

# T7 Cloud Simulation

On-demand access simulation

September 2020



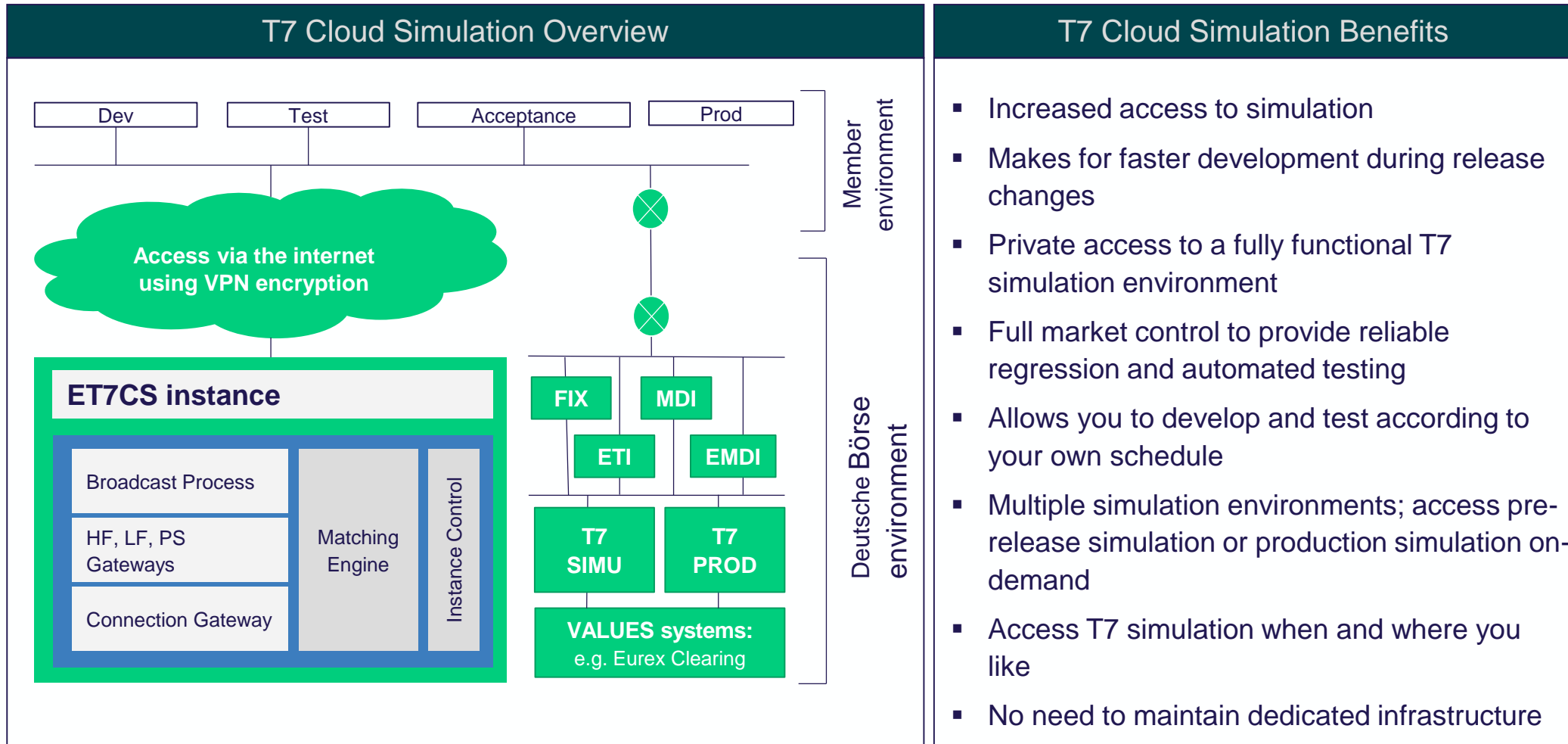
# T7 Cloud Simulation In a Nutshell

T7 Cloud Simulation allows members and customers to ...

- Control the market:
  - Create your own order books
  - Set the market trading phase
  - Change the state of specific products
  - Use the Liquidity Generator and Auto Matcher
  - Enter trade reversals
  - Test failover scenarios
  - Predefine market scenarios and test specific strategies that would not be possible in a shared environment
    - Create unique order books
    - recreate specific trading scenarios
- Test strategies that are difficult / impractical to test in a shared environment
- Perform regression testing based upon own parameters
- Automate application testing to decrease development costs

# T7 Cloud Simulation Service Offering and Benefits

Participants benefit from Deutsche Börse's T7 Cloud Simulation platform.



# T7 Cloud Simulation Overview

The T7 Cloud Simulation allows participating customers to deploy a private, on-demand instance of a T7 simulation environment for testing and development purposes. This instance is created and runs within a public cloud infrastructure allowing customers access from any computer with internet access anywhere in the world.

**Its low-cost**, consumption-based billing model offers customers easy access to a commitment-free environment for developing and testing trading software. Participants use and pay for as much access to the T7 Cloud Simulation as they choose. There are no minimums or maximums.

Participants can choose from two different simulation environments when they request a T7 Cloud Simulation instance. They can choose to access the same version of software that is running in the **regular T7** Simulation environment, the same version running in production, or both at the same time.

T7 Cloud Simulation offers the possibility to engage in testing of the upcoming T7 software version, one month prior to its deployment in the regular T7 Simulation environment.

# Supported Interfaces

T7 Cloud Simulation offers members access to T7's standard interfaces including:

Infrastructure components	Trading interfaces	Market data
<ul style="list-style-type: none"><li>▪ ETI Connection Gateway</li><li>▪ ETI Trading Gateway</li><li>▪ FIX Gateway</li><li>▪ Broadcast Gateway</li><li>▪ Matching Engine</li></ul>	<ul style="list-style-type: none"><li>▪ Enhanced Trading Interface (ETI)</li><li>▪ FIX</li></ul>	<ul style="list-style-type: none"><li>▪ Market Data Interface (MDI)</li><li>▪ Enhanced Market Data Interface (EMDI)</li><li>▪ Enhanced Order Book Interface (EOBI)</li></ul>

Access includes **five** unique member IDs, each enabled with:

- four trader IDs (one supervising trader, one head trader and two regular traders)
- high-frequency ETI sessions
- low-frequency ETI sessions

# T7 Cloud Simulation User Experience

**Step 1: Member logs into the T7 Cloud Simulation (CS) start page and requests an instance**



**T7 Cloud Simulation start page**

**Step 2: A CS instance spins up for the member**

**T7 Cloud Simulation (CS) start page**



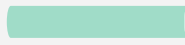
**T7 CS instance Instance Control**  
T7 Architecture

**Step 3: Member logs into the Instance Control to control their Cloud Simulation Instance**



**T7 CS instance Instance Control**  
T7 Architecture

**Step 4: Member connects to CS Instance via VPN over the Internet**



**T7 CS instance Instance Control**  
T7 Architecture

**Step 5: member develops / tests their software**



**T7 CS instance Instance Control**  
T7 Architecture

**Step 6: When finished, member logs into the T7 Cloud Simulation Launchpad to terminate the CS instance**



**T7 CS Start Page**

# T7 Cloud Simulation API Experience

**Step 1: Member logs into the T7 Cloud Simulation (CS) start page and creates an API key**



T7 Cloud Simulation start page

**Step 4: Member connects to their CS instance via VPN over the Internet**



T7 CS instance  
T7 Architecture

**Step 2: Member uses the CS API to create instances in code**

T7 Cloud Simulation REST API

T7 CS instance  
T7 Architecture

**Step 5: Member develops and tests their software**



T7 CS instance  
T7 Architecture

**Step 3: Instances are managed using the CS API, perhaps as part of an automated build or CI pipeline**

T7 Cloud Simulation REST API

T7 CS instance  
T7 Architecture

**Step 6: Member uses the CS API to terminate their instances, no human intervention required**

T7 Cloud Simulation REST API

T7 CS instance  
T7 Architecture

# T7 Cloud Simulation Limitations

**Beside its benefits, Deutsche Börse's T7 Cloud Simulation platform also has its limitations:**

- No GUI access, which means:
  - No user/entitlement maintenance
  - No trade enrichment maintenance (coming in 2021!)
  - No trading user or business unit stop actions
  - No book order limit maintenance
  
- No connection to Clearing, which means:
  - You can't test clearing / end-to-end trade processing
  - No Member risk actions will be processed
  - No Transaction-Size-Limit / Max-Order-Quantity maintenance
  
- You can save data from an instance, by downloading the raw PCAP files for an instance either via the CS API or Launchpad.
- Customer support is limited due to the information available is limited to your private instance
- The order book is empty when starting your private instance
- You can only use the Member ID's provided (it is not possible to create an instance with your specific Member ID)
- There is no Market Supervision and you can't test against other 'real' participants



# T7 Cloud Simulation Outlook

Deutsche Börse's T7 Cloud Simulation platform is highly customisable. We plan to launch further enhancements and functionality to complement our service in future releases, including:

- Sophisticated automated trade-generation scripts
- Intraday product expirations
- Addition reporting and audit trail functionality in the event of updated regulatory requirements
- Historical order book data subscriptions and scenarios

# Thank you!

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