



**BITS Pilani**  
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# Messaging Systems

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# In this segment

## Messaging Systems

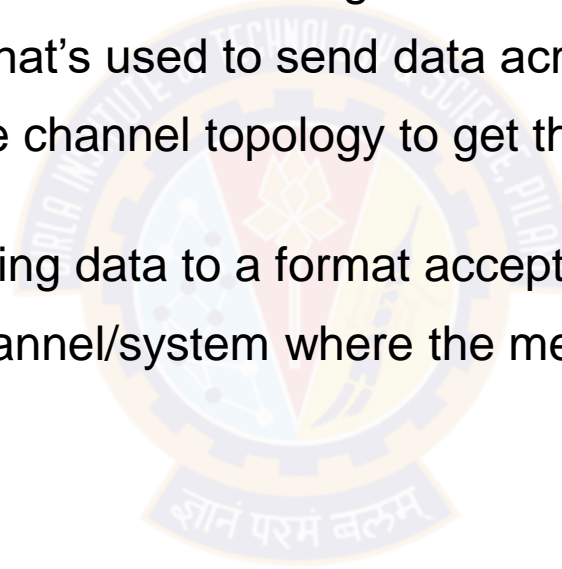
- Basic Concepts
- Message Channel
- Message
- Pipes and Filters
- Message Router
- Message Translator
- Message Endpoint



# Messaging Systems

## Basic Concepts

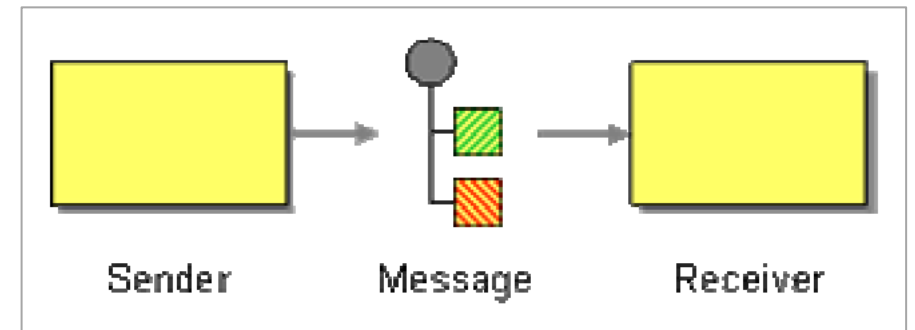
- Channel – A virtual pipe that connects sender and receiver
- Message – Atomic packet of data transmitted through a channel
- Multi-step Delivery – Architecture that's used to send data across the remote network
- Routing - Process of navigating the channel topology to get the message from sender to receiver
- Transformation – Process of adapting data to a format accepted over the network in question
- Endpoint – A logical port on the channel/system where the message is directed to, to reach with the destination/receiver application



# Messaging Systems

## Message

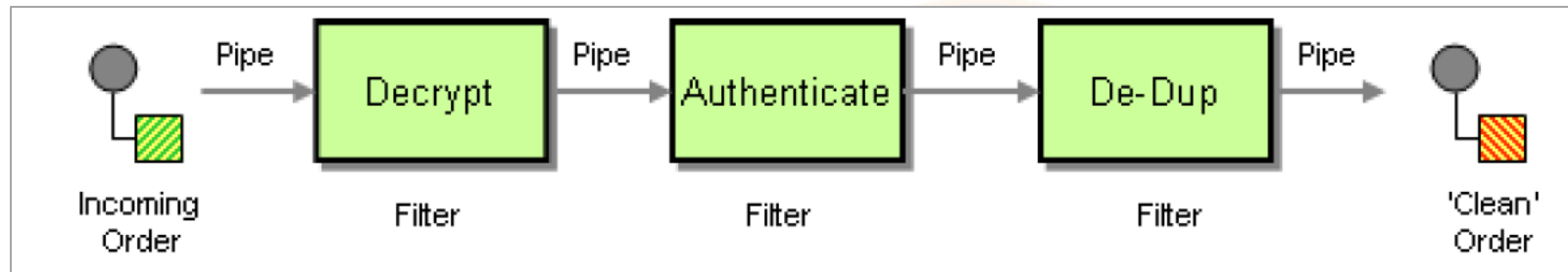
- Unit of data that's transmitted between sender/receiver
- Consists of:
  - Header - Information used by the messaging system that describes the data being transmitted
  - Body - The actual data being transmitted
- Message sequence – Used if the data can not be fit into a single message
- Types of messages – Command, Data, Event etc.
- Formats: JMS Message, SOAP Message, .NET Message etc.
- JMS Message – Represented by type “Message”
  - TextMessage
  - ByteMessage
  - ObjectMessage
  - StreamMessage
  - MapMessage



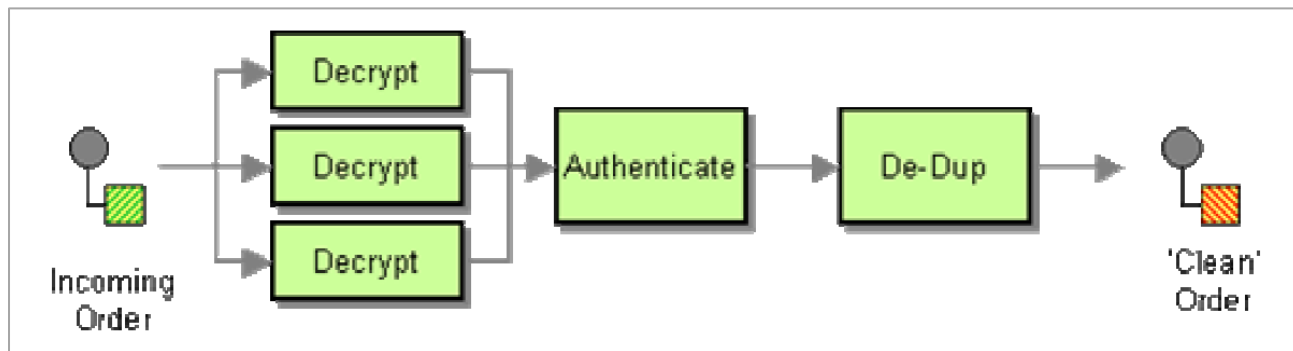
# Messaging Systems

## Pipes and Filters

- Used to divide a larger processing task into a sequence of smaller, independent processing steps (Filters) that are connected by channels (Pipes)



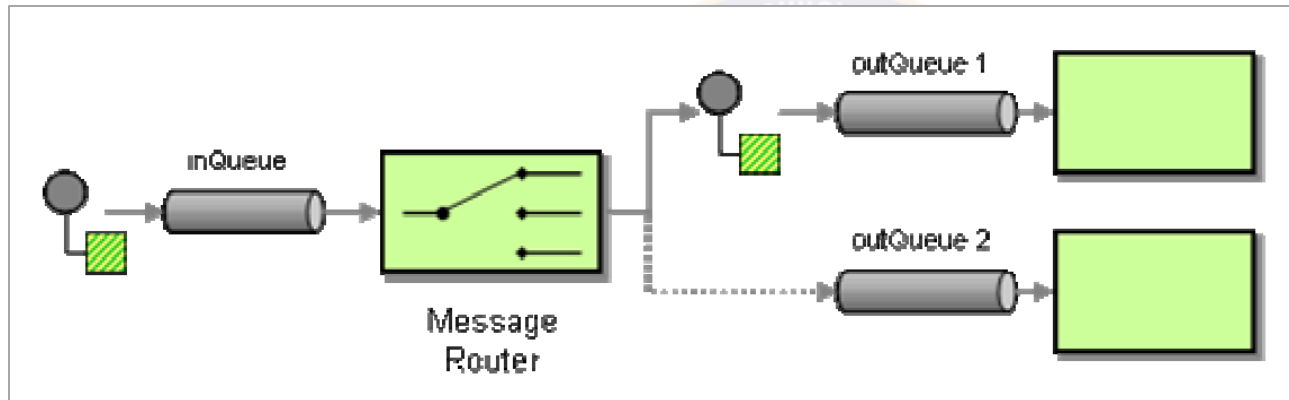
- Pipe uses Message Channel or in-memory queue as implementation
- Allows pipeline processing to cater to volume and speed
- Parallel processing of messages at a particular layer can be performed using multiple parallel filters at the bottleneck



# Messaging Systems

## Message Router

- Message Router is a special filter which consumes a Message from one Channel and republishes it to a different channel depending on a set of conditions

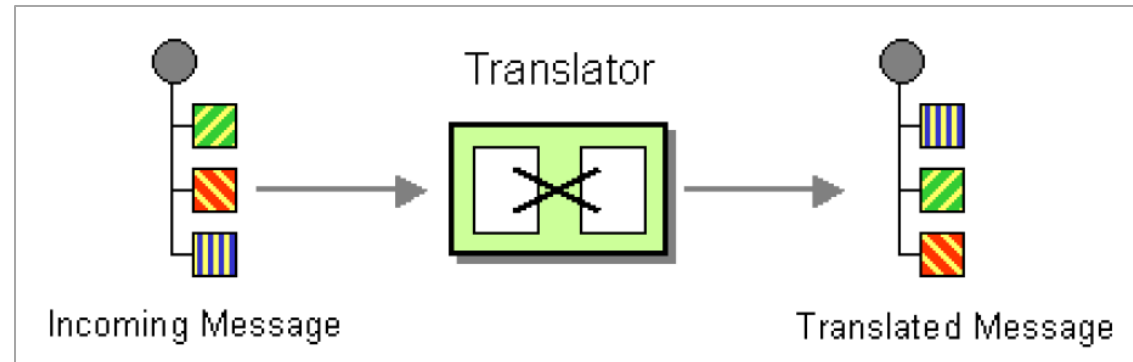


- Represents single place to maintain decision logic for message routing
- Can act as a load balancer as well
- Types
  - Content based Router
  - Context based Router

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## Message Translator

- Message Translator, is a special filter between other filters or applications to translate one data format into another



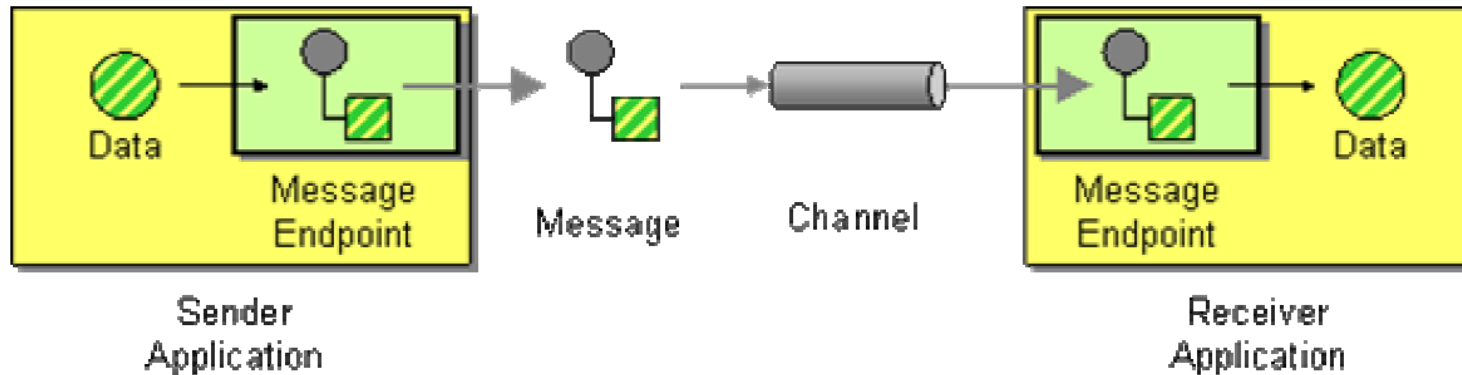
- Equivalent to “adapter” pattern of GoF patterns
- Decouples from data format dependency
- Message Translation Levels:
  - Data structures
  - Data types
  - Data representation
  - Transport



# Messaging Systems

## Message Endpoint

- Message Endpoint is a client of the messaging system that can be used to connect application to the message channel, to send messages



- Message Endpoint code is custom to both the application and the messaging system's client API
- Encapsulates the messaging system from the rest of the application, and customizes a general messaging API for a specific application and task
- One instance of Endpoint can be used to either send or receive messages, not both
- JMS Implementation – MessageProducer, MessageConsumer





# Thank You!

In our next session:  
Message Channels