
Java™

Practical Pros & Cons of Replacing Swing with JavaFX in Existing Applications

JavaFX provides a rich client API as a new and exciting way to develop client user interfaces. What are its key strengths and weaknesses? Is it ready to be used in production to replace Swing?

This panel discussion addresses the relevance of JavaFX in the context of existing Swing applications. It demonstrates and analyzes applications created in farm management, logistics, mission operations, and artificial intelligence.

The panelists show how their applications based on the NetBeans application framework leverage JavaFX, and they share their experiences of replacing Swing with JavaFX and porting Swing components to JavaFX.

Fair Questions to Ask

- Readiness
  - Is JavaFX ready to be used, at all?
  - What does “ready” mean? “Ready for toy applications” is not “Ready”, for example.
  - If JavaFX is ready, what are the risks for using it? Can its readiness be reverted?
  - How to mitigate the risks, how to keep all options open, how to adopt carefully.
- Relevance
  - If it is ready and risks can be mitigated, what is its place in existing Swing applications?
  - Does it have a place, at all?
  - What are the actually useful features that JavaFX provides, versus all the hype and buzz, etc?
- Replacement
  - Which parts of JavaFX to use and the strategies for doing so
  - Replace all of Swing with JavaFX? Swap out Swing during upgrades?
  - Don’t reinvent the wheel if others have walked the road already

- Sean Phillips
- Timon Veenstra
- Rob Terpilowski

- Commonalities:
  - Large applications, heavy investment
  - Based on NetBeans Platform application framework
  - Tomorrow 16:30 - 17:30: CON4171
    Hitchhiker's Guide to the NetBeans Platform
    (Hilton - Continental Ballroom 6)

GEONS Ground Support System

Java 7, JavaFX and the
NetBeans Platform supporting
NASA Missions Operations

Java for NASA Mission Support

The GEONS Ground Support System (GGSS) is an independent software tool designed to support analysis and mission operations using NASA GEONS.

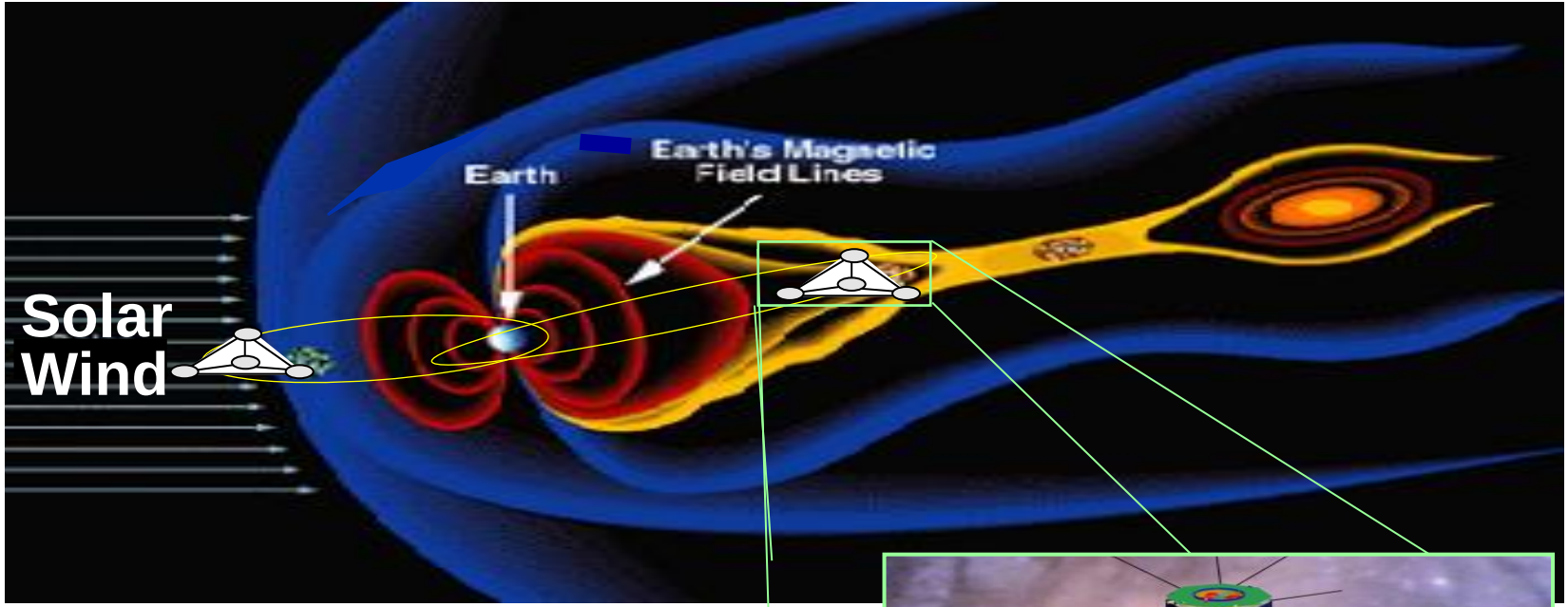
The GGSS uses the NetBeans Platform as the basis of the ground system software and will support a 2014 launch of the Magnetospheric Multiscale mission (MMS).

The GGSS is currently deployed in the MMS Mission Operations Control room at the Goddard Space Flight Center (GSFC) now for iterative acceptance testing.

The NetBeans Platform and the latest version of Java 7 has met all the base Mission Requirements for the GGSS.

JavaFX support for charting has been added to the original design as a means of rapid data exploration by both operators and analysts.

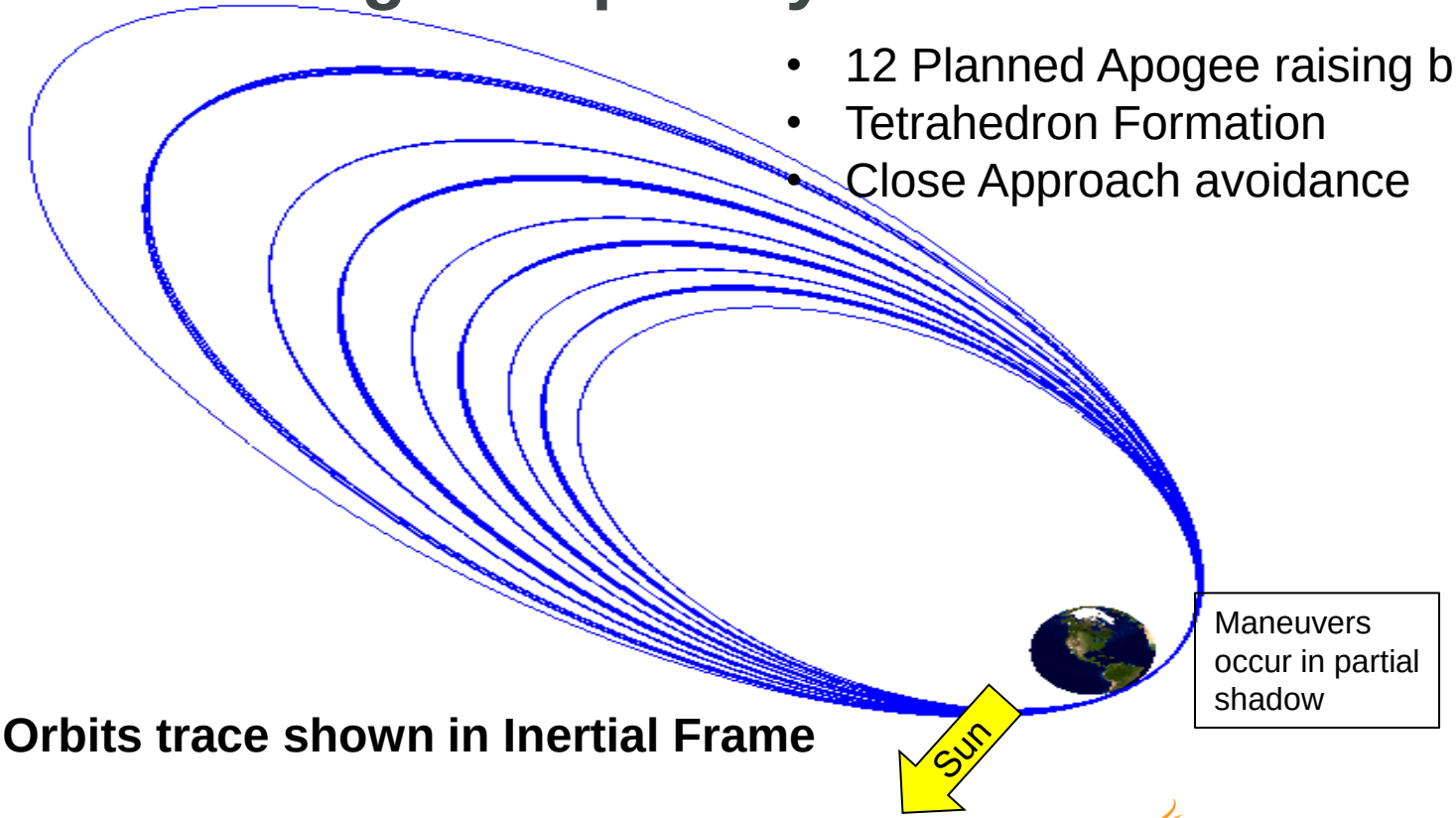
MMS Mission Overview



Sample regions of Scientific Interest at Dayside Magnetopause and the Nightside Neutral Sheet
for a 24 month mission lifetime.

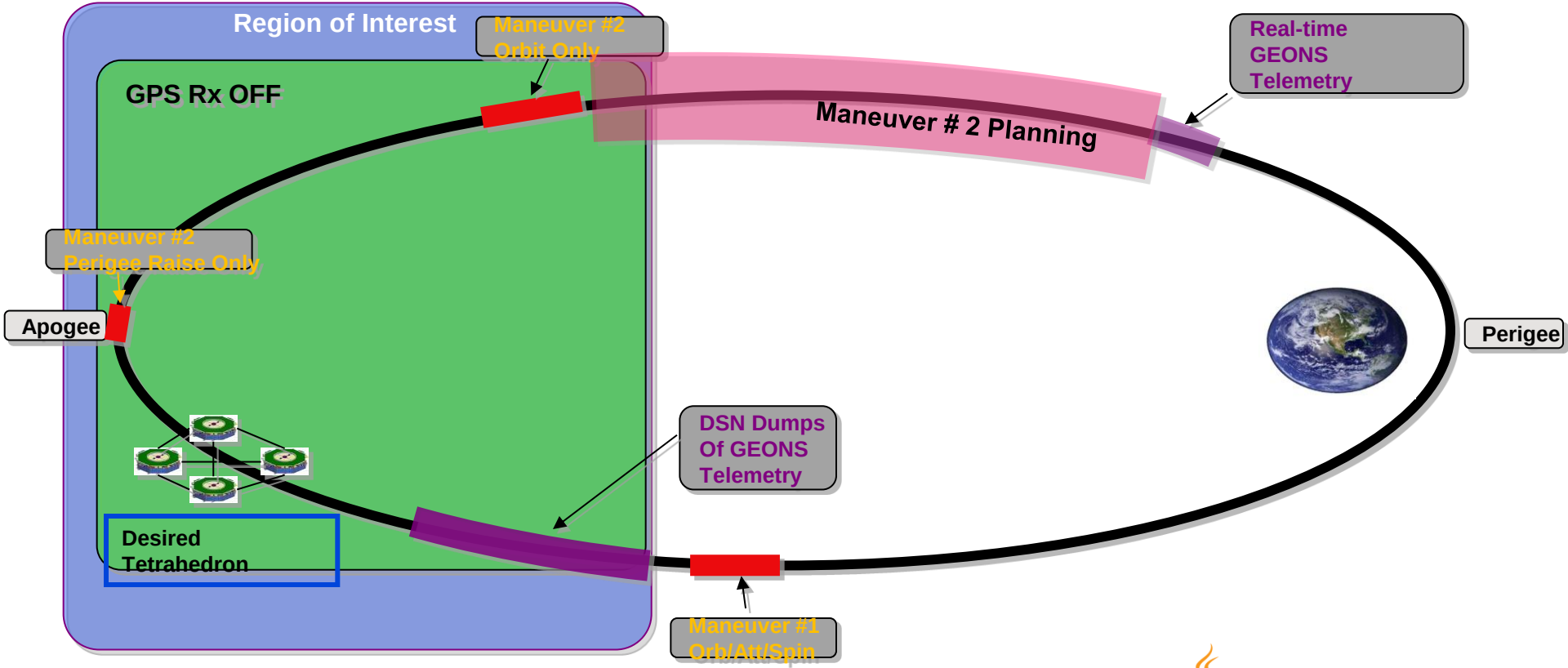
Mission Planning Complexity

- 12 Planned Apogee raising burns
- Tetrahedron Formation
- Close Approach avoidance



Orbits trace shown in Inertial Frame

Orbit in the Life



Data Product Generation using NetBeans Platform

- NetBeans Platform naturally well suited to fundamental need of all ground system software which is data product generation and management.
- Plugin architecture makes integrating core GEONS-related functions easy
- Platform is “easily” extendable for other missions flying GEONS
- GGSS should be able to be ported outside of the FDOA (e.g. to the FDF) for support on other missions with minimum impact (e.g. platform independent with clean interfaces to integrate with external packages such as propagators, telemetry extraction, and product formatting utilities)
- Routine operations can be automated (e.g. initiated via command line or script)
- Highly desirable that GGSS not require costly non-portable licenses

Quick Data Exploration using JavaFX

JavaFX charting capabilities have enhanced the original design of the GGSS.

The GGSS can now provide easy and rapid chart views of different data vectors an a large variety of combinations.

JavaFX facilitated this by reducing the development time (and therefore cost) of the following points:

- Easy Drag-And-Drop Event Handling
- Easy Custom Serialized DataFormat and Clipboard support
- Simplified Concurrency for GUI Rendering

The Combination of the NetBeans Platform custom File Type and the Swing Interop pattern made adding this JavaFX charting view straight forward.

Pros vs Cons on Adding JavaFX to Swing Applications

Should you add JavaFX to your Java GUI???

Pros

- Highly reactive GUI components are simpler to develop
- Reduced development time for rich GUI components
- Reduced code footprint for new components reduces maintenance costs

Cons

- Bidirectional Event monitoring between Swing and JavaFX is still a pain.
- JavaFX and Heavyweight controls still do not play nice.
- Making JavaFX components reusable for Swing and pure JavaFX not so easy
- Most of what JavaFX offers is viable via combination of Swing and 3rd party libraries.

Suggestions for JavaFX Adoption

As a "Swing guy" I have really come to appreciate how easy Drag/Drop, Animation and GUI event handling in general is now in JavaFX.

Implementing the interactive Drag and Drop chart controls was FUN!

However JavaFX upgrades to Java are mostly extra nice to haves. To really sell the next generation of developers and convince the current generation to switch how about the following:

- More and better 3D rendering support
- Fix and Improve support for Heavyweight components for improved backward compatibility
- Keep driving toward features that produce a measurable reduction in development time. **You can't argue with the bottom line!**

Appendix of Links

Goddard Space Flight Center Portal
http://www.nasa.gov/centers/goddard/home/index.html#.Ufh0KW2f2HM

GEONS Technical Site
http://techtransfer.gsfc.nasa.gov/ft_tech_geons.shtm

MMS Mission Site
http://mms.gsfc.nasa.gov/

ai Solutions, Inc
http://www.ai-solutions.com/

AgroSense

The worlds first and only
Open source farm management system

http://www.agrosense.eu
http://agrosense.java.net

Timon Veenstra
Architect / Lead developer

timon@agrosense.eu
@TimonVeenstra

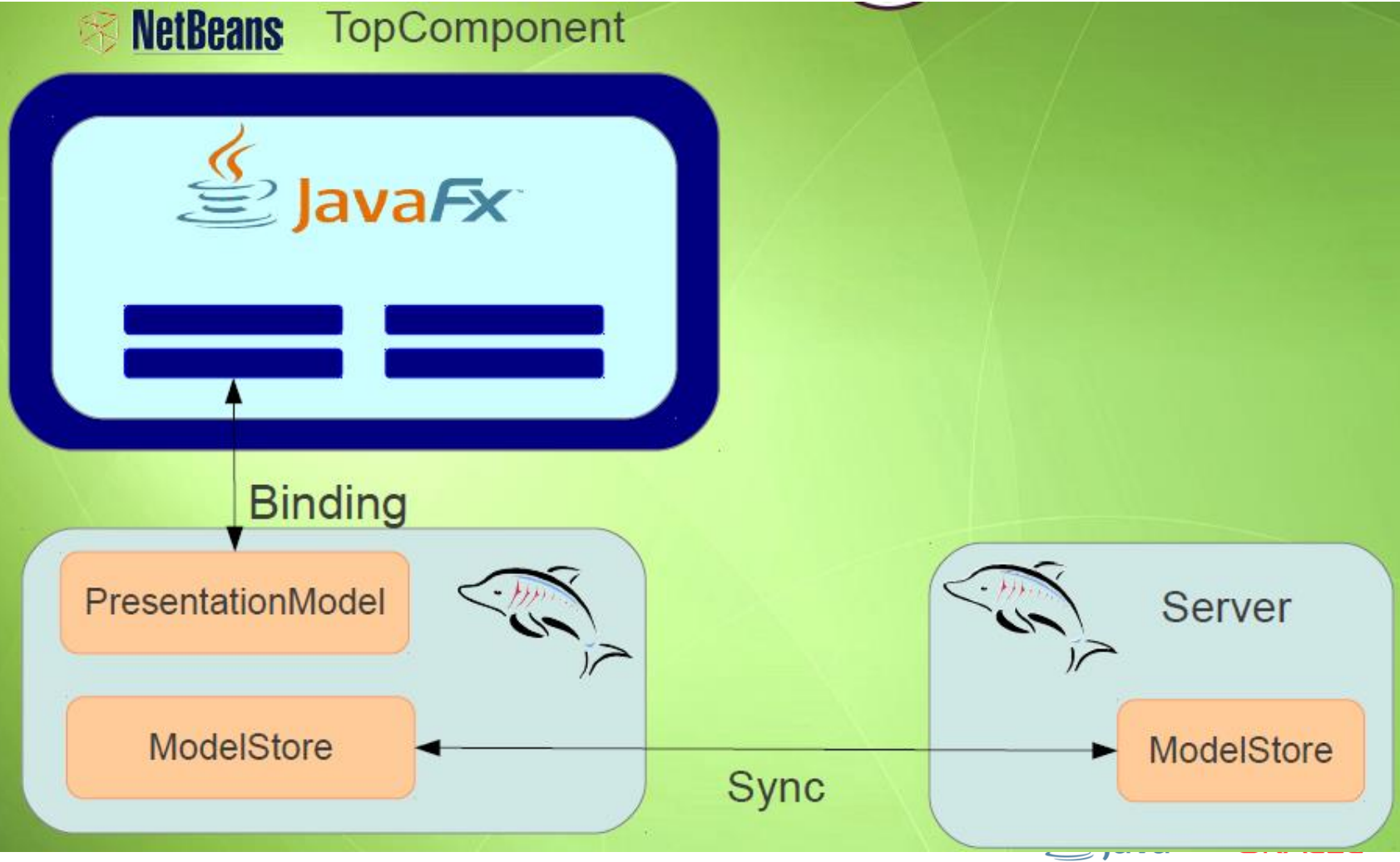
Server

Rich client

Mobile client

Web client

NetBeans


NetBeans
TopComponent
JavaFx
Binding
PresentationModel
ModelStore
Sync
Server
ModelStore

Freight Management with JavaFX on the NetBeans Rich Client Platform

Rob Terpilowski

Lynden, Inc.

Java™ ORACLE®

About Me

- Application Architect at Lynden, Inc.
- Technical lead for our freight planning and management application, “FMS”.

Operating Companies

LYNDEN TRANSPORT

LYNDEN AIR CARGO

ALASKA MARINE LINES

LTI INC.

LYNDEN INTERNATIONAL

LYNDEN AIR FREIGHT

ALASKA WEST EXPRESS

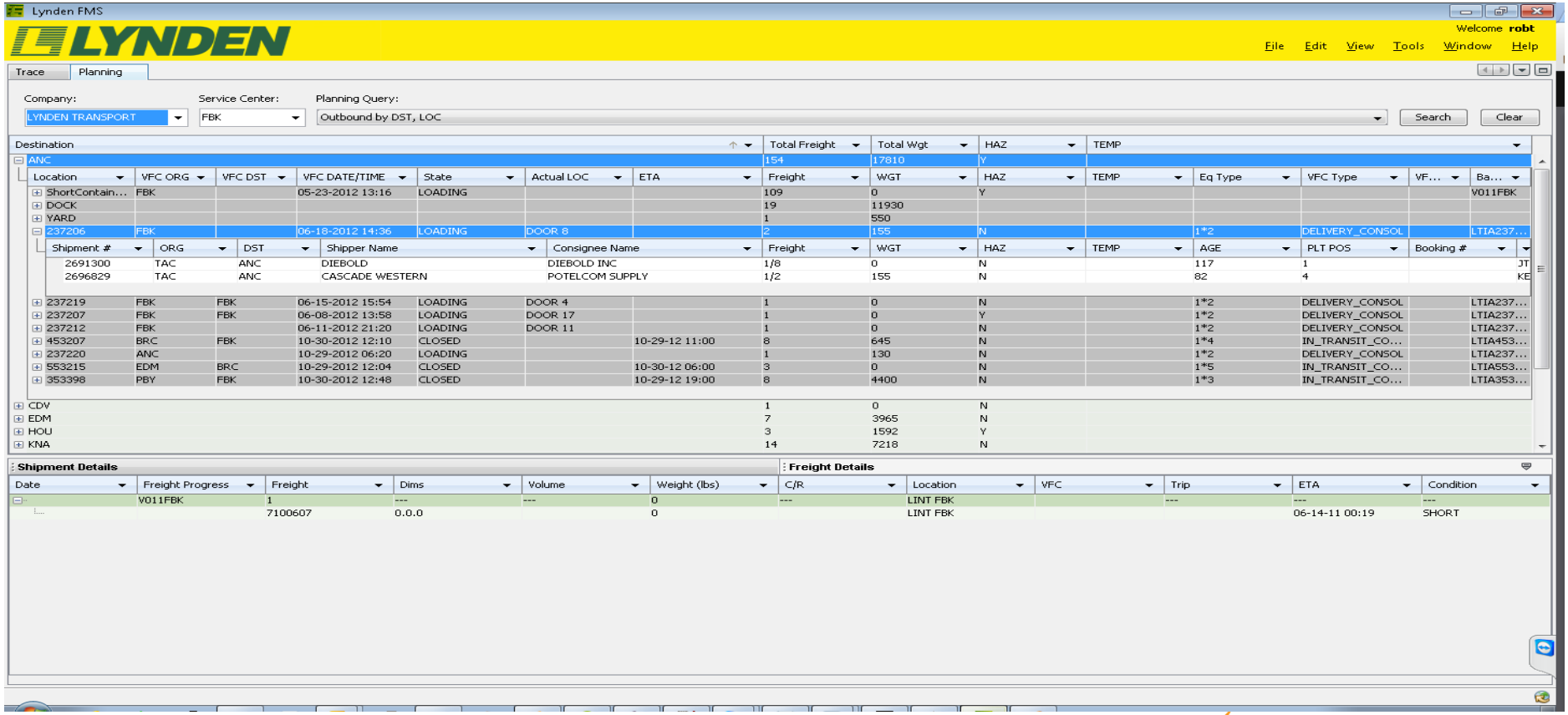
Java™ ORACLE®

The Problem

- Where's my freight???

Java™ ORACLE

Freight Management RCP App with Swing



Java™ ORACLE®

Extreme Makeovers

RecoveryArrivalBoard.fxml

VFC Recovery

LYNDEN TRANSPORT

ARRIVALS AT:
ANCHORAGE

DATE	TIME	TRIP ID	ORIGIN	MODE
02-15	14:00	Tote*1234	Tacoma	Steamship
02-15		Unit*23443	Tacoma	Highway
02-15	16:00	ARM*34448	Seattle	Barge
02-16		Unit*23443	Edmonton	Highway
02-16		AKRR*56541	Fairbanks	Rail
02-16		Unit*23443	Prudhoe Bay	Highway
02-17	16:00	Tote*234234	Tacoma	Steamship

AKRR*56541
Arrival: 02/16 16:00

Plans: 3
VFCs: 12
Shipments: 32

▼ Fred Meyer

VFC #	Consignee	Recover Date	Driver	Comments	Spot Plan	Unload Date	Temp	Status	Dispatch #
223123	Fred Meyer	07-15-12 13:30	Betty	Drop First	Door 12	07/15/12	KFF	DISP	
335341	Fred Meyer	07-15-12 14:30	JSW	Call Check	T2	07/16/12	+34	DISP	
554665	Fred Meyer	07-16-12 13:30	Mick	Trailer	T2	07/16/12	+34	DISP	
223653	Fred Meyer	07-16-12 13:30	Wallace		Spot-04	07/15/12	KFF	DISP	
456687	Fred Meyer	07-21-12 13:30	John	Call	Door 11	07/16/12	KFF	DISP	

▶ Spot

Inbound Planning

Pre-Dispatch
Shipments: 32

Steamship
Dispatches: 6
Shipments: 62

Rail
Dispatches: 2
Shipments: 15

Highway
Dispatches: 18
Shipments: 18

- Tote*13232 — 76% Complete
- Tote*55433 — 52% Complete
- Tote*65418 — 22% Complete
- Tote*14561 — 0% Complete
- Tote*15547 — 0% Complete
- Tote*88465 — 0% Complete

Full Load

Unit #	Location	Status	Date/Time	Unit Type	Org	Dst	Shipments	Consignee
345440	Yard	CLSD	07-15-12 13:30	In Trans Full	TAC	ANC	1	Lowes
546123	Yard	CLSD	07-18-12 13:30	In Trans Full	TAC	ANC	1	Fred Meyer
422211	Yard	CLSD	07-22-12 14:23	In Trans Full	TAC	ANC	1	Home Depot
456778	Yard	CLSD	07-24-12 12:12	In Trans Full	TAC	ANC	1	Home Depot
123545	Yard	CLSD	07-05-12 05:30	In Trans Full	TAC	ANC	1	Home Depot
123245	Yard	CLSD	07-13-12 13:23	In Trans Full	TAC	ANC	1	Lowes
456665	Yard	CLSD	07-21-12 04:53	In Trans Full	TAC	ANC	1	Lowes

▶ Consol

▶ Transfer

Unit Plans

Fred Meyer	10/18/12:	23 Units
	10/23/12:	15 Units
	10/30/12:	2 Units
Sea Land	10/18/12:	5 Units
	10/19/12:	3 Units
	10/25/12:	1 Unit
Darigold	10/25/12:	15 Units
	10/27/12:	3 Units
KNA	10/18/12:	23 Units
	10/23/12:	15 Units

JavaFX UI Design with Scene Builder

Java™ ORACLE®

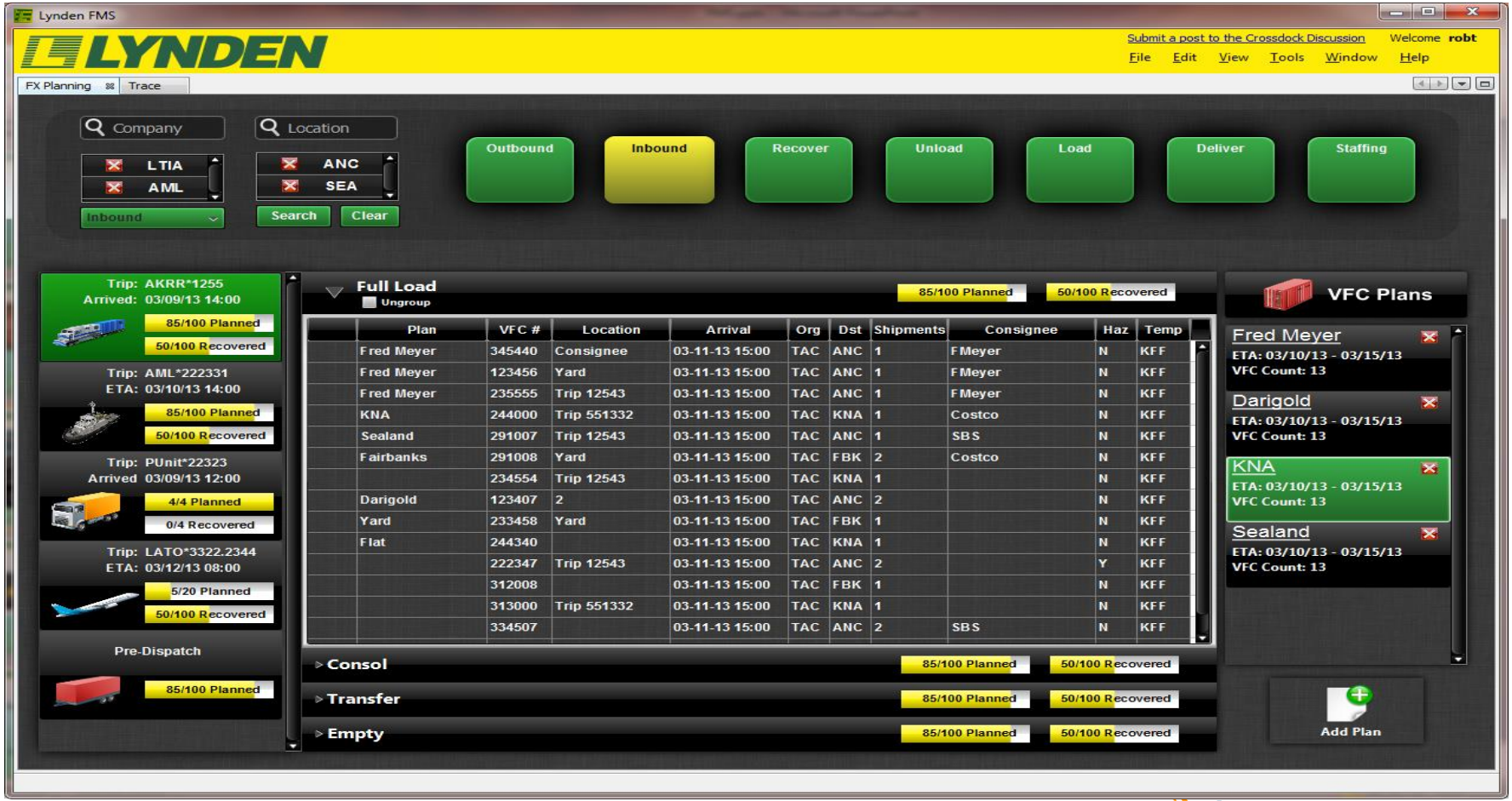
```
public FXPlanningTopComponent() {

        initComponents();
        setName(Bundle.CTL_FXPlanningTopComponentTopComponent());
        setToolTipText(Bundle.HINT_FXPlanningTopComponentTopComponent());

        Platform.setImplicitExit(false);

          Platform.runLater(new Runnable() {
            public void run() {
                Parent root;
                try {
                    root = FXMLLoader.load(
                    getClass().getResource("/com/lynden/planning/ui/InboundPlanning.fxml"));

                    JFXPanel jfxPanel = new JFXPanel();
                    jfxPanel.setScene(new Scene(root));
                } catch (IOException ex) {
                    Exceptions.printStackTrace(ex);
                }
            }
        });
        setLayout(new BorderLayout());
        add(jfxPanel, BorderLayout.CENTER);
    }
```


Lynden FMS
LYNDEN
Submit a post to the Crossdock Discussion
Welcome robt
File Edit View Tools Window Help
FX Planning
Trace
Company
Location
LTIA
AML
ANC
SEA
Inbound
Search
Clear
Outbound
Inbound
Recover
Unload
Load
Deliver
Staffing
Trip: AKRR*1255
Arrived: 03/09/13 14:00
85/100 Planned
50/100 Recovered
Trip: AML*222331
ETA: 03/10/13 14:00
85/100 Planned
50/100 Recovered
Trip: PUnit*22323
Arrived 03/09/13 12:00
4/4 Planned
0/4 Recovered
Trip: LATO*3322.2344
ETA: 03/12/13 08:00
5/20 Planned
50/100 Recovered
Pre-Dispatch
85/100 Planned
Full Load
Ungroup
85/100 Planned
50/100 Recovered
Plan VFC # Location Arrival Org Dst Shipments Consignee Haz Temp
Fred Meyer 345440 Consignee 03-11-13 15:00 TAC ANC 1 FMeyer N KFF
Fred Meyer 123456 Yard 03-11-13 15:00 TAC ANC 1 FMeyer N KFF
Fred Meyer 235555 Trip 12543 03-11-13 15:00 TAC ANC 1 FMeyer N KFF
KNA 244000 Trip 551332 03-11-13 15:00 TAC KNA 1 Costco N KFF
Sealand 291007 Trip 12543 03-11-13 15:00 TAC ANC 1 SBS N KFF
Fairbanks 291008 Yard 03-11-13 15:00 TAC FBK 2 Costco N KFF
234554 Trip 12543 03-11-13 15:00 TAC KNA 1 N KFF
Darigold 123407 2 03-11-13 15:00 TAC ANC 2 N KFF
Yard 233458 Yard 03-11-13 15:00 TAC FBK 1 N KFF
Flat 244340 03-11-13 15:00 TAC KNA 1 N KFF
222347 Trip 12543 03-11-13 15:00 TAC ANC 2 Y KFF
312008 03-11-13 15:00 TAC FBK 1 N KFF
313000 Trip 551332 03-11-13 15:00 TAC KNA 1 N KFF
334507 03-11-13 15:00 TAC ANC 2 SBS N KFF
Consol
85/100 Planned
50/100 Recovered
Transfer
85/100 Planned
50/100 Recovered
Empty
85/100 Planned
50/100 Recovered
VFC Plans
Fred Meyer
ETA: 03/10/13 - 03/15/13
VFC Count: 13
Darigold
ETA: 03/10/13 - 03/15/13
VFC Count: 13
KNA
ETA: 03/10/13 - 03/15/13
VFC Count: 13
Sealand
ETA: 03/10/13 - 03/15/13
VFC Count: 13
Add Plan

Contact Info

- Rob Terpilowski
- Email: robt@Lynden.com
- Twitter: @RobTerp
- Blog: http://rterp.wordpress.com

Questions?

- Sean Phillips
  - sean.mi.phillips@gmail.com
  - @SeanMiPhillips
- Timon Veenstra
  - timon@agrosense.eu
  - @TimonVeenstra
- Rob Terpilowski
  - robt@Lynden.com
  - @RobTerp
- Geertjan Wielenga
  - geertjan.wielenga@oracle.com
  - @geertjanw

- Commonalities:

Tomorrow 16:30 - 17:30:
CON4171 Hitchhiker's Guide to the NetBeans Platform
(Hilton - Continental Ballroom 6)


Java™