



# „Orchestrator“

## IT-Paradigmenwechsel im Zeitalter des Cloud Computing

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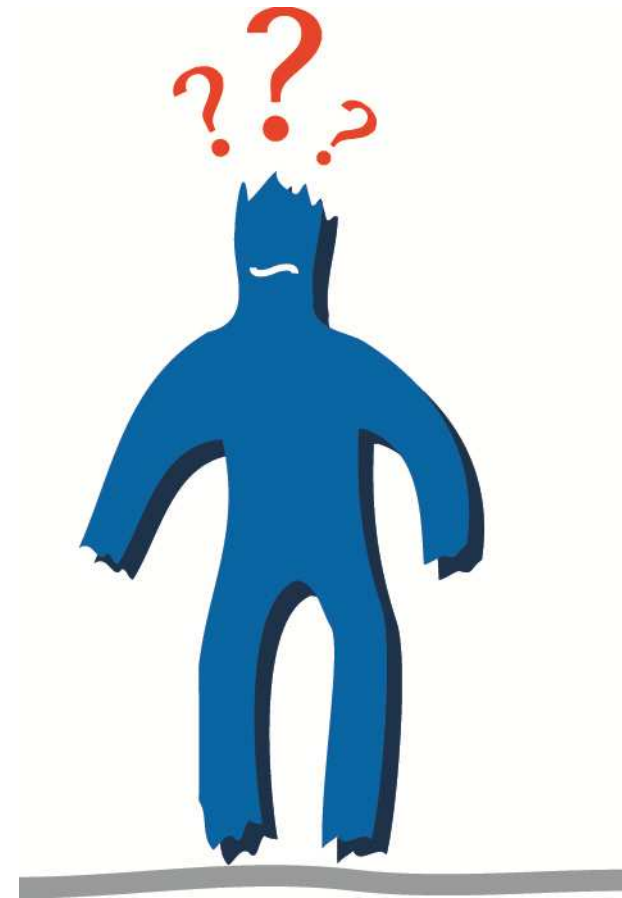
# Agenda

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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

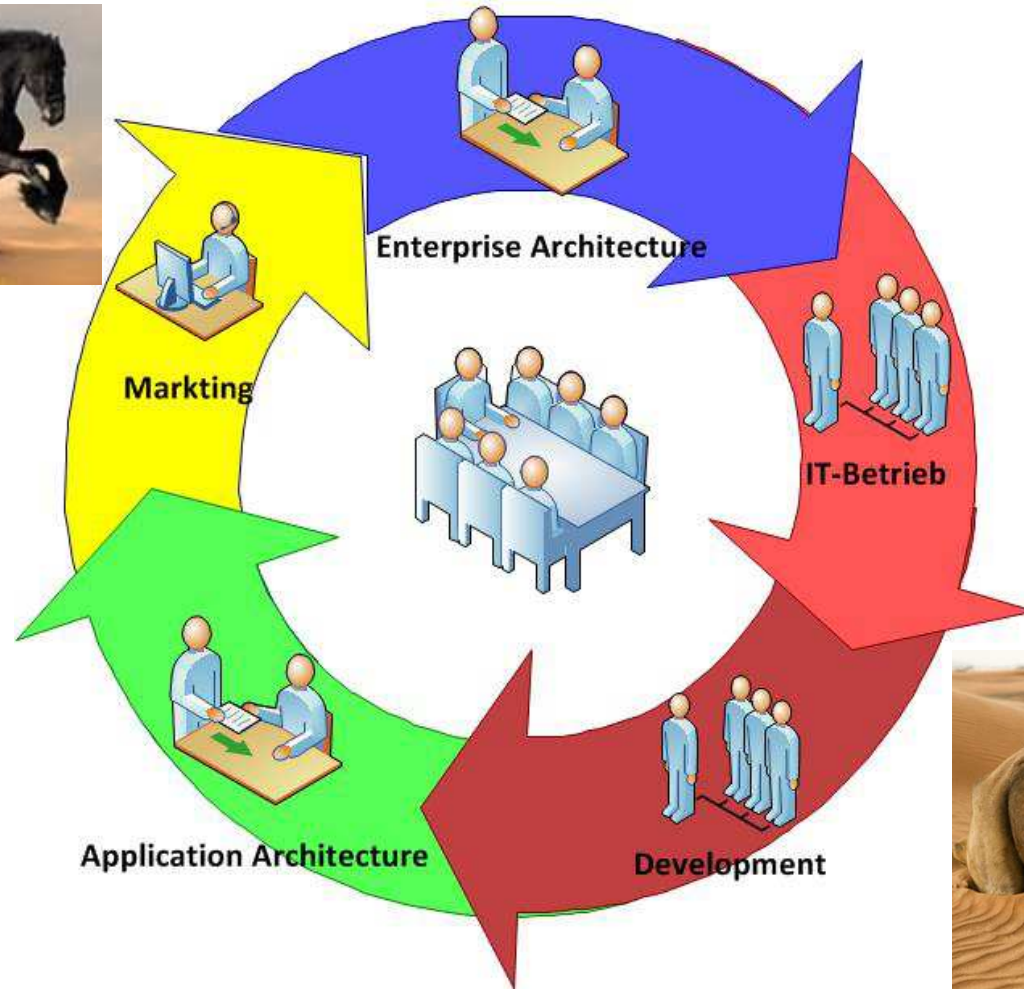


# Erste Dimension: Horizontale Komplexität

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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

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- **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**

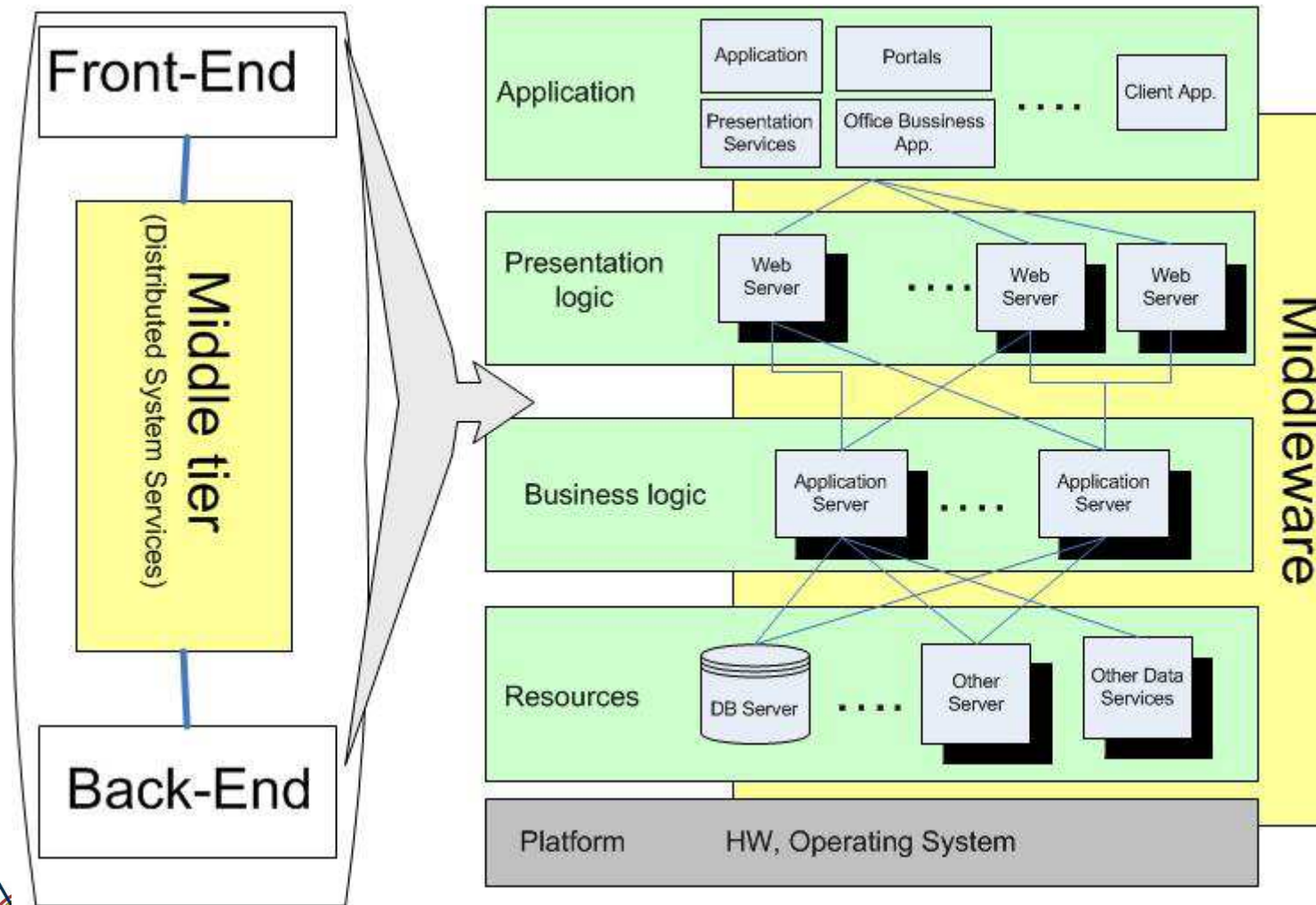


# DevOps: Nachteile

- 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?

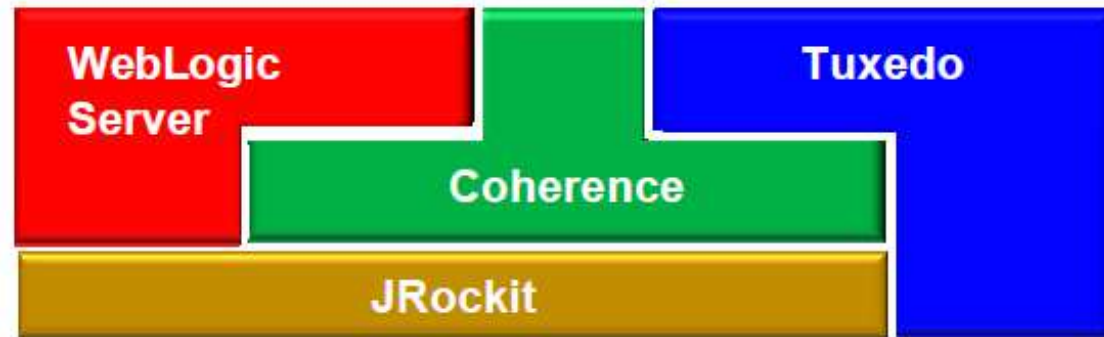


# Vertikale Komplexität: Schichtenarchitektur

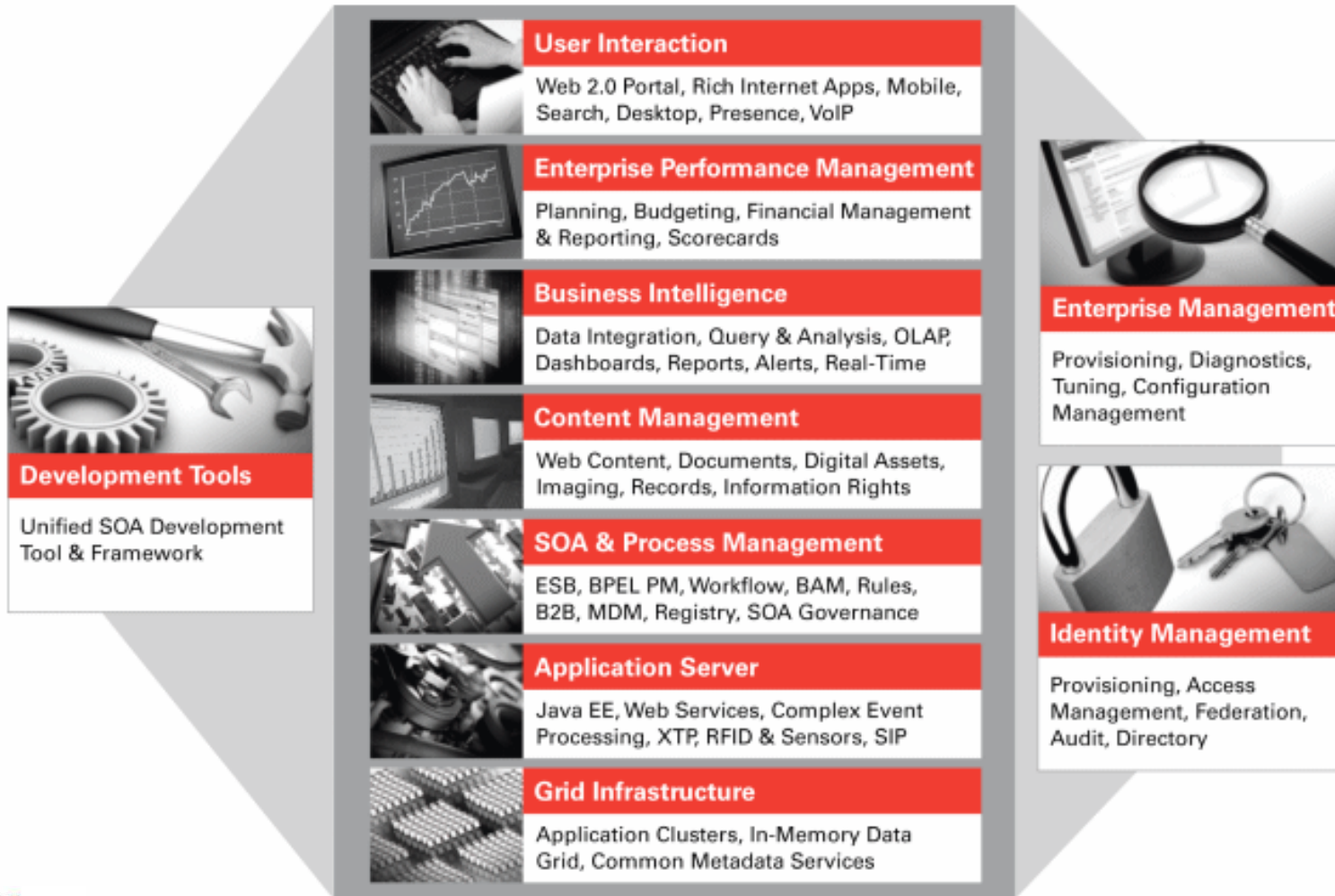




# Beispiel: Application Server

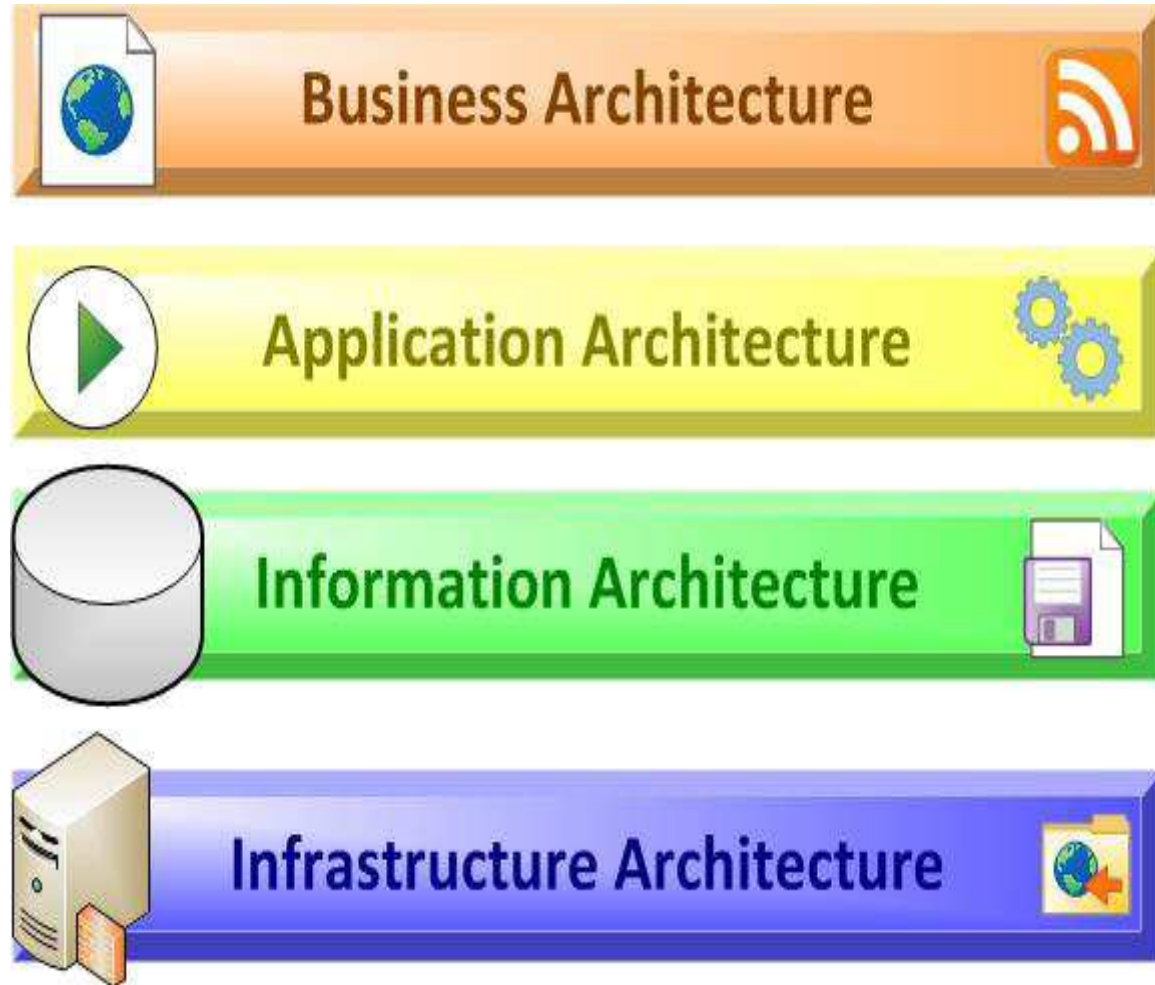


# Beispiel: Oracle Fusion Middleware



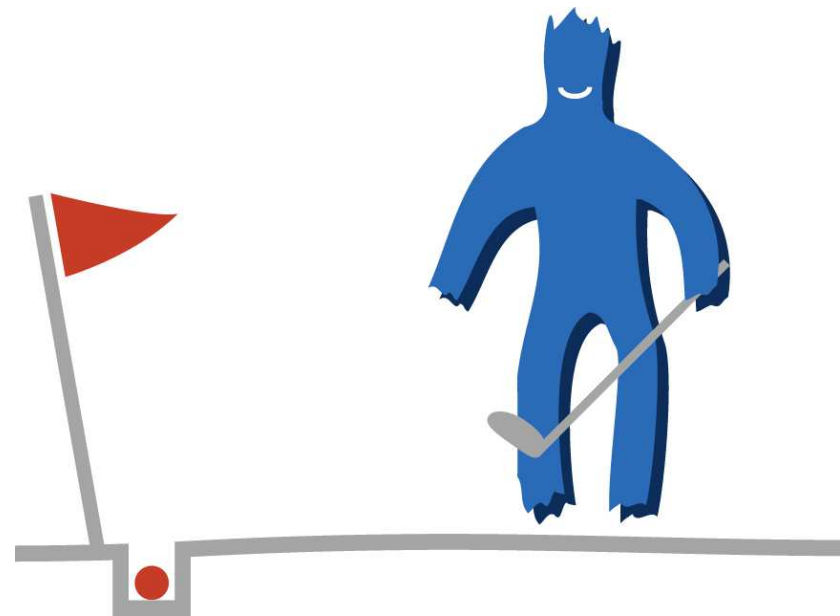
# Vertikale Komplexität: Schichtenarchitektur

- **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<br>(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<br>→ 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<br>- 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

**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

View View Trends

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

**Least Compliant Targets**

| 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 sidebar with a tree view of navigation links: "TechNet Library", "System Center", "System Center 2012", and "Orchestrator" (highlighted in orange). Under "Orchestrator", there are four sub-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" and the text "Updated: January 15, 2013". Underneath is the text "Applies To: System Center 2012 - Orchestrator, System Center 2012 SP1 - Orchestrator". The main body of 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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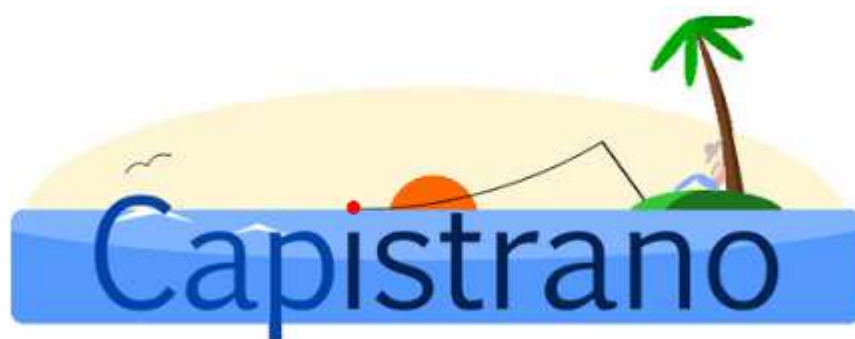


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# Werkzeuge: Automatisierung von Deployment



## 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/add11
  Scenario: Add two numbers # features/step_1
    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/add11
  Then the result should be 120 on the screen # features/add11
```

## 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/add11
  Scenario: Add two numbers # features/step_1
    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/add11
    Then the result should be 120 on the screen # features/add11
```

## 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/add11
  Scenario: Add two numbers # features/step_1
    Given I have entered 50 into
    And I have entered 70 into t
    When I press add
    Then the result should be 120
```



# 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://modj.org/index.php?id=3&tx\\_ttnews\[tt\\_news\]=7&cHash=f953c555a27bc2b6274cdfe214ba3fd1](http://modj.org/index.php?id=3&tx_ttnews[tt_news]=7&cHash=f953c555a27bc2b6274cdfe214ba3fd1)
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# Fragen?





**Danke  
für Ihre Aufmerksamkeit!**



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