



Improve App Performance Using Async Messaging with Service Broker

Allen White, Owner, DataPerf Professionals
Moderated By: Tobiasz J. Koprowski

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Allen White
Owner, DataPerf Professionals

Owner, DataPerf Professionals

Career covered multiple disciplines – operations, development, telecommunications, network design/administration and database design and administration

40+ years in IT

Started using Sybase in 1992, MS SQL Server in 1995.
PASS Director

MVP

Microsoft Certified IT Professional: Database Administrator and Database Developer, Microsoft Certified Trainer (MCT) Awarded Microsoft MVP Award for SQL Server for last 11 years



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Agenda

- Intro to Service Broker
- Asynchronous Updates
- Heavily Overloaded Triggers



What Is Service Broker

- Asynchronous Messaging System
- Uses Queues for Sending & Receiving
- Messages Delivered In Order
 - If links down, messages wait
 - Delivered as soon as links reestablished
- Can be Encrypted for Secure Transfer



Components

- Message Types
- Contracts
- Queues
- Services
- Conversations
- Endpoints
- Routes



Message Types

- Send Messages
 - Between Databases on a Single Server
 - Between SQL Server Instances on a Windows Server
 - Between Different Physical Servers

```
CREATE MESSAGE TYPE
[//AWSync/Sync/HumanResourcesEmployee]
AUTHORIZATION dbo
VALIDATION = WELL_FORMED_XML
GO
```



Contracts

- Contracts define what message types are allowed to be sent, and in which direction

```
CREATE CONTRACT [//AWSync/Sync/IntContract]
    AUTHORIZATION dbo
    ( [//AWSync/Sync/HumanResourcesEmployee] SENT BY ANY,
      [//AWSync/Sync/PersonContact] SENT BY ANY,
      [//AWSync/Sync/PurchasingVendor] SENT BY ANY )
GO
```



Queues

- A queue is a place to store messages until they can be delivered.
- Can also auto-activate a message handling process

```
CREATE QUEUE IntQueue
    WITH STATUS = ON,
         RETENTION = OFF
GO
```



Services

- Send the Messages on the Queue to their Destination
- Receive the Messages Coming from Other Senders

```
CREATE SERVICE [//IntSite/Sync/IntService]
AUTHORIZATION IntUser
ON QUEUE IntQueue
([//AWSync/Sync/IntContract])
GO
```



Conversations

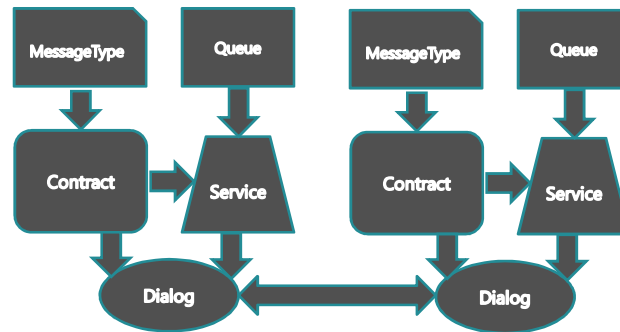
- A channel on which to send a message

```
BEGIN DIALOG @InitDlgHandle
FROM SERVICE [//IntSite/Sync/IntService]
TO SERVICE N'//ExtSite/Sync/IntService'
ON CONTRACT [//AWSync/Sync/IntContract]
WITH
    ENCRYPTION = ON;

SEND ON CONVERSATION @InitDlgHandle
MESSAGE TYPE [//AWSync/Sync/HumanResourcesEmployee]
(@ChangeMsg);
```



Let's Put it Together



Service Broker Intro

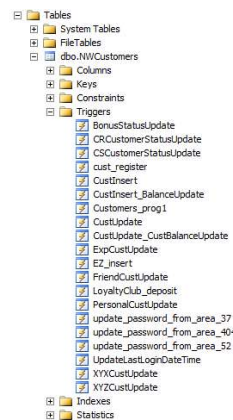
- Demo

Asynchronous Database Updates

- Not all database updates have to happen in real time
- SQL Server provides locking mechanisms to maximize concurrency
- High volume of insertions can cause collisions and lower performance
- Asynchronous operations allow us to support idea of "Eventual Consistency"

Heavily Overloaded Triggers

- Application uses triggers to cascade updates
- Performance issues due to poorly written triggers
- Replace all these with one trigger
- Convert triggers to stored procedures
- Turn synchronous operation into an asynchronous one



Asynchronous Updates and Triggers

- Demo



References

- Pro SQL Server 2008 Service Broker
 - Klaus Aschenbrenner
 - <http://www.amazon.com/Pro-Server-2008-Service-Broker/dp/1590599993>
- Service Broker External Activator Step-by-Step
 - <http://old.devkimchi.com/2014/11/08/service-broker-external-activator-for-sql-server-step-by-step-1/>





Coming up next...

[Power BI Tips to Make Stuff Work](#)

Manohar Punna



Thank you for attending



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