

# UML: Sequence Diagram

Diagramming your application steps

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# Objectives

- Learn how to application interactions in a sequence diagram
- Learn what components are in a sequence diagram

# UML Sequence Diagrams

Lays out the different interactions of some major components in the application

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# Use Case Diagram components

- Participants - components and actors in your application
- Actors - a specific type of participant but is a user normally
- Database - another specific type of participant
- Divider - used to group sections of similar functionality together
- Lifelines - when a participant is activated to depict state
- Boxes - used to logical grouping of components

Note: *Terminology is taken from the PlantUML language*

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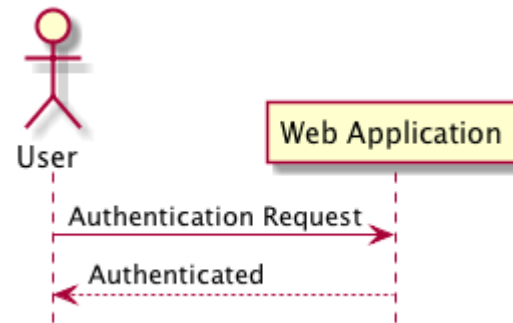
# PlantUML Sequence Diagram Documentation

Documentation: <http://plantuml.com/sequence-diagram>

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# Diagram Tutorial

# Simple Sequence Diagram Example



# Simple Sequence Diagram Code

```
@startuml
hide footbox

actor User
participant "Web Application"

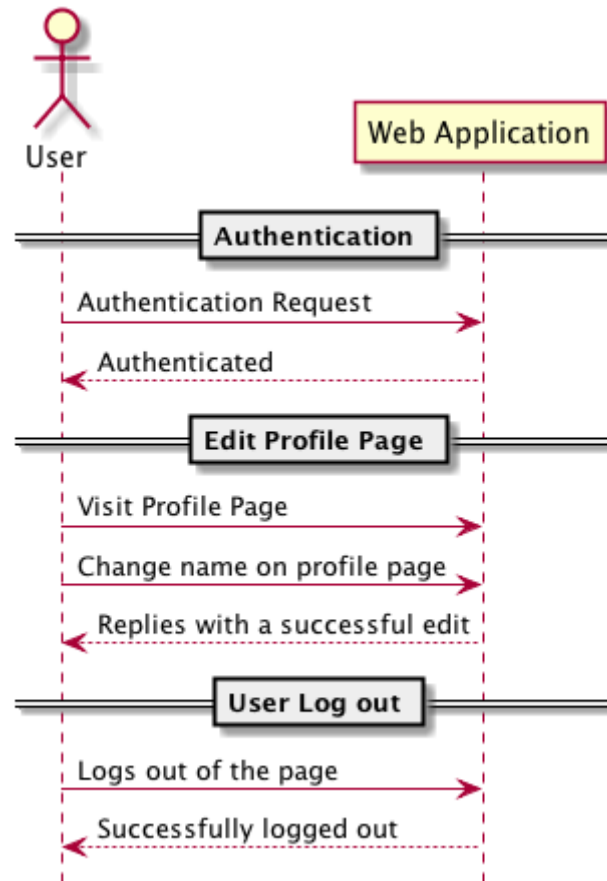
User -> "Web Application" : Authentication Request
"Web Application" --> User : Authenticated

@enduml
```



# Using Dividers

# Sequence Diagram Dividers Example



# Sequence Diagram Dividers Code

```
@startuml
hide footbox

actor User
participant "Web Application"

== Authentication ==
User -> "Web Application" : Authentication Request
"Web Application" --> User : Authenticated

== Edit Profile Page ==
User -> "Web Application" : Visit Profile Page
User -> "Web Application" : Change name on profile page
"Web Application" --> User : Replies with a successful edit

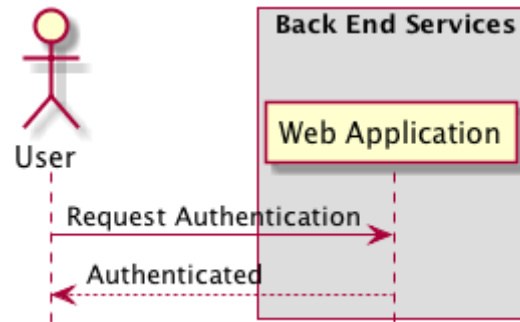
== User Log out ==
User -> "Web Application" : Logs out of the page
"Web Application" --> User : Successfully logged out

@enduml
```

# Using Boxes

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# Sequence Diagram Box Example



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# Sequence Diagram Box Code

```
@startuml
hide footbox

actor User

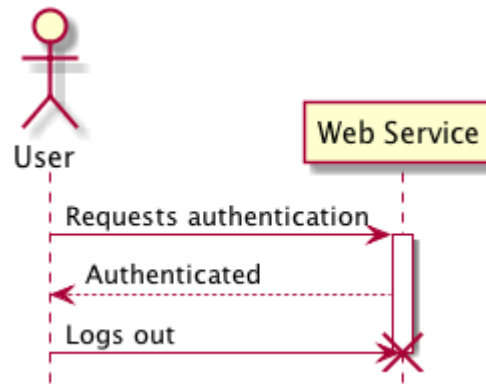
box "Back End Services"
    participant "Web Application"

    User -> "Web Application" : Request Authentication
    "Web Application" --> User : Authenticated
end
```

# Using Lifelines for State

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# Sequence Diagram Lifeline Example



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# Sequence Diagram Lifeline Code

```
@startuml
hide footbox

actor User
participant "Web Service"

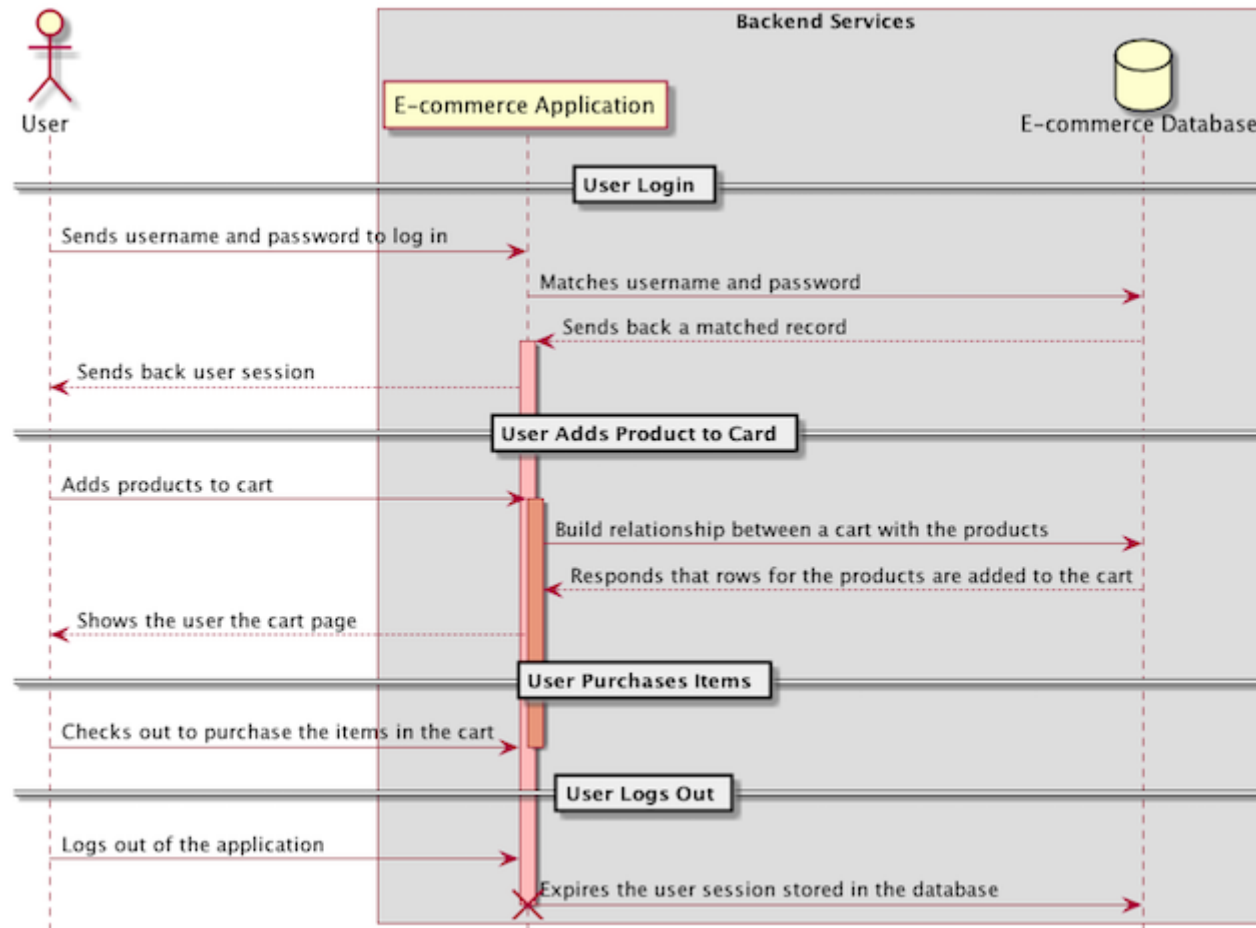
User -> "Web Service" : Requests authentication
activate "Web Service"
"Web Service" --> User : Authenticated
User -> "Web Service" : Logs out
destroy "Web Service"

@enduml
```

# A More Complete Example

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# UML Example: E-commerce Diagrams



# UML Example: E-commerce Diagram PlantUML Code

Source code ([https://github.com/wchan2/presentations/blob/master/courses/ccny\\_csc322\\_fall\\_2018/slides/code/uml\\_sequence\\_code\\_example.wsd](https://github.com/wchan2/presentations/blob/master/courses/ccny_csc322_fall_2018/slides/code/uml_sequence_code_example.wsd))

```
@startuml
hide footbox

actor User
box "Backend Services"
    participant "E-commerce Application"
    database "E-commerce Database"

== User Login ==
User -> "E-commerce Application" : Sends username and password to log in
"E-commerce Application" -> "E-commerce Database" : Matches username and password
"E-commerce Database" --> "E-commerce Application" : Sends back a matched record

activate "E-commerce Application" #FFBBBB
"E-commerce Application" --> User : Sends back user session

== User Adds Product to Card ==
User -> "E-commerce Application" : Adds products to cart
activate "E-commerce Application" #DarkSalmon
"E-commerce Application" -> "E-commerce Database" : Build relationship between a cart with the products
"E-commerce Database" --> "E-commerce Application" : Responds that rows for the products are added to th
"E-commerce Application" --> User : Shows the user the cart page

== User Purchases Items ==
```

User -> "E-commerce Application" : Checks out to purchase the items in the cart  
deactivate "E-commerce Application"

== User Logs Out ==

User -> "E-commerce Application" : Logs out of the application

"E-commerce Application" -> "E-commerce Database" : Expires the user session stored in the database  
destroy "E-commerce Application"

@endum1

# Summary

- Sequence diagrams help you visualize the workflow and high level implementation of how components work with each other

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# Thank you

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