



**Business challenge**

Service innovation is a major driver of competitive differentiation in banking. To maintain first-mover advantage and win market share, Danske Bank needed the ability to develop and test software faster.

**Transformation**

Danske Bank continues to use the IBM Application Delivery Foundation for z Systems suite to help keep key development tools available, performing well and supporting faster test/development cycles.

**Business benefits**

**Enhances**

visibility of performance and availability in development landscapes

**Accelerates**

z Systems development, contributing to first-mover advantage for the bank

**Simplifies**

development with standards-based graphical environment

# Danske Bank

## Driving faster innovation in banking and customer services with IBM z Systems

Established in 1871, [Danske Bank](#) is a Nordic universal bank. In its core markets of Denmark, Norway, Sweden and Finland, it serves all types of customer, from personal customers and businesses to large institutional clients. In total, the bank has 3.5 million customers, 2.2 million of whom use e-banking, and operates a network of 300 branches across eight countries. Danske Bank has 19,000 full-time employees and continues to grow both organically and through mergers and acquisitions.

*“What’s great about ADFz and IBM Developer for z Systems is that almost everything we need to deliver software rapidly is in one interface.”*

—Henrik Hartvig Jensen, Lead Software Engineer and Technical Architect, Danske Bank

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## Supporting rapid change

The application and systems landscape at Danske Bank is highly dynamic, as the pressures of operating in a competitive market drive the need to continually launch new services. To shorten the development cycle and bring IT closer to the business, the bank has adopted agile development processes in recent years, managed using IBM® Rational Team Concert™ software among other tools.

Henrik Hartvig Jensen, Lead Software Engineer and Technical Architect at Danske Bank, comments: “We often aim to achieve first-mover advantage, where this maximizes our opportunity to gain market share. We recently launched the first mobile payment app in Denmark, and our Rational® tools helped us to achieve that. Quality remains important; in combination with time-to-market, a solid mainframe development environment with code coverage, unit testing, and test coverage is a critical element in software production at Danske Bank.”



Amid all the change and increase in speed, Danske Bank continues to run its core banking and customer information systems on the IBM z Systems® platform, using two IBM z13® servers in an ultra-high-availability GDPS® cluster.

Jesper Hollitsch Poulsen, Senior Development Manager at Danske Bank, comments: “z Systems remains an extremely important

platform for Danske Bank. As the world changes, we are always exploring new possibilities, but it's an evolutionary process: we think that z Systems is still the best place to do core banking today. There would need to be a very strong business case for moving away from z Systems, which is at the center of our business.”

As part of its continuing journey towards DevOps, the bank wanted to make it easier for developers to create and test new software, and to automate unit testing both for z Systems and for its other platforms. It also aimed to modernize the z Systems development environment to bring it into line with Eclipse and .NET development environments running on other platforms.

In more general terms, the bank sought to change the mindset of developers for all platforms to encourage greater use of automation and better control across the full software lifecycle. Finally, Danske Bank needed to have better and faster visibility of the performance and availability of its development environments, to help ensure that internal developers can always work quickly, efficiently and productively.

## Comprehensive toolkit

To better support its large community of internal developers—there are almost 700 on the z Systems side from a total population of approximately 1,500 developers and associated business analysts—and to ensure a stable and reliable z Systems development platform, Danske Bank upgraded to the latest IBM Application Delivery Foundation for z Systems (ADFz) offering. This provides a complete set of core tools designed to boost efficiency in the creation and maintenance of applications for IBM z/OS® environments. With a continuous delivery model that delivers incremental enhancements as monthly updates, ADFz also helps z Systems landscapes to keep pace with the latest functionality and approaches.

ADFz includes the following tools: IBM Developer for z Systems, providing application development productivity tools; IBM Debug Tool for z/OS, an interactive source-level debugging tool for compiled applications; IBM Fault Analyzer for z/OS,



which gathers real-time information to help developers understand abnormal endings of applications; IBM File Manager for z/OS, which offers enhanced file processing when working with data sets on z Systems; and IBM Application Performance Analyzer for z/OS, which reports how applications use available resources.

“What’s great about ADFz and IBM Developer for z Systems is that almost everything we need to deliver software rapidly is in one interface,” says Jensen. “We can handle the whole z Systems software lifecycle from development to testing to documentation to trouble-shooting, all within a user-friendly environment that is quickly accessible to developers who are new to z Systems.

***“The IBM tools on our z Systems platform are helping us build our roadmap for the move to DevOps, particularly in areas such as the automation of testing.”***

—Jesper Hollitsch Poulsen,  
Senior Development Manager,  
Danske Bank

This promotes greater speed and efficiency, and helps to bridge the gap between development for z/OS and development for other platforms such as .NET. That’s particularly important as we bring new developers into the team, and it makes it easier to build and run hybrid applications that use COBOL or CICS® services combined with a new web front-end.”

Danske Bank developed its own unit test tool and has been able to integrate it into its IBM Developer for z Systems environment, enabling a seamless flow from development through test cases, unit testing, the addition of business logic, and finally the transition into production.

“At that point we have the Analyze and Debug tools available to trace and understand errors,” says Jensen. “The whole process is faster and more intuitive within IBM Developer for z Systems, with easy access to new tools that we have developed. For example, we have a tool called ‘Application Diagnostic Systems’. This uses the Fault Analyzer API to extract system dumps from the mainframe allowing them to be opened directly in the IDE. You can see the state of the program in production and its history in that environment, you can see its criticality and whether you are permitted to make changes, and you can add comments or notes so that other people are aware of any issues.”

Poulsen adds, “We continue to work closely with the IBM labs, in particular to inspire them to incorporate our home-grown functionality into the IBM tools. It’s a great two-way relationship, and we appreciate the cooperation.”

While core transactions and customer information reside on the z Systems platform, front-end services often sit on other platforms. By offering similar graphical environments to manage development and testing on both sides, Danske Bank is helping to reduce potential obstacles to collaboration.

“We are also migrating our COBOL and PL/1 code from old repositories into Rational Team Concert,” comments Jensen. “This will help remove limits to parallel development, and make it easier to attract a new generation of developers to work with tried-and-trusted functionality without the culture shock of working on green screens!”

The tools within ADFz play a key role in keeping the z Systems landscape performing optimally at all times, as Jensen explains: “We use the IBM tools to monitor the performance and availability of everything from the back-end CICS systems through to

the development landscapes. On top of that, we as tool owners have built other monitoring systems using some of the IBM APIs. For example, we had a situation just this morning where part of the Debug Tool was down, and our monitoring system enabled us to react and resolve the situation rapidly, rather than waiting for an internal customer to notify us that there was a problem.

“We also monitor the Problem Determination Tools to see what’s happening across the entire z Systems environment. The APIs plug into our Java-based front-end, the Remote Application Platform (RAP) within Eclipse, which provides easy-to-interpret dashboards of key performance indicators.”

## Embracing a faster and more efficient future

As Danske Bank continues to evolve its software development capabilities to meet rising pressures around time-to-market and quality, the ADFz solution is helping it to ensure that vital tools are always available for developers to use. The solution also fits with the bank's goal of making greater use of APIs to enable more efficient presentation of existing functionality both internally and externally.

"We are using an enterprise service bus to transform our internal capabilities by setting up more APIs to services running on z Systems,"

comments Jensen. "By making it easier for developers to call existing services—for example, calling up a particular customer's current balance directly from the core banking system—we should reduce the tendency for people to re-invent the wheel all the time, accelerating development and boosting internal efficiency. Within ADFz itself, using APIs helps us to bring information from multiple sources into a single viewpoint for the user, saving time and effort, as in the example I provided about finding and analyzing error logs."

With real-time syntax checking in IBM Developer for z Systems, developers can quickly see problems

without the need to keep compiling their code, which should save time and enable faster development cycles. The tool also provides easy accessibility to other programming aids, including performance hierarchies, graphical program controls, enhanced code refactoring tools and tools for rapid static code analysis.

"Moving towards DevOps is a key goal, as it will enable us to ensure the rapid ongoing delivery of high-quality applications and new functionality to meet emerging business needs," says Poulsen. "The IBM tools on our z Systems platform are helping us build our roadmap for the move to DevOps, particularly in areas such

as the automation of testing. We're not there yet, but we are getting better at automating the test cycle and building towards continuous integration. The IBM solutions are helping us to drive a new culture and mindset of increased innovation, rapid delivery of new business solutions and awareness of the full software lifecycle. They are also helping us to increase both standardization and transparency in development, testing and production, and improving the efficiency of our development processes."

## Solution components

- IBM® Application Delivery Foundation for z Systems™
  - IBM Application Performance Analyzer for z/OS®
  - IBM Debug Tool for z/OS
  - IBM Developer for z Systems
  - IBM Fault Analyzer for z/OS
  - IBM File Manager for z/OS
- IBM CICS®
- IBM Data Studio
- IBM Problem Determination Tools for z/OS
- IBM Rational DOORS® Next Generation
- IBM Rational Team Concert™
- IBM z13®

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### Connect with us



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### Take the next step

To learn more about IBM Application Delivery Foundation for z Systems, please contact your IBM representative or IBM Business Partner, or visit the following website:

[ibm.com/software/products/en/ibm-application-delivery-foundation-for-z-systems](http://ibm.com/software/products/en/ibm-application-delivery-foundation-for-z-systems)

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