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IBC custom app and IBC middleware

**IBC Deep Dive**

In the IBC custom application sections, you will learn to scaffold an IBC-enabled blockchain via Ignite CLI and explore different aspects of IBC communication and packet handling. In the IBC middleware sections, you will learn about IBC middleware and understand how it can help you to simplify your application logic.



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In this chapter, you will:

* Learn to scaffold an IBC-enabled module.
* See IBC callbacks and packet flow in the generated code.
* Discover how to make an existing chain IBC-enabled and how to create an IBC-enabled chain.
* Learn to write your own custom middleware to wrap an IBC application.
* Understand how to hook different middlewares to IBC base applications to form different IBC application stacks.

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To start with custom IBC applications, begin with an [introduction to IBC application development](https://ida.interchain.io/hands-on-exercise/5-ibc-adv/3-ibc-app-intro.html) to then dive into [making an IBC-enabled module](https://ida.interchain.io/hands-on-exercise/5-ibc-adv/4-ibc-app-steps.html) and [adding packet and acknowledgement data](https://ida.interchain.io/hands-on-exercise/5-ibc-adv/5-ibc-app-packets.html).

You are then ready to dive into [extending your checkers game with a leaderboard](https://ida.interchain.io/hands-on-exercise/5-ibc-adv/6-ibc-app-checkers.html) making it IBC-enabled. Once you made an existing chain IBC-enabled, it is time to [create a global leaderboard chain](https://ida.interchain.io/hands-on-exercise/5-ibc-adv/7-ibc-app-leaderboard.html) that can receive information (player scores) from other chains.



Please be aware that the sections listed above are recommended as **essentials** for IBC and represent valuable knowledge if you choose to undertake the final exam.

However, this chapter also covers quite a lot of content that goes very deep into the intricacies of IBC. The following sections are optional and **NOT** final exam relevant:

* [IBC Middleware](https://ida.interchain.io/academy/3-ibc/9-ibc-mw-intro.html)
* [Create a Custom IBC Middleware](https://ida.interchain.io/academy/3-ibc/10-ibc-mw-develop.html)
* [Integrating IBC Middleware Into a Chain](https://ida.interchain.io/academy/3-ibc/11-ibc-mw-integrate.html)

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Cosmos SDK

**Cosmos SDK**

A framework to build application-specific blockchains

[Documentation↗](https://docs.cosmos.network/)

CometBFT

**CometBFT**

Blockchain consensus engine and application interface

[Documentation↗](https://docs.cometbft.com/)

Cosmos Hub

**Cosmos Hub**

First interconnected public blockchain in the Interchain network

[Documentation↗](https://hub.cosmos.network/)

IBC

**IBC**

Industry standard protocol for inter-blockchain communication

[Documentation↗](https://ibc.cosmos.network/)

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**[Backend Script for Game Indexing](https://ida.interchain.io/hands-on-exercise/3-cosmjs-adv/5-server-side.html)**

up next

**[IBC Application Developer Introduction](https://ida.interchain.io/hands-on-exercise/5-ibc-adv/3-ibc-app-intro.html)**

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