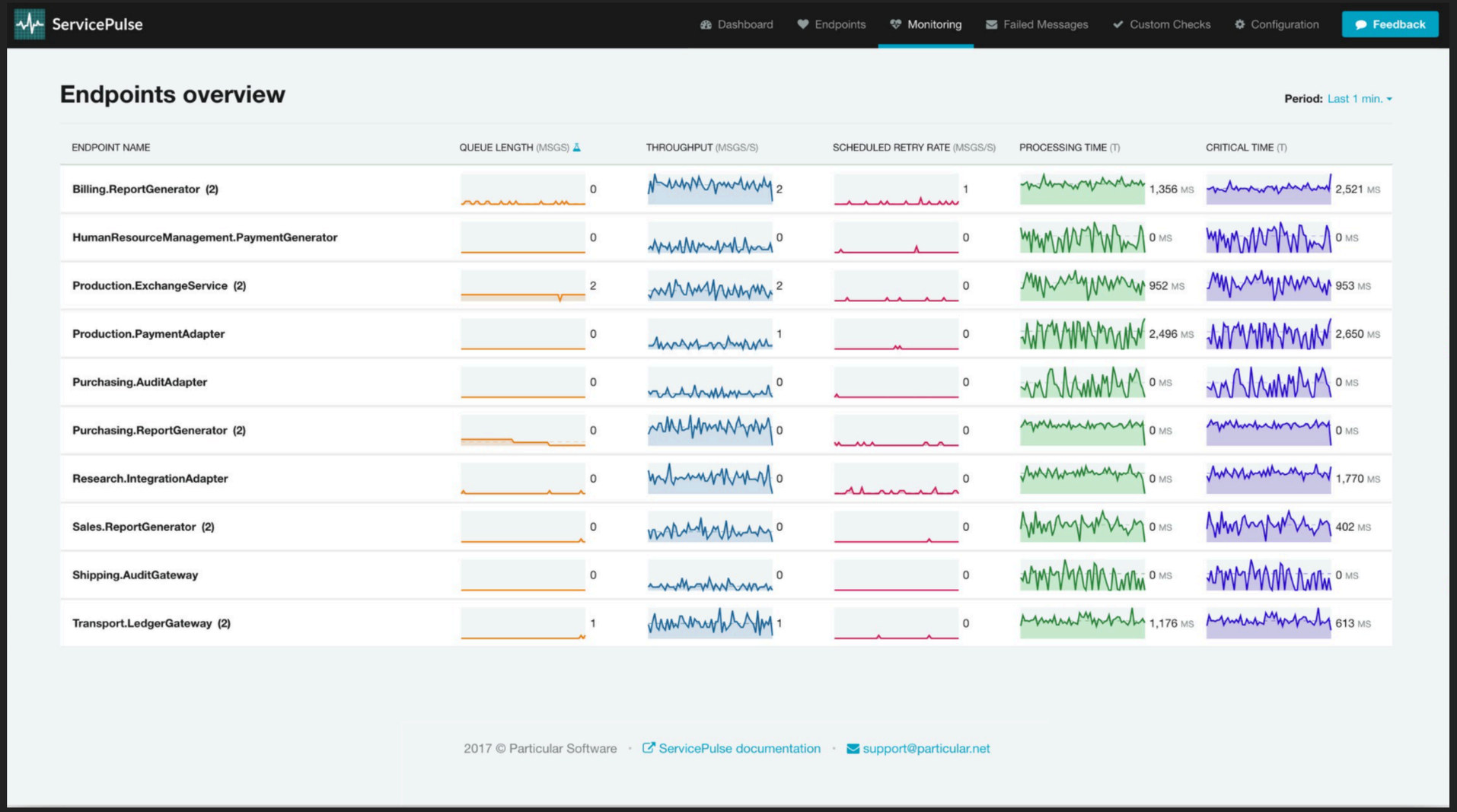
Queue Length

MessageRetry

Processing Time

Message Throughput

Critical Time



Embrace Asynchrony
with
Messaging
Strive for Autonomy
Reliability
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THANK YOU

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