DYNA

Welcome & Introduction

Morten Kromberg, CTO

Introducing the Cast

Brian Becker

APL Tools Architect, Dyalog Ltd

With over 45 years of APL experience, Brian has developed APL applications across a variety of industries, including financial planning, manufacturing control, legislative tracking, full text databases and risk assessment. He now coordinates the design and development of APL-based software tools including Jarvis and HttpCommand.

Josh David

APL Consultant, Dyalog Ltd

Josh initially encountered APL and Dyalog during an internship with The Carlisle Group. He is now a consultant to clients who use APL for production applications.

Introduction to Dyalog – DYNA 2024

Introducing the Cast

Mark Wolfson

CTO at BIG, consultants to the Jewelry Industry

Mark has been CTO at BIG, a service company in the jewellery industry, since 2006. He serves as designer, architect and data specialist, overseeing a tech team of 13 developers and support staff that create and maintain a suite of products for jewellery retailers, manufacturers and other service providers in the industry.

Over the last few years, Mark has successfully migrated BIG's legacy IBM APL2 system to an entirely new production environment using Dyalog.
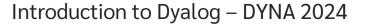
DYNA

Introducing the Cast

Jay N. Whipple III

Chairman at Osprey Partners LLC, President at J.N. Whipple, Inc

Jay Whipple currents uses APL to provide services to bridge players all over the world with TheCommonGame.com and provides pro-bono consulting in APL for the parent organisation of bridge in the US, the American Contract Bridge League.

Introduction to Dyalog – DYNA 2024

Morten Kromberg

- CTO of Dyalog since 2005

- CTO of Adaytum Software 1995-1999 (BI vendor)

  - (20 => 200 employees, sold to Cognos for $160M)

- APL Consultant for ~20 years

  - Focus on interfacing/integration, client/server architectures and developer tools / frameworks

- Met APL in 1979 while at High School

  - Finally dropped out of University in 1985

- Born in the same year as APL (1962)

Introduction to Dyalog – DYNA 2024

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Introducing Dyalog

- Dyalog is the "New Kid" on The APL Block
  - Only 40 years since release of Dyalog version 1.0 in 1983
  - Has emerged as the Market Leader for APL
  - Still relatively unknown in North America

- "Management Buy-In" in 2005
  - Financed by two clients and an APL distributor / consulting firm

The Last 20 Years

- Headcount and Turnover ~~Quadrupled~~ Quintupled
  - Headcount now ~26 full time equivalents
  - Steadily increasing R&D budget
  - First generation of interpreter developers retired; Second productive; Third recruited
  - Largest sustained investment in APL technology in history

DYNA

The Last 20 Years

- Trading Profit in every year since 2005. Sources:
  - Growing partnerships with major customers
  - Increasing share of APL market ("unfortunately" accelerating)
  - A small number of completely new APL systems (so far)

- Manoevering towards re-launching APL as a modern tool for prototyping and rapid application development

Introduction to Dyalog – DYNA 2024

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Financial Status

Owners	2008	2018	Present
SimCorp (Denmark)	32.33%	40%	24%
APL Italiana (Italy)	32.33%		
Management & Employees	35.33%	60%	76%

- **Ownership**
  - 24% owned by SimCorp (itself acquired by Deutsche Börse)
  - 76% owned by management and employees

- **Revenue steadily increasing:**

5-year period	Growth
2017-2023	35%
2012-2017	8%
2007-2012	57%

- **Profitable every year since acquisition in 2005**

DYNA

11 April 2023 – A Day to Celebrate!

Today we reach two very significant milestones.

40 Years of Dyalog APL
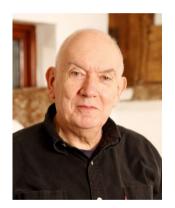
On this day, we have cause for celebration: it is 40 years since the release of Dyalog version 1.0! Geoff Streeter would say that from his perspective we are already in the 42nd year, as he and John Scholes started work on the new interpreter in 1981. On the other hand, Pete Donnelly might argue that the interpreter wasn't really ready for serious use until a few years after that date. The fact remains that the APL '83 conference in Washington DC saw the first official release of the product, and is considered to be the "birth" of Dyalog APL.

Farewell Geoff Streeter

We Stand on the Shoulders of Giants

John Scholes (1948-2019)

Roger Hui (1953-2021)

Geoff Streeter (retired 2023)

https://rogerhui.rip
https://johnscholes.rip
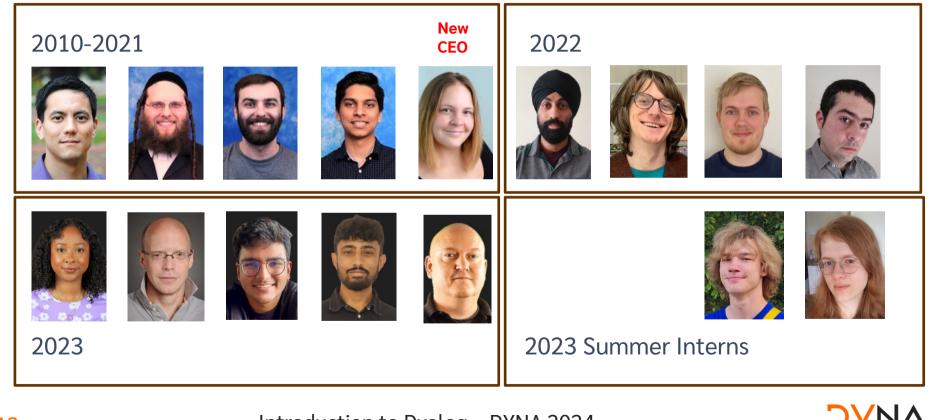
Ken Iverson's Blackboard arrives in Bramley (2010)
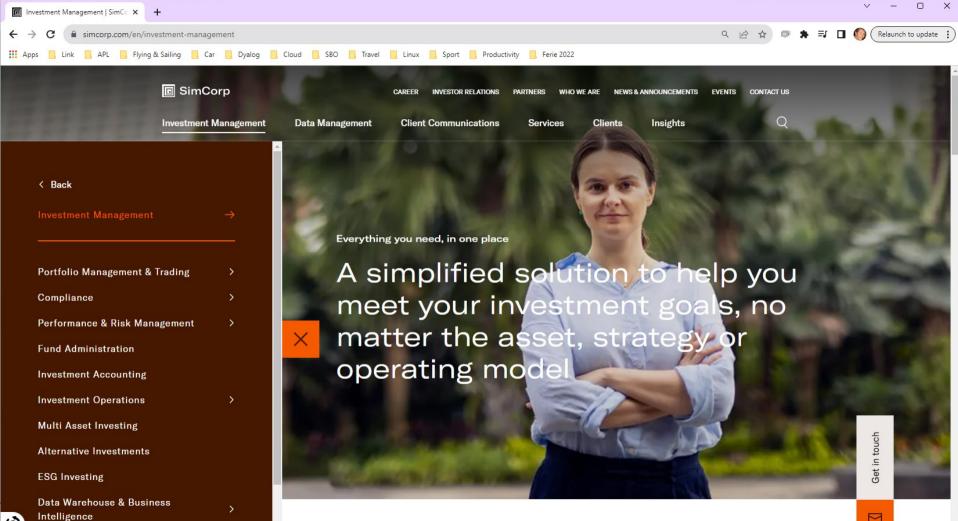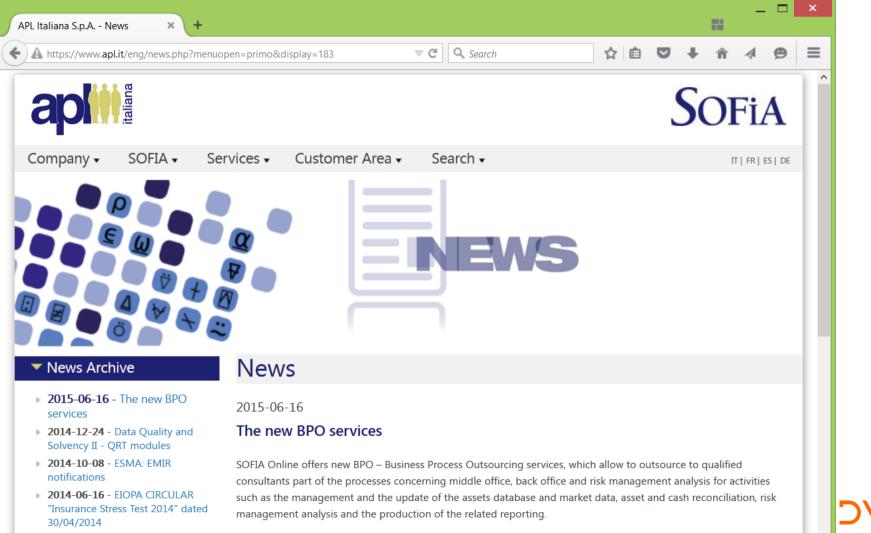
Dyalog – The Next Generation

2010-2021 **New CEO**

2022

2023

2023 Summer Interns

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Selected Customers
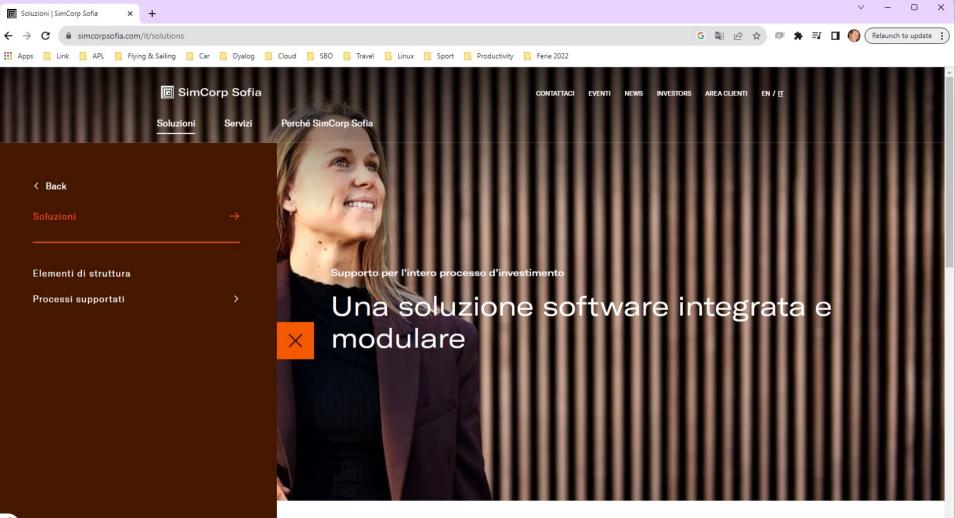
- Carlisle Group (US)
  - Collateral and Securitization for Global Capital Markets
- CompuGroupMedical (Sweden)
  - Worlds Largest "Patient Record" system: 40,000 users
    and 2.5 million patients records at largest hospital in Scandinavia
- A major ~~Oil~~Energy Company (US)
  - Optimizes the "Cracking" of Petroleum Products and research into lubricants using APL
- Sandvik Coromant (Sweden)
  - Computer Aided Design and Production Management of Machine Tools
- SimCorp (Denmark), APL Italiana (Italy), InvestCloud Financial Supermarket (US)
  - Leaders in various markets for Asset Management Systems

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SimCorp

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▸ **2014-12-24** - Data Quality and Solvency II - QRT modules

▸ **2014-10-08** - ESMA: EMIR notifications

▸ **2014-06-16** - EIOPA CIRCULAR "Insurance Stress Test 2014" dated 30/04/2014

▸ **2014-05-29** - COVIP Circular n. 250

News

2015-06-16

The new BPO services

SOFIA Online offers new BPO – Business Process Outsourcing services, which allow to outsource to qualified consultants part of the processes concerning middle office, back office and risk management analysis for activities such as the management and the update of the assets database and market data, asset and cash reconciliation, risk management analysis and the production of the related reporting.

With the Application Management and User Administration Profile, the BPO completes the offer of services

SimCorp Sofia

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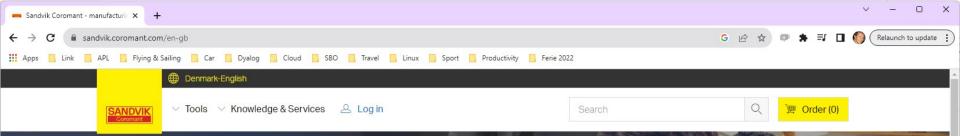## Welcome to Digital Transformation & Commerce for the Financial Industry

InvestCloud is transforming the Financial Industry's approach to digital. A single, no-code software platform for both Digital and Commerce enablement within the Financial Industry - covering all aspects of communication, planning, shopping and selling financial products. Cloud-native and multi-tenanted, we are changing how the world's largest banks, wealth managers and asset managers work – empowering them to leverage and leapfrog decades of technology debt and meet the elevated needs of today's, and tomorrow's, end clients.

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  Tegra118
  Fiserv Investment Services
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1: Anna Hallander (läk)   2: Bertil Bertilsson(03)   3: Ulrica Tests

Bertil Bertilsson(03)

Jul - 13

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Revenue Splits

Very Roughly

- USA vs ROW: 40/60

- UNIX & Linux vs Windows: 25/75

  - UNIX revenue is currently 90% AIX

  - We expect Linux to grow, replacing both AIX and Windows

- USA and UNIX: a smaller number of larger clients

  - Migrants to Dyalog APL from US-based APL vendors

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The Market

- We believe that the key strength of APL is and always has been that it allows the "Domain Expert" to be – or to work closely with – the "Programmer"

- This is getting more important as requirements grow in compexity and time-to-market grows in importance

- Recently, keeping auditors happy about security and best practices has become critical

Introduction to Dyalog – DYNA 2024

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Strategy – Part 1

Support the Domain Expert

Provide *Tool of Thought* for subject matter experts

Provide simple interfaces to:

- Microsoft Office

- Databases, XML, JSON

- Statistical / computational packages R, MatLab, Python, …

- GUI, Charting Tools

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Strategy – Part 2

Keep IT, Auditors & Software Engineers Happy

Provide interfaces and documentation required to satisfy the IT organization:

- Integrate with popular or "mainstream" development platforms

- Perform well and scale across multiple Cores and Machines

- Support Containerization & Service Orientation

- Enable Source Code Management and Continuous Integration

- Be Secure, Maintainable and Auditable

  - Allow our users to achieve the same for applications written in Dyalog APL

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Marketing Strategy

- Above all, keep existing clients Happy and Safe!
- Documentation and Tutorials
- Make it free to get started with APL
- Open-Source all Tools
- Evangelism: Non-APL conferences and social media
- Understand the needs of the modern "Data Scientist"
  - (Python and R users)
- Pave way for the Second Coming of APL

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HERDING CODE 140 – LIGHTNING ROUND WITH MORTEN KROMBERG ON APL

No Comments Posted by admin Posted in interview, podcast

While at Software Passion Summit, K Scott continues a series of lightning round interviews with Morten Kromberg, discussing APL.

Download / Listen:

Herding Code 140 – Lightning Round with Morten Kromberg

Show Notes:

- Morten describes the history and purpose of APL.
  - Did you know that APL stands for "A Programming Language"?
  - The first book about APL was written in 1962. It's as old as COBOL and FORTRAN.
  - APL was first written as a mathematical notation, and was used in teaching for 4 years before an interpreter was even written.
- It's a dynamic, interpreted language, and it encourages a functional style. Dyalog APL, which branched off about 30 years ago, is even more functional.
- People are still developing with APL, especially within the financial sector.
- Morten's company makes APL interpreters.
- K Scott asks about the ability to work with APL from .NET. Morten says that, while it's not a managed language, they have full interop so you can both create .NET classes in APL and consume them. You can use the GUI features in Dyalog APL, or you can interop with Windows / .NET GUI's, and it can even be used as an ASP.NET scripting language.
- K Scott asks why such an interesting language that's been around for so long isn't well known. Morten speculates on some reasons and talks about why he thinks it's seeing a resurgence.
- Morten and K Scott talk about some of the examples which really show off the language, such as a one line implementation of Conway's Game Of Life.
- Morten talks about how APL sees matrices as a fundamental concept, expressing them at a level higher than objects.
- APL is a very agile language, as it encourages direct interaction from domain experts.
- Morten recommends http://tryapl.org, an interactive website where you can learn more about APL.
- That's it! Scott runs off to tackle some more lightning round interviews.

Show Links:

6614 listeners

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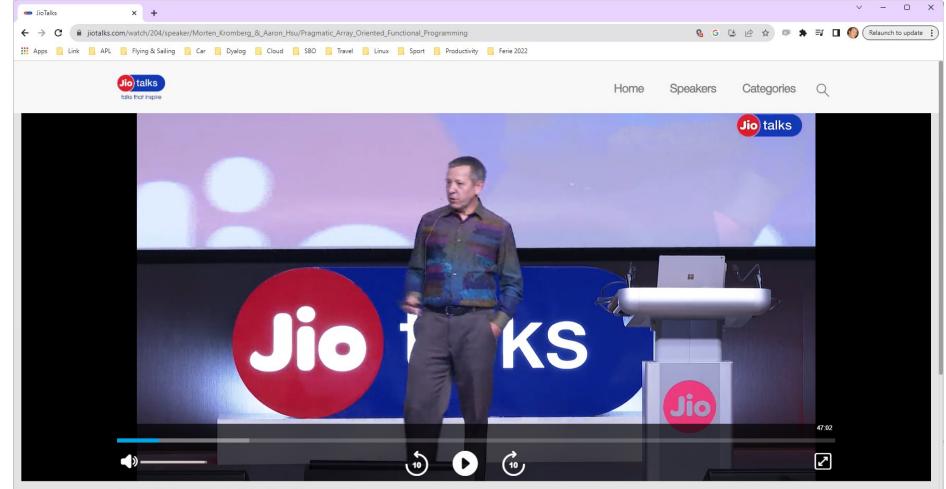
Talks at Google

Morten Kromberg

CTO, Dyalog Ltd.

June 16th, 2015

Pragmatic Array Oriented Functional Programming

Morten Kromberg & Aaron Hsu

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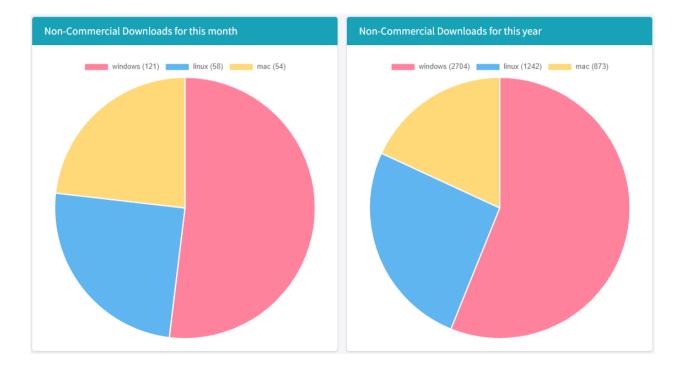
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Got a minute? — Try APL!

APL is an array-oriented programming language that will change the way you think about problems and data. With a powerful, concise syntax, it lets you develop shorter programs that enable you to think more about the problem you're trying to solve than how to express it to a computer.

TryAPL runs on Dyalog, which you can download for free, or try it now by entering an expression (use the language bar above to type the special APL symbols), or clicking one of these expressions, followed by ⌷Enter⌷, to see it in action:

| 2 + 2 | No points for guessing this |
| 4 2 3 + 8 5 7 | Functions apply to arrays |

⍳10	Generate the first ten integers
+/⍳100000	Sum the first 100 000 integers
×/⍳10	A long, slow way to write !10

| Avg←{(+/⍵)÷≢⍵} | Average is the sum divided by the count |
| Avg 1 6 3 4 | ... and apply it |

throws←?10000⍴6	Store 10 000 dice throws
+/1=throws	Of 10 000 throws, how many 1s?
+/(⍳6)∘.=throws	Frequency of all 6 possibilities

| 'Hello, World!' | Not just about maths! |
| {⍺,≢⍵}⌸'Mississippi' | See? |

What can APL do for you?

Are you a Problem Solver (a domain or subject matter expert with problems to solve) or a Programmer (someone who translates those solutions into a computer-executable format)? Problem Solvers benefit from APL's ability to concisely express advanced concepts without getting bogged down with a lot of

```
TryAPL Version 3.6.1 (enter ]State for details)
Sun Sep 17 2023 21:50:06
Copyright (c) Dyalog Limited 1982-2023
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Non-Commercial Downloads
(snapshot September 18th, 2023)
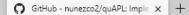
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Academic Collaboration

- University of Rome: Masters Level Financial Mathematics using Dyalog APL

- National University of Ukraine in Kiev started teaching introductory course in APL in 2011

- Herriot University (Scotland) and University of Copenhagen: Research into APL as a model for data-parallel computation

  - Compiling APL for GPGPUs etc

Directly Funded by Dyalog

- University of Indiana: Research into APL as a model for "deterministic task parallel computation"

  - Aaron Hsu's Co-dfns compiler

- Jesús Galán López (Ghent University)

  - Metallurgy with APL

- Santiago Núñez-Corrales, PhD

  - National Center for Supercomputing Applications

DYNA

README.md

quAPL 🔗

Santiago Núñez-Corrales, PhD (nunezco2@illinois.edu)

Marcos Frenkel (marcosf2@illinois.edu)

Bruno de Abreu (babreu@illinois.edu)

National Center for Supercomputing Applications

Description 🔗

quAPL is an APL implementation of a collection of primitives that can be used to simulate a quantum computer. The code is inteded to be experimental, and will continue to be expanded upwards to contain composable primitives leading to the vision of an Instruction Set Architecture, as well as downwards to replace core entities with calls to existing quantum implementations, ideally using OpenQASM.

Why APL 🔗

- APL naturally captures the effect of operators over vectors in normed, finite-dimensional Hilbert spaces representing quantum states
- APL's array-based syntax allows quantum programmers to focus on the semantics of qubit operators while removing concerns about implementation details unrelated to quantum computing
- APL's ability to optimize operations across multiple data types
- APL's native handling of complex numbers

Selected Features 2006-2024

- Web Server and Web Service Frameworks
- Run APL as a Windows Service
- Public Docker Containers
- Remote IDE for debugging service processes
- Health Monitor for monitoring collections of processes
- Parallel and Asynchronous Execution
- New Data Types:
  - 128-bit Decimal Floating Point
  - Complex Numbers
- Functional Programming (dfns)
- New primitives: Key, Stencil, Where, …
- Significant steps towards an APL compiler
- Many speed-ups of interpreter algorithms

- Object Orientation
- Microsoft.Net Integration
- HTMLRenderer object embeds Chromium Web Browser engine
- 64-bit: *NO* workspace or component file size limits
- Unicode Support incl APL Source in Text Files
- Secure TCP Sockets w/ IPv6 Support
- Encryption Toolkit
- Regular Expressions (PCRE) built-in to APL
- XML and JSON parsers for fast conversion to (and from) APL structures

Vast majority of features are identical across all platforms

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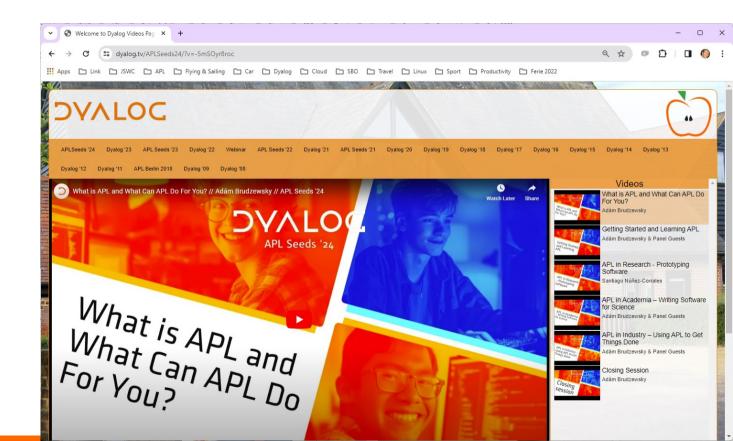
Summary

- Dyalog has emerged as the leader of the APL technology market

  - Continuously gained market share since early 1990's.

  - Dyalog APL allows domain experts to participate in rapid application development using recognized best practices

- APL can easily be integrated into any development environment as a client or server component using:

  - Web Service (SOAP/REST – HTTP/JSON) or Web Server (HTTP)

  - .NET and Microsoft.NET Framework

  - ODBC/ADO/ADO.NET

  - (Still support COM / ActiveX, even DDE)

- We are just getting started after 40 years!

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Videos from User Meetings

- dyalog.tv

Welcome to Dyalog Videos Pag

dyalog.tv/Dyalog23/?v=IvGmrjW_Jv4

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Welcome to Dyalog '23 // Gitte Christensen // Dyalog '23

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Welcome to Dyalog '23
Gitte Christensen

Introduction

Welcome to Dyalog '23
Gitte Christensen

The Road Ahead
Morten Kromberg

Behind The Scenes
Stine Kromberg & Jada Andrade

APL Problem Solving Competition

How I Won the APL Problem Solving Competition – Introduction and Prize Ceremony
Brian Becker

How I Won the APL Problem Solving Competition – Non-student Winner
Alexander Block

How I Won the APL Problem Solving Competition – Student Winner
Andrea Piseri

Dyalog Core Development

Dyalog Version 20.0 – Part 1
John Daintree

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The Real Reason to Pick Dyalog APL

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