Management for Professionals

Michael Missbach
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SAP on the Cloud

Springer

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Michael Missbach • Josef Stelzel •
Cameron Gardiner • George Anderson •
Mark Tempes

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Michael Missbach
SAP Competence Center
Cisco Systems
Walldorf
Germany

Josef Stelzel
Leimen
Germany

Cameron Gardiner
Tokyo
Japan

George Anderson
Cypress
USA

Mark Tempes
Carnegie
Australia

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I think the Internet was the last big change. The Internet is maturing. They don't call it the Internet anymore. They call it cloud computing

Larry Ellison

Preface

Since the turn of the millennium, the IT industry has regularly been besieged by new hype. Derived from the word *hyperbole*, hype denotes a phenomenon whereby the media devotes such a high level of attention to something that it appears to be more important than it really is. One of today's most hyped terms is cloud.

What started with adaptive infrastructures and was later called grid and utility computing has now condensed to metaphoric clouds.

"Real clouds" in the sky have an interesting property: You can't see what's inside them, a sometimes-disastrous result for planes cruising at low altitude without the benefit of radar. In the case of cloud computing, the mantra is that you don't really have to know exactly what's inside a cloud as long as the price for the requested cloud service is acceptably low enough.

This may be sufficient to store your personal pictures and host a web page. But what about mission-critical applications and the sensitive data they contain? And what to do with application architectures established decades ago that simply are not "cloudable?"

SAP systems and solutions are among the most mission-critical applications within enterprises, tasked with maintaining highly sensitive data and business-critical processes. The majority of these systems are based on an SAP Basis architecture which was developed literally a century ago. Moving these systems and solutions to the cloud is not necessarily straightforward if even warranted. Even the most careful of system migrations may suffer from hiccups, obstacles, and other challenges despite the generally undisputed benefits of cloud computing.

In numerous conversations with our own SAP customers around the globe, we have learned that there is a need for a concise overview about the technologies, architectural concepts, and proven practices necessary to avoid such obstacles and challenges and successfully run SAP system landscapes atop various cloud infrastructures. This book is in response to those conversations. Our hope is SAP on the Cloud helps provide our readers with the necessary instrumentation to safely lift off and sail through the clouds, bypassing obstacles and circumventing most of these challenges on the way to quickly realizing the cloud's benefits.

Contents of This Book

This book provides an overview of the various facets of building and operating SAP applications on cloud infrastructures. It describes and discusses the latest developments, challenges, and suitable solutions, and also outlines future trends where plausible or possible.

To ensure that this book is also useful to readers who do not consider themselves to be "gurus" in this area, this book explains in detail the backgrounds of several possible cloud solutions in the context of various SAP applications and components. Examples are provided throughout this book in order to make the reader aware of essential but perhaps less-obvious points. However, keep in mind that this book concentrates exclusively on the setup and operation of the SAP infrastructure; it does not give details related to installing and customizing the SAP software itself, nor does it deal with the much more complex tasks involved in business process implementation and reengineering.

Chapter 1, *A Little History of Cloud Computing*, describes how the development of IT has culminated in the concept of cloud computing. In preparation for the topics dealt later in this book, it describes the different flavors of cloud computing and their relevance as a possible SAP platform.

Chapter 2, *From R/3 to HANA*, deals with the technical characteristics of the most commonly used SAP solutions from ECC to HANA and discuses how well they fit into the various cloud concepts described in the first chapter. This chapter gives you a good understanding of the very specific requirements of SAP systems and why not any cloud offering is a good fit for SAP.

Chapter 3, *Service Levels for SAP on Clouds*, takes you through the definition of appropriate service levels for SAP systems in cloud environments. It focuses on the prediction of the necessary resources to fulfill the SLA and how to measure and bill their actual consumption. Additional topics include service guarantees and availability as well as innovative billing tools for SAP systems.

Chapter 4, *Security Aspects for SAP Systems*, deals with one of the key topics for the decision between public and private cloud computing. The chapter provides a detailed description of the risks of cloud computing as well as hints how to harden the x86 operating systems typical for clouds.

Chapter 5, *Change and Configuration Management*, discusses the topic of lifecycle management of ever-changing business processes in cloud environments. It focuses on cloud-specific constructs such as resource pools, failure domains, scale units, health models, stateless computing, service profiles, and more, in the context of SAP.

Chapter 6, *How Public and Private Clouds Work*, assesses the technical concepts of cloud computing. Amazon AWS and Microsoft Azure are described as examples for the technologies used in public cloud; VMware vCloud and Microsoft Private Cloud as examples for software solutions used in private clouds.

Chapter 7, *From Traditional IT to Public Cloud Computing*, discusses the controversial topics of governance, control, and security of highly shared, multitenant computing environments. This chapter also provides an overview on a

current cloud infrastructure offering for SAP and eventually presents an outlook on new developments.

Chapter 8, *Private Cloud Infrastructures for SAP*, demonstrates how companies that prefer to retain their mission-critical SAP systems and sensitive data in-house or in their own premises can benefit from infrastructures boasting cloud attributes. This chapter introduces new developments as well, including lossless Ethernet, converged networks, and unified computing.

Chapter 9, *Stateless Computing*, describes how innovative concepts like unified computing and service profiles enable full flexibility for SAP on public and private cloud implementations and how these influence the organizational structure of SAP operations. Within the chapter containerized datacenters as well as block and pod based datacenter concepts are discussed. The chapter closes with a discussion on how green clouds can be.

Chapter 10, *Economic and Legal aspects of Cloud Computing*, explores which of the numerous promises of cloud computing may actually be realized for different organizations. This chapter indicates how business applications in the future will offer enterprises a competitive edge by enabling them to "fail fast." In doing so, cloud-enabled organizations will benefit from their ability to pilot and change their business processes faster than their traditionally hosted counterparts.

Prerequisites

The solutions presented in this book generally refer to the latest versions of the relevant SAP products at the time of writing. While new hardware and software solutions are developed increasingly quickly, the underlying technologies and architectures change more slowly. Therefore, the cloud solutions or techniques described in this book will likely prove useful for future SAP releases. Also, many of the technical solutions and techniques presented here should be suitable for other enterprise-critical software systems, both off the shelf and custom developed.

This book has intentionally taken a neutral stance in terms of products. However, because most of the authors and contributors are employees of Cisco, Microsoft, HP, and Realtech, much of their expertise draws on the concepts and best practices developed in these companies through their partnerships with SAP and customers. For this reason, Cisco solutions are used as best practise examples of technologies that proved their worth in thousands of installations. Where the name of a specific product is mentioned, this is intended only as an example of a class of solutions and does not represent a value judgment of that product.

Acknowledgments

This book is the product of voluntary work done in our free time over many nights and weekends. We therefore dedicate this work to our wives and children, who have had to spend more time than usual without our full attention.

We would also like to thank all of our customers and colleagues who selflessly provided much help in the form of tips, contributions, reviews, and constructive criticism. Without their support, we would not have been able to write this book. In particular, we would like to call out the following people: Oliver Widhölzl from Egger Holz, Austria; Mike Bieley from Glencore International, Swiss; Nick de Groof from Maersk, Denmark; Otto Bruggeman from Intel, Deutschland, Tobias Brandl from Gopa-it; Heike Brendemuehl from Unisys; Wolfgang Neumar from Voest Alpine; Peter Klewinghaus from Amazon; Derek Kaufman retired from LS&Co; Weber Michael from Munich-Re; and Dr. Walter Dey, Peter Sladeczek, Klaus Aker, Anver Vanker, Yves Fauser, Andreas Wentland, Josephine Bruggeman and Ulrich Kleidon from Cisco.

Special thanks are also due to Robert-Andreas Riemann from Porsche, whose detailed comments influenced the content of several chapters.

The practical experience of all our advisors greatly added to the value of this book, and their support was a great source of encouragement.

A special mention, however, must also go to Christian Rauscher, our editor at Springer Heidelberg, for his involvement in the production of this book. It is due to his expert feedback that only unavoidable errors remain in this book. Mr. Rauscher has been a constant and much-welcomed partner and supporter in this regard.

Wolkenschlösser werden von Visionären gebaut,
Träumer bewohnen sie und Psychiater kassieren die Miete[1]

[1] Castles in the clouds are build by visionaries, they give home to dreamers, but psychiatrist cash in the rental fee – German proverb.

Foreword by Nick De Groof

Today's business demands agility, availability, and faster speed of execution to meet tighter SLAs. This is provided by the office of the CIO, which has the mission to provide more capabilities, but with less human and infrastructure resources. Clearly, traditional architectures are no longer sufficient and thus new forms for deployment and management are necessary. These new Cloud architectures should not only be designed for the infrastructure but should also include whole ready-made solutions for the enterprise.

SAP solutions continue to be the most mission- and business-critical applications for an enterprise, with new SAP technologies and solutions that can integrate into an existing SAP environment, the operational and management complexity can increase dramatically. SAP on the Cloud will allow your enterprise to do more with less and effectively meet increasing business demands at a lower operational cost.

While many have just begun their adventure and are stumbling through the "mist"-eries and hype around cloud computing, the authors will guide you through the crucial initial stages and beyond in this book. As the storm rolls in, they help clear the fog and provide guidance for your enterprise to navigate through the shallow waters and underwater obstacles on your journey to running SAP on the cloud. All aspects will pass the revue, from the basics of the infrastructure requirements to host complete SAP-based solutions, to the service-level management processes and functions to best support these environments. With proper planning and navigation, the final destination of SAP on the Cloud will deliver the requirements of your enterprise, with a manageable and agile distributed architecture.

So enjoy reading and be guided. . .

Nick De Groof
SAP Technical Architect
Maersk Line IT, Copenhagen, Denmark

Foreword by Robert-Andreas Riemann

Today "the Cloud" is everywhere – analysts urge you to investigate in cloud technology and TV spots call to move all your private data to the cloud.
And the buzzwords sound great for your IT department – always enough resources on hand and a lot of money to save.
The reality may be a far cry from slogans like "Put all of our services into the cloud and you will get rid of all problems."
As a manager in an enterprise IT you have to consider topics like Security, Governance, Validations, release management and SLA and legal issues. You also have to consider which of your IT services fit to what type of the numerous cloud flavors – if they fit at all?
Going cloud will also have an impact on the organization of your IT that breaks up established silos – organizational "kingdoms" have to be conquered to build a new federated union of collaborating teams.
This book is about SAP in the cloud. SAP solutions are among the most mission-critical applications of any company. Performance and stability of such systems often have priority over cost; nevertheless, costs are always a major issue. But to impair the business to save some money is not an option.
On the other side, the classical SAP architecture is "cloud friendly" and fits well to IaaS concepts because most SAP environments are very well standardized. However this is not true for all SAP solutions, BWA and HANA are examples of individual services that do not fit the cloud paradigm yet.
Knowing such nifty details and the technologies to overcome the obstacles offer a good chance to launch a successful SAP-on-cloud-project.
This book shows you how to move SAP into the cloud without ending up in fog.

Robert-Andreas Riemann
General Manager
IT Platformservice
Dr. Ing. H.c. F. Porsche AG

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