

Table of contents

Executive Summary	5
Table of contents.....	8
Table of figures	14
Chapter 1 Introduction.....	16
Chapter 2 How to navigate this book	17
Chapter overview.....	17
Reading guide per role.....	18
Chapter 3 The mainframe defined.....	21
The mainframe: a definition	21
A very brief history	21
Chapter 4 Mainframe hardware	23
The box, a big box	23
Peripherals and other quirks.....	26
Big hardware, but partitioned into smaller parts.....	27
Specialty engines.....	28
AI Accelerators for IBM Z.....	30
Chapter 5 Mainframe Operating Systems.....	31
z/OS	31
z/VM, the mother of all hypervisors	31
z/VSE.....	32
z/TPF.....	32
Linux on IBM Z	32
What's next in this book.....	32
Chapter 6 z/OS – the mainframe flagship operating system.....	34
The MVS part of z/OS	34
The Unix parts of z/OS.....	41

Making Sense of Unix and Linux on IBM Z.....	43
Parallel Sysplex.....	44
The interface to z/OS and the green-screen myth	47
Modern tools for development and operations.....	50
Chapter 7 Middleware for z/OS.....	53
Application Servers.....	53
Database management systems.....	56
Batch processes and the Job Scheduler	58
Integration software.....	59
AI and Machine Learning on z/OS.....	60
Chapter 8 Programming languages for z/OS.....	61
COBOL.....	61
PL/I.....	61
Assembler.....	62
Fortran.....	63
Java.....	63
C/C++	64
JCL.....	64
Rexx	64
Unix shell script	65
SAS.....	65
Easytrieve.....	66
Python.....	66
Other languages.....	66
Augmenting traditional COBOL and PL/I code with Java.....	66
Guidance: Selecting the Right Language for Mainframe Development	67
Chapter 9 Integration technologies.....	70
File interfaces	70

Message queueing.....	71
Web services (SOAP, REST).....	72
Event streaming.....	73
Enterprise Service Bus.....	74
Adapters.....	75
Database access via JDBC, ODBC.....	79
Chapter 10 Application development for z/OS	81
Traditional DevOps process for development.....	81
Modern development processes for the mainframe	83
DevOps implications for mainframe infrastructure patterns.....	87
In summary: work to do.....	90
Chapter 11 Security	91
Centralized security management.....	91
Zero Trust architecture on z/OS.....	92
Multifactor Authentication.....	94
Data protection	95
Cryptographic facilities on the mainframe.....	97
Mainframes and compliance	98
Chapter 12 System management.....	100
System operations	100
Monitoring.....	103
Chapter 13 Modern application architectures.....	108
Main characteristics and principles	108
Position of mainframe applications in modern application landscapes	110
Bridging the Gap: From Ideal to Reality	113
Chapter 14 Transformation strategies	114
A problem for the organization.....	114
Technical debt.....	115

Technical debt is the neglect of maintenance	118
What to do if you want to decommission the mainframe	119
Investing in modernization.....	122
Can't we move to the Cloud?	122
A Program to regain control of your Mainframe platform	123
Addressing the cultural aspect.....	125
Chapter 15 Linux for the mainframe	126
Linux on IBM Z	126
Linux containers on IBM Z	127
OpenShift.....	129
In summary: Linux on Z.....	131
Chapter 16 Understanding mainframe cost.....	133
An overview of the cost of a mainframe	133
The cost of managing a mainframe configuration.....	133
The cost of hardware for the mainframe	135
The cost of mainframe software	140
Special topics related to mainframe costs	145
Mainframe hardware and software cost summary.....	148
Chapter 17 Mainframes in the Cloud Era.....	151
Standardization and automation.....	151
The approach to cloud for z/OS.....	152
Hybrid Cloud Architecture Patterns	153
Comparison: when Cloud, when Mainframe.....	156
A Financial Model for Cloud and Mainframe	157
Conclusion.....	158
Chapter 18 The future of mainframe computing.....	159
The modern mainframe is not a paradox.....	159
Strategic pillars for the future of the mainframe.....	159

Challenges and opportunities	162
Lindy's Law in the Age of Mainframes	163
Chapter 19 About the Author.....	165
Acknowledgments	166
Glossary	167
A	167
B	168
C	168
D	170
E	171
F	172
G	172
H	173
I	173
J	174
K	175
L	175
M	176
N	177
O	177
Q	178
R	179
S	179
T	181
U	182
V	183
W	183
X	184

Z.....	184
Appendix A: Assessment Frameworks	186
Framework 0: The "Pre-Flight Check"	186
Framework 1: Mainframe Platform Health Assessment	186
Framework 2: Transformation Decision Matrix.....	189
A Final Word	193