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#lhindjavaee

Lufthansa
Industry Solutions

Java EE in Practice at

LUFTHANSA INDUSTRY SOLUTIONS

#lhindjavaee

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Lufthansa Industry Solutions

Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

speaker

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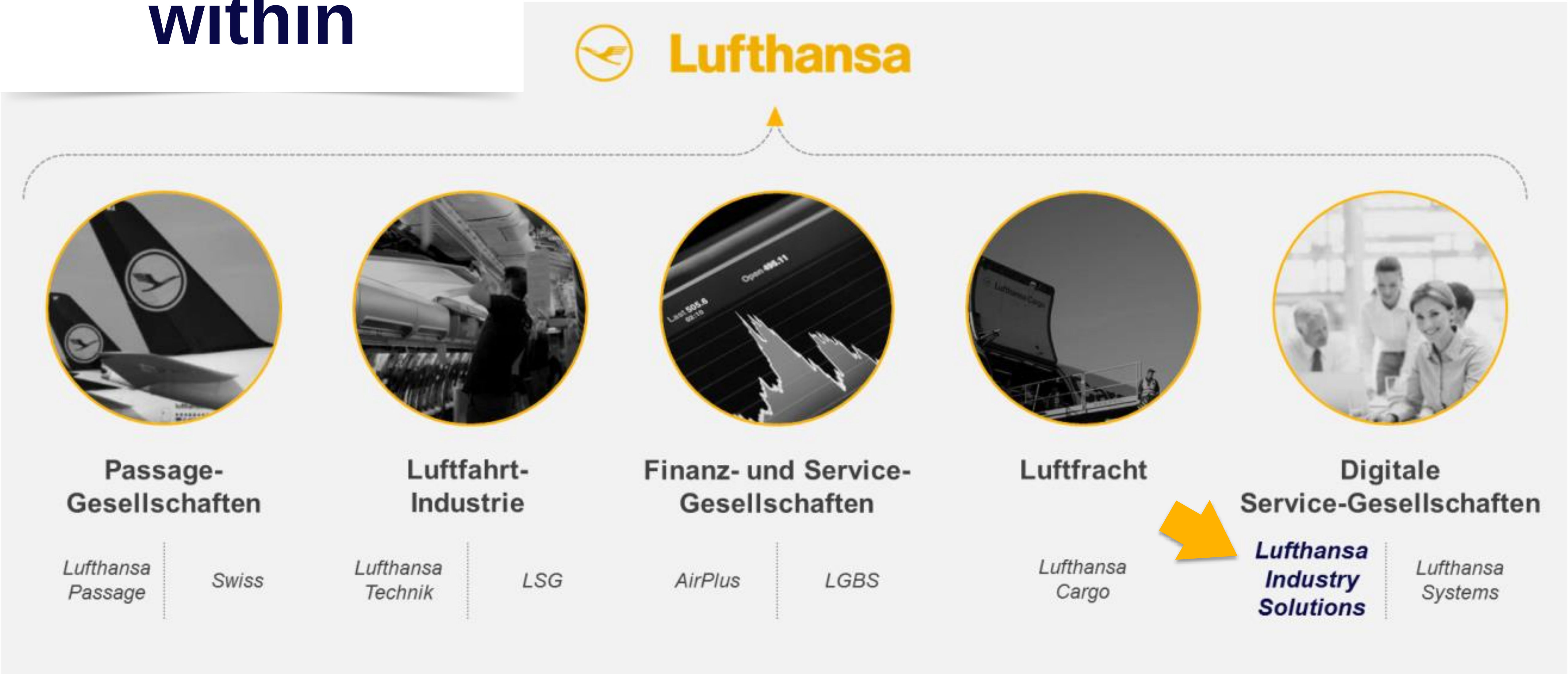
a guide to this presentation

multiple flight levels

a guide to this presentation

multiple flight levels

Our stand
within



Lufthansa

Passage-Gesellschaften

- Lufthansa Passage
- Swiss

Luftfahrt-Industrie

- Lufthansa Technik
- LSG

Finanz- und Service-Gesellschaften

- AirPlus
- LGBS

Luftfracht

- Lufthansa Cargo

Digitale Service-Gesellschaften

- **Lufthansa Industry Solutions**
- Lufthansa Systems

Lufthansa Industry Solutions

creates, **operates**, **maintains**

…differing software for a wide range of customers in different domains.

NFR’s vary strongly

► no one fits all solution ◄

► needs flexible standards ◄

proven practices…

…guiding better training

technology patrons

stand by for the hardest questions

what we call…

THE BOOK OF STANDARDS

Amongst others our standards include…

JPA JMS PrimeFaces

Hibernate search EJB CDI JSF

JAX-WS Bean validation JAX-RS

...

Static Languages/RDBMS vs. Dynamic Languages/NOSQL

Deferred design decisions and potentially higher maintenance cost

- Complexity has to live somewhere
  - Explicitly defined
    - Statically Typed Languages
      - Compiler/Linker/Build system
    - Reliance on the call stack
    - Relational Databases
      - Schema
  - Implicitly defined
    - Dynamically typed languages
      - Pass around a bunch of JSON with a priori knowledge of how to interpret it
      - Loosely defined concept of inheritance and/or polymorphism
    - NOSQL databases
      - No schema, a prior knowledge of what is a table

… but now for some

Real-world examples

c/note

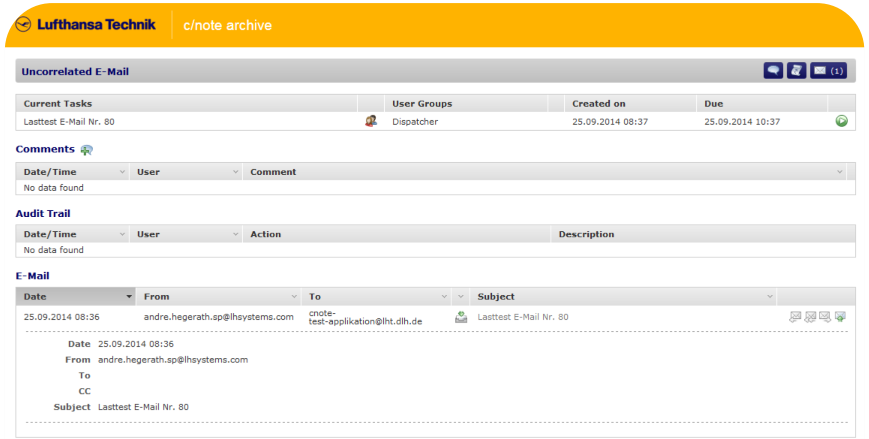
Lufthansa Technik, Product Division Components

Workflow application for customer service

- Business process-based performance of various tasks
- Individual, configurable task list
- Archive view of completed tasks

Special Challenges:

- Interfaces to 10+ external systems
- Integration of Outlook Web Apps for reading and composing E-Mails
- Highly volatile, rule-based assignment of tasks



Uncorrelated E-Mail (1)

Current Tasks	User Groups	Created on	Due
Lasttest E-Mail Nr. 80	Dispatcher	25.09.2014 08:37	25.09.2014 10:37

Comments

Date/Time	User	Comment
No data found		

Audit Trail

Date/Time	User	Action	Description
No data found			

E-Mail

Date	From	To	Subject
25.09.2014 08:36	andre.hegerath.sp@lhsystems.com	cnote-test-applikation@lht.dlh.de	Lasttest E-Mail Nr. 80

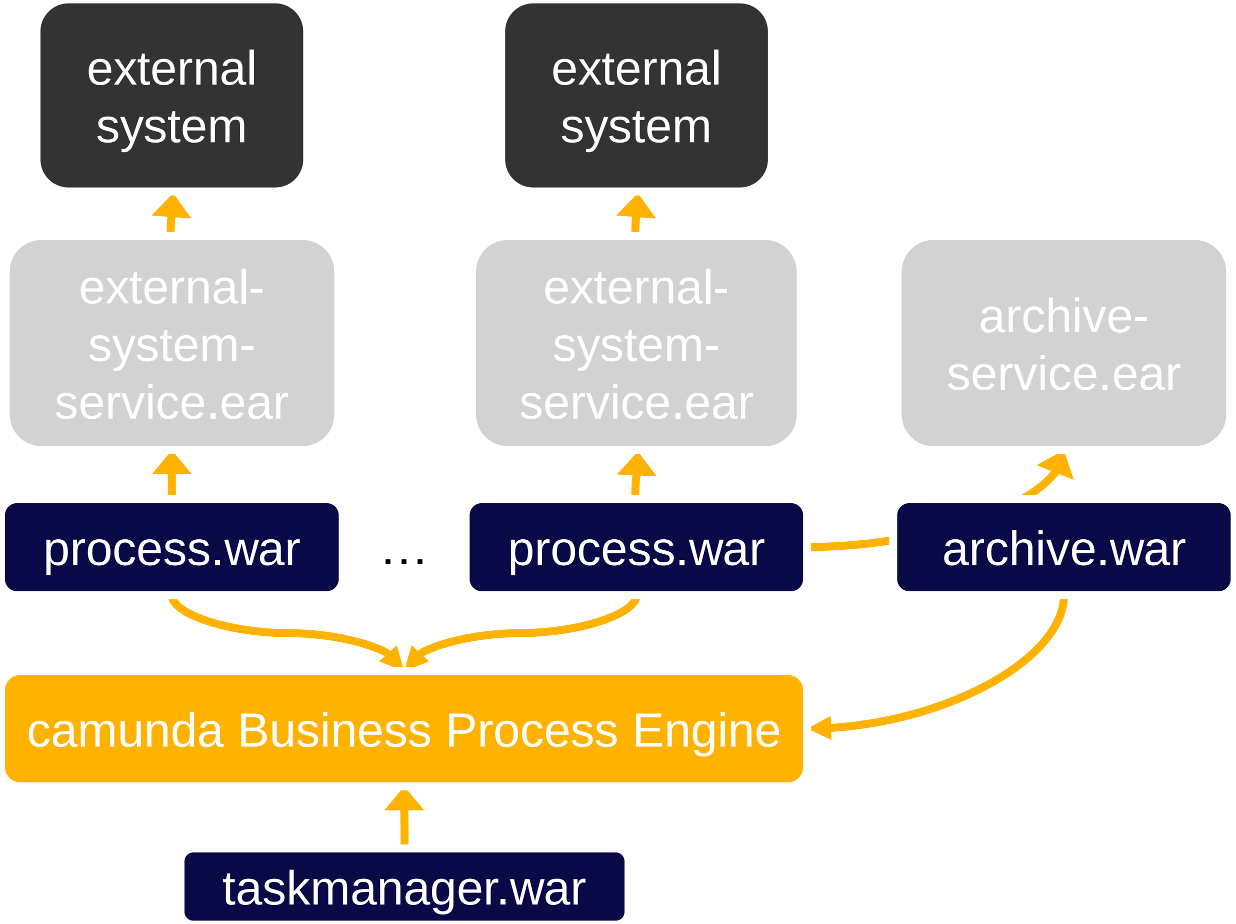
Date 25.09.2014 08:36
From andre.hegerath.sp@lhsystems.com
To
CC
Subject Lasttest E-Mail Nr. 80

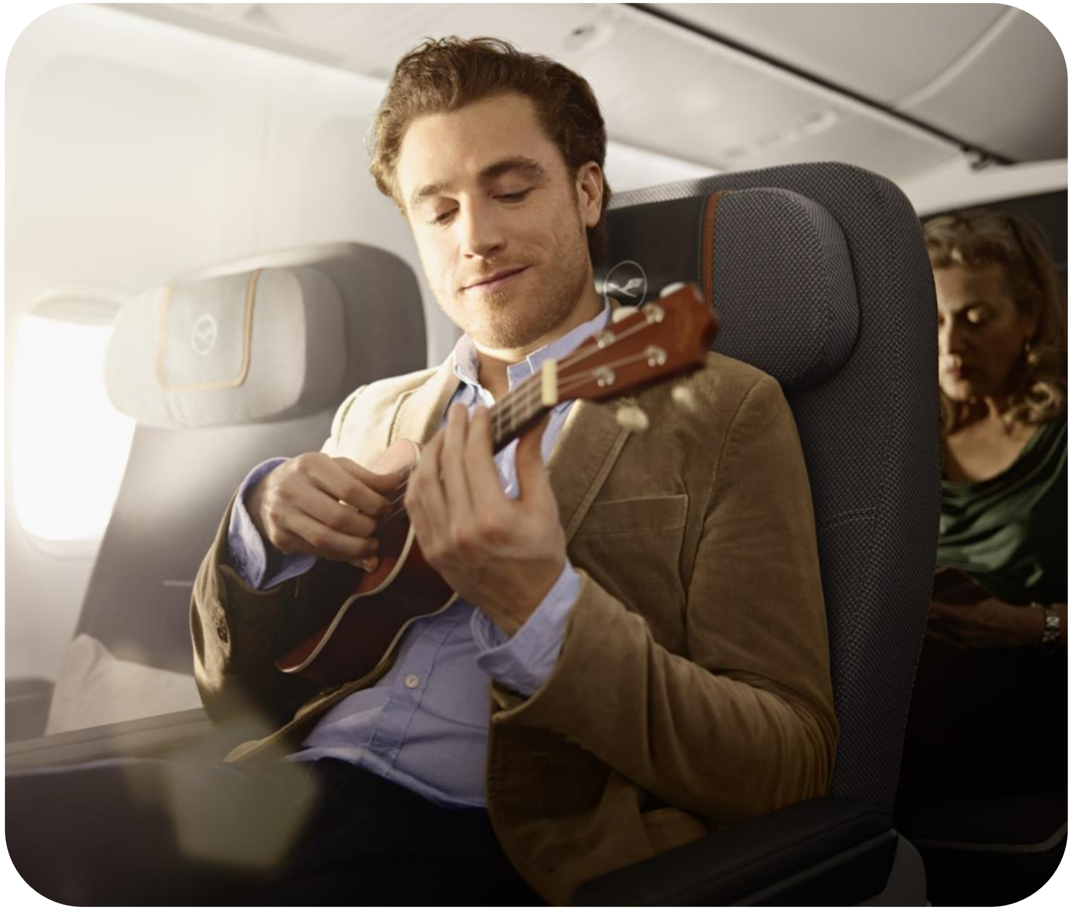
Lufthansa Technik

- Java EE 6, Java 7
- JBoss EAP 6 Application Server
- camunda Business Process Engine
- ICEfaces
- JBoss Drools
- Hibernate Search

Architecture

An Orchestra of ears and wars





Problems & Solutions

CDI ViewScope in Java EE 6

Problems & Solutions

Long-running reports

Problems & Solutions

Keeping track of changes to database tables

HAM SuITe

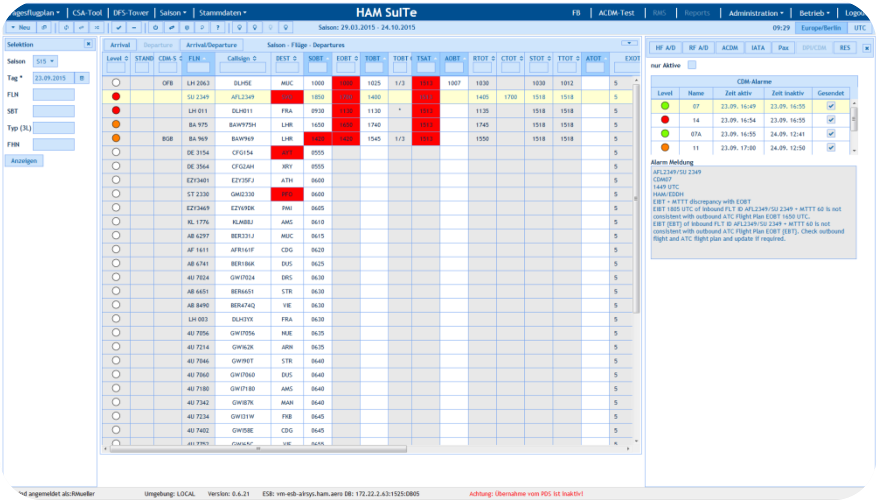
Hamburg Airport

Renewal of the central operative systems at Hamburg Airport, e.g.:

- Flight plan editing
- Flight database
- Resource management

Special Challenges:

- Integration of 50 subsystems
- Requirement for immediate visibility of changes in browser
- Sophisticated date/time calculations



Saison: 29.03.2015 - 24.10.2015

Saison: S15

Tag *: 23.09.2015

Saison - Flüge - Departures

Level	STAND	CDM-S	FLN	Callsign	DEST	SOBT	EOBT	TOBT	TOBT (	TSAT	AOBT	RTOT	CTOT	STOT	TTOT	ATOT	EXOT
○		OFB	LH 2063	DLH5E	MUC	1000	1000	1025	1/3	1513	1007	1030		1030	1012		5
●			SU 2349	AFL2349	SVO	1850	1700	1400		1513		1405	1700	1518	1518		5
●			LH 011	DLH011	FRA	0930	1130	1130	*	1513		1135		1518	1518		5
●			BA 975	BAW975H	LHR	1650	1650	1740		1513		1745		1518	1518		5
●		BGB	BA 969	BAW969	LHR	1420	1420	1545	1/3	1513		1550		1518	1518		5
○			DE 3154	CFG154	AYT	0555											5
○			DE 3564	CFG2AH	XRY	0555											5
○			EZY3401	EZY35FJ	ATH	0600											5
○			ST 2330	GMI2330	PFO	0600											5
○			EZY3469	EZY69DK	PMI	0605											5
○			KL 1776	KLM88J	AMS	0610											5
○			AB 6297	BER331J	MUC	0615											5
○			AF 1611	AFR161F	CDG	0620											5
○			AB 6741	BER186K	DUS	0625											5
○			4U 7024	GWI7024	DRS	0630											5
○			AB 6651	BER6651	STR	0630											5
○			AB 8490	BER474Q	VIE	0630											5
○			LH 003	DLH3YX	FRA	0630											5
○			4U 7056	GWI7056	NUE	0635											5
○			4U 7214	GWI62K	ARN	0635											5
○			4U 7046	GWI90T	STR	0640											5
○			4U 7060	GWI7060	DUS	0640											5
○			4U 7180	GWI7180	AMS	0640											5
○			4U 7342	GWI87K	MAN	0640											5
○			4U 7234	GWI31W	FKB	0645											5
○			4U 7402	GWI58E	CDG	0645											5

CDM-Alarme

Level	Name	Zeit aktiv	Zeit inaktiv	Gesendet
●	07	23.09. 16:49	23.09. 16:55	☑
●	14	23.09. 16:54	23.09. 16:55	☑
●	07A	23.09. 16:55	24.09. 12:41	☑
●	11	23.09. 17:00	24.09. 12:50	☑

Alarm Meldung

AFL2349/SU 2349
CDM07
1449 UTC
HAM/EDDH
EIBT + MTTT discrepancy with EOBT
EIBT 1805 UTC of inbound FLT ID AFL2349/SU 2349 + MTTT 60 is not consistent with outbound ATC Flight Plan EOBT 1650 UTC.
EIBT (EBT) of inbound FLT ID AFL2349/SU 2349 + MTTT 60 is not consistent with outbound ATC Flight Plan EOBT (EBT). Check outbound flight and ATC flight plan and update if required.

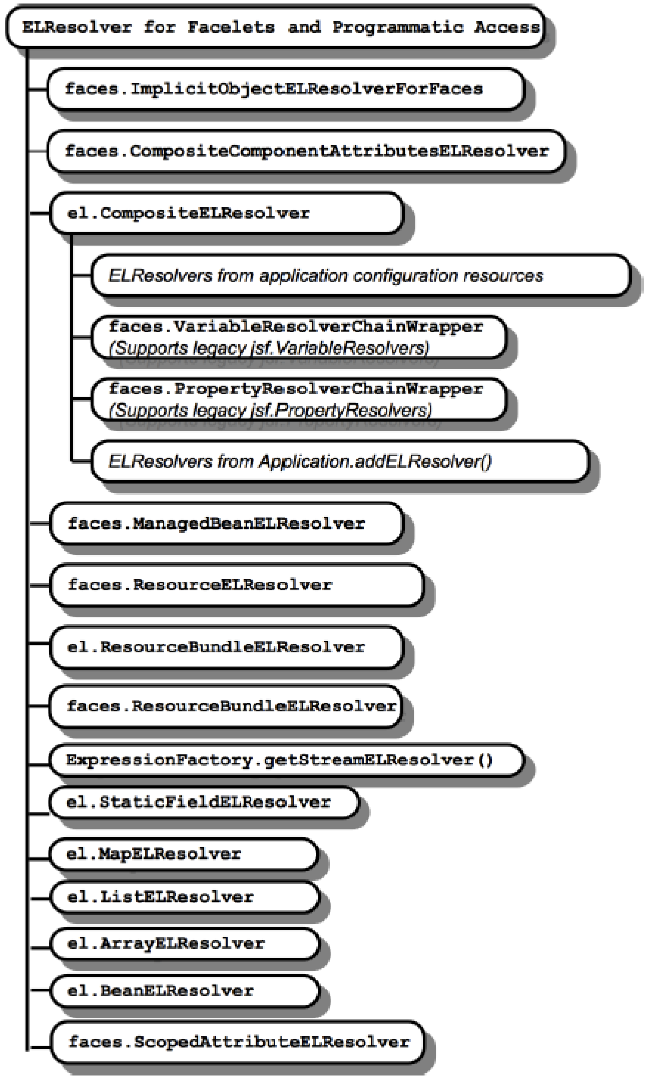
nd angemeldet als:RMueller Umgebung: LOCAL Version: 0.6.21 ESB: vm-esb-airsys.ham.aero DB: 172.22.2.63:1525:DB05 Achtung: Übernahme vom PDS ist inaktiv!

Hamburg Airport

- Java EE 7, Java 8
- Wildfly Application Server
- Mule Enterprise Service Bus
- PrimeFaces & PrimeFaces Push
- Usage of Java 8 Date/Time API
- Hibernate Envers
- Sencha Ext JS & Bryntum Gantt Scheduler

Problems & Solutions

Use literal value expressions from surrounding facelet

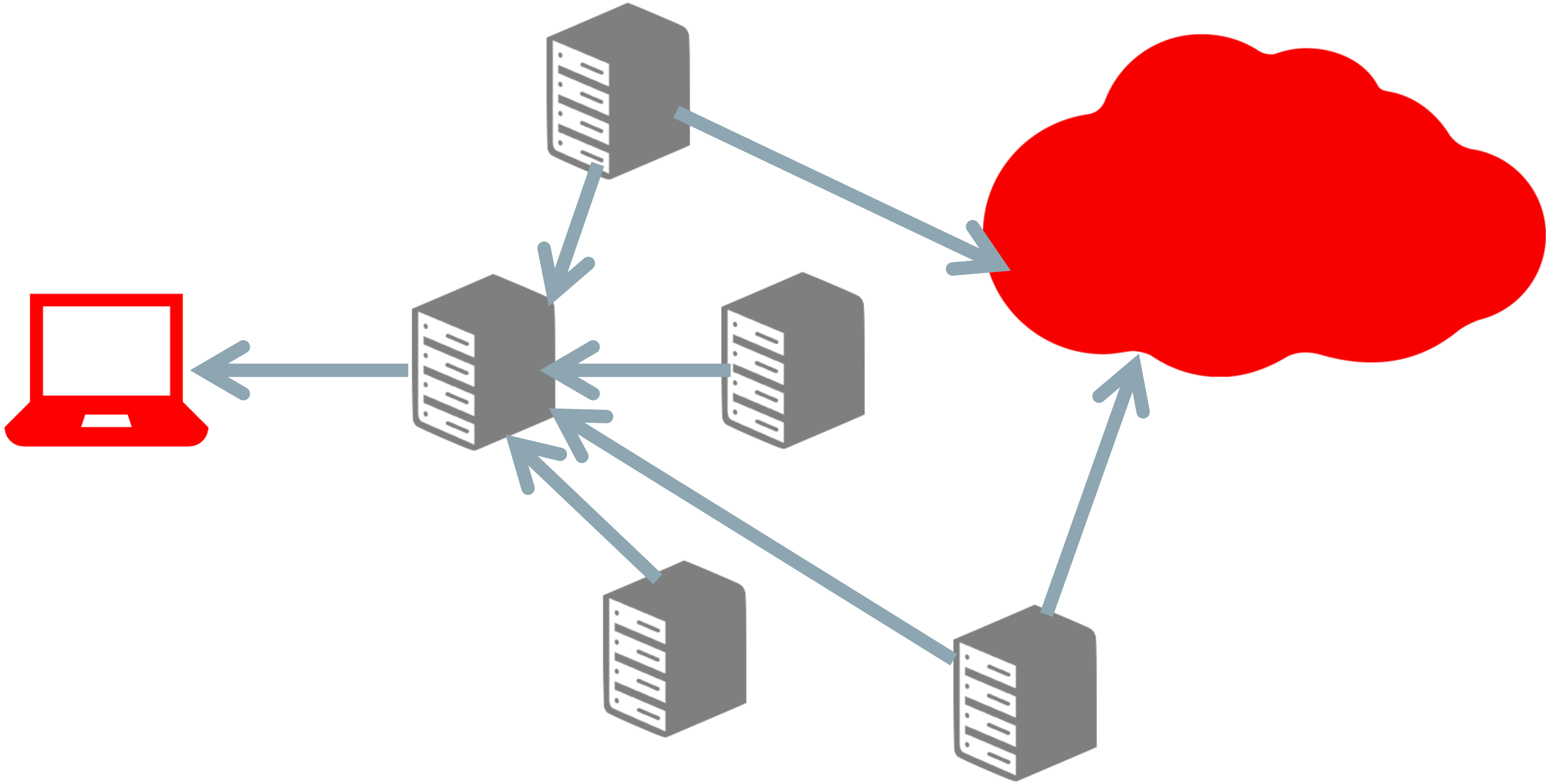


ELResolver for Facelets and Programmatic Access

- faces.ImplicitObjectELResolverForFaces
- faces.CompositeComponentAttributesELResolver
- el.CompositeELResolver
  - *ELResolvers from application configuration resources*
  - faces.VariableResolverChainWrapper *(Supports legacy jsf.VariableResolvers)*
  - faces.PropertyResolverChainWrapper *(Supports legacy jsf.PropertyResolvers)*
  - *ELResolvers from Application.addELResolver()*
- faces.ManagedBeanELResolver
- faces.ResourceELResolver
- el.ResourceBundleELResolver
- faces.ResourceBundleELResolver
- ExpressionFactory.getStreamELResolver()
- el.StaticFieldELResolver
- el.MapELResolver
- el.ListELResolver
- el.ArrayELResolver
- el.BeanELResolver
- faces.ScopedAttributeELResolver

Content Aggregation

Microservices Before They Were Cool



A LOOK TO THE FUTURE

Faces Flows

Allows modularization of behaviour
Well suited for “screen driven” apps

Multi-component validation

Uses standard Bean Validation
The oldest issue in the JSF spec issue tracker

WebSocket integration

Useful for propagating “out-of-band” events to existing user sessions

summary summary summary

We got to know IT consulting in aviation…

…compared Java EE and its alternatives

discussed some real world examples…

…and showed some of the many suitable problems…

…best solved in Java EE

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