

## CLLOUD COMPUTING: Implementation, Management, and Security

By: John W. Rittinghouse and James F. Ransome  
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*Cloud Computing: Implementation, Management, and Security* is a non-fiction introduction to cloud computing for the non-technical person.<sup>1</sup> The authors introduce various common cloud technologies without dwelling on technical details, directing the book toward “managers and technical people alike.”<sup>2</sup> Both classes of people can gain knowledge of what cloud computing technologies are, and the business and legal implications behind these technologies.

Dr. John Rittinghouse has twenty-five years of experience as a security and management specialist.<sup>3</sup> Dr. Rittinghouse worked for many Fortune 500 companies, and currently assists the Department of Homeland Security and Department of Commerce.<sup>4</sup> Dr. James Ransome is the senior director and chief security officer of Cisco’s Collaborative Software Group where he works on Cisco’s WebEx product.<sup>5</sup>

In *Cloud Computing: Implementation, Management, and Security*, the authors present a persuasive case for businesses to use cloud computing solutions, but a less persuasive case that the time to switch cloud computing is now. While acknowledging the vagueness and confusion

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<sup>1</sup> JOHN W. RITTINGHOUSE & JAMES F. RANSOME, *CLOUD COMPUTING: IMPLEMENTATION, MANAGEMENT, AND SECURITY*, xix (CRC Press, Taylor & Francis Group) (2010).

<sup>2</sup> *Id.*

<sup>3</sup> Biography of John W. Rittinghouse, Ph.D., CISM, *archived at* <http://www.webcitation.org/5ntFJvrGR>

<sup>4</sup> *Id.*

<sup>5</sup> Biography of James Ransome, Cisco Systems, Inc., *archived at* <http://www.webcitation.org/5ntGFFdpU>.

surrounding the term cloud computing, the authors tentatively define it as “the delivery of computational resources from a location other than the one from which you are computing.”<sup>6</sup>

The authors begin with the technical background of cloud computing, by describing the history and evolution of computers and the internet. After laying the basic framework of networking, the authors explain “virtualization,” which is a method of cloud computing that enables one piece of hardware to run multiple virtual environments.

Many types of cloud computing services are available because of massive presence of the internet. Communication-as-a-Service (“CaaS”) allows for certain messaging tools such as Voice over IP (“VoIP”), Instant Messaging (“IM”), and video conferencing.<sup>7</sup> Infrastructure as a Service (“IaaS”) is the “delivery of computer infrastructure as a service” that allows the customer to “maintain ownership and management of their application(s) while off-loading . . . infrastructure management to the IaaS provider.”<sup>8</sup> Monitoring as a Service (“MaaS”) is the outsourcing of security services to a third party security team.<sup>9</sup> Platform-as-a-Service (“PaaS”) is an application delivery model that is independent from the specific operation system it is running on—it is meant to be only a web-based development infrastructure.<sup>10</sup> Software-as-a-Service (“SaaS”) is typically when a software vendor supplies software over a network as opposed to the typical distribution of installation on individual computers.<sup>11</sup>

IT Professionals use several protocols and technologies to build cloud networks. One reason for making a switch to cloud networks is that cloud data centers are cost-effective and allow

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<sup>6</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at xxvii.

<sup>7</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 30.

<sup>8</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 34-35.

<sup>9</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 44.

<sup>10</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 48.

<sup>11</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 50.

for better collaboration<sup>12</sup> “Service-oriented architectures” (“SOAs”) can leverage network services, but SOAs only somewhat overlap with the area of cloud computing.<sup>13</sup> Cloud computing is not a replacement for SOAs, but SOAs are a building step towards getting a cloud computing system.<sup>14</sup> The authors describe how to enable an SOA by planning for capacity, availability, and security.<sup>15</sup> After planning, open source software can then inexpensively enable the systems.<sup>16</sup> The book describes various open source solutions such as the Apache web server, database software such as MySQL and PostgreSQL, and virtualization software such as VMWare and Xen.<sup>17</sup>

Sun xVM VirtualBox, available free of charge, can virtualize software on a computer.<sup>18</sup> The authors detail the general steps of downloading and installing the virtualization software.<sup>19</sup> Then, the authors describe how to download and install a guest operating system onto to the Sun xVM VirtualBox while using FreeDOS.<sup>20</sup> The book provides screenshots of every step of the installation process for both the Sun xVM VirtualBox and the FreeDos Operating System.<sup>21</sup>

The three elements of federation, presence, and privacy in cloud computing help describe, on a semi-technical level, whether there are reasonable concerns about security in the cloud and how those concerns can be eliminated.<sup>22</sup> Federation is, generally, the ability for two

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<sup>12</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 62 (describing collaboration as the “opiate of the masses”). The authors further note that employees could be concerned, for instance, that the company email system is limited to 80 MB of storage, where Google and Yahoo! offer gigabytes of storage. RITTINGHOUSE & RANSOME, *supra* note 1, at 67.

<sup>13</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 70-71.

<sup>14</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 72.

<sup>15</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 73-74.

<sup>16</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 77.

<sup>17</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 78-79, 82-83.

<sup>18</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 103.

<sup>19</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 104-112.

<sup>20</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 112-21. (describing FreeDOS as one of many possible free virtual operating systems available online).

<sup>21</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 103-128.

<sup>22</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 129.

servers to exchange information. There are four different types of federation and some are more secure than the others.<sup>23</sup> Presence in the cloud is what allows for a user's availability to be broadcast to other users.<sup>24</sup> Privacy is the "relationships between collection and dissemination of data, technology, the public expectation of privacy, and the legal issues surrounding them."<sup>25</sup> However, there are legal issues regarding data privacy.<sup>26</sup> Laws can "oblige a cloud provider to examine user records for evidence of criminal activity" but the status of privacy and confidentiality in the cloud is legally uncertain.<sup>27</sup>

Security in cloud computing is only as good as the security of the cloud computing provider.<sup>28</sup> Compliance standards help with data level security, requiring that data is not intermixed with other data.<sup>29</sup> In addition, statutes and regulations such as the Sarbanes-Oxley Act, the Gramm-Leach-Bliley Act, and the Health Insurance Portability and Accountability Act also govern security in cloud computing.<sup>30</sup> Third party risk management can mitigate legal actions if the provider hasn't "performed due diligence on its third-party vendors."<sup>31</sup> The book does not limit the discussion to technical security methods, but also stresses the importance of training a company's personnel to comply with security standards as well.<sup>32</sup>

Technical standards continue to emerge in cloud computing.<sup>33</sup> For instance, the open cloud consortium develops standards to allow different cloud numbers to operate with each

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<sup>23</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 132.

<sup>24</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 136.

<sup>25</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 147.

<sup>26</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 149.

<sup>27</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 149-50.

<sup>28</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 158.

<sup>29</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 160.

<sup>30</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 160.

<sup>31</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 169.

<sup>32</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 164.

<sup>33</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 183.

other.<sup>34</sup> Application developers also have standards, such as AJAX, an interface that allows developers to dynamically grab data from the cloud and display it on “the client side.”<sup>35</sup> Data standards, like XML, allow users to create their own “markup” to enable sharing of “structured data.”<sup>36</sup> Messaging standards range from the IMAP STMP and POP email standards to syndication standards, RSS and ATOM and regular communication standards such as HTTP or XMMP.<sup>37</sup>

Some of the popular Software-as-a-Service providers can be integrated into other cloud computing solutions.<sup>38</sup> The book describes YouTube, the popular streaming video website, Zimbra, a web-based email, calendar, and collaboration software package, Facebook, the social networking website, Zoho, the document application suite, and the DimDim collaboration suite. The book introduces these SaaS packages as case studies of cloud computing integration.<sup>39</sup>

Mobile internet devices, such as ‘smartphones,’ can also integrate with cloud computing.<sup>40</sup> The authors explain the differences between the popular smartphone operating systems, iPhone, Android, BlackBerry, Windows Mobile, and Ubuntu Mobile Internet Device.<sup>41</sup> The authors describe mobile virtualization and collaboration applications for mobile devices.<sup>42</sup> In closing, the authors predict that cloud computing is at an immature stage of its development, but that when security and privacy improves cloud computing will expand. The authors, however, believe that companies and consumers are missing out on cloud computing because

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<sup>34</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 183.

<sup>35</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 188.

<sup>36</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 189-90.

<sup>37</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 193-205.

<sup>38</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 214.

<sup>39</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 215-223.

<sup>40</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 235.

<sup>41</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 237-250.

<sup>42</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 257.

they do not “fully grasp the concept” and they hope the book improves the grasp of this technology.<sup>43</sup>

*Cloud Computing: Implementation, Management, and Security* collects and provides quality information about cloud computing in one source. As a resource, this book would be valuable to either a business person trying to decide whether to switch to cloud computing, or IT personnel who would like to educate themselves on cloud computing because it has a wealth of information of both the background of cloud computing, and examples of possible implementations. It does not fully answer concerns about the maturity of the technology, and while it does explain the security of cloud computing, it would not fully assuage the fears of a manager about possible security breaches in the cloud because, as the authors admit, the technology is at an immature stage of its development. Structurally, however, the book lays forth a pyramid of ideas to reach its conclusion: that cloud computing is here to stay, and companies should get on board.

The book does prove this thesis, but lacks a continuous theme of clearly bringing each chapter back to why cloud computing should be implemented at companies. In appendix B, a mock dialogue of a board meeting explains why a company would switch to cloud computing. While contrived, this appendix does a good job of concisely explaining what advantages cloud computing would provide for a company, and successfully pulls the book together. The appendix does not offer any new information—it is a collection of information scattered throughout the technical chapters—but it ties the book together. In sum, *Cloud Computing: Implementation, Management and Security* performs the difficult task of providing technical

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<sup>43</sup> RITTINGHOUSE & RANSOME, *supra* note 1, at 259.

information for people who don't necessarily have technical experience can make an informed decision about whether to adopt cloud computing.