GFT

Messaging in .NET

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AGENDA

1. Request-reply communication
2. Message passing
3. AMPQ
4. Basic message flow
5. Various exchange types
6. Other features
7. Documentation

Request-reply communication

- Basic concept in communication supported by most development environments
- Point-to-Point communication
- Clear separation between a client and a server
- Every request requires a reply
- Synchronous processing
- Problems
  - notifications
  - multiple replies to a single message
  - load balancing
  - failover

Message passing

- Concept similar to traditional or electronic mail
- Asynchronous communication
- Middle-tier software required for message passing - broker
- Various routing (addressing) schemes
- Several communication patterns
  - request-reply (RPC)
  - one-to-one
  - one-to-many
- Client/Server becomes Publisher/Consumer
- **Not only network communication!**

Messaging solutions

- Software:
  - MSMQ
  - Apache ActiveMQ
  - Windows Azure Service Bus
  - IBM WebSphereMQ
  - RabbitMQ
- Hardware
  - Solace
  - Tervela
  - Apigee
- What to choose?
- Do all solutions provide the same concepts, terminology and features?

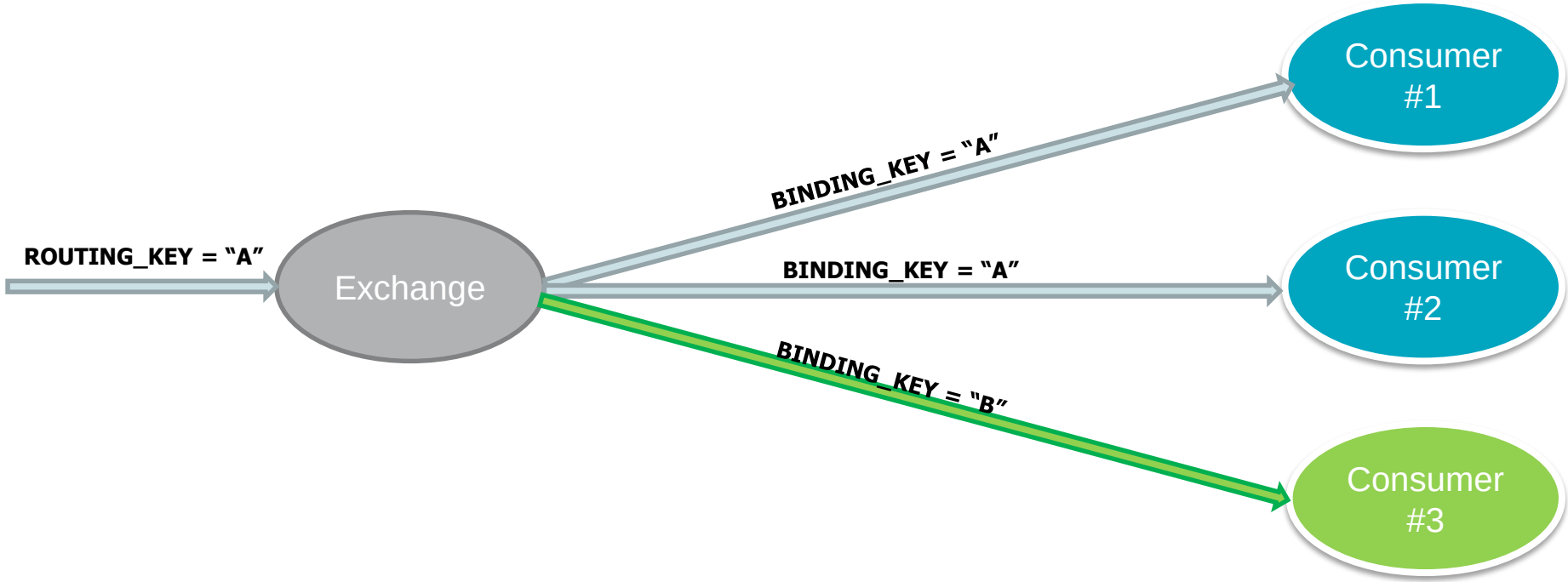
AMPQ

- Advanced Message Queueing Protocol
- Wire format
- Relies on TCP/IP for packet exchange
- Standard naming of communication components
- Mandates the behavior of the message provider and the client
- Provides:
  - Flow control
  - Message-delivery guarantees
- Includes features such as:
  - queueing
  - routing (point-to-point, publish-subscribe)
  - reliability
  - security (SASL/TSL)
  - load balancing (consumer not queue based)
- Originated from JPMorgan Chase

Basic message flow

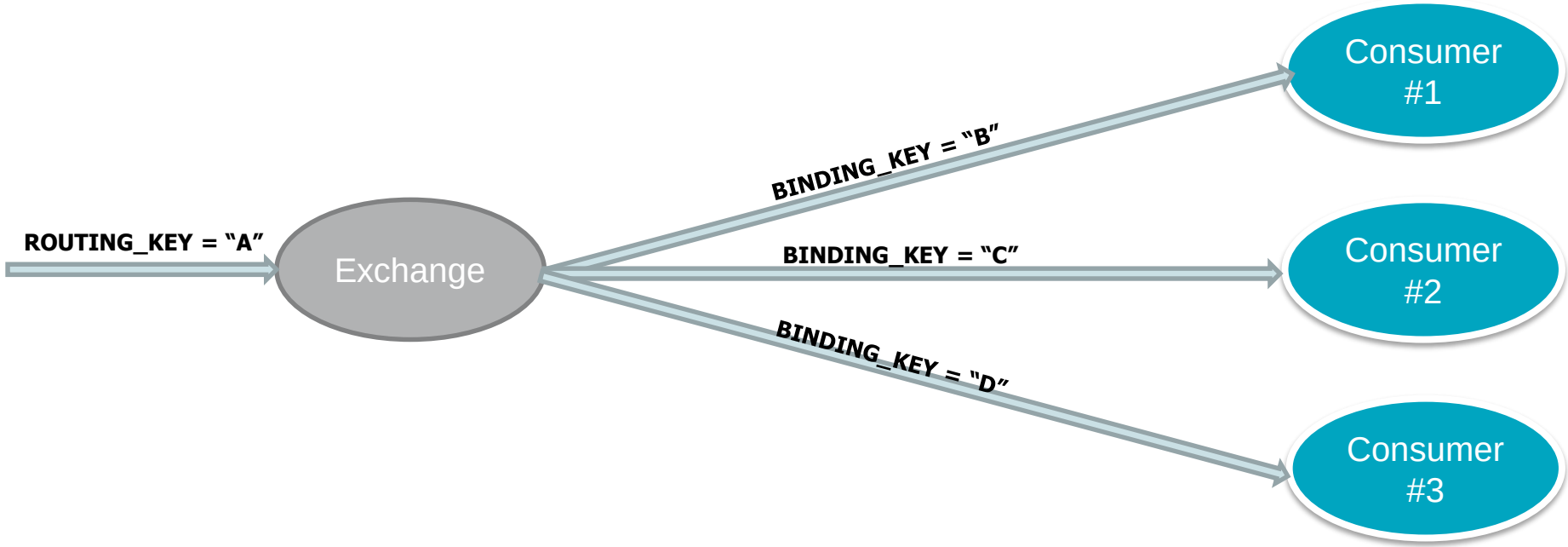
Direct exchange

- Message will be delivered to queues where routing key matches exactly the binding key



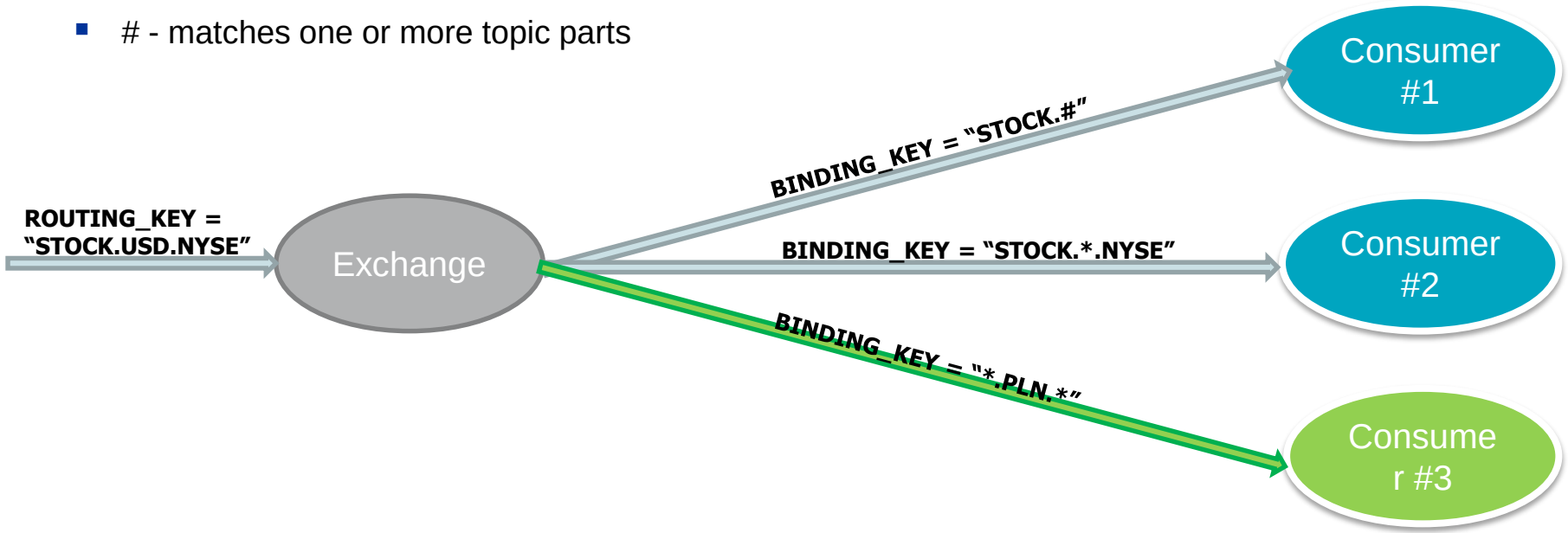
Fanout exchange

- Message will be delivered to all queues, regardless of the routing key



Topic exchange

- Message will be delivered to queues with matching (based on a pattern) binding keys:
  - Parts of topic delimited by “.”
  - * - matches single topic part
  - # - matches one or more topic parts



Other features

- Load balancing (round robin) across all consumers bound to the same queue
  - Message dispatching can be controller with ACK and prefetch
- Message acknowledgments (until no ACK is received, message is saved)
- Ability to create broker clusters
  - Failover capabilities
  - Load balance across consumer connected to different brokers
  - Increase scalability

Documentation

- Advanced Message Queueing Protocol: http://www.amqp.org/
- RabbitMQ: http://www.rabbitmq.com/
- Apache ActiveMQ: http://activemq.apache.org/
- MSDN: http://msdn.microsoft.com/

Thank You!