

Micro-services Architecture and implementation



Contents

MOTIVATION FOR MICROSERVICE	3
WHAT IS MONOLITHIC APPLICATION?	4
DEALING WITH COMPLEXITY	36
MICROSERVICE SECURITY	40
API MANAGEMENT AND GATEWAYS	51
THE FUTURE OF MICROSERVICES	59
MICROSERVICES GOVERNANCE	61
SUMMARY OF MICROSERVICES	64

NodeJS

Table of Contents

1.	INTRODUCTION	2
1.1.	NODEJS	3
1.1.1.	KEY FEATURES OF NODEJS	5
1.2.	EXPRESS FRAMEWORK	6
1.3.	MONGODB	6
1.3.1.	KEY FEATURES OF MONGODB	6
2.	GETTING STARTED	7
2.1.	INSTALLATION AND CONFIGURATION	7
2.1.1.	NODEJS COMMAND LINE	7
2.1.2.	SAMPLE PROJECT USING NODE EXPRESS COMMAND PROMPT	11
2.1.3.	NODECLIPSE PLUGIN	13
2.1.4.	SAMPLE PROJECT USING NODECLIPSE	14
2.2.	PROJECT STRUCTURE	17
3.	BASIC ROUTING	18
4.	FILE SYSTEM	19
4.1.	GLOBAL OBJECTS	19
4.1.1.	CONSOLE	19
4.1.2.	__FILENAME	19
4.1.3.	__DIRNAME	19
4.2.	SYNCHRONOUS VS ASYNCHRONOUS FILE READ	20
5.	VIEW TEMPLATES	22
6.	SERVING STATIC CONTENT	23
7.	HANDLING HTTP AND HTTPS	24
8.	CONNECTING TO DATABASE	25
8.1.1.	MONGODB INSTALLATION & SETUP	25
8.1.2.	NODEJS MONGODB DRIVER	26
8.1.3.	PERFORMING CRUD OPERATIONS	26
8.1.4.	CONNECTION POOLING	28
8.1.5.	CONNECTION POOLING USING NODEJS MONGODB DRIVER	29
9.	REFERENCES	30
9.1.	REFERENCE GUIDES	30
9.2.	TUTORIALS	30

Container & Dockers

1.	WHY USE CONTAINERS ?	4
2.	DOCKER: A SHIPPING CONTAINER FOR CODE	6
3.	BENEFITS OF USING CONTAINERS	7
4.	VIRTUAL MACHINES VERSUS CONTAINERS	8
5.	DEV VERSUS OPS	9
6.	DOCKER MISSION	11
7.	DOCKER ADOPTION	12
8.	DOCKER BASIC CONCEPTS	13
9.	DOCKER ARCHITECTURE	14
10.	DOCKER TYPICAL WORKFLOW	15
11.	DOCKER SHARED AND LAYERED FILE SYSTEMS TECHNOLOGY	16

Kubernetes

1.	INTRODUCTION	4
1.	CONTAINER ECOSYSTEM	8
2.	CONTAINER ORCHESTRATION	16
3.	WHAT IS KUBERNETES?	17
4.	KUBERNETES STRENGTHS	18
5.	KUBERNETES ARCHITECTURE	19
6.	MASTER NODE COMPONENTS	30
7.	WORKER NODE COMPONENTS	33
8.	KUBERNETES BUILDING BLOCKS	34
	A) IMAGES	35
	B) IMMUTABILITY	36
	C) POD	37
	D) SIMPLE POD DEFINITION	38
	E) CONFIG MAPS & SECRETS	40
	F) REPLICASET	42
	G) SERVICE DISCOVERY	43
	H) SERVICE CONFIGURATION	44
	I) SCALING	45
	J) STATEFULSETS	46
	K) PERSISTENCE & STORAGE	47
	L) VOLUMES	49
	M) NAMING	50
	N) LABELS	51
	O) SELECTORS, AND ANNOTATIONS	52
	P) NODEPORT	55
	Q) INGRESS RESOURCES	56
9.	DEPLOYING APPLICATIONS ON KUBERNETES	57
10.	HELM	60
11.	APPLICATION CENTER COMPONENTS	61
12.	POD HEALTH CHECKING	62
13.	HEALTH CHECK EXAMPLES	64
14.	KUBECTL COMMANDS	65
15.	KUBECTL COMMANDS – EXAMPLES	66
16.	CLOUD APPLICATION COMPONENT ARCHITECTURE	67
17.	BENEFITS OF USING KUBERNETES WITH IBM CONTAINERS	68