



# „Orchestrator“

## IT-Paradigmenwechsel im Zeitalter des Cloud Computing

Mohammad Esad-Djou, Solution Architect  
OPITZ CONSULTING Deutschland GmbH



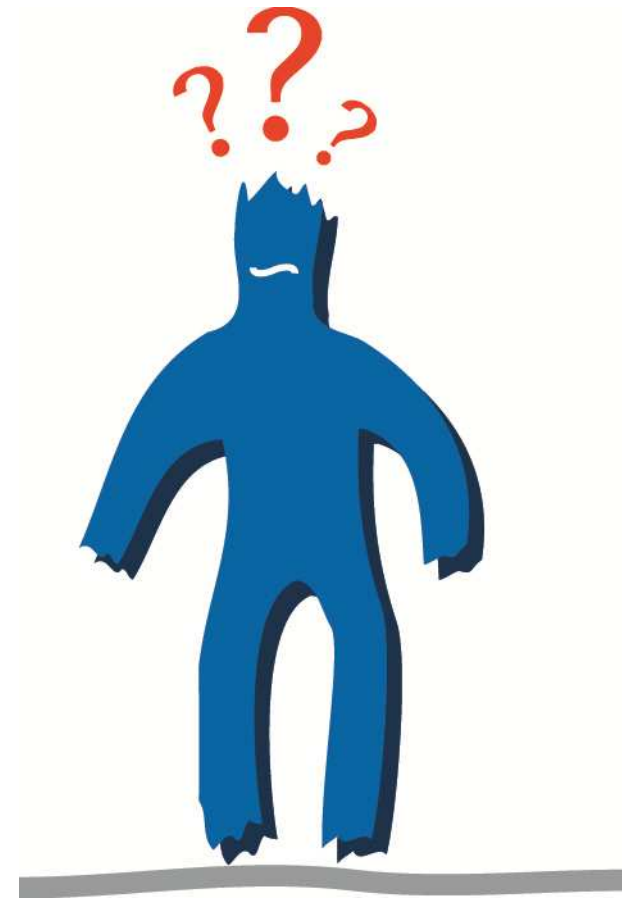
# Agenda

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- **Problemstellung**
- **Erste Dimension: Horizontale Komplexität**
- **Zweite Dimension: Vertikale Komplexität**
- **Dritte Dimension: IT-Strategie**
- **Vierte Dimension: Plattformübergreifende Probleme**
- **Was nun? Rahmenarchitektur für eine Lösung:  
Orchestration**
- **Zusammenfassung**

# IT-Landschaft wird noch komplexer!

- die klassische Kluft zwischen den Abteilungen
- versteckte Komplexität von Hardware- und Software-Welt
- Neue IT-Strategien und Entwicklungen
- Cloud Computing als verteiltes Echtzeit-System

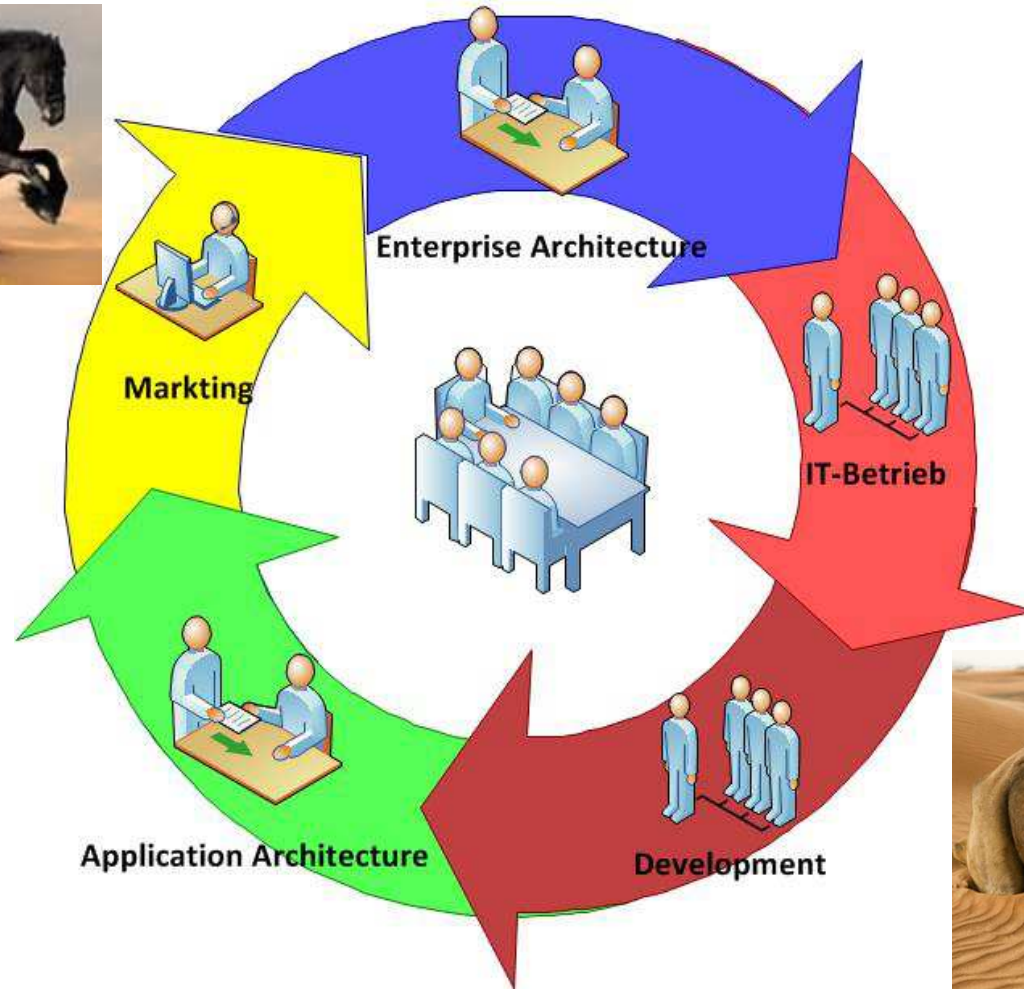


# Erste Dimension: Horizontale Komplexität

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- **Beziehungen zwischen den Abteilungen in Großunternehmen**
  - EA und App. Aechitektur-Abteilungen
  - Development
  - IT-Betrieb
  - Marketing
- **“DevOps”**: Worum es geht?
- Welche DevOps Lösungen vorhanden sind?
- Wie kann man von Best-Practice-Pattern nutzen?
- Vorteile und Nachteile

# A camel is a horse designed by a committee!



# DevOps: Vorteile

- **Automatisierung**
- **Aufmerksamkeit verlagert sich auf die Kluft zwischen den Abteilungen, besonders Entwicklung und Betrieb**
- **Betonung auf Änderung von Arbeitskultur**
- **Entdeckung einer Lücke: interdisziplinäre IT-Experten**

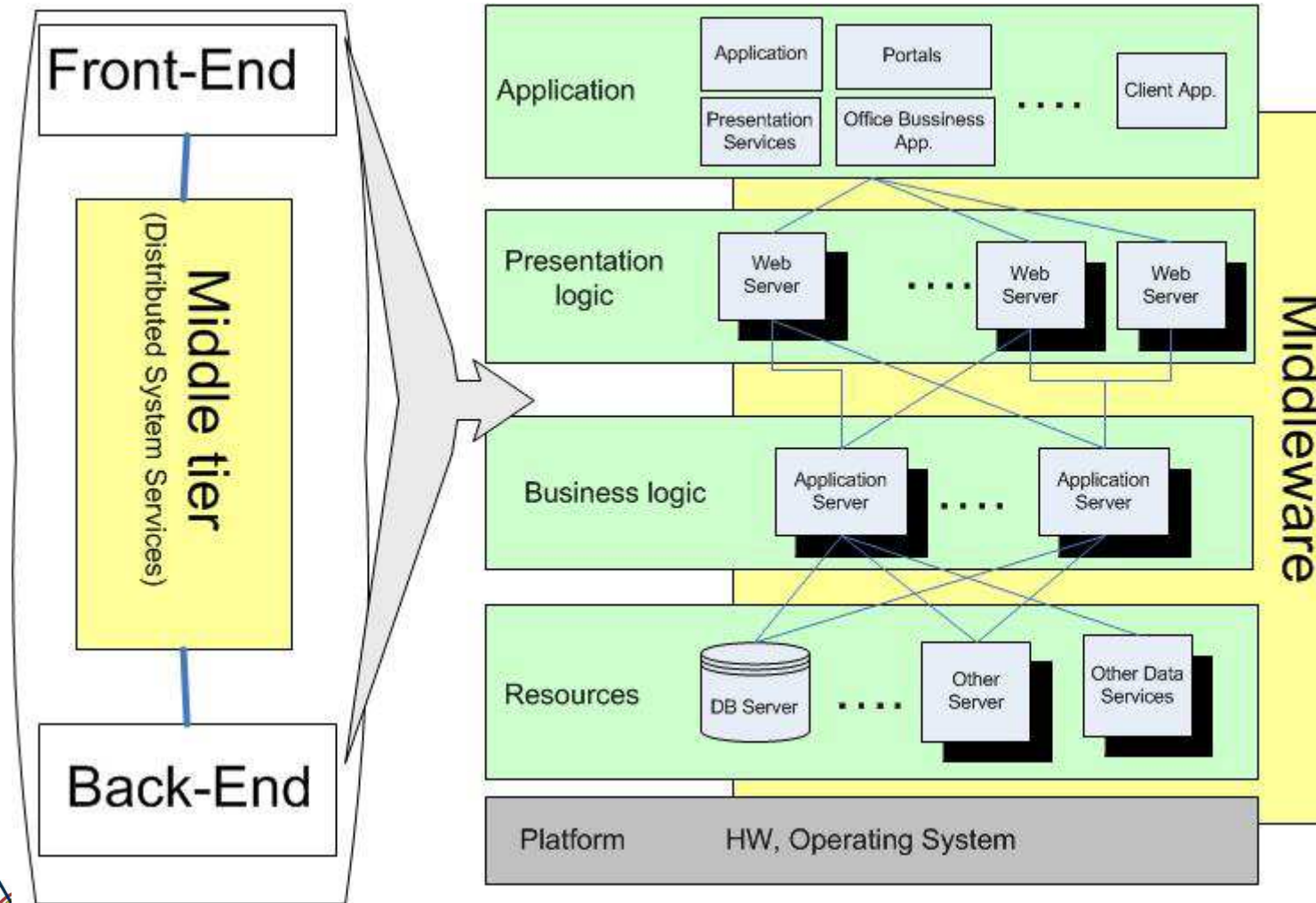


# DevOps: Nachteile

- Die Aufmerksamkeit verlagert sich **NUR** auf die Kluft zwischen den Abteilungen?
- Es fehlt ein klares Gesamt-Konzept
- ohne logische Konsequenz
  - Teambildungsmaßnahmen
  - Weiterbildungsmaßnahmen
- Last but not least: Wie wird unternehmerischer Erfolg gemessen?

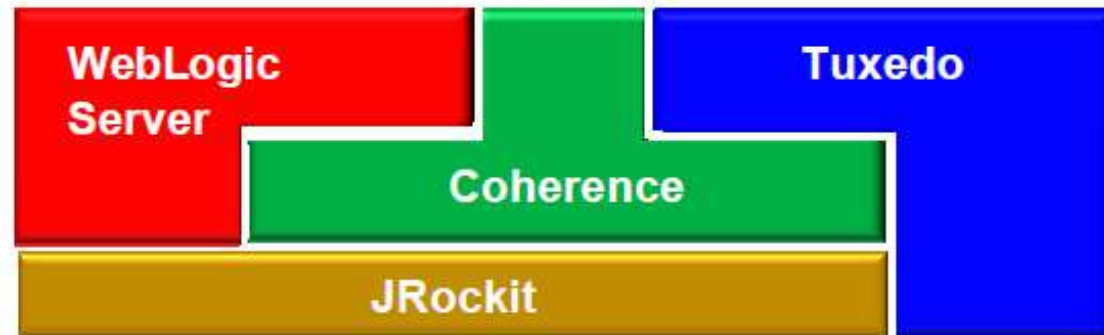


# Vertikale Komplexität: Schichtenarchitektur

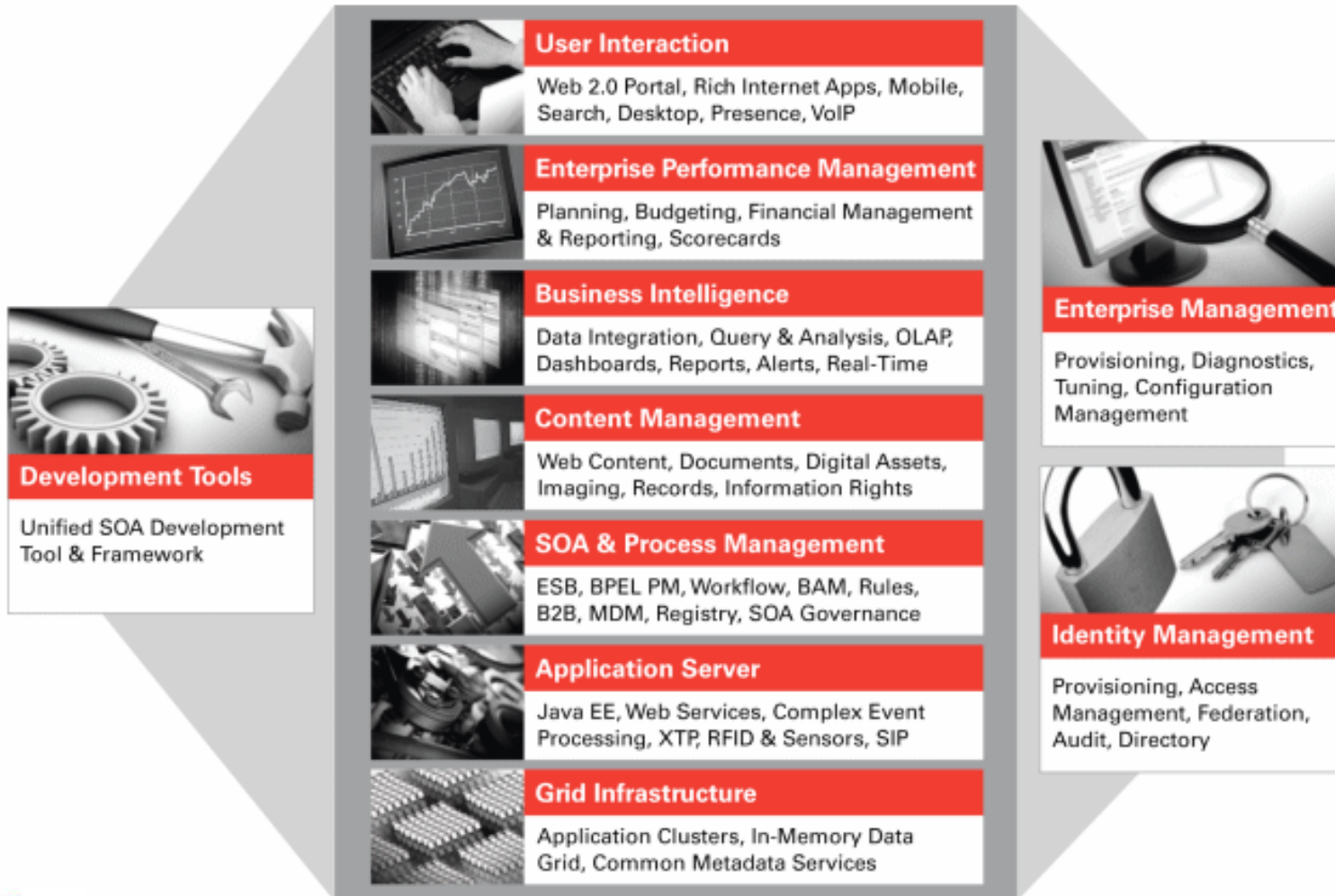




# Beispiel: Application Server

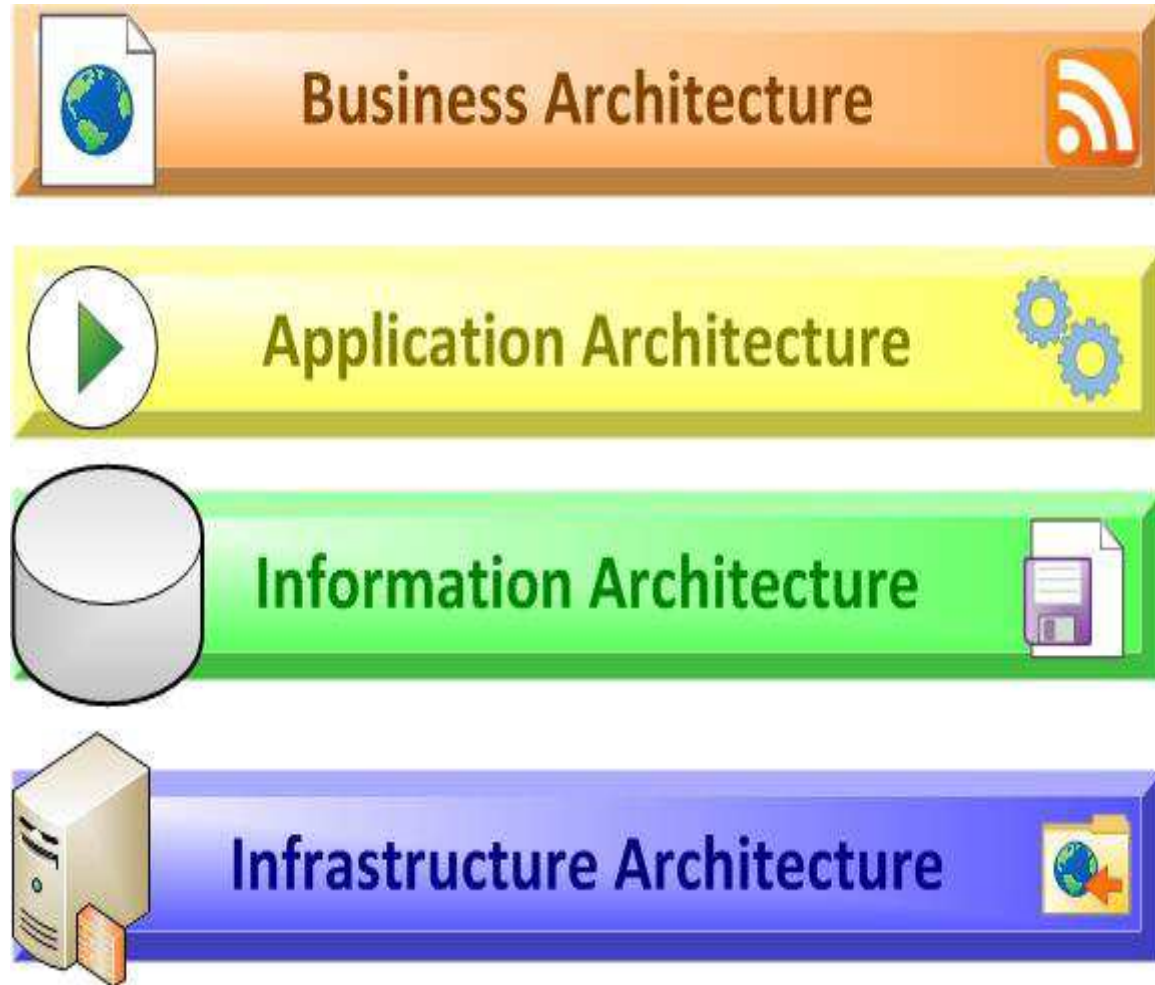


# Beispiel: Oracle Fusion Middleware



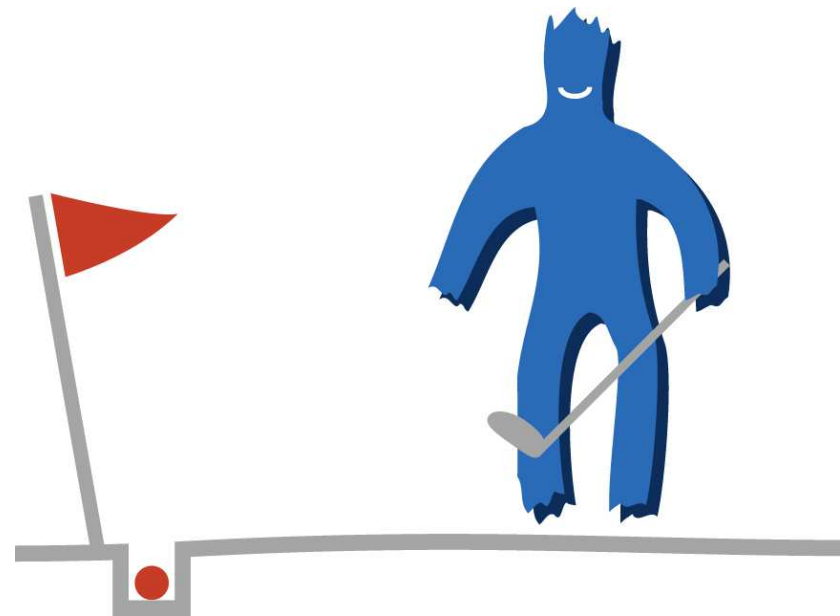
# Vertikale Komplexität: Schichtenarchitektur

- **Wartbarkeit**
- **Sicherheit**
- **Schwachstellen**
- **Automatisierte bzw. Semi-Automatisierte Upgrade, Deployment**
- **Schichtenübergreifende Probleme**



# Dritte Dimension: IT-Strategie

- **Diskrepanz zwischen strategischer, taktischer und operativer Sicht**
- **Enterprise Architecture (EA)**
- **IT-Architektur**
- **IT-Projekte**
- **IT-Governance**
- **IT-Prozesse und Personal**



# SOA and EA Architecture Domains

Architecture domains	Software tiers (figure 4)	SOA	EA
Business	A part of Business logic; Presentation logic and Application → "Process & Rule"	Business process	Business architecture
Applications	A part of Business logic	Services and components	Application architecture
Integration	A part of Business logic	Integration architecture / ESB	Technology architecture
Data	Resources	Data architecture	Information architecture
Operations	Platform	QoS, security, monitoring, and infrastructure	Technology architecture

# SOA and EA: gemeinsame Zuständigkeit

Topic	EA	SOA
similar architectural domains	✓	✓
closely align IT with business	✓	✓
use input based on business objectives	✓	✓
require similar strategies and planning activities	✓	✓

<http://modj.org/home/aktuelles/enterprise-architecture-ea-and-middleware/31c2030dc9cfa9730a3f85c888322f24.html>

# EA Domain

Topic	EA	SOA
macro level	✓	✗
business components	✓	✗
application frameworks and enterprise applications	✓	✗
enterprise-level infrastructure including servers, DB, etc.	✓	✗
All integration patterns and when they should be used	✓	✗

<http://modj.org/home/aktuelles/enterprise-architecture-ea-and-middleware/31c2030dc9cfa9730a3f85c888322f24.html>

# SOA Domain

Topic	EA	SOA
micro level	✗	✓
business services	✗	✓
service modelling	✗	✓
infrastructure that supports services, namely the Enterprise Service Bus	✗	✓
Only integration approach based on using services	✗	✓

<http://modj.org/home/aktuelles/enterprise-architecture-ea-and-middleware/31c2030dc9cfa9730a3f85c888322f24.html>



# Architektur-Probleme

Potential problem	Solution
With all the focus on SOA, other EA aspects are ignored	reciprocally cooperation between both departments (EA and SOA) for a common architecture on enterprise level → Technical Cooperation Centre
Inefficiencies as a result of duplicated efforts and missed opportunities to leverage existing architecture artefacts	Optimizing monitoring, cooperation and integration between EA, MW, and also SOA → using: Enterprise Service Bus (ESB) as integration tool
Failure to identify and incorporate SOA-specific needs as part of EA	- Separation between SOA and non-SOA projects - SOA as the basis for the EA functional architecture domain

<http://modj.org/home/aktueles/enterprise-architecture-ea-and-middleware/31c2030dc9cfa9730a3f85c888322f24.html>

# Governance-Probleme

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Potential problem	Solution
Overlap between the responsibilities of the SOA lead and the enterprise architect	Build-up the "Technical Cooperation Centre" help to "common decision-making"
Competition between SOA and EA for the same business resources	Sharing the same governance boards for both SOA and EA allowed business resources to address both SOA and EA needs in the same forum.
Potential for making contradicting architectural decisions that affect the whole enterprise	Except specific SOA-related issues, all other architectural decisions were approved by the EA

<http://modj.org/home/aktueles/enterprise-architecture-ea-and-middleware/31c2030dc9cfa9730a3f85c888322f24.html>

# Was nun? Rahmenarchitektur für eine Lösung

- **Orchestration: Definition**
- **Orchestrator vs. DevOps**
- **Technologien**
  - Oracle-Ansatz
  - Microsoft-Ansatz
  - Weitere Ansätze
- **IT-Experten als „Orchestrators“:**  
**Voraussetzung**



# Werkzeuge: Oracle CloudControl

ORACLE Enterprise Manager Cloud Control 12c Setup Help GUEST\_SUPER\_ADMIN1 Log Out

Grid Targets Favorites History Search Target Name

## Enterprise Summary

Page Refreshed Jul 29, 2011 4:39:05 AM PDT

### Overview View All Targets

Targets Monitored 2905

#### Status

Targets with Status 2241

- Down(93)
- Metric Collection Error(267)
- Agent Unreachable(68)
- Status Pending(338)
- Up(1.475)

#### Incidents

Open 1097  
Updated in last 24 hours 696

Category	🟢	🔴	⚠️	🚩
Availability	95	244	60	-
Performance	-	4	-	-
Security	-	122	-	-
Others	95	934	62	-

#### Problems

Open 36 Without Service Request 36  
Updated in last 24 hours 30

#### Jobs

- Suspended Executions (last 7 days) 15 ⚠️
- Problem Executions (last 7 days) 4267 🔴
- Action Required Executions (last 7 days) 0 ✔️

#### Patch Recommendations

View by  Classification  Target Type

### Inventory and Usage

Show Hosts See Details

View Platform

Platform	Hosts	OS Patches
Enterprise Linux Server release 5.6 (Carthage)	39	No
Enterprise Linux AS release 4 (October Update 8)	15	No
Enterprise Linux Server release 5.4 (Carthage)	6	No
SunOS	5	No
Red Hat Enterprise Linux Server release 6.0 (Santiago)	3	No

### Compliance Summary

Compliance Frameworks Compliance Standards

View View Trends

Name	Target Evaluations	Violations	Average Compliance Score (%)
No data to display			

### Least Compliant Targets

View >>

Target Name	Target Type	Standard Evaluations	Violations	Average Compliance Score (%)
slc00ahq.us.oracle.com	Host	0 0 1	1 0 0	51
adc2170590.us.oracle.com	Host	1 0 0	2 0 0	51
staic01.us.oracle.com	Host	1 0 0	1 0 0	51
adc2120071.us.oracle.com	Host	1 0 0	2 0 0	51
slc00eif.us.oracle.com	Host	0 0 1	0 0 0	100

### Service Requests

My Oracle Support  
You cannot access My Oracle Support while in offline mode.

# Werkzeuge: Microsoft Orchestrator

## Workflow management solution für Datacenter



The screenshot shows the Microsoft System Center website. At the top left is the Microsoft System Center logo. To its right is a search bar with the text "Search System Center with Bing" and a magnifying glass icon. Below the logo and search bar is a navigation menu with links for "Home", "2012", "Previous Versions", "Library" (highlighted in orange), "Forums", and "Gallery". On the right side of the navigation menu is a printer icon with a dropdown arrow. The main content area is divided into two columns. The left column contains a breadcrumb trail: "TechNet Library" > "System Center" > "System Center 2012" > "Orchestrator" (highlighted in orange). Below this are several links: "Getting Started with System Center 2012 - Orchestrator", "Upgrading System Center 2012 - Orchestrator to System Center 2012 SP1", "Deploying System Center 2012 - Orchestrator", and "Administering System Center 2012 - Orchestrator". The right column features the title "Orchestrator" in a large font. Below the title is a rating: "4 out of 9 rated this helpful - Rate this topic". The update date is "Updated: January 15, 2013". The "Applies To" section lists "System Center 2012 - Orchestrator, System Center 2012 SP1 - Orchestrator". The main text reads: "Welcome to System Center 2012 - Orchestrator. Orchestrator is a workflow management solution for the data center. Orchestrator lets you automate the creation, monitoring, and deployment of resources in your environment." At the bottom of the right column, it says: "The following topics provide information to help you deploy and use Orchestrator."

# Werkzeuge: Konfigurationsmanagement



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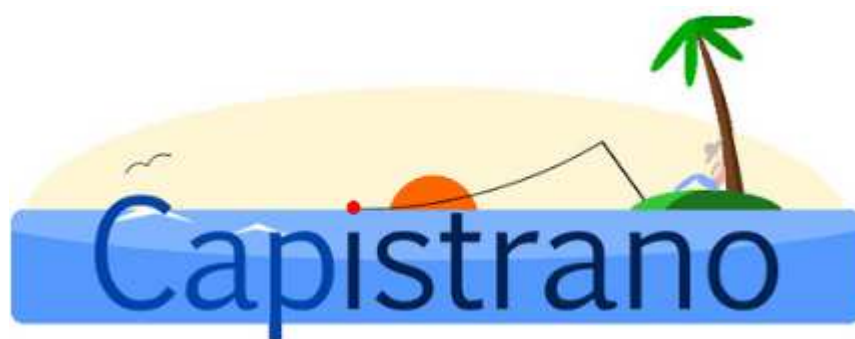


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# Werkzeuge: Automatisierung von Deployment



## Fabric

### About

Fabric is a Python (2.5 or higher) library and command-line tool for streamlining the use of SSH for application deployment or systems administration tasks.

It provides a basic suite of operations for executing local or remote shell commands (normally or via `sudo`) and uploading/downloading files, as well as auxiliary functionality such as prompting the running user for input, or aborting execution.

Typical use involves creating a Python module containing one or more functions, then executing them via the `fab` command-line tool. Below is a small but complete “fabfile” containing a single task:

```
from fabric.api import run

def host_type():
    run('uname -s')
```

Once a task is defined, it may be run on one or more servers, like so:

```
$ fab -H localhost,linuxbox host_type
[localhost] run: uname -s
[localhost] out: Darwin
[linuxbox] run: uname -s
[linuxbox] out: Linux

Done.
Disconnecting from localhost... done.
Disconnecting from linuxbox... done.
```



# Werkzeuge: Automatisierung von Testen und Monitoring



## 1: Describe behaviour in plain text

```
Feature: Addition
  In order to avoid silly mistakes
  As a math idiot
  I want to be told the sum of two numbers

Scenario: Add two numbers
  Given I have entered 50 into the calculator
  And I have entered 70 into the calculator
  When I press add
  Then the result should be 120 on the screen
```

## 2: Write a step definition in Ruby

```
Given /I have entered (.*) into the calculator/ do |n|
  calculator = Calculator.new
  calculator.push(n.to_i)
end
```

## 3: Run and watch it fail

```
$ cucumber features/addition.feature
Feature: Addition # features/addition.feature
  In order to avoid silly mistakes
  As a math idiot
  I want to be told the sum of two numbers # features/addit1
Scenario: Add two numbers # features/addit1
  Given I have entered 50 into the calculator # features/step_1
  uninitialized constant Calculator (NameError)
  ./features/step_definitions/calculator_steps.rb:2:in `Given /
  features/addition.feature:7:in `Given I have entered 50 into
  And I have entered 70 into the calculator # features/step_1
  When I press add # features/addit1
  Then the result should be 120 on the screen # features/addit1
```

## 4. Write code to make the step pass

```
class Calculator
  def push(n)
    @args ||= []
    @args << n
  end
end
```

## 5. Run again and see the step pass

```
$ cucumber features/addition.feature
Feature: Addition # features/addition.feature
  In order to avoid silly mistakes
  As a math idiot
  I want to be told the sum of two numbers # features/addit1
Scenario: Add two numbers # features/addit1
  Given I have entered 50 into the calculator # features/step_1
  And I have entered 70 into the calculator # features/step_1
  When I press add # features/addit1
  Then the result should be 120 on the screen # features/addit1
```

## 6. Repeat 2-5 until green like a cucumber

```
$ cucumber features/addition.feature
Feature: Addition # features/addition.feature
  In order to avoid silly mistakes
  As a math idiot
  I want to be told the sum of two numbers # features/addit1
Scenario: Add two numbers # features/addit1
  Given I have entered 50 into the calculator # features/step_1
  And I have entered 70 into the calculator # features/step_1
  When I press add # features/addit1
  Then the result should be 120 on the screen # features/addit1
```



# Jenkins

An extendable open source continuous integration server

# cucumber-nagios



# IT-Experten als „Orchestrators“

- Auf der untersten Ebene eine Orchestrierung ist ein Mensch, ein IT-Experte.
- Interdisziplinäre IT-Experten auf strategische, taktische und operative Ebenen
- Generalisten vs. klassischen Spezialisten?

## Business Skills for IT Professionals

Build "T-Shaped"—Business and Technical—Skills with WebSphere Education

It's no longer enough for a programmer to be just a programmer; in today's multi-function world, even techies need to possess more of the skills traditionally associated with other business functions—skills like strategic thinking, interpersonal communication, project management and business analysis. IBM calls this new breed of technology skills 'T-Shaped.' Like the capital letter "T", the 'T-shaped' skilled professional has both broad and deep capabilities, encompassing both business skills and deep technical understanding.



# Zusammenfassung

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- IT-Landschaft wird noch komplexer!
- Mehr dimensionale Komplexität von IT-Landschaft
- Wir können flexibler mit den Problemen und Herausforderungen umgehen
- Mehrdimensionale Denkmuster
- Aktualisierung von Enterprise Architecture
- Neue Maßnahmen für Team- und Weiterbildung
- „Orchestrator“ ist daher mehr als nur ein klassischer Administrator. Er ist eine neue Generation von Experten

# References for further Information

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<http://www.oracle.com/technetwork/middleware/bpel/overview/index.html>
- WebSphere software: <http://www-01.ibm.com/software/websphere/>



# Fragen?





**Danke  
für Ihre Aufmerksamkeit!**



**Mohammad Esad-Djou, Solution Architect**

**OPITZ CONSULTING Deutschland GmbH**

[Mohammad.Esad-Djou@opitz-consulting.com](mailto:Mohammad.Esad-Djou@opitz-consulting.com)

**Fon +49 89 680098-1409**

**Mobil: +49 173 7279576**