

Contents

1	Introduction	1
1.1	Cloud Computing and Communications	2
1.2	Heterogeneous Networks	5
	References	8
2	Green Symbiotic Cloud Communications	11
2.1	Transcending Generic Cloud Computing	13
2.2	Pedestals for Systems of Future	15
2.2.1	<i>Data Caching</i> —Downloading the WWW onto the Cloud	15
2.2.2	Smart Home Integration	16
2.2.3	<i>Data Security</i> —Locally Distributed Storage	18
2.2.4	Incorporating Greenness	19
2.3	Design Postulates for GSCC Systems	20
2.3.1	Virtualization	20
2.3.2	Abstraction	20
2.3.3	Distributiveness	21
2.3.4	Greenness	21
2.3.5	Symbiosis	21
2.3.6	Pervasiveness/Ubiquity	22
2.3.7	Integration	22
2.3.8	Unification	22
2.3.9	Evolution	23
2.4	Architectural Design of GSCC Paradigm	23
2.4.1	Process Flow	25
2.4.2	Communication Process Flow	27
	References	34

3 Green Symbiotic Cloud Communications—Theory and Experimentation	37
3.1 Capacity Maximization	38
3.1.1 Proposition I	40
3.2 Operational Power Dynamics	41
3.3 Experimental Evaluation	42
3.3.1 Simulation with Combined <i>LTE</i> and <i>Wi-Fi</i>	42
3.3.2 Experimental Results	54
References	62
4 GSCC Universal Modem: Unifying Communications	63
4.1 Architecture of <i>UCM</i>	64
4.1.1 Transmitter Architecture	65
4.1.2 Receiver Architecture	65
4.2 Channel Estimation of <i>UCM</i>	66
4.3 Signal Processing and Classification	68
4.4 Duplex Communication Module	71
4.4.1 Addressing Schematic	73
4.4.2 Throughput Evaluation	73
4.5 Experimental Analysis: <i>UCM</i>	74
References	78
5 GSCC Channel Characterization and Modelling	81
5.1 Existing Channel Models: Drawbacks	82
5.1.1 Voltage as a Parameter	82
5.1.2 Knowledge of the Network	83
5.1.3 Load Impedance	83
5.2 Theoretical Modelling: Channel Model	84
5.3 Theoretical Modelling: Channel Model	90
5.4 Conclusion and Future Directions	94
References	95

Green Symbiotic Cloud Communications

Mustafa, H.D.; Merchant, S.; Desai, U.B.; Baveja, B.M.

2017, XI, 96 p. 51 illus., 46 illus. in color., Hardcover

ISBN: 978-981-10-3511-1