



Case Study: Virtualised Private Simulation

An on-demand SaaS solution for the financial market place

Agenda

02 Introduction to Deutsche Börse

05 Virtualised Private Simulation
Product overview

10 Requirements for Virtualised
Private Simulation

13 Challenges in implementing
VPS

15 Benefits to using the cloud

The image shows a high-angle view of a modern office building's interior. The space is characterized by its multi-level design, featuring several floors with glass railings and white paneling. A prominent feature is a wide, open staircase with a light-colored wooden or stone tread, which winds through the central atrium. The architecture is clean and minimalist, with a focus on light and transparency. Large windows on the right side allow natural light to flood the space. The overall atmosphere is professional and contemporary.

Introduction to Deutsche Börse

Introduction

Deutsche Börse operates financial venues for capital market communities – intermediaries, investors and issuers worldwide – our clients. They appreciate our neutrality and the high quality of market services we provide: information, execution, post-trade, risk management, infrastructure.

We manage an integrated group of businesses. They are leaders in their fields. Each of them – in an entrepreneurial spirit – is set for growth. In combination and through valuable partnerships they bring unique innovation to our industry.

Our two highest-profile venues are Eurex[®], on the derivatives side and Xetra[®], on the equities side.

Global operations



12 locations in Europe

Berlin
Brussels
Dublin
Frankfurt/
Eschborn
Leipzig
London
Luxembourg
Madrid
Moscow
Paris
Prague
Zurich

9 locations in Asia / North America

Beijing
Chicago
Dubai
Hong Kong
New York
Ottawa
Singapore
Tokyo
Washington,
D.C.



Virtualised Private Simulation Product Overview

Product Overview

Eurex[®] members felt that the normal shared Eurex[®] simulation environment did not meet their needs. It was not available when it was needed (especially when preparing for a new software release), it did not provide the flexibility required and was difficult / costly to maintain year-round.

We considered many ways to improve the situation, including introducing exchange software emulators, running multiple simulation environments to allow staggered maintenance windows and offering fee rebates to decrease the cost of maintaining a permanent connection to the simulation system.

None of these solutions were practicable for various reasons. They either cost too much, required too much effort or did not do enough to help the members.

Product Overview (cont.)

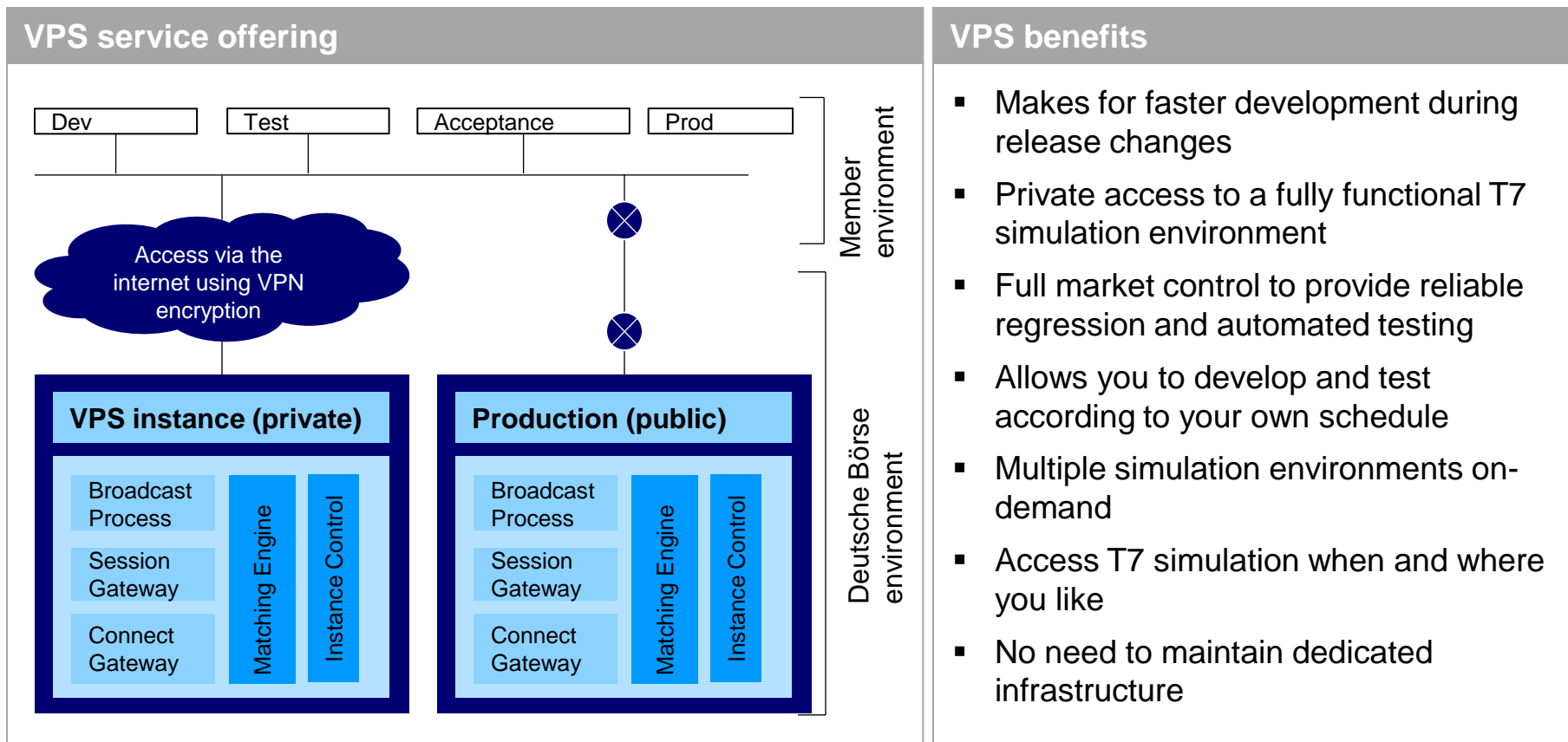
With the introduction of our new T7 trading architecture, we found we could leverage functionality that T7 developers used everyday (scripted, automatic deployment of T7 architecture on virtual machines) to improve our members' access to the Eurex[®] T7 simulation environment.

Virtualised Private Simulation (VPS) allows customers to deploy a private, on-demand instance of Eurex[®]'s T7 simulation environment for testing and development purposes. This VPS instance is created and runs within a public cloud provider's infrastructure allowing customers access from any computer with internet access anywhere in the world.

Customers can choose from two different simulation environments when they request a VPS instance; production simulation or pre-release simulation.

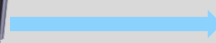
Service Offering and Benefits

Almost all of Eurex[®]'s members and customers can benefit from Deutsche Börse's VPS platform.



User Experience

Step 1: member logs into VPS start page and requests a VPS Instance



VPS start page

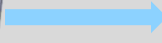
Step 2: VPS start page spins up a VPS instance for member

VPS start page



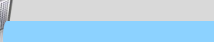
VPS instance
Instance Control
T7 Architecture

Step 3: member logs into VPS Instance Control to control their VPS Instance



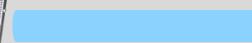
VPS instance
Instance Control
T7 Architecture

Step 4: member connects to VPS Instance via VPN over the Internet



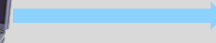
VPS instance
Instance Control
T7 Architecture

Step 5: member develops / tests their software



VPS instance
Instance Control
T7 Architecture

Step 6: when finished, member logs into VPS start page to terminate VPS Instance



VPS start page



Requirements for Virtualised Private Simulation

Requirements

Our primary motivation for creating Virtualised Private Simulation was to provide our members with a high quality simulation environment. Any product we proposed to our members had to fit their primary needs:

- Low-cost / low maintenance for our members
- No commitment
- 24 x 7 availability
- Identical functionality as existing simulation and production environments

To further complicate things, management imposed their own set of constraints on us

- Small budget
- Minimal project staff
- Aggressive delivery date
- High degree of data & privacy security

Requirements (cont.)

It became clear, however, when we factored in all the requirements from both our members and our management, we saw that building a hosting environment within Deutsche Börse AG's infrastructure would be too costly and time-consuming.

The only implementation platform that made sense was in the cloud.

The background image shows a high-angle view of a modern office building's interior. It features multiple levels with glass railings, white paneling, and a central staircase. The architecture is clean and contemporary, with large windows and a bright, open atmosphere. A semi-transparent white box is overlaid on the upper right portion of the image, containing the text.

Challenges in implementing VPS

Challenges

We did not approach the task at hand with the goal of designing a cloud application. To the contrary, at first we to avoid even using the term “cloud”. We feared:

- F.U.D. (Fear, Uncertainty, Doubt) inherent to those unfamiliar with Cloud tech
- Concerns about data privacy & security
- Reliability
- Intellectual property controls

In order to convince the organization that a cloud deployment was the best way to go, we reached out to the key stakeholders within the company. We took the time to find out their concerns and design our product in such a way as to alleviate as many of them as possible.

This done, we were pleasantly surprised as to how open our management and colleagues were to a cloud deployment when the business case was made on facts.



Benefits to using the cloud

Benefits

A public cloud provider gave us immediate access to both a development environment and a production deployment environment with little effort and no sunk (CAPEX) cost. This flexibility and scalability increased development speed while keeping costs low, especially through the proof-of-concept phase.

Additionally, our customers' usage habits vary widely according to the release schedule for exchange software. Partnering with a cloud provider allows us to focus our energies on functionality and marketing, and not capacity.

Lastly, by using a third party cloud provider, like CloudSigma, we are able to easily grow our VPS client base as well as quickly (and inexpensively) expand our product portfolio.



Thank you for your attention

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