



KEMENTERIAN DIGITAL  
JABATAN DIGITAL NEGARA

**DevOps**  
Sektor Awam

# PANDUAN

## PELAKSANAAN DEVOPS DALAM

## PEMBANGUNAN SISTEM

## APLIKASI SEKTOR AWAM



**Kementerian Digital  
Jabatan Digital Negara**

**Panduan  
Pelaksanaan DevOps  
dalam Pembangunan  
Sistem Aplikasi  
Sektor Awam  
(Lampiran)**

## KANDUNGAN

<b>KANDUNGAN.....</b>	<b>i</b>
<b>SENARAI JADUAL.....</b>	<b>iv</b>
<b>SENARAI RAJAH.....</b>	<b>v</b>
<b>LAMPIRAN A: AGILE SCRUM .....</b>	<b>1</b>
LAMPIRAN A-1: TEMPLAT ARTIFAK <i>PRODUCT VISION</i> .....	1
LAMPIRAN A-2: TEMPLAT ARTIFAK <i>USER STORY</i> .....	2
LAMPIRAN A-3: TEMPLAT ARTIFAK <i>PRODUCT BACKLOG</i> .....	3
LAMPIRAN A-4: TEMPLAT ARTIFAK <i>DEFINITION OF DONE</i> .....	4
LAMPIRAN A-5: TEMPLAT ARTIFAK PERANCANGAN KAPASITI .....	5
LAMPIRAN A-6: TEMPLAT ARTIFAK <i>SPRINT BACKLOG</i> .....	6
LAMPIRAN A-7: TEMPLAT ARTIFAK <i>BURNDOWN CHART</i> .....	7
LAMPIRAN A-8: TEMPLAT ARTIFAK <i>SPRINT RETROSPECTIVE</i> .....	8
LAMPIRAN A-9: KAJIAN KES <i>AGILE SCRUM</i> .....	9
<b>LAMPIRAN B: PERINGKAT PERANCANGAN .....</b>	<b>23</b>
LAMPIRAN B-1: MEMBUAT PERANCANGAN PRODUK [A1] MENGGUNAKAN WIKI.JS .....	23
LAMPIRAN B-2: MEMBUAT PERANCANGAN PRODUK [A1] MENGGUNAKAN WIKI GITLAB .....	37
LAMPIRAN B-3: MEWUJUDKAN GITLAB GROUP [A2].....	45
LAMPIRAN B-4: MEWUJUDKAN GITLAB EPIC [A3].....	51
LAMPIRAN B-5: MENETAPKAN AHLI PASUKAN KE GITLAB GROUP [A4] .....	55
LAMPIRAN B-6: MEWUJUDKAN GITLAB MILESTONE [A5] .....	59
LAMPIRAN B-7: MEWUJUDKAN GITLAB ITERATION [A6].....	63
LAMPIRAN B-8: MEWUJUDKAN GITLAB NEW PROJECT/REPOSITORY [A7] .....	68
LAMPIRAN B-9: MEWUJUDKAN GITLAB ENVIRONMENT BRANCH [A9] .....	74
LAMPIRAN B-10: MENYEDIAKAN GITLAB RUNNER [A10] .....	78
LAMPIRAN B-11: MEWUJUDKAN PRODUK BACKLOG DENGAN GITLAB ISSUES [A13] .....	82
LAMPIRAN B-12: MELIHAT PAPARAN GITLAB ROADMAP .....	92
LAMPIRAN B-13: MEWUJUDKAN MATTERMOST TEAM.....	94
LAMPIRAN B-14: MEWUJUDKAN MATTERMOST CHANNEL.....	97
LAMPIRAN B-15: MENYEDIAKAN INTEGRASI ANTARA GITLAB DAN MATTERMOST [A8] .....	101

LAMPIRAN B-16: TRIGGER PRODUCT BACKLOG PADA MATTERMOST [A14] .....	111
LAMPIRAN B-17: PERANCANGAN PELAKSANAAN PIPELINE CI/CD ....	118
LAMPIRAN B-18: TEMPLAT KES PENGUJIAN .....	121
LAMPIRAN B-19: TAHAP KRITIKAL.....	122
LAMPIRAN B-20: TEMPLAT TRACEABILITY MATRIX UJIAN.....	123
LAMPIRAN B-21: MARKDOWN CHEAT SHEET.....	124
LAMPIRAN B-22: MEWUJUDKAN GITLAB LABEL .....	132
<b>LAMPIRAN C: PERINGKAT PENGEKODAN.....</b>	<b>138</b>
LAMPIRAN C-1: MEWUJUDKAN FEATURE BRANCH [B1].....	138
LAMPIRAN C-2: MENGEMASKINI KOD [B2] .....	143
LAMPIRAN C-3: COMMIT DAN PUSH [B3] .....	148
LAMPIRAN C-4: MERGE REQUEST [B4].....	151
LAMPIRAN C-5: CODE REVIEW [B5].....	158
LAMPIRAN C-6: MELULUSKAN MERGE REQUEST [B6] .....	164
LAMPIRAN C-7: KONFIGURASI PIPELINE CI/CD SISTEM APLIKASI WEB .....	165
LAMPIRAN C-8: KONFIGURASI PIPELINE CI/CD UNTUK SISTEM APLIKASI MUDAH ALIH .....	179
LAMPIRAN C-9: KAWALAN KUALITI KOD.....	185
<b>LAMPIRAN D: PERINGKAT PEMBANGUNAN.....</b>	<b>189</b>
LAMPIRAN D-1: COMPILE CODE [C1] .....	189
LAMPIRAN D-2: PACKAGE CODE [C2] .....	190
LAMPIRAN D-3: MEMBINA IMEJ CONTAINER [C3] .....	192
LAMPIRAN D-4: PUSH IMEJ KE CONTAINER REGISTRY [C4].....	195
<b>LAMPIRAN E: PERINGKAT PENGUJIAN.....</b>	<b>199</b>
LAMPIRAN E-1: PENGUJIAN UNIT.....	199
LAMPIRAN E-2: PENGUJIAN INTEGRASI.....	212
LAMPIRAN E-3: PENGUJIAN SISTEM.....	222
LAMPIRAN E-4: TEMPLAT LAPORAN UJIAN PENERIMAAN PENGGUNA.....	232
LAMPIRAN E-5: PENGUJIAN PENERIMAAN PENGGUNA (UAT) .....	237
LAMPIRAN E-6: KUALITI KOD .....	239
LAMPIRAN E-7: STATIC APPLICATION SECURITY TEST (SAST) .....	244
LAMPIRAN E-8: SOFTWARE COMPOSITION ANALYSIS (SCA).....	248
LAMPIRAN E-9: DYNAMIC APPLICATION SECURITY TESTING (DAST)256	
LAMPIRAN E-10: SECRET DETECTION .....	262
LAMPIRAN E-11: PENGUJIAN PRESTASI .....	268

<b>LAMPIRAN F: PERINGKAT PELEPASAN .....</b>	<b>273</b>
LAMPIRAN F-1: PENGIMBASAN IMEJ CONTAINER .....	273
LAMPIRAN F-2: PELEPASAN KE PERSEKITARAN PEMBANGUNAN ....	277
LAMPIRAN F-3: PELEPASAN KE PERSEKITARAN STAGING .....	282
LAMPIRAN F-4: PELEPASAN KE PERSEKITARAN PRODUKSI .....	287
<b>LAMPIRAN G: PERINGKAT PENEMPATAN .....</b>	<b>292</b>
LAMPIRAN G-1: PENGIMBASAN INFRASTRUKTUR SEBAGAI KOD (IAC) .....	292
LAMPIRAN G-2: PENEMPATAN KE VM .....	296
LAMPIRAN G-3: PENEMPATAN MENGGUNAKAN IMEJ DARI DOCKER CONTAINER .....	301
LAMPIRAN G-4: PENEMPATAN KE KUBERNETES.....	306
<b>LAMPIRAN H: PERINGKAT PENGOPERASIAN .....</b>	<b>310</b>
LAMPIRAN H-1: PENYANDARAN PANGKALAN DATA.....	310
LAMPIRAN H-2: PENGEMASAN CONTAINER REGISTRY.....	317
LAMPIRAN H-3: PEMULIHAN SISTEM APLIKASI .....	327
<b>LAMPIRAN I: PERINGKAT PEMANTAUAN.....</b>	<b>333</b>
LAMPIRAN I-1: PEMANTAUAN LOG.....	333
LAMPIRAN I-2: PEMANTAUAN INFRASTRUKTUR .....	346
LAMPIRAN I-3: PEMANTAUAN UPTIME.....	350
LAMPIRAN I-4: PEMANTAUAN PRESTASI APLIKASI.....	355
LAMPIRAN I-5: PEMANTAUAN PENGGUNA SEBENAR.....	359
LAMPIRAN I-6: PEMANTAUAN SINTETIK .....	361
LAMPIRAN I-7: KONFIGURASI PEMANTAUAN ELASTIC.....	370
<b>LAMPIRAN J: URL.....</b>	<b>390</b>
LAMPIRAN J-1: URL TOOLS.....	390

## **SENARAI JADUAL**

Jadual 0-1: Tahap Kritikal. Sumber: Item (g), Langkah 5, Pelan Induk Pengujian [F5.1] KRISA..... 122

## SENARAI RAJAH

Rajah A-1: Templat Artifak <i>Product Vision</i> .....	9
Rajah A-2: Artifak <i>User Story</i> .....	11
Rajah A-3: Artifak <i>Product Backlog</i> .....	13
Rajah A-4: Artifak Perancangan Kapasiti .....	14
Rajah A-5: Artifak <i>Sprint Backlog</i> Hari 1 bagi <i>Sprint 1</i> .....	15
Rajah A-6: Artifak Log <i>Daily Scrum</i> .....	17
Rajah A-7: Artifak <i>Sprint Backlog</i> sehingga Hari 10 .....	18
Rajah A-8: Carta <i>Burndown</i> sehingga Hari ke 10.....	19
Rajah A-9: Artifak <i>Sprint Retrospective</i> .....	20
Rajah A-10: Artifak <i>Definition of Done</i> .....	22
Rajah B-11: Wiki.js – Paparan Laman Utama .....	24
Rajah B-12: Wiki.js – Maklumat Mewujudkan Halaman Baharu.....	25
Rajah B-13: Wiki.js – Paparan Mewujudkan Halaman Baharu.....	26
Rajah B-14: Wiki.js – Halaman Mewujudkan Halaman Baharu.....	27
Rajah B-15: Wiki.js – Editor Markdown .....	28
Rajah B-16: Wiki.js – Paparan Setelah Halaman Diwujudkan.....	29
Rajah B-17: Wiki.js – Paparan <i>Visual Editor</i> .....	30
Rajah B-18: Wiki.js – Memilih Templat Tersedia.....	31
Rajah B-19: Wiki.js – Memilih Halaman .....	32
Rajah B-20: Wiki.js – Memilih Templat Tersedia.....	33
Rajah B-21: Wiki.js – Paparan Halaman Templat Tersedia .....	34
Rajah B-22: Wiki.js – Paparan Proses <i>Rendering</i> .....	35
Rajah B-23: Wiki.js – Paparan Dokumentasi.....	36
Rajah B-24: Wiki Gitlab – Paparan Laman Utama .....	38
Rajah B-25: Wiki Gitlab – Maklumat Mewujudkan Halaman Baharu .....	39
Rajah B-26: Wiki Gitlab – Paparan Mewujudkan Halaman Baharu .....	40
Rajah B-27: Wiki Gitlab – Penggunaan Markdown .....	41
Rajah B-28: GitLab – Halaman <i>GitLab Group</i> .....	46
Rajah B-29: GitLab – Halaman <i>GitLab Group</i> .....	47
Rajah B-30: GitLab – Halaman <i>Create New Group</i> .....	47
Rajah B-31: GitLab – Halaman <i>Create Group</i> .....	48
Rajah B-32: GitLab – Halaman <i>Create Group</i> .....	49
Rajah B-33: GitLab – Paparan Halaman <i>Group Baharu</i> .....	50
Rajah B-34: GitLab – Halaman Mewujudkan <i>Epics</i> .....	51

Rajah B-35: GitLab – Halaman <i>New Epic</i> .....	52
Rajah B-36: Gitlab – Halaman Mewujudkan <i>New Epic</i> .....	53
Rajah B-37: GitLab – Paparan Halaman <i>Epics</i> .....	54
Rajah B-38: GitLab – Paparan Halaman <i>Groups</i> .....	55
Rajah B-39: GitLab – Paparan Halaman <i>Groups</i> .....	56
Rajah B-40: GitLab – Halaman <i>Group Information</i> .....	56
Rajah B-41: GitLab – Halaman <i>Group Members</i> .....	57
Rajah B-42: GitLab – Halaman <i>Invite Members</i> .....	58
Rajah B-43: GitLab – Halaman Menu Utama .....	59
Rajah B-44: GitLab – Halaman <i>New Milestones</i> .....	60
Rajah B-45: GitLab – Halaman <i>New Milestone</i> .....	60
Rajah B-46: GitLab – Paparan Halaman <i>Milestone</i> .....	61
Rajah B-47: GitLab – Paparan <i>Burndown Chart</i> .....	62
Rajah B-48: GitLab – Paparan Menu <i>New Iteration Cadence</i> .....	64
Rajah B-49: GitLab – Paparan Halaman <i>Burndown Chart</i> .....	65
Rajah B-50: GitLab – Paparan Menu <i>Iteration Cadence</i> .....	66
Rajah B-51: GitLab – Paparan Pada Setiap <i>Iteration</i> .....	67
Rajah B-52: Gitlab – Paparan Halaman Menu Utama.....	68
Rajah B-53: Gitlab – Paparan <i>Subgroups Dan Projects</i> .....	69
Rajah B-54: Gitlab – Paparan Menu Mewujudkan <i>New Project/Repository</i> .....	70
Rajah B-55: Gitlab – Paparan Mewujudkan Projek Baharu.....	71
Rajah B-56: Gitlab – Paparan Halaman <i>Create New Project</i> .....	71
Rajah B-57: Gitlab – Paparan Halaman Mewujudkan Halaman Baharu .....	72
Rajah B-58: Gitlab – Paparan Halaman Projek Baharu Dan <i>Repository</i> .....	73
Rajah B-59: Gitlab – Paparan Halaman Menu Utama.....	74
Rajah B-60: Gitlab – Paparan <i>New Branch</i> .....	75
Rajah B-61: Gitlab – Paparan Halaman <i>New Environment Branch</i> .....	76
Rajah B-62: Gitlab – Paparan Halaman <i>Environment Branch</i> .....	77
Rajah B-63: Gitlab – Paparan Halaman Menu Utama.....	78
Rajah B-64: Gitlab – Paparan Halaman <i>Expand Runners</i> .....	79
Rajah B-65: Gitlab – Paparan Halaman <i>Runners</i> .....	80
Rajah B-66: GitLab – Memilih Projek .....	82
Rajah B-67: GitLab – Menu <i>Issues</i> .....	83
Rajah B-68: GitLab – Mewujudkan <i>Issue Baharu</i> .....	84
Rajah B-69: GitLab – Memilih <i>Group</i> .....	85

Rajah B-70: GitLab – <i>Issue List</i> .....	86
Rajah B-71: GitLab – Memilih Projek .....	87
Rajah B-72: Gitlab – Memilih Projek.....	88
Rajah B-73: Gitlab – Memilih Projek.....	89
Rajah B-74: GitLab – Paparan <i>New Issue</i> .....	90
Rajah B-75: GitLab – Paparan <i>New Issue</i> .....	91
Rajah B-76: GitLab – Paparan GitLab <i>Roadmap</i> .....	92
Rajah B-77: GitLab – Paparan GitLab <i>Roadmap</i> .....	93
Rajah B-78: Gitlab – Paparan Halaman Utama.....	94
Rajah B-79: Gitlab – Paparan Halaman Gitlab Mattermost .....	95
Rajah B-80: Gitlab – Halaman Gitlab Mattermost .....	95
Rajah B-81: Gitlab – Halaman Gitlab Mattermost .....	96
Rajah B-82: Gitlab – Halaman Nama Kumpulan Baharu.....	96
Rajah B-83: Gitlab – Paparan Halaman Menu Utama.....	97
Rajah B-84: Gitlab – Paparan Halaman Mewujudkan Halaman Baharu .....	98
Rajah B-85: Gitlab – Paparan Halaman Utama Mattermost.....	99
Rajah B-86: Gitlab – Paparan Halaman <i>Channels</i> .....	100
Rajah B-87: Gitlab – Paparan Halaman Projek <i>Repository</i> .....	101
Rajah B-88: Gitlab – Paparan Halaman Integrasi .....	102
Rajah B-89: Gitlab – Paparan Halaman Mattermost <i>Slash Commands</i> .....	103
Rajah B-90: Gitlab – Paparan Halaman Konfigurasi Mattermost <i>Slash Commands</i> .....	104
Rajah B-91: Gitlab – Paparan <i>Install</i> Mattermost <i>Command</i> .....	105
Rajah B-92: Gitlab – Paparan Halaman Mattermost <i>Slash Commands</i> .....	106
Rajah B-93: Mattermost – Paparan Halaman <i>Channels</i> .....	107
Rajah B-94: Gitlab – Paparan Halaman <i>Channels</i> .....	108
Rajah B-95: Gitlab – Paparan Halaman <i>Channel</i> .....	109
Rajah B-96: Gitlab – Paparan Halaman Pengesahan Akaun Gitlab .....	109
Rajah B-97: Gitlab – Paparan Halaman Menu Utama.....	110
Rajah B-98: Gitlab – Paparan Halaman <i>Channel</i> .....	111
Rajah B-99: Gitlab – Paparan Halaman <i>Channel</i> .....	112
Rajah B-100: Gitlab – Paparan Dari BOT.....	113
Rajah B-101: Gitlab – Paparan Halaman <i>Channel</i> .....	114
Rajah B-102: Gitlab – Paparan Dari BOT.....	114
Rajah B-103: Gitlab – Paparan Halaman Projek .....	115

Rajah B-104: Gitlab – Paparan Halaman Senarai Isu .....	116
Rajah B-105: Gitlab – Paparan Halaman Data Dari Mattermost .....	117
Rajah B-106: Gitlab – Paparan Halaman Menu Utama.....	118
Rajah B-107: Gitlab – Paparan Halaman Konfigurasi CI/CD <i>Pipelines</i> .....	119
Rajah B-108: Gitlab – Paparan Ruangan Editor.....	120
Rajah B-109: Gitlab – Paparan Menu Utama .....	132
Rajah B-110: Gitlab – Paparan Menu Utama .....	133
Rajah B-111: Gitlab – Mewujudkan <i>New Label</i> .....	134
Rajah B-112: Gitlab – Paparan <i>New Label</i> .....	135
Rajah B-113: Gitlab – Paparan <i>Labels</i> .....	136
Rajah B-114: Gitlab – Paparan <i>Edit Label</i> .....	136
Rajah B-115: Gitlab – Paparan Label Berskop.....	137
Rajah C-116: GitLab – Paparan Utama Projek Yang Dipilih .....	138
Rajah C-117: GitLab – Paparan Menu <i>Branches</i> .....	139
Rajah C-118: GitLab – Paparan Senarai <i>Branch</i> .....	140
Rajah C-119: GitLab – Mewujudkan <i>Branch</i> Baharu.....	141
Rajah C-120: GitLab – Halaman Repotori Projek .....	142
Rajah C-121: Gitlab – Paparan Halaman <i>Feature Branch</i> .....	144
Rajah C-122: Gitlab – Paparan Halaman <i>Feature Branch</i> .....	145
Rajah C-123: Gitlab – Paparan Halaman Konfigurasi Kod.....	146
Rajah C-124: Gitlab – Paparan Halaman Konfigurasi Kod.....	147
Rajah C-125: Gitlab – Paparan Halaman Konfigurasi Kod.....	148
Rajah C-126: Gitlab – Paparan Halaman Konfigurasi Kod.....	149
Rajah C-127: Gitlab – Paparan Halaman <i>New Merge Request</i> .....	150
Rajah C-128: Gitlab – Paparan Halaman <i>Merge Requests</i> .....	152
Rajah C-129: Gitlab – Paparan Halaman <i>Merge Request</i> .....	153
Rajah C-130: Gitlab – Paparan Halaman <i>New Merge Request</i> .....	153
Rajah C-131: Gitlab – Paparan Halaman <i>Merge Request</i> .....	157
Rajah C-132: Gitlab – Paparan Halaman <i>Merge Request</i> .....	158
Rajah C-133: Gitlab – Paparan Halaman <i>Merge Request</i> .....	158
Rajah C-134: Gitlab – Paparan Halaman <i>Merge Request</i> .....	161
Rajah C-135: Gitlab – Paparan Halaman <i>Update README.md</i> .....	162
Rajah C-136: Gitlab – Paparan Halaman <i>Update README.md</i> .....	162
Rajah C-137: Gitlab – Paparan Halaman <i>Update README.md</i> .....	163
Rajah C-138: Gitlab – Paparan Halaman <i>Merge Request</i> .....	164

Rajah C-139: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i> .....	179
Rajah C-140: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i> .....	180
Rajah C-141: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i> .....	181
Rajah C-142: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i> .....	182
Rajah C-143: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i> .....	183
Rajah C-144: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i> .....	184
Rajah D-145: GitLab – Editor <i>Pipeline</i> GitLab .....	194
Rajah D-146: GitLab – Editor <i>Pipeline</i> GitLab .....	198
Rajah E-147: <i>Visual Studio Code</i> – Fail Kod Sumber Untuk Pengujian Unit.....	199
Rajah E-148: Gitlab – Paparan Menu Utama .....	200
Rajah E-149: Gitlab – Paparan <i>Pipeline</i> GitLab .....	203
Rajah E-150: Gitlab – Paparan Menu Utama .....	204
Rajah E-151: Gitlab – Paparan <i>Repository Files</i> .....	205
Rajah E-152: Gitlab – Paparan Skrip .....	206
Rajah E-153: Gitlab – Paparan <i>New Merge Request</i> .....	209
Rajah E-154: Gitlab – Paparan Menu Utama .....	210
Rajah E-155: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	210
Rajah E-156: Gitlab – Status Log Tugasan .....	211
Rajah E-157: Gitlab – Paparan Menu Utama .....	214
Rajah E-158: Gitlab – Paparan <i>Pipeline</i> GitLab .....	215
Rajah E-159: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	215
Rajah E-160: Gitlab – Status Log Tugasan .....	216
Rajah E-161: Gitlab – Paparan Menu Utama .....	219
Rajah E-162: Gitlab – Paparan <i>Pipeline</i> GitLab .....	220
Rajah E-163: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	220
Rajah E-164: Gitlab – Status Log Tugasan .....	221
Rajah E-165: <i>Visual Studio Code</i> – Fail Kod Sumber Untuk Pengujian Fungsian .	223
Rajah E-166: Gitlab – Repotori Fail GitLab.....	224
Rajah E-167: Gitlab – Paparan Menu Utama .....	225
Rajah E-168: Gitlab – Paparan Skrip .....	227
Rajah E-169: Gitlab – Paparan Menu Utama .....	229
Rajah E-170: Gitlab – Senarai Status Tugas <i>Pipeline</i> Gitlab.....	230
Rajah E-171: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	230
Rajah E-172: Gitlab – Status Log Tugasan .....	231
Rajah E-173: Gitlab – Senarai <i>Product Backlog</i> .....	237

Rajah E-174: Gitlab – Paparan Menu Utama .....	239
Rajah E-175: Gitlab – Paparan Konfigurasi Skrip .....	241
Rajah E-176: Gitlab – Paparan Menu Utama .....	242
Rajah E-177: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	243
Rajah E-178: Gitlab – Status Pengujian Kualiti Kod.....	243
Rajah E-179: Gitlab – Paparan Menu Utama .....	244
Rajah E-180: Gitlab – Paparan Halaman Konfigurasi Skrip .....	245
Rajah E-181: Gitlab – Paparan Menu Utama .....	246
Rajah E-182: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	247
Rajah E-183: Gitlab – Status Log Tugasan.....	247
Rajah E-184: Gitlab – Paparan Menu Utama .....	248
Rajah E-185: Gitlab – Paparan Halaman Konfigurasi Skrip .....	252
Rajah E-186: Gitlab – Paparan Menu Utama .....	253
Rajah E-187: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	254
Rajah E-188: Gitlab – Status Log Tugasan.....	255
Rajah E-189: Gitlab – Paparan Menu Utama .....	256
Rajah E-190: Gitlab – Paparan Halaman Konfigurasi Skrip .....	259
Rajah E-191: Gitlab – Paparan Menu Utama .....	260
Rajah E-192: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	260
Rajah E-193: Gitlab – Status Log Tugasan.....	261
Rajah E-194: Gitlab – Paparan Menu Utama .....	262
Rajah E-195: Gitlab – Paparan Halaman Konfigurasi Skrip .....	264
Rajah E-196: Gitlab – Paparan Menu Utama .....	265
Rajah E-197: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab .....	266
Rajah E-198: Gitlab – Status Log Tugasan.....	267
Rajah E-199: Gitlab – Paparan Menu Utama .....	268
Rajah E-200: Gitlab – Paparan Konfigurasi <i>Load Performance</i> .....	270
Rajah E-201: Gitlab – Paparan <i>Pipeline</i> .....	271
Rajah E-202: Gitlab – Paparan <i>Pipeline</i> .....	271
Rajah E-203: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab. ....	272
Rajah E-204: Gitlab – Status Log Tugasan.....	272
Rajah F-205: Gitlab – Paparan Menu Utama .....	274
Rajah F-206: Gitlab – Paparan Editor Fail .gitlab-ci.yml.....	275
Rajah F-207: GitLab – Editor <i>Pipeline</i> GitLab .....	276
Rajah F-208: Gitlab – Paparan Menu Utama .....	277

Rajah F-209: Gitlab – Paparan Fail Editor .gitlab-ci.yml.....	278
Rajah F-210: GitLab – Editor <i>Pipeline</i> GitLab .....	281
Rajah F-211: Gitlab – Paparan Menu Utama .....	282
Rajah F-212: Gitlab – Paparan Editor Fail .gitlab-ci.yml.....	283
Rajah F-213: GitLab – Editor <i>Pipeline</i> GitLab .....	286
Rajah F-214: Gitlab – Paparan Menu Utama .....	287
Rajah F-215: Paparan Fail Editor .gitlab-ci.yml .....	288
Rajah F-216: GitLab – Editor <i>Pipeline</i> GitLab .....	291
Rajah F-217: Gitlab – Paparan Menu Utama .....	293
Rajah F-218: Gitlab – Paparan Editor Fail .gitlab-ci.yml.....	294
Rajah F-219: GitLab – Editor <i>Pipeline</i> GitLab .....	295
Rajah G-220: Gitlab – Paparan Menu Utama.....	297
Rajah G-221: Gitlab – Paparan Fail Editor .gitlab-ci.yml .....	298
Rajah G-222: GitLab – Editor <i>Pipeline</i> GitLab.....	300
Rajah G-223: Gitlab – Paparan Menu Utama.....	302
Rajah G-224: Gitlab – Paparan Fail Editor .gitlab-ci.yml .....	303
Rajah G-225: GitLab – Editor <i>Pipeline</i> GitLab.....	305
Rajah G-226: Gitlab – Paparan Menu Utama.....	306
Rajah G-227: Gitlab – Paparan Fail Editor .gitlab-ci.yml .....	307
Rajah G-228: GitLab – Editor <i>Pipeline</i> GitLab .....	309
Rajah H-229: Gitlab – Paparan Menu Utama.....	310
Rajah H-230: Gitlab – Paparan Skrip Editor.....	313
Rajah H-231: Gitlab – Paparan Menu Utama .....	315
Rajah H-232: Gitlab – Status Tugasan Untuk <i>Pipeline</i> .....	316
Rajah H-233: Gitlab – Status Log Tugasan.....	316
Rajah H-234: Gitlab – Paparan Menu Utama .....	317
Rajah H-235: Gitlab – Paparan Editor .....	319
Rajah H-236: Gitlab – Paparan Menu Utama .....	321
Rajah H-237: Gitlab – Status Tugasan Untuk Pipeline.....	322
Rajah H-238: Gitlab – Status Log Tugasan.....	322
Rajah H-239: <i>Harbor</i> – Paparan Senarai Projek .....	323
Rajah H-240: <i>Harbor</i> – Paparan Repozitori.....	324
Rajah H-241: <i>Harbor</i> – Paparan Senarai Artifak .....	325
Rajah H-242: <i>Harbor</i> – Paparan Pengesahan.....	326
Rajah H-243: Gitlab – Paparan Menu Utama .....	327

Rajah H-244: Gitlab – Paparan CI/CD Editor .....	329
Rajah H-245: Gitlab – Paparan Menu Utama .....	331
Rajah H-246: Gitlab - Status Tugasan Untuk <i>Pipeline</i> .....	332
Rajah H-247: Gitlab – Status Log Tugasan.....	332
Rajah I-248: Elastic – Paparan Halaman Log Masuk .....	333
Rajah I-249: Elastic – Paparan Halaman Utama .....	334
Rajah I-250: Elastic – Paparan Halaman <i>Integrations</i> .....	335
Rajah I-251: Elastic – Paparan Halaman <i>Integrations</i> .....	336
Rajah I-252: Elastic – Paparan <i>Integrations</i> .....	337
Rajah I-253: Elastic – Paparan <i>Integrations</i> .....	338
Rajah I-254: Elastic – Paparan <i>Integrations</i> .....	339
Rajah I-255: Elasic – Paparan <i>Integrations</i> .....	340
Rajah I-256: Elastic – Paparan <i>Integrations</i> .....	341
Rajah I-257: Elastic – Paparan <i>Integrations</i> .....	342
Rajah I-258: Elastic – Paparan Halaman Utama .....	342
Rajah I-259: Elastic – Paparan <i>Overview</i> .....	343
Rajah I-260: Elastic – Paparan <i>Logs Stream</i> .....	344
Rajah I-261: Elastic – Paparan Data Daripada <i>Logs Stream</i> .....	344
Rajah I-262: Elastic – Paparan Halaman <i>Fleet</i> .....	346
Rajah I-263: Elastic – Paparan Log Masuk Terminal Linux Ubuntu .....	347
Rajah I-264: Elastic – Paparan Skrip.....	347
Rajah I-265: Elastic – Paparan Skrip.....	348
Rajah I-266: Elastic – Paparan Halaman <i>Infrastructure Inventory</i> .....	348
Rajah I-267: Elastic – Paparan <i>Metrics</i> .....	349
Rajah I-268: Elastic – Paparan Halaman <i>Fleet</i> .....	350
Rajah I-269: Elastic – Paparan Log masuk Terminal Linux Ubuntu .....	351
Rajah I-270: Elastic – Paparan Skrip.....	351
Rajah I-271: Elastic – Paparan Skrip.....	352
Rajah I-272: Elastic – Paparan Halaman <i>Monitors</i> .....	353
Rajah I-273: Elastic – Paparan <i>Monitors</i> .....	353
Rajah I-274: Elastic – Paparan Halaman <i>Fleet</i> .....	355
Rajah I-275: Elastic – Paparan Konfigurasi APM Agent.....	356
Rajah I-276: Elastic – Paparan Skrip.....	357
Rajah I-277: Elastic – Paparan halaman APM Services.....	357
Rajah I-278: Elastic – Paparan halaman APM <i>Traces</i> .....	358

Rajah I-279: Elastic – Paparan APM data .....	358
Rajah I-280: Elastic – Paparan Halaman <i>Dashboard</i> .....	359
Rajah I-281: Elastic – Paparan Halaman <i>Dashboard</i> .....	360
Rajah I-282: <i>Visual Studio Code</i> – Fail Kod Sumber Untuk Pemantauan Sintetik.	362
Rajah I-283: Gitlab – Paparan Menu Utama. ....	363
Rajah I-284: Gitlab – Paparan Skrip.....	365
Rajah I-285: Gitlab – Senarai Status Tugas <i>Pipeline</i> Gitlab .....	366
Rajah I-286: Gitlab – Status Tugasan Untuk <i>Pipeline</i> Gitlab .....	366
Rajah I-287: Gitlab – Status Log Tugasan .....	367
Rajah I-288: Gitlab – Paparan <i>Job Artifacts</i> .....	368
Rajah I-289: Gitlab – Paparan Hasil Status Pemantauan Sintetik.....	369
Rajah I-290: Elastic – Paparan Halaman Log Masuk .....	370
Rajah I-291: Elastic – Paparan Halaman Pemilihan <i>Space</i> .....	371
Rajah I-292: Elastic – Paparan Halaman <i>Welcome Home</i> .....	372
Rajah I-293: Elastic – Paparan <i>Home Dan Stack Management</i> .....	373
Rajah I-294: Elastic – Paparan Halaman <i>Create Space</i> .....	374
Rajah I-295: Elastic – Paparan Halaman <i>Create Space</i> .....	375
Rajah I-296: Elastic – Paparan Halaman <i>Create Space</i> .....	376
Rajah I-297: Elastic – Paparan Halaman <i>Create Space</i> .....	377
Rajah I-298: Elastic – Paparan Halaman <i>Create Role</i> .....	378
Rajah I-299: Elastic – Paparan Halaman <i>Create Role</i> .....	379
Rajah I-300: Elastic – Paparan Halaman <i>Create Role</i> .....	380
Rajah I-301: Elastic – Paparan Halaman <i>Create Role</i> .....	381
Rajah I-302: Elastic – Paparan Halaman <i>Create Role</i> .....	382
Rajah I-303: Elastic – Paparan Halaman <i>Create Role</i> .....	383
Rajah I-304: Elastic – Paparan Halaman <i>Create Role</i> .....	383
Rajah I-305: Elastic – Paparan Halaman <i>Create User</i> .....	384
Rajah I-306: Elastic – Paparan Halaman <i>Create User</i> .....	385
Rajah I-307: Elastic – Paparan Halaman <i>Users</i> .....	386
Rajah I-308: Elastic – Paparan Halaman Log Masuk .....	387
Rajah I-309: Elastic – Paparan Halaman <i>Welcome Home</i> .....	388
Rajah I-310: Elastic – Paparan Halaman <i>Welcome Home</i> .....	389

## LAMPIRAN A: AGILE SCRUM

### Lampiran A-1: Templat Artifak *Product Vision*

## **PRODUCT VISION BOARD UNTUK SISTEM TEMPAHAN BILIK MESUARAT**

### VISI

Halatuju dan visi utama produk secara umum. Visi ini boleh diekstrak dari dokumen *Business Requirement Specification* (\*BRS) sekiranya ada.

### KUMPULAN SASARAN

Memberi penerangan kepada sasaran pengguna yang akan menggunakan produk yang akan dibangunkan. (\*\*PPS)

### JUSTIFIKASI

Memberi justifikasi kepada permasalahan yang dihadapi oleh pengguna buat masa sekarang. (\*\*PPS)

### PRODUK

Penerangan kepada produk yang akan dibangunkan beserta modul-modulnya. (\*BRS)

### TUJUAN

Penerangan berkenaan matlamat pembangunan produk. (\*BRS)

**Lampiran A-2: Templat Artifak User Story**

ARTIFAK USER STORY					
USER STORY ID	PERANAN	FUNGSI	IMPAK	ACCEPTANCE CRITERIA	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

**Lampiran A-3: Templat Artifak Product Backlog**

ARTIFAK PRODUCT BACKLOG								
PRODUCT BACKLOG ID	KEUTAMAAN	TURUTAN KEUTAMAAN	USER STORY			STORY POINT	SPRINT NO	STATUS

**Lampiran A-4: Templat Artifak *Definition of Done***

Komponen	Senarai Semak	Status	Catatan
<b>Pengujian Keperluan Fungsian</b>			
<b>Pengujian Keperluan Bukan Fungsian</b>			
<b>Penempatan</b>			
<b>Dokumentasi</b>			

## Lampiran A-5: Templat Artifak Perancangan Kapasiti

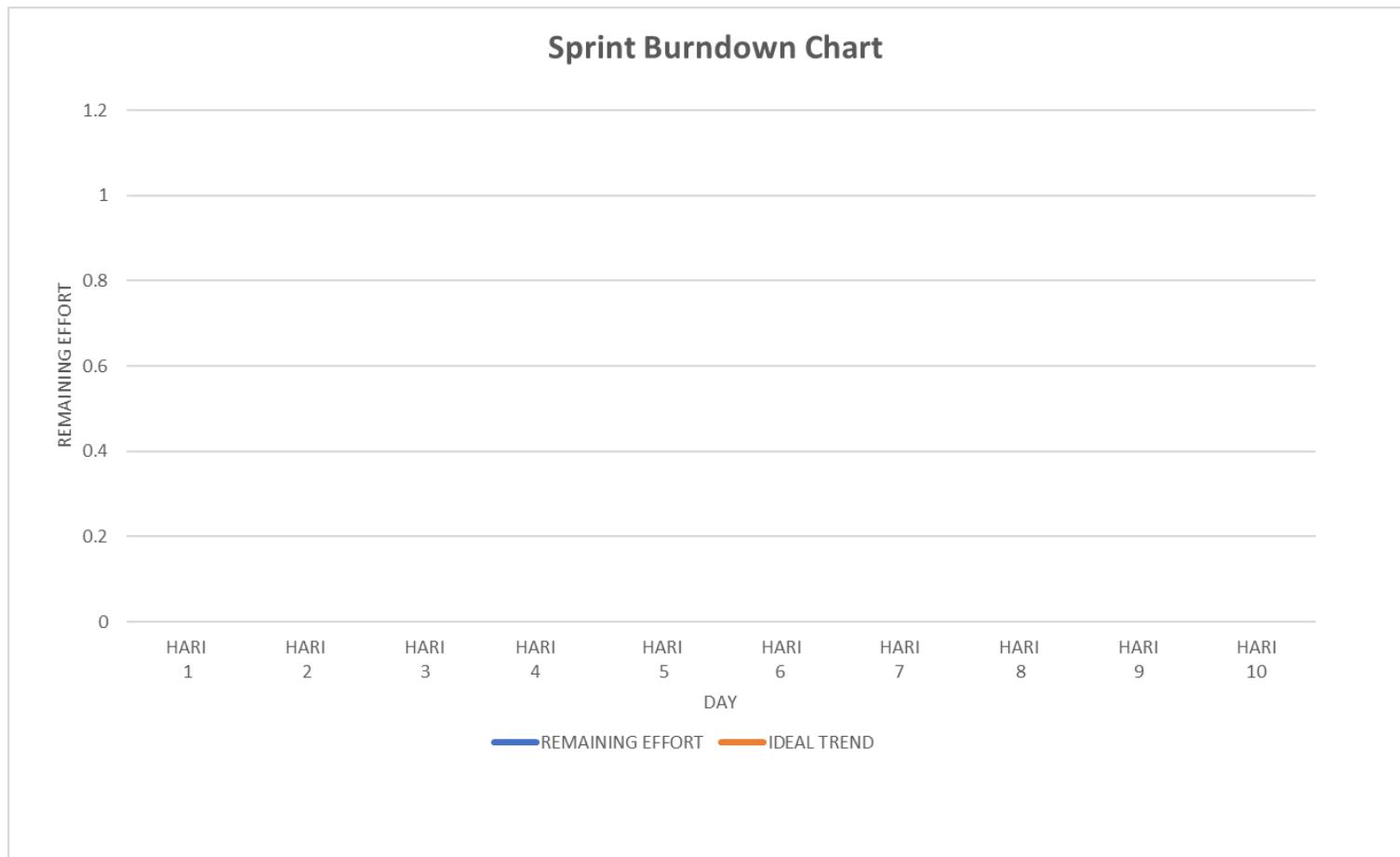
### Perancangan Kapasiti *Sprint 1*

Tempoh Sprint =

Nama	Jumlah Hari Bekerja Semasa <i>Sprint</i> (Hari) (a)	Jumlah Masa Bekerja Sehari (Jam) (b)	Jumlah Masa yang Diperuntukkan (Jam) (a*b)
<b>Jumlah Masa Keseluruhan (Jam) (c)</b>			
(-)	<b>5-10% Interrupt Buffer(Jam) (d)</b>		
(-)	<b>5-10% PB refinement (Jam) (e)</b>		
<b>Jumlah Masa Bersih (Jam) <math>= (c - (d+e))</math></b>			

## Lampiran A-6: Templat Artifak *Sprint Backlog*

PRODUCT BACKLOG ID	PRODUCT BACKLOG ITEM	ID TUGASAN	TUGASAN	AHLI PASUKAN	STATUS	STORY POINT	ANGGARAN MASA (JAM)	HARI 1	HARI 2	HARI 3	HARI 4	HARI 5	HARI 6	HARI 7	HARI 8	HARI 9	HARI 10
						JUMLAH STORY POINT											
						MASA SEBENAR (Jam) (a)											
						REMAINING EFFORT (Jam) (b) (b=b hari sebelum - a hari semasa)											
						IDEAL TREND (jam) (c) (c = c rancang - (c rancang/jumlah hari x hari semasa))											

**Lampiran A-7: Templat Artifak *Burndown Chart***

**Lampiran A-8: Templat Artifak *Sprint Retrospective***

ARTIFAK SPRINT RETROSPECTIVE			
ID	Perkara Yang Berjalan Dengan Lancar	Perkara Yang Tidak Berjalan Seperti Dijangka	Perkara Yang Perlu Ditambah Baik

**Lampiran A-9: Kajian Kes Agile Scrum****PRODUCT VISION BOARD UNTUK SISTEM TEMPAHAN BILIK MESUARAT**

<b>PRODUCT VISION BOARD UNTUK SISTEM TEMPAHAN BILIK MESUARAT</b>			
<b>VISI</b>  Ke arah pengurusan sumber manusia, aset dan kewangan agensi yang lebih sistematis dan efisyen. (BRS)			
<b>KUMPULAN SASARAN</b>  1. Warga agensi (MAMPU) bagi membuat permohonan 2. Pegawai tadbir bagi peringkat kelulusan - pentadbir bilik mesyuarat 3. Peringkat pengurusan agensi bagi tujuan perancangan keperluan.  (Pelan Pembangunan Sistem)	<b>JUSTIFIKASI</b>  1. Kebergantungan sepenuhnya kepada Pegawai tadbir bagi semakan kekosongan bilik mesyuarat. 2. Pertindihan tempahan bilik mesyuarat disebabkan oleh human error. 3. Proses pembatalan tidak boleh dilakukan dalam kadar segera. 4. Status kesedian bilik mesyuarat sukar dipantau. 5. Laporan penggunaan bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.  (Pelan Pembangunan Sistem)	<b>PRODUK</b>  Sistem yang mempunyai fungsi-fungsi bisnes yang mengurus penggunaan bilik mesyuarat seperti berikut: 1. Mengurus Pengguna 2. Mengurus Bilik Mesyuarat 3. Mengurus Tempahan 4. Paparan dashboard dan Jana Laporan  (BRS)	<b>TUJUAN</b>  Sistem yang dibangunkan adalah untuk mengganti sistem ada dalam menyokong proses mengurus penggunaan bilik mesyuarat oleh Bahagian Khidmat Pengurusan  (BRS)

**Rajah A-1: Templat Artifikat Product Vision**

ARTIFAK USER STORY				
USER STORY ID	PERANAN	FUNGSI	IMPAK	ACCEPTANCE CRITERIA
<b>Epic 1 : Pengurusan Pengguna</b>				
BF-BM-EP01-US01	Pengguna (warga MAMPU)	BOLEH mendaftar profil pengguna baru	SUPAYA boleh mendaftar masuk sistem tempahan bilik mesyuarat	Semasa warga melengkapkan butiran pendaftaran perlu pastikan: i.Format nombor kad pengenalan 12 digit dimasukan dan tidak termasuk simbol '-'. ii.Hanya alamat e-mel rasmi agensi sahaja yang boleh diterima. iii.Semak dan pastikan tiada pertindihan untuk kad pengenalan dan e-emel
BF-BM-EP01-US02	Pengguna (warga MAMPU)	BOLEH mengemaskini maklumat profil pengguna yang telah didaftarkan	SUPAYA akaun dapat disahkan dan selamat.	i.Saiz gambar dicadangkan tidak boleh melebih dari 800 x 800 piksel. ii.Format gambar yang dicadangkan adalah .jpeg dan .png sahaja.
<b>Epic 2 : Pengurusan Bilik Mesyuarat</b>				
BF-BM-EP02-US01	Pentadbir Bilik Mesyuarat	BOLEH menyelenggara maklumat bilik mesyuarat dengan mewujudkan rekod bilik yang baharu atau mengemaskini rekod sedia ada.	SUPAYA mendapatkan maklumat bilik mesyuarat yang tepat	i. rekod maklumat bilik mesyuarat dapat dilihat dari tahun 2019
BF-BM-EP02-US02	Pentadbir Bilik Mesyuarat	BOLEH menyemak maklum balas penggunaan bilik mesyuarat yang diterima daripada pengguna (warga Agensi)	SUPAYA mendapatkan sumber rujukan untuk melaporkan kerosakan dan perlukan pembaikan yang berkaitan.	i. statistik laporan kerosakan akan dijana di
BF-BM-EP02-US03	Pentadbir Bilik Mesyuarat	BOLEH menyediakan aduan kerosakan	SUPAYA hantar aduan kerosakan tersebut ke Sistem Selenggara Aset untuk tindakan seterusnya.	i. aduan kerosakan dihantar ke sistem selenggara asset mengikut batch harian
BF-BM-EP02-US04	Pentadbir Bilik Mesyuarat	BOLEH menerima notifikasi status aduan pembaikan kerosakan dari Sistem Selenggara Aset	SUPAYA kemaskini maklumat status bilik mesyuarat.	i. pengemaskinian boleh dilakukan sehari sebelum tarikh tempahan sahaja. ii. Pengemaskinian hanya boleh dilakukan oleh pengguna yang melakukan tempahan sahaja.

<b>Epic 3 : Pengurusan Tempahan</b>					
BF-BM-EP03-US01	Pengguna (warga MAMPU)	BOLEH menyemak kekosongan bilik mesyuarat	SUPAYA melakukan permohonan tempahan penggunaan bilik mesyuarat yang ingin digunakan pada tempoh masa tertentu.	i. memaparkan kekosongan bilik mesyuarat dalam bentuk dashboard dan infografik.	
BF-BM-EP03-US02	Pentadbir Bilik Mesyuarat	BOLEH menyemak permohonan bilik mesyuarat yang memerlukan tindakan kelulusan	SUPAYA memberi kelulusan bagi setiap permohonan tempahan	i. notifikasi ke alamat emel dihantar	
BF-BM-EP03-US03	Pengguna (warga MAMPU)	BOLEH melihat status pemohonan bilik mesyuarat	SUPAYA tahu berkenaan status permohonan yang telah dilakukan.	i. boleh melihat dan menerima notifikasi pemohonan	
BF-BM-EP03-US04	Pengguna (warga MAMPU)	BOLEH melihat status pemohonan bilik mesyuarat	SUPAYA membatalkan permohonan sekiranya perlu.	i. pembatalan boleh dilakukan sekali sahaja	
BF-BM-EP03-US05	Pengguna (warga MAMPU)	BOLEH menerima notifikasi untuk memberikan maklum balas penggunaan bilik	SUPAYA melengkapkan maklum balas penggunaan bilik mesyuarat setelah selesai penggunaan bilik.	i. notifikasi emel diberikan sejurus selepas selesai penggunaan bilik	
<b>Epic 4: Paparan Dashboard dan Jana Laporan</b>					
BF-BM-EP04-US01	Pentadbir Bilik Mesyuarat	BOLEH melihat dashboard maklumat status rekod terkinin dan rumusan statistik bilik, tempahan, penggunaan dan status bilik mesyuarat	SUPAYA gunakan maklumat tersebut untuk tujuan pelaporan	i. dashboard dan laporan boleh dijana dalam bentuk xlsx,jpeg, png	
BF-BM-EP04-US02	Pentadbir Bilik Mesyuarat	BOLEH menjana dan memaparkan laporan statistik terperinci tempahan, penggunaan dan penyelenggaraan bilik mesyuarat	SUPAYA mencetak laporan yang dijana atau dieksport laporan untuk disimpan	i. laporan boleh dijana dalam bentuk xlsx,jpeg, png	

**Rajah A-2: Artifak User Story**

ARTIFAK PRODUCT BACKLOG								
PRODUCT BACKLOG ID	KEUTAMAAN	TURUTAN KEUTAMAAN	USER STORY			STORY POINT	SPRINT NO	STATUS
<b>Epic 1 : Pengurusan Pengguna</b>								
BF-BM-EP01-PB01	Mesti Ada	1	Pengguna (warga MAMPU)	<b>BOLEH</b> mendaftar profil pengguna baru	<b>SUPAYA</b> boleh mendaftar masuk sistem tempahan bilik mesyuarat	3	Sprint 1	Dalam Tindakan
BF-BM-EP01-PB02	Mesti Ada	2	Pengguna (warga MAMPU)	<b>BOLEH</b> mengemaskini maklumat profil pengguna yang telah didaftarkan	<b>SUPAYA</b> akaun dapat disahkan dan selamat.	5	Sprint 1	Baharu
<b>Epic 2 : Pengurusan Bilik Mesyuarat</b>								
BF-BM-EP02-PB01	Mesti Ada	4	Pentadbir Bilik Mesyuarat	<b>BOLEH</b> menyelenggara maklumat bilik mesyuarat dengan mewujudkan rekod bilik yang baharu atau mengemaskini rekod sedia ada.	<b>SUPAYA</b> mendapatkan maklumat bilik mesyuarat yang tepat.	13		
BF-BM-EP02-PB02	Mesti Ada	3	Pentadbir Bilik Mesyuarat	<b>BOLEH</b> menyemak maklum balas penggunaan bilik mesyuarat yang diterima daripada pengguna (warga Agensi)	<b>SUPAYA</b> mendapatkan sumber rujukan untuk melaporkan kerosakan dan perlukan pembaikan yang berkaitan.	8	Sprint 1	
BF-BM-EP02-PB03	Patut ada	5	Pentadbir Bilik Mesyuarat	<b>BOLEH</b> menyediakan aduan kerosakan	<b>SUPAYA</b> hantar aduan kerosakan tersebut ke Sistem Selenggara Aset untuk tindakan seterusnya.	13		
BF-BM-EP02-PB04	Patut ada	6	Pentadbir Bilik Mesyuarat	<b>BOLEH</b> menerima notifikasi status aduan pembaikan kerosakan dari Sistem Selenggara Aset	<b>SUPAYA</b> kemaskini maklumat status bilik mesyuarat.	8		

<b>Epic 3 : Pengurusan Tempahan</b>							
BF-BM-EP03-PB01	Patut ada	7	Pengguna (warga MAMPU)	<b>BOLEH</b> menyemak kekosongan bilik mesyuarat	<b>SUPAYA</b> melakukan permohonan tempahan penggunaan bilik mesyuarat yang ingin digunakan pada tempoh masa tertentu.	8	
BF-BM-EP03-PB02	Patut ada	8	Pentadbir Bilik Mesyuarat	<b>BOLEH</b> menyemak permohonan bilik mesyuarat yang memerlukan tindakan kelulusan	<b>SUPAYA</b> memberi kelulusan bagi setiap permohonan tempahan	8	
BF-BM-EP03-PB03	Patut ada	9	Pengguna (warga MAMPU)	<b>BOLEH</b> melihat status semasa pemohonan tempahan yang telah dilakukan	<b>SUPAYA</b> tahu berkenaan status dan maklumat permohonan permohonan yang telah dilakukan.	5	
BF-BM-EP03-PB04	Patut ada	10	Pengguna (warga MAMPU)	<b>BOLEH</b> melihat status pemohonan bilik mesyuarat	<b>SUPAYA</b> membatalkan permohonan sekiranya perlu.	5	
BF-BM-EP03-PB05	Patut ada	11	Pengguna (warga MAMPU)	<b>BOLEH</b> menerima notifikasi untuk memberikan maklum balas penggunaan bilik	<b>SUPAYA</b> melengkapkan maklum balas penggunaan bilik mesyuarat setelah selesai penggunaan bilik.	8	
<b>Epic 4 : Paparan Dashboard dan Jana Laporan</b>							
BF-BM-EP04-PB01	Mungkin Ada	12	Pentadbir Bilik Mesyuarat	<b>BOLEH</b> melihat dashboard maklumat status rekod terkinin dan rumusan statistik bilik, tempahan, penggunaan dan status bilik	<b>SUPAYA</b> gunakan maklumat tersebut untuk tujuan pelaporan	8	
BF-BM-EP04-PB02	Mungkin Ada	13	Pentadbir Bilik Mesyuarat	<b>BOLEH</b> menjana dan memaparkan laporan statistik terperinci tempahan, penggunaan dan penyelenggaraan bilik mesyuarat	<b>SUPAYA</b> mencetak laporan yang dijana atau dieksport laporan untuk disimpan	8	

**Rajah A-3: Artifak Product Backlog**

<b>Perancangan Kapasiti Sprint 1</b>			
<b>Tempoh Sprint, 2 minggu = 10 hari bekerja</b>			
<b>Nama</b>	<b>Jumlah Hari Bekerja Semasa Sprint (Hari) (a)</b>	<b>Jumlah Masa Bekerja Sehari (Jam) (b)</b>	<b>Jumlah Masa yang Diperuntukkan (Jam) (a*b)</b>
Ali	8	5	40
Azhim	9	5	45
Ahmad	7	5	35
Raziman	6	2	12
Fauzi	4	4.5	18
<b>Jumlah Masa Keseluruhan (Jam) (c)</b>			<b>150</b>
(-)	<b>5-10% Interrupt Buffer (Jam) (d)</b>		<b>15</b>
(-)	<b>5-10% PB Refinement (Jam) (e)</b>		<b>15</b>
<b>Jumlah Masa Bersih (Jam) = (c - (d+e))</b>			<b>120</b>

Rajah A-4: Artifak Perancangan Kapasiti

PRODUCT BACKLOG ID	PRODUCT BACKLOG ITEM	ID TUGASAN	TUGASAN	AHLI PASUKAN	STATUS	STORY POINT	ANGGARAN MASA (JAM)	HARI 1	HARI 2	HARI 3	HARI 4	HARI 5	HARI 6	HARI 7	HARI 8	HARI 9	HARI 10	
<b>Epic 1: Pengurusan Pengguna</b>																		
BF-BM-EP01-PB01	Pengguna (warga MAMPU)BOLEH mendaftar profil pengguna baru SUPAYA boleh mendaftar masuk sistem tempahan bilik mesyuarat	US-001-ST01	<i>new table format</i>	Azhim	Selesai	3	8											
		US-001-ST02	<i>new table UI</i>	Ahmad	Selesai		4											
		US-001-ST03	<i>implement new db format</i>	Fauzi	Selesai		6											
		US-001-ST04	<i>template setup</i>	Raziman	Selesai		2											
		US-001-ST05	<i>creation of auto approve</i>	Ali	Selesai		4											
BF-BM-EP01-PB02	Pengguna (warga MAMPU)BOLEH mengemaskini maklumat profil pengguna yang telah didaftarkan SUPAYA akaun dapat disahkan dan selamat.	US-002-ST01	<i>Install contact page.</i>	Ali	Selesai	5	5											
		US-002-ST02	<i>new table UI</i>	Raziman	Selesai		6											
		US-002-ST03	<i>implement new db format</i>	Ahmad	Selesai		8											
		US-002-ST04	<i>template setup</i>	Azhim	Selesai		8											
		US-002-ST05	<i>export configuration</i>	Ahmad	Selesai		7											
		US-002-ST06	<i>creation of auto approve</i>	Ali	Selesai		8											
		US-002-ST07	<i>audit trail</i>	Azhim	Selesai		5											
		US-002-ST08	<i>creation of new table</i>	Raziman	Selesai		5											
<b>Epic 2: Pengurusan Bilik Mesyuarat</b>																		
BF-BM-EP02-PB02	Penadibir Bilik Mesyuarat BOLEH menyemak maklum balas penggunaan bilik mesyuarat yang diterima daripada pengguna (warga Agensi)SUPAYA mendapatkan sumber rujukan untuk melaporkan kerosakan dan perlukan pembaikan yang berkaitan.	US-004-ST01	<i>Install contact page</i>	Azhim	Selesai	8	8											
		US-004-ST02	<i>new table UI</i>	Raziman	Selesai		6											
		US-004-ST03	<i>implement new db format</i>	Ali	Selesai		7											
		US-004-ST04	<i>template setup</i>	Ahmad	Selesai		7											
		US-004-ST05	<i>table implementation</i>	Ali	Selesai		6											
		US-004-ST06	<i>export configuration</i>	Fauzi	Selesai		5											
		US-004-ST07	<i>creation of auto approve</i>	Raziman	Selesai		6											
						JUMLAH STORY POINT	16											
						MASA SEBENAR (Jam) (a)	0											
						REMAINING EFFORT (Jam) (b) (b=b hari sebelum – a hari semasa)	121											
						IDEAL TREND (jam) (c) (c = c rancang – (c rancang/jumlah hari x hari semasa))	121											

Rajah A-5: Artifak Sprint Backlog Hari 1 bagi Sprint 1

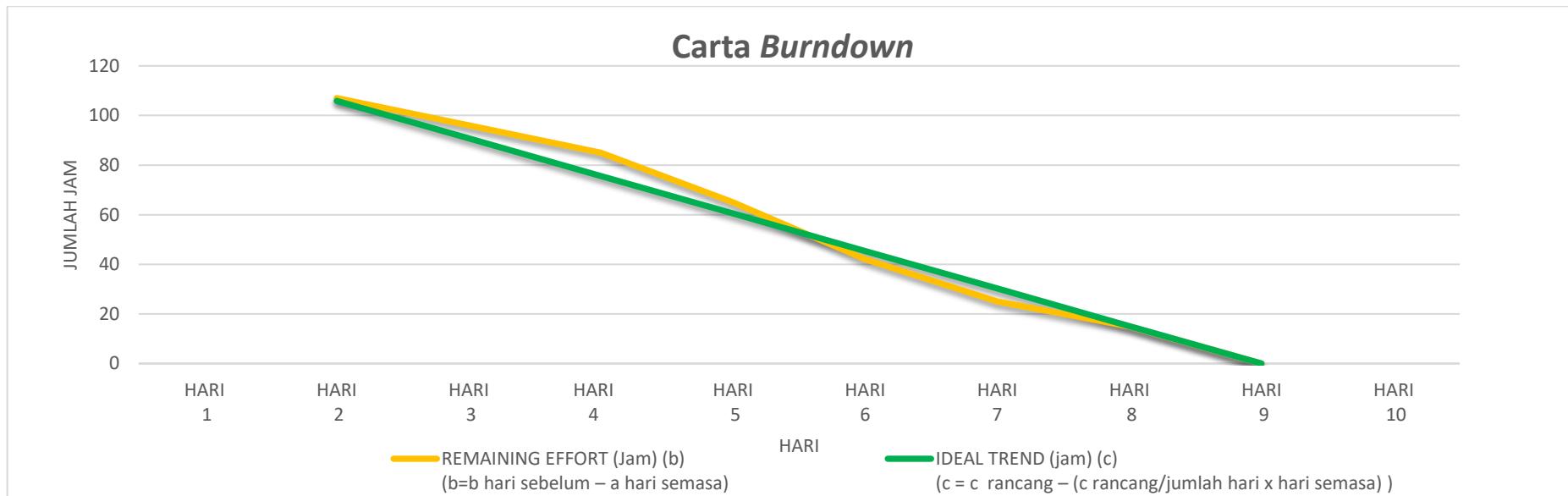
DAILY SCRUM LOG						
Ahli Pasukan	Soalan	Hari 2 Selasa	Hari 3 Rabu	Hari 4 Khamis	Hari 5 Jumaat	Hari 6 Isnin
Ali	Apakah yang anda lakukan semalam?	menyediakan auto approve fungsi	penyediaan fungsian auto approve (50% siap)	bercuti	bercuti	penyediaan fungsian auto approve (100% siap)
	Tugasan apakah yang akan dilakukan hari ini?	sambungan penyediaan fungsian auto approve	sambungan penyediaan fungsian auto approve	bercuti	sambungan penyediaan fungsian auto approve (80% siap)	melakukan pengujian
	Adakah terdapat sebarang permasalahan?	memerlukan maklumat lanjut berkenaan db table auto approve	tiada	bercuti	tiada	tiada
Azhim	Apakah yang anda lakukan semalam?	menyelesaikan new table format untuk User story 1	bercuti	table formatting untuk user story 1 (65% siap)	table formatting untuk user story 1 (90% siap)	table formatting untuk user story 1 (100% siap)
	Tugasan apakah yang akan dilakukan hari ini?	bercuti	sambungan kepada menyediakan formatting table bagi user story 1	sambungan kepada menyediakan formatting table bagi user story 1	sambungan kepada menyediakan formatting table bagi user story 1 dan melakukan pengujian	melakukan pengujian
	Adakah terdapat sebarang permasalahan?	memerlukan maklumat lanjut dari DBA berkenaan struktur db table	tiada	tiada	tiada	tiada
Ahmad	Apakah yang anda lakukan semalam?	menyediakan UI kepada modul pendaftaran pengguna	bercuti	bercuti	bercuti	
	Tugasan apakah yang akan dilakukan hari ini?	sambungan kepada penyediaan UI bagi modul pendaftaran pengguna	bercuti	sambungan kepada penyediaan UI bagi modul pendaftaran pengguna	bercuti	penyediaan UI bagi modul pendaftaran pengguna (90% siap)
	Adakah terdapat sebarang permasalahan?	memerlukan perbincangan bersama pemilik produk untuk mengesahkan UI yang diingini.	bercuti	UI telah mencapai peratusan siap 75%. Perlukan input dari pemilik produk mengenai UI lain yang diperlukan.	bercuti	duplication of UI yang mempunyai sama UI, memerlukan perbincangan bersama pemilik produk

Raziman	Apakah yang anda lakukan semalam?	menyediakan template bagi modul pendaftaran pengguna	bercuti	penyediaan template (85% siap)	penyediaan template setup (100% siap)	pengujian kepada template setup yang telah dikonfigurasi
	Tugasan apakah yang akan dilakukan hari ini?	bercuti	sambungan kepada penyediaan template setup	sambungan kepada penyediaan template dan melakukan pengujian	melakukan pengujian	sambungan pengujian
	Adakah terdapat sebarang permasalahan?	tiada	memerlukan pengesahan pemilik produk berkenaan templat yang telah dibangunkan	tiada	memerlukan pengesahan pemilik produk berkenaan template yang telah disediakan	tiada
Fauzi	Apakah yang anda lakukan semalam?	bercuti	bercuti	bercuti	implement new db table (50% siap)	implement new db table 80% siap)
	Tugasan apakah yang akan dilakukan hari ini?	bercuti	bercuti	implement new db table	sambungan kepada implementation new db table	sambungan kepada implementation new db table
	Adakah terdapat sebarang permasalahan?	bercuti	bercuti	perlukan maklumat lajut dari DBA berkenaan struktur db modul	tiada	perlukan sokongan dan maklumat lanjut DBA

**Rajah A-6: Artifak Log *Daily Scrum***

PRODUCT BACKLOG ID	PRODUCT BACKLOG ITEM	ID TUGASAN	TUGASAN	AHLI PASUKAN	STATUS	STORY POINT	ANGGARAN MASA (JAM)	HARI 1	HARI 2	HARI 3	HARI 4	HARI 5	HARI 6	HARI 7	HARI 8	HARI 9	HARI 10	
<b>Epic 1: Pengurusan Pengguna</b>																		
BF-BM-EP01-PB01	Pengguna (warga MAMPU) BOLEH mendaftar profil pengguna baru SUPAYA boleh mendaftarkan masuk sistem tempahan bilik mesyuarat	US-001-ST01	<i>new table format</i>	Azhim	Selesai	3	8	3	0	2	2	1	0	0	0	0		
		US-001-ST02	<i>new table UI</i>	Ahmad	Selesai		4	3	1	0	0	0	0	0	0	0		
		US-001-ST03	<i>implement new db format</i>	Fauzi	Selesai		6	2	0	0	4	0	0	0	0	0		
		US-001-ST04	<i>template setup</i>	Raziman	Selesai		2	0	0	2	1	0	0	0	0	0		
		US-001-ST05	<i>creation of auto approve</i>	Ali	Selesai		4	2	3	0	0	0	0	0	0	0		
BF-BM-EP01-PB02	Pengguna (warga MAMPU) BOLEH mengemaskini maklumat profil pengguna yang telah didaftarkan SUPAYA akan dapat disahkan dan selamat.	US-002-ST01	<i>Install contact page.</i>	Ali	Selesai	5	5	0	3	0	3	0	0	0	0	0		
		US-002-ST02	<i>new table UI</i>	Raziman	Selesai		6	0	0	0	2	2	0	0	2			
		US-002-ST03	<i>implement new db format</i>	Ahmad	Selesai		8	0	2	3	0	3	1	0	0			
		US-002-ST04	<i>template setup</i>	Azhim	Selesai		8	0	0	4	2	3	0	0	0			
		US-002-ST05	<i>export configuration</i>	Ahmad	Selesai		7	0	0	0	0	4	2	0	0			
		US-002-ST06	<i>creation of auto approve</i>	Ali	Selesai		8	0	0	0	0	4	4	1	0			
		US-002-ST07	<i>audit trail</i>	Azhim	Selesai		5	0	0	0	1	2	3	1	0			
		US-002-ST08	<i>creation of new table</i>	Raziman	Selesai		5	0	0	0	0	2	0	0	2			
<b>Epic 2: Pengurusan Bilik Mesyuarat</b>																		
BF-BM-EP02-PB02	Penadibir Bilik Mesyuarat BOLEH menyemak maklum balas penggunaan bilik mesyuarat yang diterima daripada pengguna (warga Agensi) SUPAYA mendapatkan sumber rujukan untuk melaporkan kerosakan dan perlukan pembaikan yang berkaitan.	US-004-ST01	<i>Install contact page</i>	Azhim	Selesai	8	8	0	0	0	0	0	0	0	2	3		
		US-004-ST02	<i>new table UI</i>	Raziman	Selesai		6	0	0	0	0	0	0	0	0	3		
		US-004-ST03	<i>implement new db format</i>	Ali	Selesai		7	1	0	0	0	0	2	3	1			
		US-004-ST04	<i>template setup</i>	Ahmad	Selesai		7	0	2	0	0	0	2	0	0			
		US-004-ST05	<i>table implementation</i>	Ali	Selesai		6	3	0	0	0	0	0	0	3	1		
		US-004-ST06	<i>export configuration</i>	Fauzi	Selesai		5	0	0	0	2	0	3	0	3			
		US-004-ST07	<i>creation of auto approve</i>	Raziman	Selesai		6	0	0	0	3	2	0	0	0			
JUMLAH STORY POINT						16												
MASA SEBENAR (Jam) (a)							121		14	11	11	20	23	17	10	15		
REMAINING EFFORT (Jam) (b) (b=b hari sebelum – a hari semasa)							121		107	96	85	65	42	25	15	0		
IDEAL TREND (jam) (c) (c = c rancang – (c rancang/jumlah hari x hari semasa))							121		105.875	90.75	75.625	60.5	45.375	30.25	15.125	0		

Rajah A-7: Artifak Sprint Backlog sehingga Hari 10



	Jumlah Jam	HARI 1	HARI 2	HARI 3	HARI 4	HARI 5	HARI 6	HARI 7	HARI 8	HARI 9	HARI 10
REMAINING EFFORT (Jam) (b) (b=b hari sebelum – a hari semasa)	121		107	96	85	65	42	25	15	0	
IDEAL TREND (jam) (c) (c = c rancang – (c rancang/jumlah hari x hari semasa))	121		105.875	90.75	75.625	60.5	45.375	30.25	15.125	0	

Rajah A-8: Carta Burndown sehingga Hari ke 10

ARTIFAK SPRINT RETROSPECTIVE					
SPRINT ID	MULA	BERHENTI	TERUSKAN	LAKUKAN LEBIH LAGI	DIKURANGKAN
SP001	Tambah user demo	Memanjangkan tempoh Daily Scrum Meeting lebih daripada 15 minit.	Mengedarkan nota Daily Scrum Meeting untuk rujukan	Komunikasi kepada Pihak Pengurusan Tertinggi	Tiada
SP001	Menyediakan deployment plan diakhir setiap sprint	Tiada	Mengadakan demo	Tiada	Mengurangkan mesyuarat/ perbincangan yang memerlukan penglibatan pasukan pembangunan

Rajah A-9: Artifak Sprint Retrospective

Komponen	Senarai Semak	Status	Catatan
Pengujian Keperluan Fungsian	1. Kod sumber selesai dibangunkan	✓	<b>Sprint 1</b>
	2. Kod sumber disemak	✓	<b>Sprint 1</b>
	3. Kod sumber digabungkan (merged)	✓	<b>Sprint 1</b>
	4. Melepas pengujian unit	✓	<b>Sprint 1</b>
	5. Melepas pengujian integrasi	✓	<b>Sprint 1</b>
	6. Melepas pengujian sistem dan memenuhi <i>acceptance criteria</i> bagi setiap <i>user story</i>	✓	<b>Sprint 1</b>
	7. Melepas pengujian penerimaan pengguna		<b>Sprint 3</b>
Pengujian Keperluan Bukan Fungsian	1. Melepas pengujian kualiti kod	✓	<b>Sprint 1</b>
	2. Melepas pengujian SAST	✓	<b>Sprint 1</b>
	3. Melepas pengujian prestasi	✓	<b>Sprint 1</b>
Penempatan	1. Penempatan ke persekitaran <i>staging</i> pada <i>sprint</i> yang melibatkan <i>product release</i> sahaja		<b>Sprint 3</b>
Dokumentasi	1. Artifak <i>product vision</i>	✓	<b>Sprint 1</b>

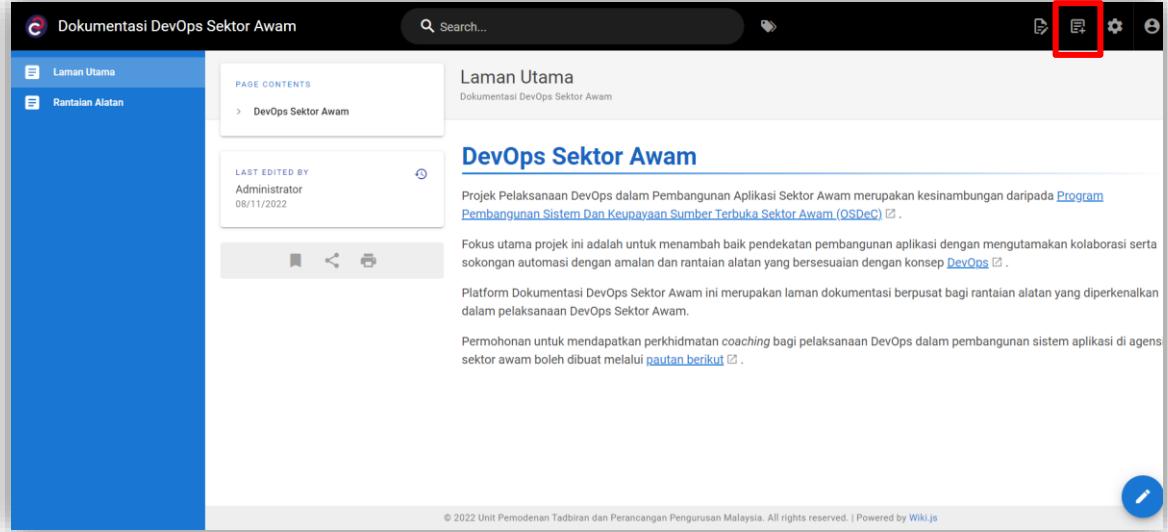
Komponen	Senarai Semak	Status	Catatan
	<b>2. Dokumen laporan UAT</b>		<b>Sprint 3</b>
	<b>3. Artifak <i>sprint backlog</i></b>	✓	<b>Sprint 1</b>
	<b>4. Artifak carta <i>burndown</i></b>	✓	<b>Sprint 1</b>
	<b>5. Artifak perancangan kapasiti</b>	✓	<b>Sprint 1</b>
	<b>6. Artifak log <i>daily scrum</i></b>	✓	<b>Sprint 1</b>
	<b>7. Artifak <i>sprint retrospective</i></b>	✓	<b>Sprint 1</b>

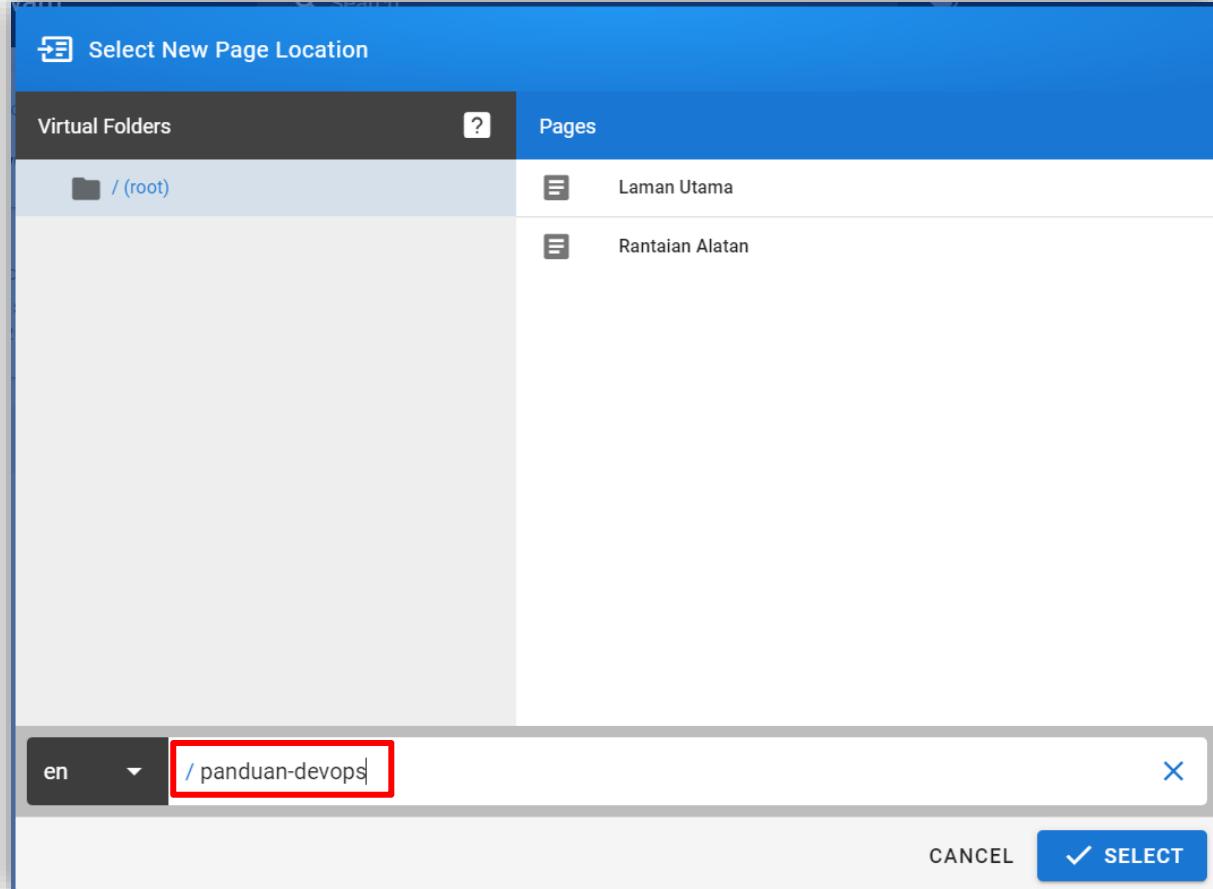
Rajah A-10: Artifak *Definition of Done*

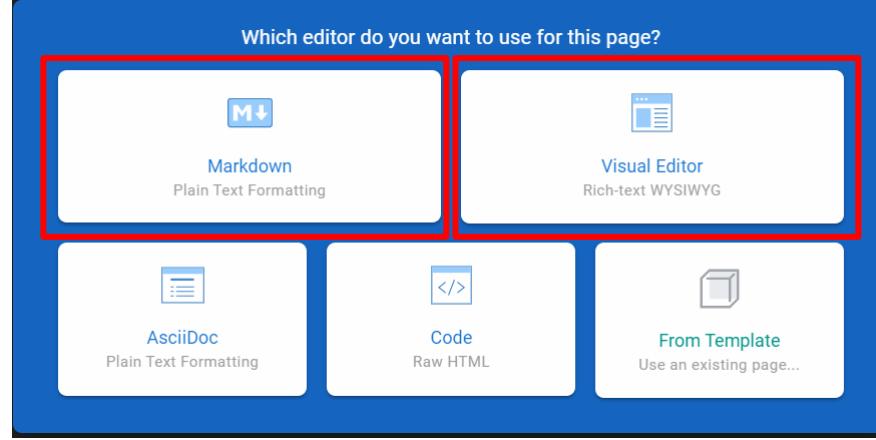
## **LAMPIRAN B: PERINGKAT PERANCANGAN**

### **Lampiran B-1: Membuat Perancangan Produk [A1] menggunakan Wiki.js**

Perancangan yang telah dibincangkan bersama ahli pasukan boleh diterjemahkan ke dalam bentuk wiki bagi tujuan dokumentasi. Antara dokumen yang dicadangkan adalah *produk vision board*, *epic*, dan *user story*. Berikut merupakan tatacara untuk mewujudkan halaman baharu pada Wiki.js.

Tatacara	Paparan
<p>Log masuk laman web Wiki.js yang telah disediakan.</p> <p>1. Klik  untuk mewujudkan halaman baharu [Rajah B-11].</p>	 <p><b>Rajah B-11: Wiki.js – Paparan Laman Utama</b></p>

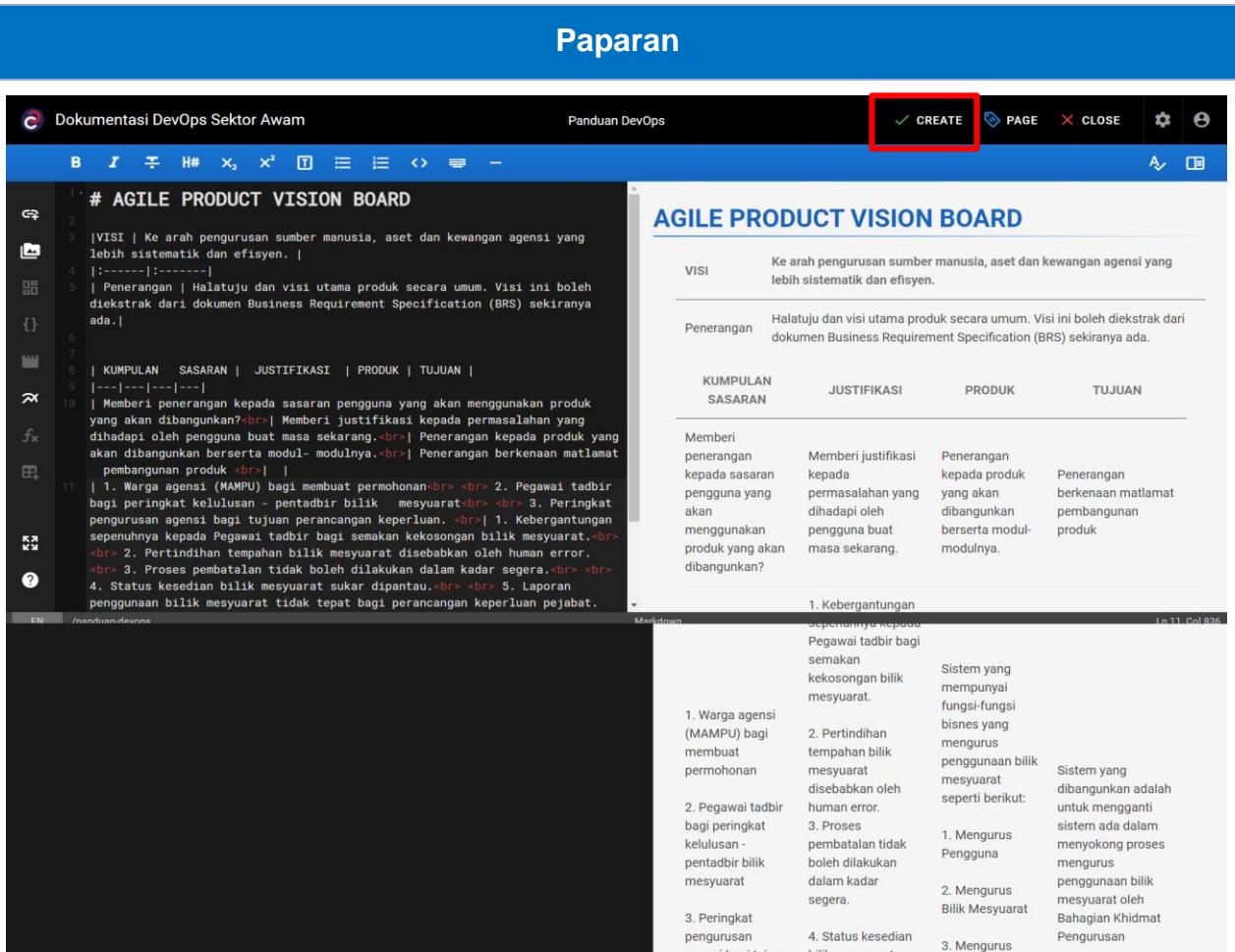
Tatacara	Paparan
<p>1. Masukkan <i>full path</i> ke halaman yang ingin diwujudkan [Rajah B-12].</p> <ol style="list-style-type: none"><li><i>The path</i> tidak boleh mengandungi <i>spaces</i> (gunakan <i>dashes</i>), tiada noktah dan mengandungi <i>URL-safe characters</i>.</li><li><b>JANGAN</b> letakkan <i>slash</i> dibelakang.</li><li>Tidak perlu mewujudkan folder. Masukkan <i>full path</i> yang ingin diwujudkan dan <i>folder</i> akan diwujudkan secara automatik. Contohnya masukkan panduan-devops/bilik-mesyuarat dan secara automatik, <i>subfolder</i> bilik-mesyuarat akan diwujudkan.</li></ol> <p>2. Klik <b>Select</b> untuk teruskan.</p>	 <p>Rajah B-12: Wiki.js – Maklumat Mewujudkan Halaman Baharu</p>

Tatacara	Paparan
<p>Apabila mewujudkan halaman baharu, dialog berikut akan dipaparkan [Rajah B-13].</p> <p>Wiki.js menawarkan pelbagai editor bergantung pada jenis kandungan yang ingin ditulis atau bergantung pada pilihan pengguna. Pembangun biasanya akan menggunakan editor <b>Markdown</b> manakala pengguna bukan teknikal akan lebih memilih <b>Visual Editor</b>.</p>	 <p>Which editor do you want to use for this page?</p> <ul style="list-style-type: none"><li><b>Markdown</b> Plain Text Formatting</li><li><b>Visual Editor</b> Rich-text WYSIWYG</li><li>AsciiDoc Plain Text Formatting</li><li>Code Raw HTML</li><li>From Template Use an existing page...</li></ul>

Rajah B-13: Wiki.js – Paparan Mewujudkan Halaman Baharu

Tatacara	Paparan
<p>Berikut merupakan paparan untuk mewujudkan halaman baru [Rajah B-14].</p> <ol style="list-style-type: none"><li>1. Masukkan <b>Title</b>.</li><li>2. Masukkan <b>Short Description</b>.</li><li>3. Masukkan <b>Tags</b>.</li><li>4. Klik <b>OK</b>.</li></ol>	<p>The screenshot shows the 'PAGE INFO' section with 'Title' set to 'Panduan DevOps' (14 / 255 characters). In the 'Short Description' field, it says 'Dokumentasi panduan DevOps bagi case study Sistem Tempahan Bilik Mesyuarat' (74 / 255 characters). Under 'PATH', 'Locale' is 'en' and 'Path' is 'panduan-devops'. A note says 'Do not include any leading or trailing slashes.' The 'CATEGORIZATION' section shows a single tag 'devops' with a delete icon. Below it is a 'Tags' input field with a note: 'Use tags to categorize your pages and make them easier to find.'</p>

Rajah B-14: Wiki.js – Halaman Mewujudkan Halaman Baharu

Tatacara	Paparan																								
<p>Berikut merupakan contoh penggunaan editor Markdown [Rajah B-15].</p> <ol style="list-style-type: none"> <li>Setelah selesai menulis, klik <b>CREATE</b>.</li> </ol> <p>Rujuk <b>Lampiran B-21: Markdown Cheat Sheet</b> bagi panduan penggunaan Markdown Editor.</p>	 <p><b>AGILE PRODUCT VISION BOARD</b></p> <p><b>VISI</b>   Ke arah pengurusan sumber manusia, aset dan kewangan agensi yang lebih sistematis dan efisyen.</p> <p><b>Penerangan</b>   Halatju dan visi utama produk secara umum. Visi ini boleh diekstrak dari dokumen Business Requirement Specification (BRS) sekiranya ada.</p> <table border="1"> <thead> <tr> <th>KUMPULAN SASARAN</th> <th>JUSTIFIKASI</th> <th>PRODUK</th> <th>TUJUAN</th> </tr> </thead> <tbody> <tr> <td>Memberi penerangan kepada sasaran pengguna yang akan menggunakan produk yang akan dibangunkan?</td> <td>Memberi justifikasi kepada permasalahan yang dihadapi oleh pengguna buat masa sekarang.</td> <td>Penerangan kepada produk yang akan dibangunkan berserta modul-modulnya.</td> <td>Penerangan berkenaan matlamat pembangunan produk</td> </tr> <tr> <td>1. Warga agensi (MAPU) bagi membuat permohonan</td> <td>2. Pegawai tadbir bagi peringkat kelulusan - pentadbir bilik mesyuarat</td> <td>Sistem yang mempunyai fungsi-fungsi bisnes yang mengurus penggunaan bilik mesyuarat</td> <td>Sistem yang dibangunkan adalah untuk menggantikan sistem ada dalam menyokong proses mengurus penggunaan bilik mesyuarat oleh Bahagian Khidmat Pengurusan</td> </tr> <tr> <td>2. Pertindihan tempahan bilik mesyuarat disebabkan oleh human error.</td> <td>3. Proses pembatalan tidak boleh dilakukan dalam kadar segera.</td> <td>1. Mengurus Pengguna Bilik Mesyuarat</td> <td>1. Mengurus Pengguna Bilik Mesyuarat</td> </tr> <tr> <td>3. Status kesedian bilik mesyuarat sukar dipantau.</td> <td>5. Laporan penggunaan bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.</td> <td>2. Mengurus Bilik Mesyuarat</td> <td>2. Mengurus Bilik Mesyuarat</td> </tr> <tr> <td>4. Status kesedian bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.</td> <td></td> <td>3. Mengurus Tempahan</td> <td>3. Mengurus Tempahan</td> </tr> </tbody> </table> <p>1. Kebangkitan Seperiannya kepada Pegawai tadbir bagi semakan kekosongan bilik mesyuarat.</p> <p>1. Warga agensi (MAPU) bagi membuat permohonan</p> <p>2. Pertindihan tempahan bilik mesyuarat disebabkan oleh human error.</p> <p>3. Proses pembatalan tidak boleh dilakukan dalam kadar segera.</p> <p>4. Status kesedian bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.</p> <p>5. Laporan penggunaan bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.</p>	KUMPULAN SASARAN	JUSTIFIKASI	PRODUK	TUJUAN	Memberi penerangan kepada sasaran pengguna yang akan menggunakan produk yang akan dibangunkan?	Memberi justifikasi kepada permasalahan yang dihadapi oleh pengguna buat masa sekarang.	Penerangan kepada produk yang akan dibangunkan berserta modul-modulnya.	Penerangan berkenaan matlamat pembangunan produk	1. Warga agensi (MAPU) bagi membuat permohonan	2. Pegawai tadbir bagi peringkat kelulusan - pentadbir bilik mesyuarat	Sistem yang mempunyai fungsi-fungsi bisnes yang mengurus penggunaan bilik mesyuarat	Sistem yang dibangunkan adalah untuk menggantikan sistem ada dalam menyokong proses mengurus penggunaan bilik mesyuarat oleh Bahagian Khidmat Pengurusan	2. Pertindihan tempahan bilik mesyuarat disebabkan oleh human error.	3. Proses pembatalan tidak boleh dilakukan dalam kadar segera.	1. Mengurus Pengguna Bilik Mesyuarat	1. Mengurus Pengguna Bilik Mesyuarat	3. Status kesedian bilik mesyuarat sukar dipantau.	5. Laporan penggunaan bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.	2. Mengurus Bilik Mesyuarat	2. Mengurus Bilik Mesyuarat	4. Status kesedian bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.		3. Mengurus Tempahan	3. Mengurus Tempahan
KUMPULAN SASARAN	JUSTIFIKASI	PRODUK	TUJUAN																						
Memberi penerangan kepada sasaran pengguna yang akan menggunakan produk yang akan dibangunkan?	Memberi justifikasi kepada permasalahan yang dihadapi oleh pengguna buat masa sekarang.	Penerangan kepada produk yang akan dibangunkan berserta modul-modulnya.	Penerangan berkenaan matlamat pembangunan produk																						
1. Warga agensi (MAPU) bagi membuat permohonan	2. Pegawai tadbir bagi peringkat kelulusan - pentadbir bilik mesyuarat	Sistem yang mempunyai fungsi-fungsi bisnes yang mengurus penggunaan bilik mesyuarat	Sistem yang dibangunkan adalah untuk menggantikan sistem ada dalam menyokong proses mengurus penggunaan bilik mesyuarat oleh Bahagian Khidmat Pengurusan																						
2. Pertindihan tempahan bilik mesyuarat disebabkan oleh human error.	3. Proses pembatalan tidak boleh dilakukan dalam kadar segera.	1. Mengurus Pengguna Bilik Mesyuarat	1. Mengurus Pengguna Bilik Mesyuarat																						
3. Status kesedian bilik mesyuarat sukar dipantau.	5. Laporan penggunaan bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.	2. Mengurus Bilik Mesyuarat	2. Mengurus Bilik Mesyuarat																						
4. Status kesedian bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.		3. Mengurus Tempahan	3. Mengurus Tempahan																						

**Rajah B-15: Wiki.js – Editor Markdown**

Paparan setelah halaman diwujudkan [Rajah B-16].

**Panduan DevOps**  
Dokumentasi panduan DevOps bagi case study Sistem Tempahan Bilik Mesyuarat

## AGILE PRODUCT VISION BOARD

VISI	Ke arah pengurusan sumber manusia, aset dan kewangan agensi yang lebih sistematik dan efisyen.		
Penerangan	Halatju dan visi utama produk secara umum. Visi ini boleh diekstrak dari dokumen Business Requirement Specification (BRS) sekrinnya ada.		
KUMPULAN SASARAN	JUSTIFIKASI	PRODUK	TUJUAN
Memberi penerangan kepada sasaran pengguna yang akan menggunakan produk yang akan dibangunkan?	Memberi justifikasi kepada permasalahan yang dihadapi oleh pengguna buat masa sekarang.	Penerangan kepada produk yang akan dibangunkan berserta modul-modulnya.	Penerangan berkaitan matlamat pembangunan produk
1. Warga agensi (MAMPU) bagi membuat permohonan	1. Kebanggantungan sepenuhnya kepada Pegawai tadbir bagi semakan kekosongan bilik mesyuarat.	Sistem yang mempunyai fungsi-fungsi bisnes yang mengurus penggunaan bilik mesyuarat seperti berikut:	Sistem yang dibangunkan adalah untuk mengantikan sistem ada dalam memerlukan proses mengurus penggunaan bilik mesyuarat oleh Bahagian Khidmat Pengurusan
2. Pegawai tadbir bagi peringkat kelulusan - pentadbir bilik mesyuarat	2. Pertindihan tempahan bilik mesyuarat disebabkan oleh human error.	1. Mengurus Pengguna	
3. Peringkat pengurusan agensi bagi tujuan perancangan keperluan.	3. Proses pembatalan tidak boleh dilakukan dalam kadar segera.	2. Mengurus Bilik Mesyuarat	
	4. Status kesedian bilik mesyuarat sukar dipantau.	3. Mengurus Tempahan	
	5. Laporan penggunaan bilik mesyuarat tidak tepat bagi perancangan keperluan pejabat.	4. Paparan dashboard dan Jana Laporan	

### EPIC

Epic merupakan sebahagian besar kerja yang boleh dibahagikan ke dalam format user story. Epic merupakan keperluan peringkat tinggi yang diingini oleh pengguna dan ianya merentasi keseluruhan Sprint.

**Epic**  
Mengurus Penggunaan Bilik Mesyuarat Dengan Efisien

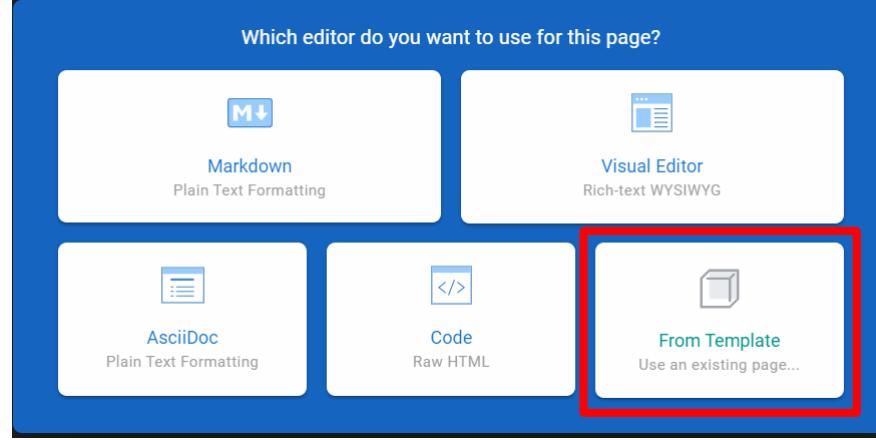
### USER STORY

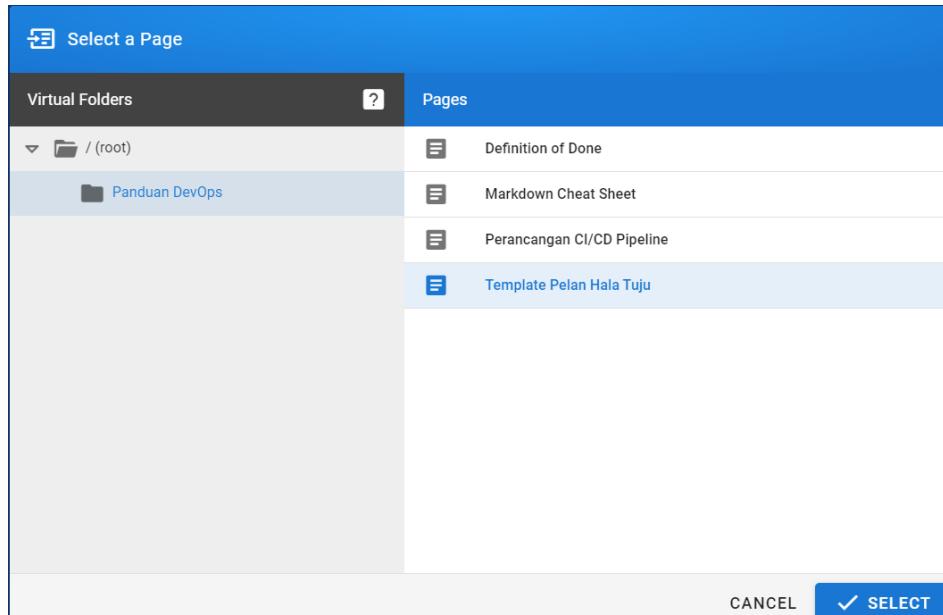
Antara fungsi-fungsi produk yang telah diterjemahkan ke dalam format user story:

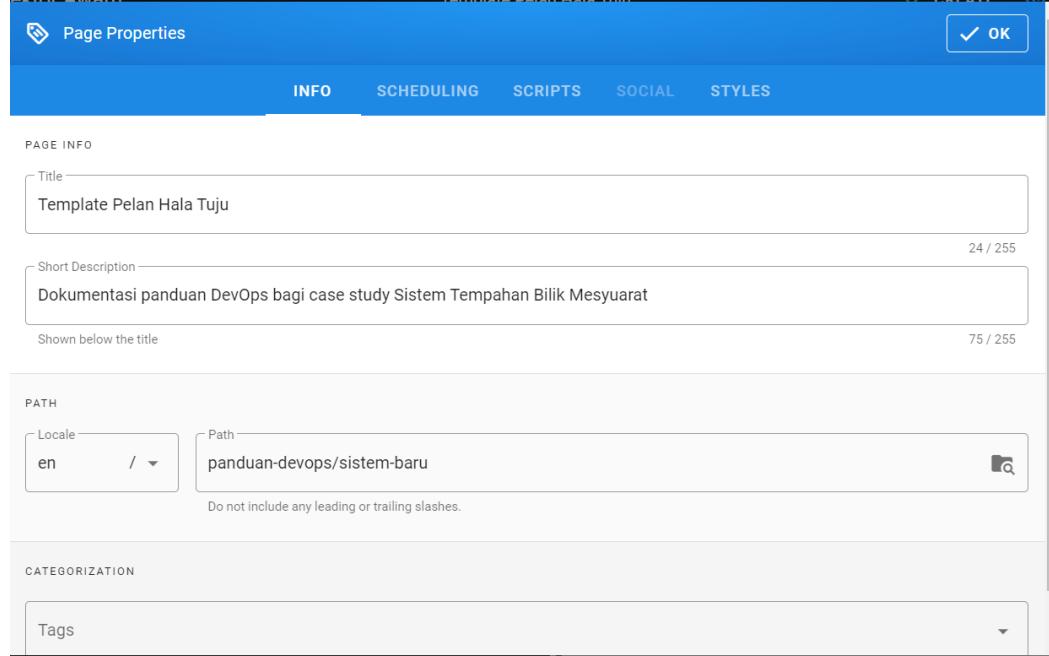
1. Pengguna (warga MAMPU) **BOLEH** mendaftar profil pengguna baru **SUPAYA** boleh mendaftar masuk Sistem Tempahan Bilik Mesyuarat.
2. Pengguna (warga MAMPU) **BOLEH** mengemaskini maklumat profil pengguna yang telah didaftarkan **SUPAYA** akaun dapat disahkan dan selamat.
3. Pentadbir Bilik Mesyuarat **BOLEH** menyelenggarakan maklumat bilik mesyuarat dengan mewujudkan rekod bilik yang baharu atau mengemaskini rekod sediar ada **SUPAYA** mendapatkan maklumat bilik mesyuarat yang tepat.
4. Pentadbir Bilik Mesyuarat **BOLEH** menyenamak maklum baas penggunaan bilik mesyuarat yang diterima daripada pengguna **SUPAYA** boleh mendapatkan sumber rujukan untuk melaporkan kerosakan dan perlukan pembaikan yang berkaitan.

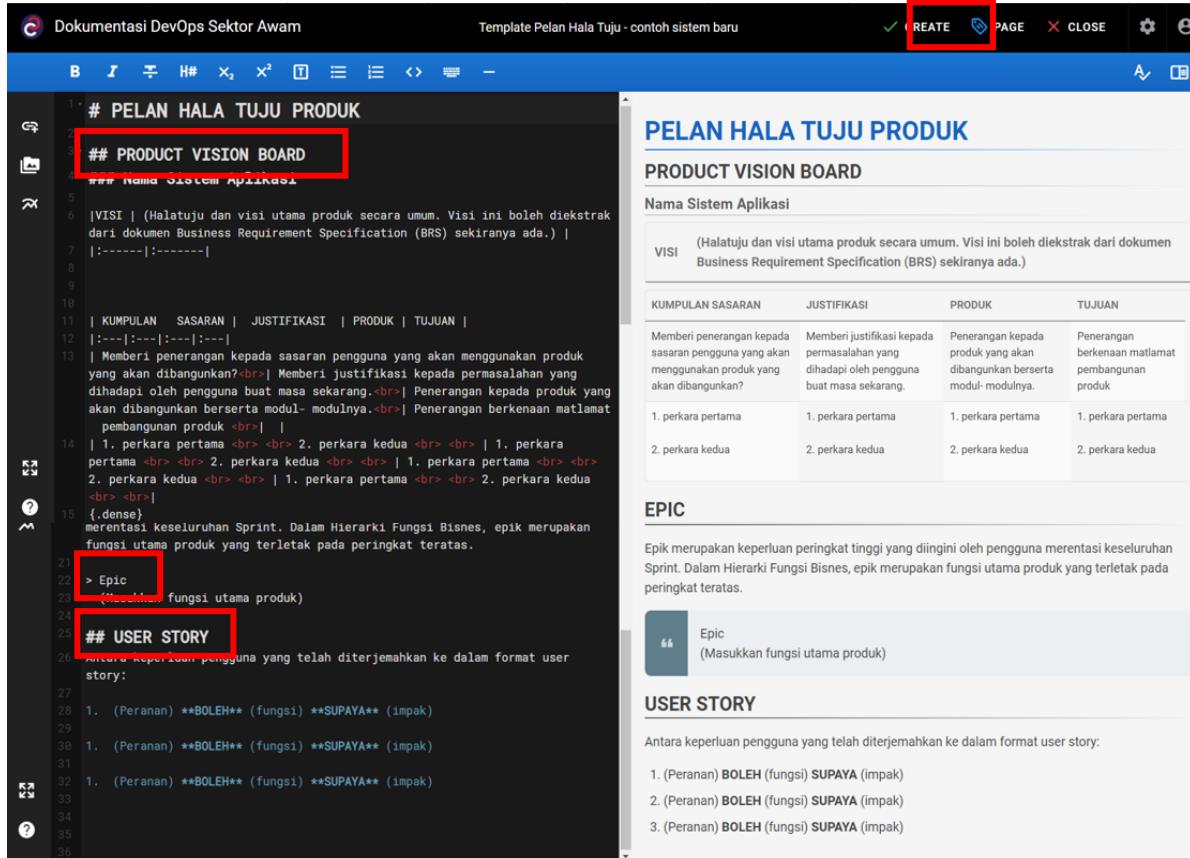
Rajah B-16: Wiki.js – Paparan Setelah Halaman Diwujudkan

Tatacara	Paparan
Contoh penggunaan bagi editor <b>Visual Editor</b> [Rajah B-17].	 <p>The screenshot shows a web-based visual editor interface. At the top, there's a header bar with the title 'Dokumentasi DevOps Sektor Awam' and 'Sistem Tempahan Bilik Mesyuarat'. On the right side of the header are buttons for 'SAVED', 'PAGE', 'CLOSE', and settings. Below the header is a toolbar with various icons for text formatting like bold, italic, underline, and superscript. The main content area has a section titled 'Pengenalan' with some descriptive text and a numbered list of four points. At the bottom of the editor window, there are status indicators: 'EN /panduan-devops/bilik-mesyuarat', 'Visual Editor', and character/word count '1163 chars, 156 words'.</p> <p><b>Rajah B-17: Wiki.js – Paparan Visual Editor</b></p>

Tatacara	Paparan
<p>Sekiranya pengguna ingin menggunakan templat sedia ada, pengguna boleh memilih <b>From Template</b> [Rajah B-18].</p>	 <p>The screenshot shows a blue header bar with the text "Which editor do you want to use for this page?". Below it are five options arranged in two rows: "Markdown Plain Text Formatting" (with a "M" icon), "Visual Editor Rich-text WYSIWYG" (with a document icon), "AsciiDoc Plain Text Formatting" (with a document icon), "Code Raw HTML" (with a code icon), and "From Template Use an existing page..." (with a document icon). The "From Template" option is highlighted with a red rectangular border.</p> <p><b>Rajah B-18: Wiki.js – Memilih Templat Tersedia</b></p>

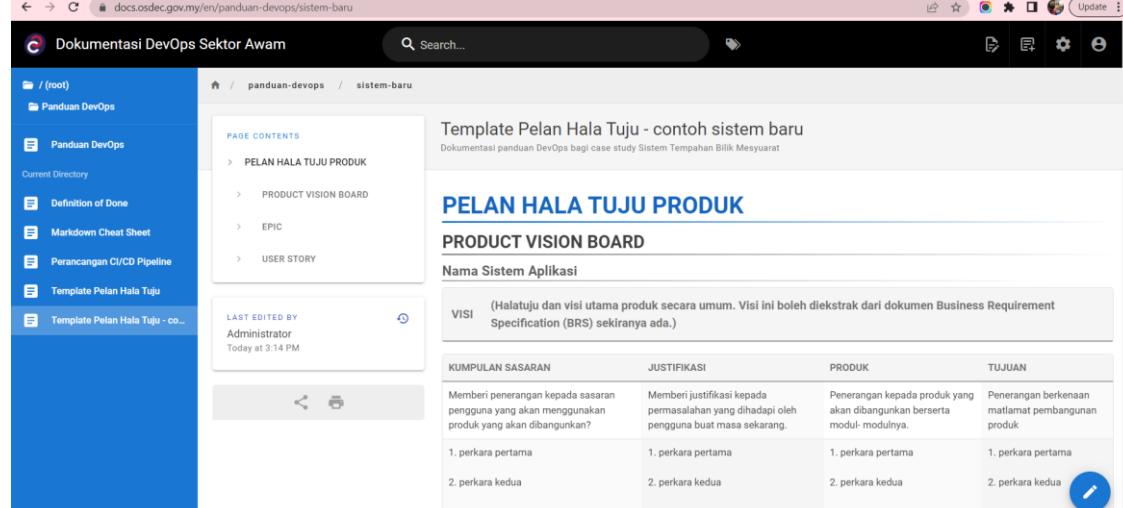
Tatacara	Paparan
<p>Paparan memilih halaman [Rajah B-19]Rajah B-19: Wiki.js – Memilih Halaman.</p> <ol style="list-style-type: none"><li>1. Klik <b>Folder Panduan DevOps</b>.</li><li>2. Klik pada <b>Page Template Pelan Hala Tuju</b>.</li><li>3. Klik <b>SELECT</b>.</li></ol>	 <p>Rajah B-19: Wiki.js – Memilih Halaman</p>

Tatacara	Paparan
<p>Berikut merupakan paparan untuk memilih <i>templat</i> tersedia [Rajah B-20].</p> <ol style="list-style-type: none"><li>1. Masukkan <b>Title</b>.</li><li>2. Masukkan <b>Short Description</b>.</li><li>3. Klik <b>OK</b>.</li></ol>	 <p><b>Rajah B-20: Wiki.js – Memilih Templat Tersedia</b></p>

Tatacara	Paparan
<p>Paparan halaman Wiki.js templat tersedia [Rajah B-21].</p> <ol style="list-style-type: none"> <li>1. Masukkan <b>Product Vision Board</b>.</li> <li>2. Masukkan <b>Epic</b>.</li> <li>3. Masukkan <b>User Story</b>.</li> <li>4. Klik <b>CREATE</b>.</li> </ol>	 <p>The screenshot shows the Wiki.js interface with a blue header bar. On the right side of the header, there are several icons: a green checkmark labeled 'CREATE', a blue link icon labeled 'PAGE', a red 'X' icon labeled 'CLOSE', a gear icon, and a user icon. The main content area has a dark background with white text. At the top left, it says 'Dokumentasi DevOps Sektor Awam'. Below that, it says 'Template Pelan Hala Tuju - contoh sistem baru'. In the center, there is a code editor window containing a template for a 'PELAN HALA TUJU PRODUK'. The template includes sections for '# PRODUCT VISION BOARD', 'EPIC', and '# USER STORY'. The 'CREATE' button is highlighted with a red box. The right side of the screen shows a preview of the template with sections for 'PRODUCT VISION BOARD', 'EPIC', and 'USER STORY', each with some placeholder text.</p>

**Rajah B-21: Wiki.js – Paparan Halaman Templat Tersedia**

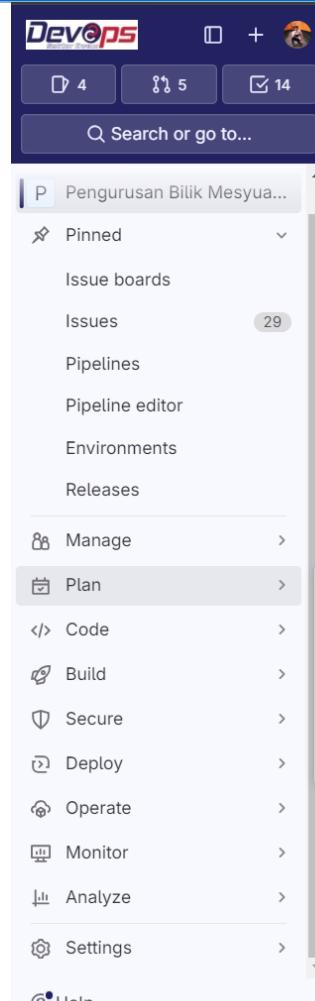
Tatacara	Paparan
Paparan semasa <i>rendering</i> berlaku [Rajah B-22].	 <p>The screenshot shows a Wiki.js interface with a blue header bar. The main content area displays a page titled "# PELAN HALA TUJU PRODUK" which includes sections like "# PRODUCT VISION BOARD" and "## Nama Sistem Aplikasi". A modal dialog box in the center says "Rendering Please wait..." with a circular progress icon. In the top right corner of the main window, there are four small preview cards labeled "2. perkara kedua", "2. perkara kedua", "2. perkara kedua", and "2. perkara kedua". The bottom right corner of the main window has a message: "Sifat peringkat tinggi yang diingini oleh pengguna merentasi keseluruhan kerja Fungsi Bisnes; epik merupakan fungsi utama produk yang terfokus pada".</p> <p><b>Rajah B-22: Wiki.js – Paparan Proses <i>Rendering</i></b></p>

Tatacara	Paparan																
Paparan dokumentasi pada Wiki.js [Rajah B-23].	 <p>Template Pelan Hala Tuju - contoh sistem baru Dokumentasi panduan DevOps bagi case study Sistem Tempahan Bilik Mesyuarat</p> <p><b>PELAN HALA TUJU PRODUK</b></p> <p><b>PRODUCT VISION BOARD</b></p> <p>Nama Sistem Aplikasi</p> <p>VISI (Halatuju dan visi utama produk secara umum. Visi ini boleh diekstrak dari dokumen Business Requirement Specification (BRS) sekiranya ada.)</p> <table border="1"><thead><tr><th>KUMPULAN SASARAN</th><th>JUSTIFIKASI</th><th>PRODUK</th><th>TUJUAN</th></tr></thead><tbody><tr><td>Memberi pererangan kepada sasaran pengguna yang akan menggunakan produk yang akan dibangunkan?</td><td>Memberi justifikasi kepada permasalahan yang dihadapi oleh pengguna buat masa sekarang.</td><td>Penerangan kepada produk yang akan dibangunkan berserta modul-modulnya.</td><td>Penerangan berkenaan matlamat pembangunan produk</td></tr><tr><td>1. perkara pertama</td><td>1. perkara pertama</td><td>1. perkara pertama</td><td>1. perkara pertama</td></tr><tr><td>2. perkara kedua</td><td>2. perkara kedua</td><td>2. perkara kedua</td><td>2. perkara kedua</td></tr></tbody></table>	KUMPULAN SASARAN	JUSTIFIKASI	PRODUK	TUJUAN	Memberi pererangan kepada sasaran pengguna yang akan menggunakan produk yang akan dibangunkan?	Memberi justifikasi kepada permasalahan yang dihadapi oleh pengguna buat masa sekarang.	Penerangan kepada produk yang akan dibangunkan berserta modul-modulnya.	Penerangan berkenaan matlamat pembangunan produk	1. perkara pertama	1. perkara pertama	1. perkara pertama	1. perkara pertama	2. perkara kedua	2. perkara kedua	2. perkara kedua	2. perkara kedua
KUMPULAN SASARAN	JUSTIFIKASI	PRODUK	TUJUAN														
Memberi pererangan kepada sasaran pengguna yang akan menggunakan produk yang akan dibangunkan?	Memberi justifikasi kepada permasalahan yang dihadapi oleh pengguna buat masa sekarang.	Penerangan kepada produk yang akan dibangunkan berserta modul-modulnya.	Penerangan berkenaan matlamat pembangunan produk														
1. perkara pertama	1. perkara pertama	1. perkara pertama	1. perkara pertama														
2. perkara kedua	2. perkara kedua	2. perkara kedua	2. perkara kedua														

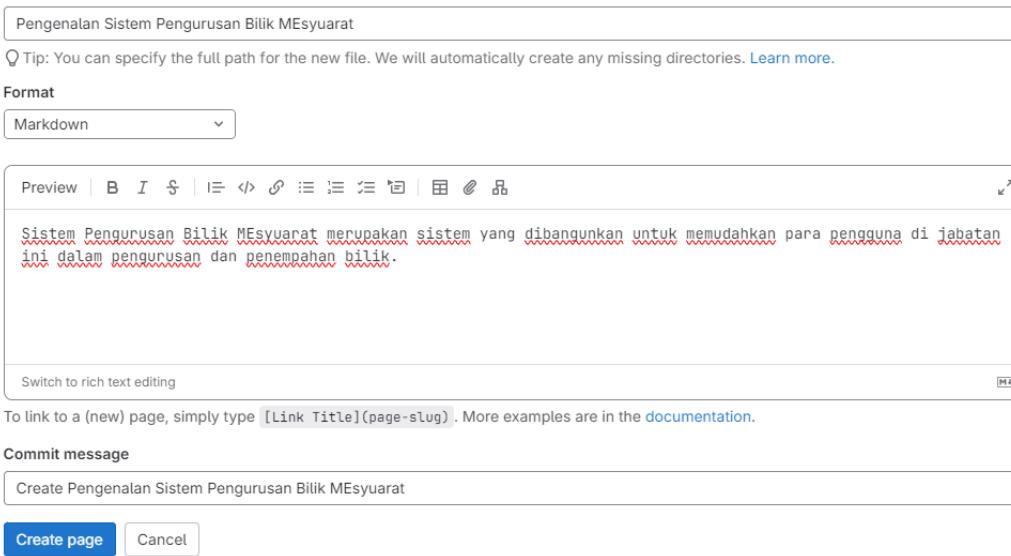
**Rajah B-23: Wiki.js – Paparan Dokumentasi**

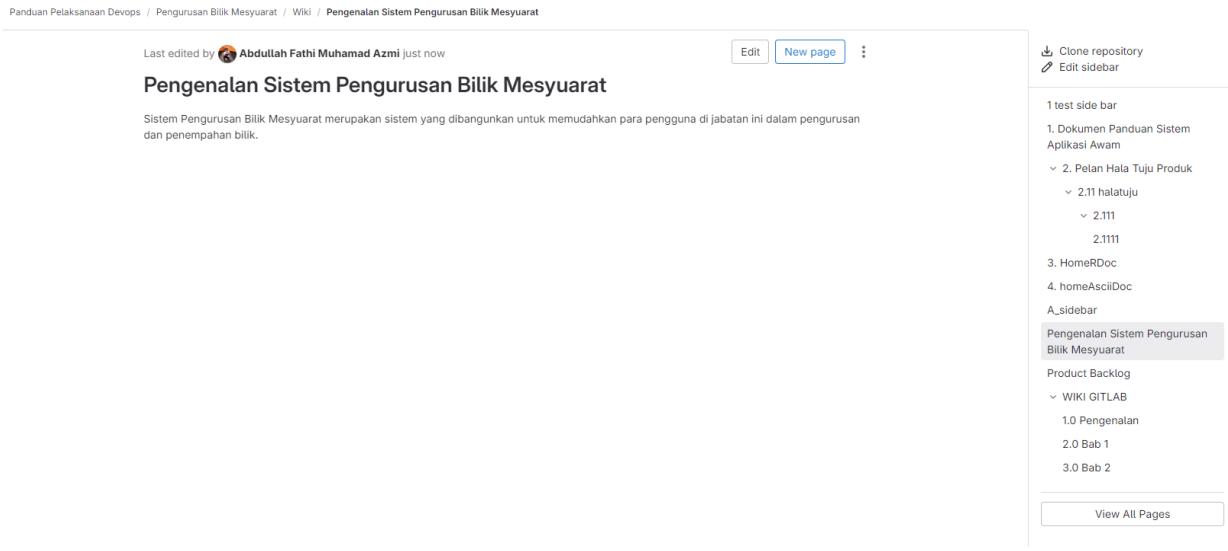
## **Lampiran B-2: Membuat Perancangan Produk [A1] Menggunakan Wiki Gitlab**

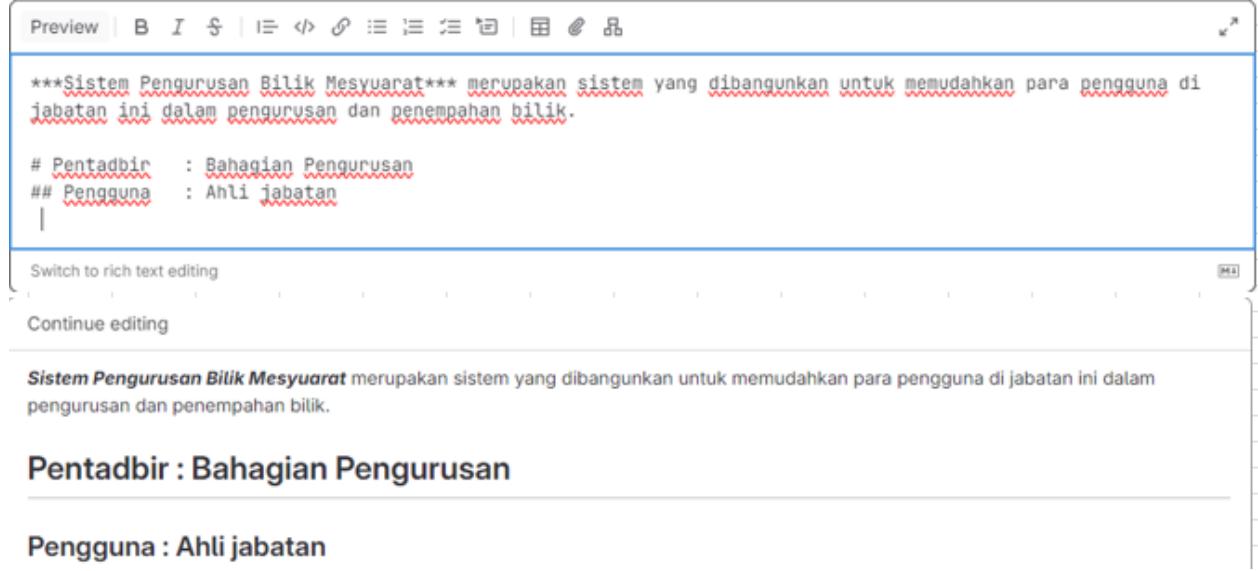
Perancangan yang telah dibincangkan bersama ahli pasukan boleh diterjemahkan ke dalam bentuk wiki Gitlab bagi tujuan dokumentasi. Antara dokumen yang dicadangkan adalah *produk vision board*, *epic*, dan *user story*. Berikut merupakan tatacara untuk mewujudkan halaman baharu pada Wiki Gitlab.

Tatacara	Paparan												
<p>Log masuk halaman Wiki Gitlab yang telah disediakan.</p> <p>1. Klik Plan &gt; Wiki untuk mewujudkan halaman baharu [Rajah B-11].</p>	 <p>Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat</p> <h2>P Pengurusan Bilik Mesyuarat</h2> <p>-o 19 Commits 3 Branches 1 Tag 9.5 MiB Prc</p> <p>Update .gitlab-ci.yml file Abdullah Fathi Muhamad Azmi authored 11 months ago</p> <p>main pengurusan-bilik-mesyuarat / +</p> <p>+ README + CI/CD configuration + Add LICENSE + Add Wiki + Configure Integrations</p> <table border="1"><thead><tr><th>Name</th><th>Last updated</th></tr></thead><tbody><tr><td>Issues 29</td><td>Uplo...</td></tr><tr><td>Issue boards</td><td>Uplo...</td></tr><tr><td>Milestones</td><td>Upd...</td></tr><tr><td>Iterations</td><td>Initi...</td></tr><tr><td>Wiki</td><td></td></tr></tbody></table> <p><b>Pengurusan Bilik Mesyuarat</b></p> <p><b>Getting started</b></p>	Name	Last updated	Issues 29	Uplo...	Issue boards	Uplo...	Milestones	Upd...	Iterations	Initi...	Wiki	
Name	Last updated												
Issues 29	Uplo...												
Issue boards	Uplo...												
Milestones	Upd...												
Iterations	Initi...												
Wiki													

Rajah B-24: Wiki Gitlab – Paparan Laman Utama

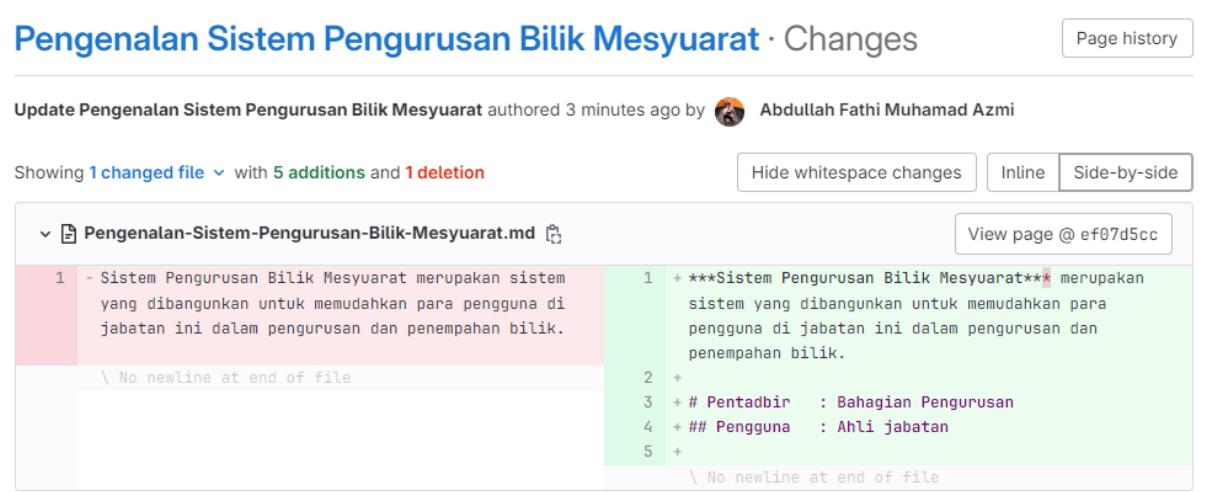
Tatacara	Paparan
<p>Masukkan maklumat terperinci ke dalam halaman yang ingin diwujudkan [Rajah B-12].</p> <ul style="list-style-type: none"> <li>a. Masukkan nama tajuk di bahagian <i>Title</i>.</li> <li>b. Pilih Format <b>Markdown</b> (terdapat tiga format pilihan lain seperti RDoc, AsciiDoc dan Org).</li> <li>c. Ruang isi ini TIDAK boleh kosong, akan menyebabkan tidak boleh klik <i>Create page</i>.</li> <li>d. Fungsi <i>Preview</i> membantu menunjukkan paparan sebenar kandungan halaman sebagai rujukan sebelum disimpan.</li> <li>e. Pada bahagian atas terdapat beberapa alat bantuan untuk memudahkan suntingan kandungan seperti <i>Bold</i>, <i>Italic</i>, <i>Alignment</i>, <i>attachment</i> dan pautan.</li> </ul>	 <p><b>Rajah B-25: Wiki Gitlab – Maklumat Mewujudkan Halaman Baharu</b></p>

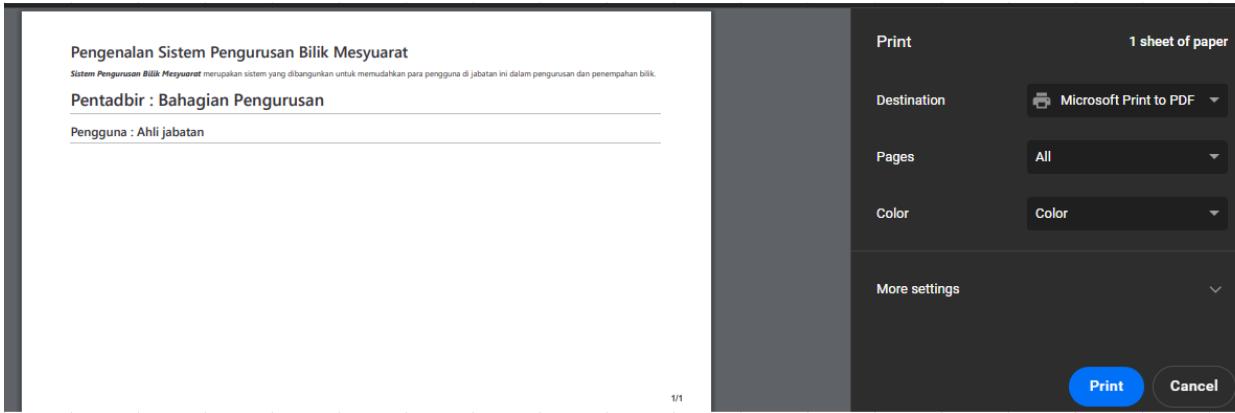
Tatacara	Paparan
<p>f. Klik <i>Create page</i> untuk disimpan.</p>	
<p>Paparan Halaman Wiki Gitlab yang telah berjaya diwujudkan [Rajah B-13].</p> <p>Nama halaman dipaparkan pada sebelah kanan, berserta dengan halaman lain yang telah diwujudkan.</p> <ol style="list-style-type: none"> <li>1. Jika perlu, mengubah kandungan, klik pada butang <i>edit</i> pada bahagian atas.</li> <li>2. Butang <i>New page</i> untuk mewujudkan halaman baru.</li> </ol>	 <p><b>Rajah B-26: Wiki Gitlab – Paparan Mewujudkan Halaman Baharu</b></p>

Tatacara	Paparan
<p>Berikut merupakan contoh penggunaan Syntax Markdown [Rajah B-15].</p> <p>Rujuk <b>Lampiran B-21: Markdown Cheat Sheet</b> bagi panduan penggunaan Syntax Markdown.</p>	 <p>The screenshot shows a GitLab Wiki interface. At the top, there's a toolbar with icons for Preview, Bold (B), Italic (I), Strike (S), and other rich text options. Below the toolbar, the page content is displayed in a code editor-like area:</p> <pre>***Sistem Pengurusan Bilik Mesyuarat*** merupakan sistem yang dibangunkan untuk memudahkan para pengguna di jabatan ini dalam pengurusan dan penempahan bilik. # Pentadbir : Bahagian Pengurusan ## Pengguna : Ahli jabatan</pre> <p>Below the code editor, there are two buttons: "Switch to rich text editing" and "Continue editing". The main content area displays the rendered Markdown text:</p> <p><b>Sistem Pengurusan Bilik Mesyuarat</b> merupakan sistem yang dibangunkan untuk memudahkan para pengguna di jabatan ini dalam pengurusan dan penempahan bilik.</p> <p><b>Pentadbir : Bahagian Pengurusan</b></p> <p><b>Pengguna : Ahli jabatan</b></p>

**Rajah B-27: Wiki Gitlab – Penggunaan Markdown**

Tatacara	Paparan												
<p>Berikut merupakan kaedah untuk membuat rujukan sejarah halaman Wiki Gitlab yang telah berjaya diwujudkan [Rajah B-13].</p> <ol style="list-style-type: none"> <li>1. Klik pada titik pada sebelah kanan, Pilih <i>page history</i>.</li> </ol>	<p>Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat / Wiki / Pengenalan Sistem Pengurusan Bilik Mesyuarat</p> <p>Last edited by  Abdullah Fathi Muhamad Azmi just now</p> <p><b>Pengenalan Sistem Pengurusan Bilik Mesyuarat</b></p> <p><i>Sistem Pengurusan Bilik Mesyuarat</i> merupakan sistem yang dibangunkan untuk memudahkan para pengguna dan penempahan bilik.</p> <p><b>Pentadbir : Bahagian Pengurusan</b></p> <p><b>Pengguna : Ahli jabatan</b></p> <p><b>Rajah B-6: Wiki Gitlab – Paparan Sejarah Halaman</b></p>												
<p>Halaman ini memaparkan rekod pengubahsuaian halaman. [Rajah B-13].</p> <ol style="list-style-type: none"> <li>1. Klik senarai <i>Page Version</i> atau <i>Changes</i>, untuk melihat rekod secara lebih terperinci.</li> </ol>	<p>Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat / Wiki / Pengenalan Sistem Pengurusan Bilik Mesyuarat</p> <p><b>Pengenalan Sistem Pengurusan Bilik Mesyuarat · History</b></p> <table border="1"> <thead> <tr> <th data-bbox="990 838 1080 859">Page version</th><th data-bbox="1102 838 1192 859">Author</th><th data-bbox="1394 838 1484 859">Changes</th><th data-bbox="1866 838 2001 859">Last updated</th></tr> </thead> <tbody> <tr> <td data-bbox="990 882 1080 903">ef07d5cc</td><td data-bbox="1102 882 1372 903">Abdullah Fathi Muhamad Azmi</td><td data-bbox="1394 882 1821 903">Update Pengenalan Sistem Pengurusan Bilik Mesyuarat</td><td data-bbox="1866 882 2001 903">3 minutes ago</td></tr> <tr> <td data-bbox="990 927 1080 948">eaeef18</td><td data-bbox="1102 927 1372 948">Abdullah Fathi Muhamad Azmi</td><td data-bbox="1394 927 1821 948">Create Pengenalan Sistem Pengurusan Bilik Mesyuarat</td><td data-bbox="1866 927 2001 948">45 minutes ago</td></tr> </tbody> </table> <p><b>Rajah B-6: Wiki Gitlab – Paparan Sejarah Halaman</b></p>	Page version	Author	Changes	Last updated	ef07d5cc	Abdullah Fathi Muhamad Azmi	Update Pengenalan Sistem Pengurusan Bilik Mesyuarat	3 minutes ago	eaeef18	Abdullah Fathi Muhamad Azmi	Create Pengenalan Sistem Pengurusan Bilik Mesyuarat	45 minutes ago
Page version	Author	Changes	Last updated										
ef07d5cc	Abdullah Fathi Muhamad Azmi	Update Pengenalan Sistem Pengurusan Bilik Mesyuarat	3 minutes ago										
eaeef18	Abdullah Fathi Muhamad Azmi	Create Pengenalan Sistem Pengurusan Bilik Mesyuarat	45 minutes ago										

Tatacara	Paparan
<p>Halaman ini memaparkan rekod pengubahsuaian halaman. [Rajah B-13].</p> <ol style="list-style-type: none"> <li>Butang bantuan seperti <i>Hide whitespace changes</i>, <i>Inline</i> dan <i>Side-by-side</i> dibekalkan untuk memudahkan mengenalpasti perubahan yang berlaku.</li> </ol>	 <p>Pengenalan Sistem Pengurusan Bilik Mesyuarat · Changes</p> <p>Update Pengenalan Sistem Pengurusan Bilik Mesyuarat authored 3 minutes ago by Abdullah Fathi Muhamad Azmi</p> <p>Showing 1 changed file ▾ with 5 additions and 1 deletion</p> <p>Hide whitespace changes    Inline    Side-by-side</p> <p>View page @ ef07d5cc</p> <p>Pengenalan-Sistem-Pengurusan-Bilik-Mesyuarat.md</p> <pre> 1 - Sistem Pengurusan Bilik Mesyuarat merupakan sistem yang dibangunkan untuk memudahkan para pengguna di jabatan ini dalam pengurusan dan penempahan bilik.  \ No newline at end of file 1 + ***Sistem Pengurusan Bilik Mesyuarat*** merupakan sistem yang dibangunkan untuk memudahkan para pengguna di jabatan ini dalam pengurusan dan penempahan bilik.  2 + 3 + # Pentadbir : Bahagian Pengurusan 4 + ## Pengguna : Ahli jabatan 5 + \ No newline at end of file </pre>
<p>Berikut merupakan kaedah membolehkan cetakan menggunakan format PDF dilakukan [Rajah B-13].</p> <ol style="list-style-type: none"> <li>Klik pada titik pada sebelah kanan, <i>Print as PDF</i>.</li> </ol>	 <p>Rajah B-6: Wiki Gitlab – Paparan Rekod Pengubahsuaian Halaman</p> <p>Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat / Wiki / Pengenalan Sistem Pengurusan Bilik Mesyuarat</p> <p>Last edited by Abdullah Fathi Muhamad Azmi 20 minutes ago</p> <p>Edit    New page    ...</p> <p>Page history</p> <p>Print as PDF</p> <p>Pengenalan Sistem Pengurusan Bilik Mesyuarat</p> <p>Sistem Pengurusan Bilik Mesyuarat merupakan sistem yang dibangunkan untuk memudahkan para pengguna dan penempahan bilik.</p> <p>Pentadbir : Bahagian Pengurusan</p> <p>Pengguna : Ahli jabatan</p> <p>Rajah B-6: Wiki Gitlab – Mencetak Halaman</p>

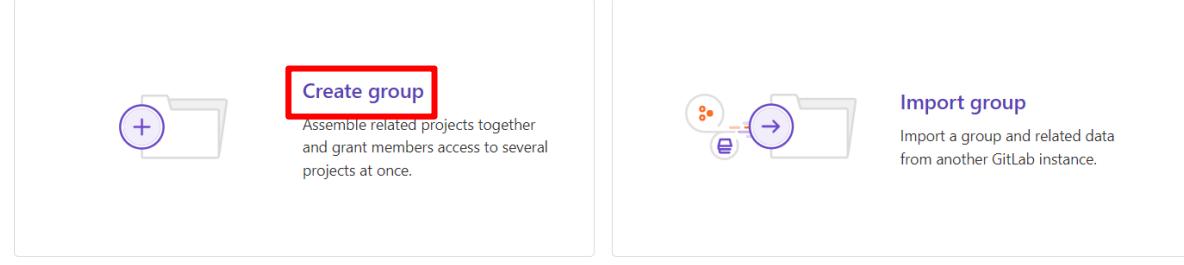
Tatacara	Paparan
<p>Paparan halaman yang akan dicetak [Rajah B-13].</p> <ol style="list-style-type: none"><li>1. Klik pada butang <i>Print</i> untuk mencetak.</li></ol>	 <p>The screenshot shows a Microsoft Print dialog box. At the top, it says "Print" and "1 sheet of paper". On the right, there are dropdown menus for "Destination" set to "Microsoft Print to PDF", "Pages" set to "All", and "Color" set to "Color". Below these are "More settings" and "Print" and "Cancel" buttons. The background of the dialog box shows a preview of a page titled "Pengenalan Sistem Pengurusan Bilik Mesyuarat" with text about the system's purpose and users.</p>

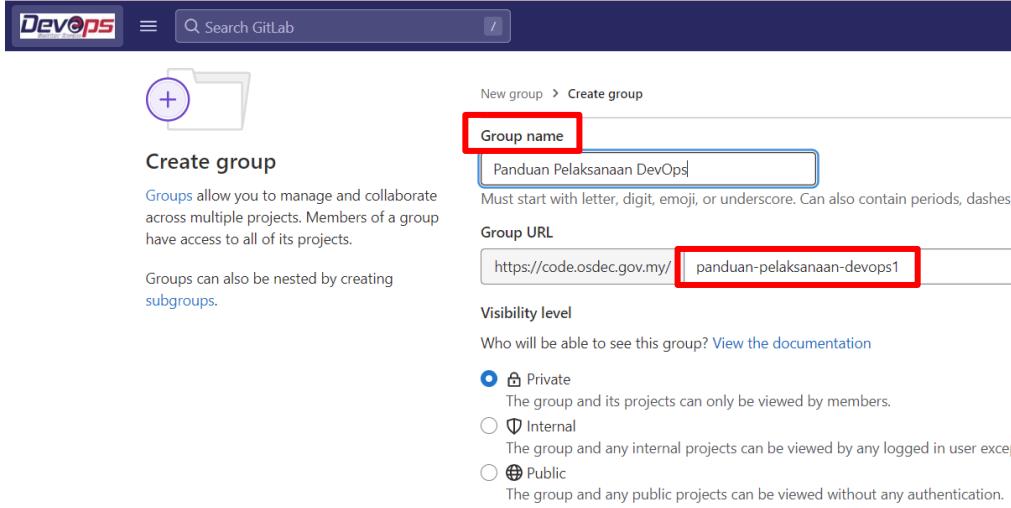
Rajah B-6: Wiki Gitlab – Mencetak Halaman

### **Lampiran B-3: Mewujudkan GitLab Group [A2]**

GitLab *Group* digunakan untuk mengurus satu atau lebih projek dalam masa yang sama. Di bawah *group* ini juga *epic* akan dihasilkan. Berikut merupakan tatacara untuk mewujudkan *group* baharu sekiranya perlu.

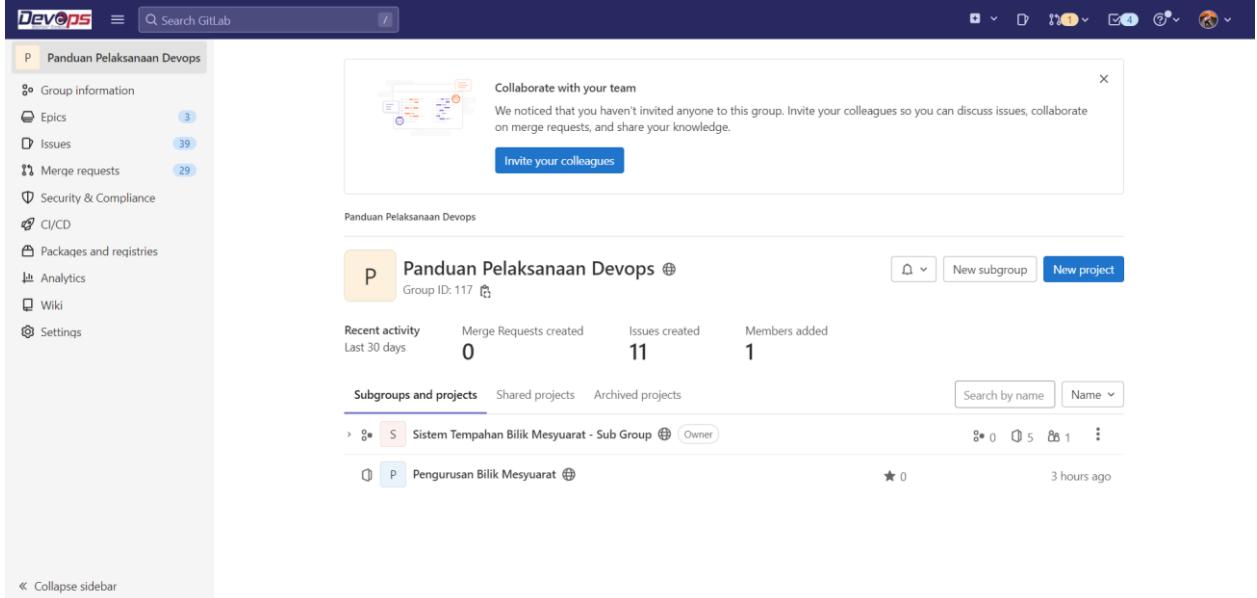
Tatacara	Paparan
<ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Groups</b>.</li><li>3. Pilih <b>View all groups</b>.</li><li>4. Pada sebelah kanan, klik <b>New group</b> untuk <i>create new group</i> [Rajah B-28].</li></ol>	<p>The screenshot shows the GitLab dashboard at <a href="http://code.osdec.gov.my/dashboard/groups">code.osdec.gov.my/dashboard/groups</a>. The top navigation bar has a search bar and a 'New group' button. Below it is a sidebar with a 'Switch to' dropdown set to 'Groups'. The 'Groups' option is highlighted with a red box. At the bottom of the sidebar, there is a 'View all groups' button also highlighted with a red box.</p> <p><b>Rajah B-28: GitLab – Halaman GitLab Group</b></p>

Tatacara	Paparan
<ol style="list-style-type: none"><li>1. Pada sebelah kiri search box, klik pada simbol tambah (+).</li><li>2. Pilih <b>New group</b> [Rajah B-29].</li></ol>	 <p>Rajah B-29: GitLab – Halaman GitLab Group.</p>
1. Pilih <b>Create group</b> [Rajah B-30].	 <p>Rajah B-30: GitLab – Halaman Create New Group</p>

Tatacara	Paparan
<ol style="list-style-type: none"> <li>1. Masukkan nama bagi <b>Group name</b>. Terdapat senarai perkataan yang tidak boleh digunakan sebagai <b>Group name</b>.</li> <li>2. <b>Group URL</b> akan dimasukkan secara automatik berdasarkan <i>group name</i>.</li> <li>3. Pilih tahap <b>visibility group</b> [Rajah B-31].</li> <li>4. Pilih <b>role</b> anda.</li> <li>5. Siapakah yang akan menggunakan <i>group</i> ini?</li> <li>6. Tujuan <i>group</i> ini diwujudkan.</li> <li>7. Jemputan <i>user</i> lain ke <i>group</i> baharu ini. Boleh ditambah kemudian setelah <i>group</i> diwujudkan.</li> <li>8. Klik <b>Create Group</b> setelah selesai [Rajah B-32].</li> </ol>	 <p><b>Rajah B-31: GitLab – Halaman Create Group</b></p>

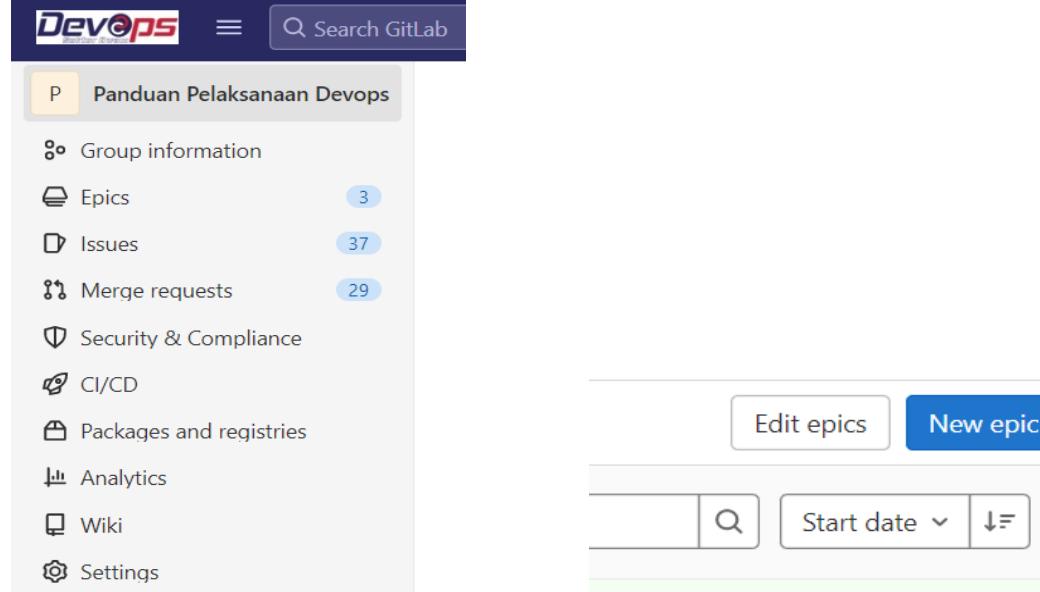
Tatacara	Paparan
	<p>Role</p> <p>Other</p> <p>Who will be using this group?</p> <p><input type="radio"/> My company or team <input type="radio"/> Just me</p> <p>What will you use this group for?</p> <p>Invite Members (optional)</p> <p>Invited users will be added with developer level permissions. <a href="#">View the documentation</a> to see how to change this later.</p> <p>Email 1</p> <p>member1@company.com</p> <p>+ Invite another member</p> <p><b>Create group</b> <b>Cancel</b></p>

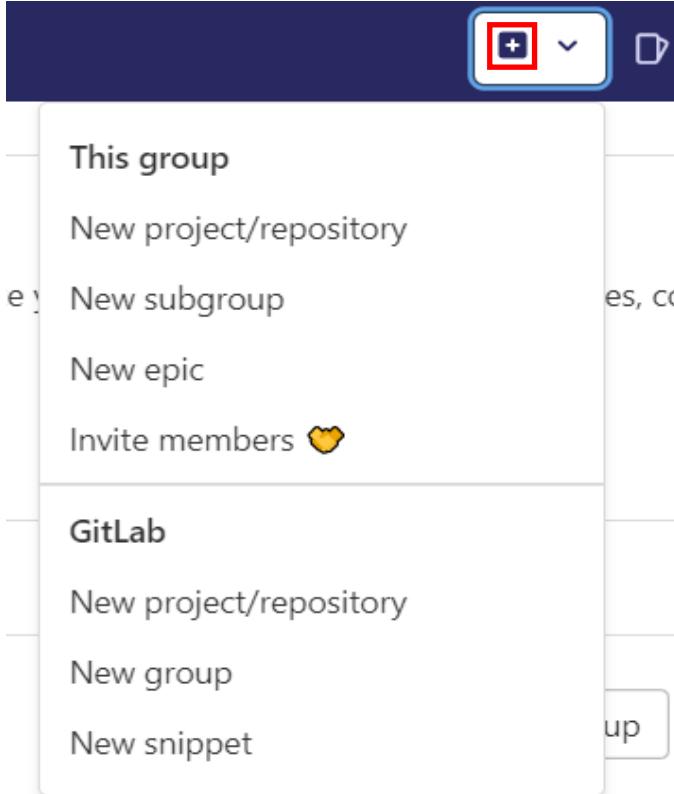
Rajah B-32: GitLab – Halaman *Create Group*

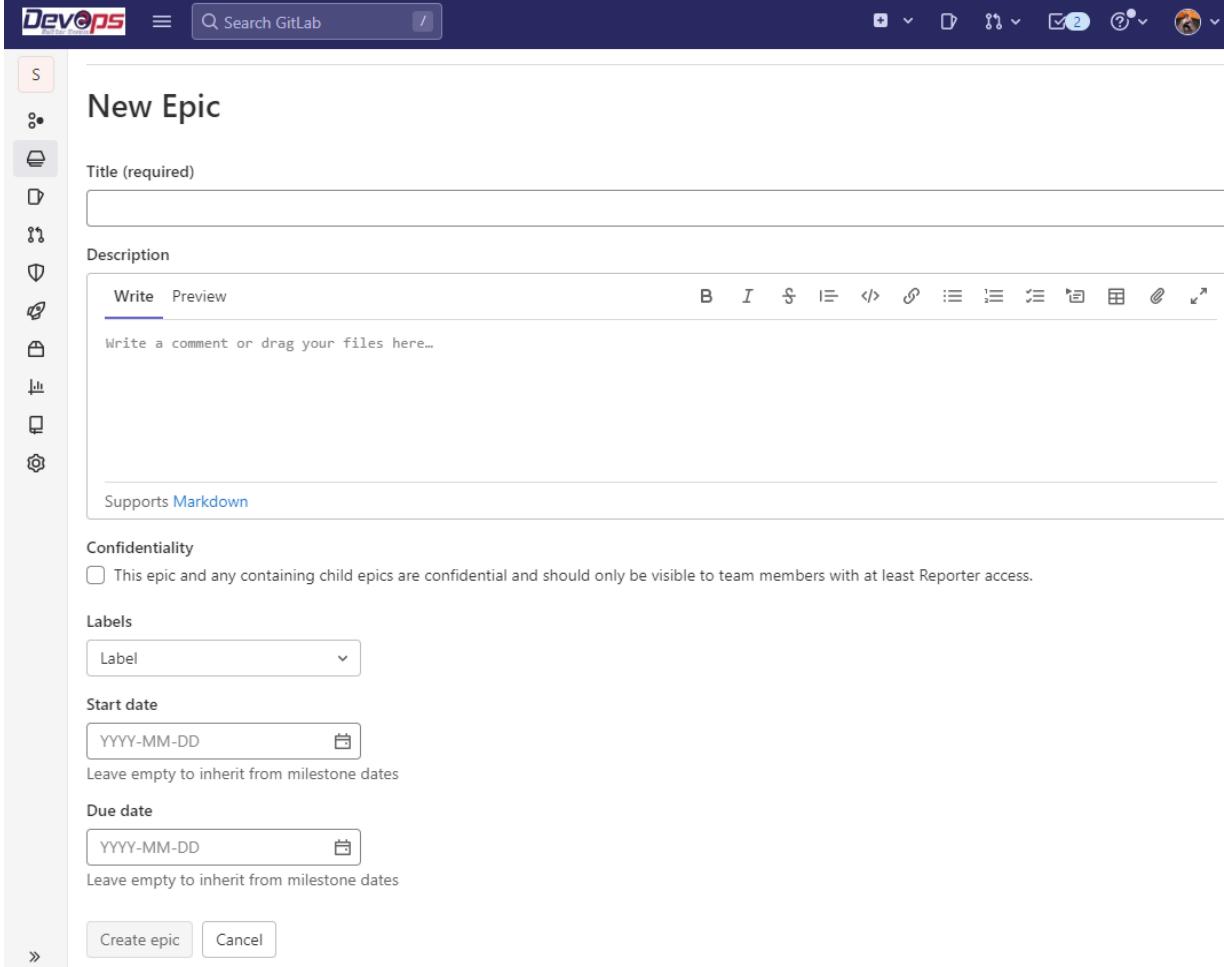
Tatacara	Paparan
Paparan halaman <i>group</i> baharu [Rajah B-33].	 <p>Rajah B-33: GitLab – Paparan Halaman <i>Group</i> Baharu</p>

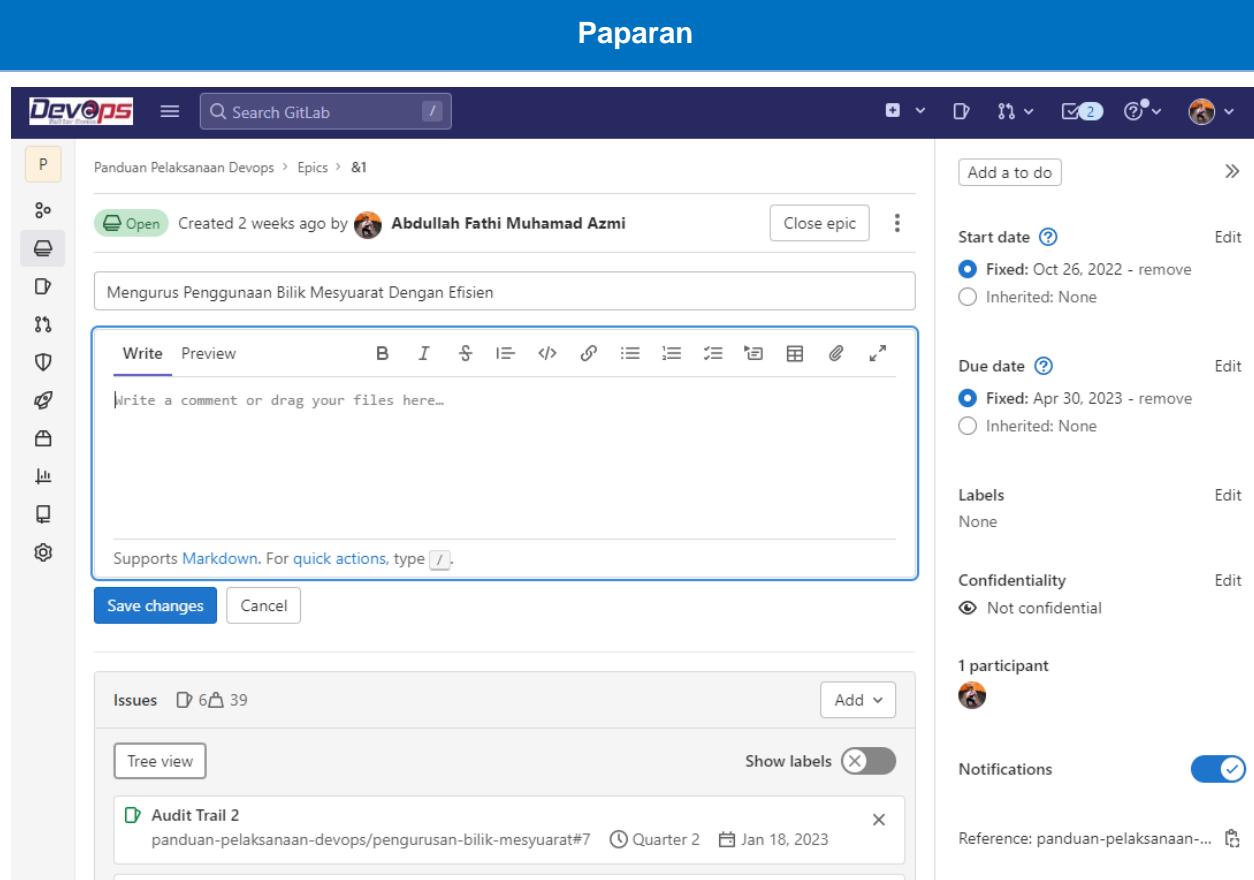
## Lampiran B-4: Mewujudkan GitLab *Epic* [A3]

Setelah mengenal pasti *group* untuk pengurusan produk tersebut, *epic* pula boleh diwujudkan. *Epics* merupakan produk premium daripada GitLab dan pengguna perlu mempunyai akses sekurang-kurangnya *Reporter role* bagi mengakses *epic*. Berikut merupakan tatacara untuk mewujudkan *epic* baharu.

Tatacara	Paparan
<p>Paparan halaman mewujudkan <i>Epics</i>[Rajah B-34].</p> <ol style="list-style-type: none"><li>1. Pilih <b>Group</b>.</li><li>2. Pilih <b>Epics</b>.</li><li>3. Klik <b>New epic</b>.</li></ol>	 <p>Rajah B-34: GitLab – Halaman Mewujudkan <i>Epics</i></p>

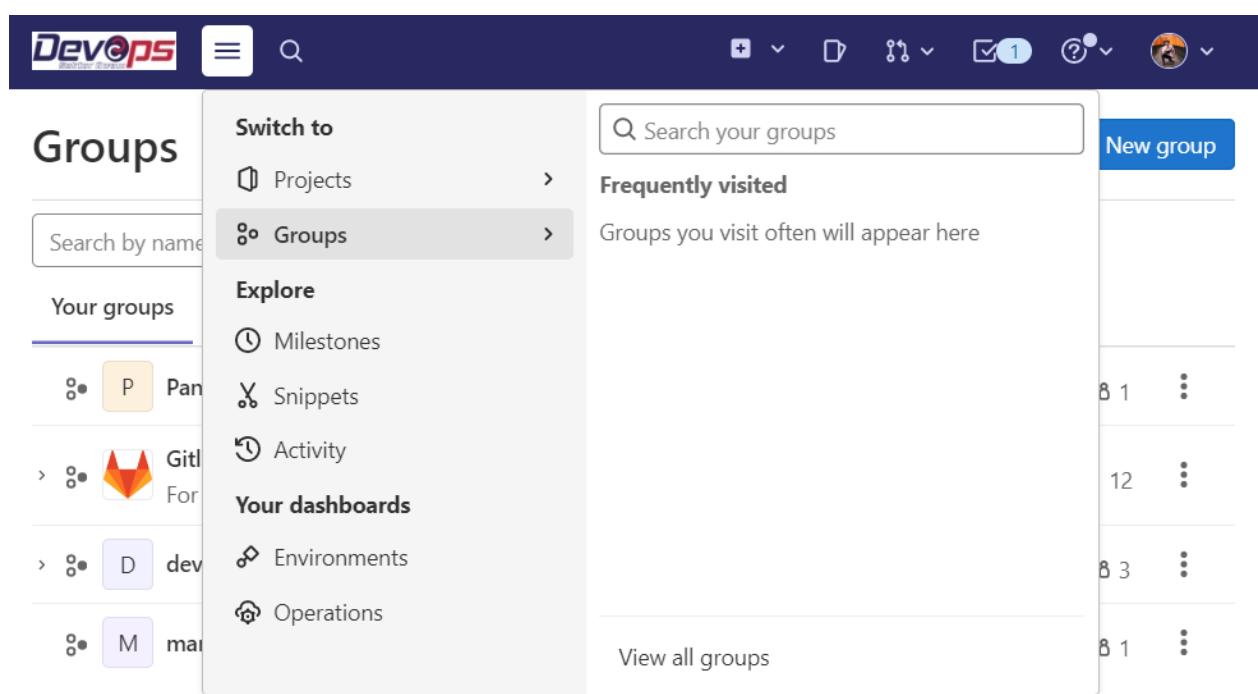
Tatacara	Paparan
<ol style="list-style-type: none"><li>1. Pada sebelah kiri search box, klik pada simbol tambah (+).</li><li>2. Pilih <b>New epic</b> [Rajah B-35].</li></ol>	 <p>The screenshot shows a dropdown menu from GitLab's interface. At the top right of the menu is a red-bordered '+' icon. The menu items listed are: This group, New project/repository, New subgroup, New epic, Invite members (with a yellow heart icon), GitLab, New project/repository, New group, and New snippet.</p> <p><b>Rajah B-35: GitLab – Halaman New Epic</b></p>

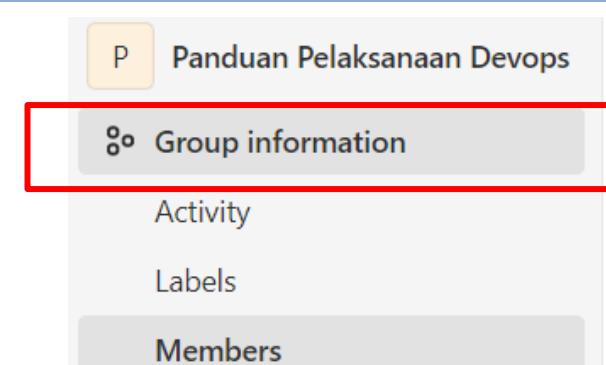
Tatacara	Paparan
<p>Paparan halaman mewujudkan <b>New Epic</b> [Rajah B-36].</p> <ol style="list-style-type: none"> <li>1. Masukkan <b>Title</b>.</li> <li>2. Masukkan <b>description/tujuan epic</b>.</li> <li>3. Untuk jadikan <i>epic</i> ini sulit, <i>tick</i> pada <b>confidentiality check box</b>.</li> <li>4. Pilih <b>Label</b>.</li> <li>5. Pilih tarikh mula dan tamat atau biarkan kosong untuk <i>inherit</i> daripada tarikh <i>milestone</i>.</li> <li>6. Klik <b>Create epic</b> setelah selesai.</li> </ol>	 <p><b>New Epic</b></p> <p>Title (required)</p> <p>Description</p> <p>Write Preview</p> <p>Supports Markdown</p> <p>Confidentiality</p> <p><input type="checkbox"/> This epic and any containing child epics are confidential and should only be visible to team members with at least Reporter access.</p> <p>Labels</p> <p>Start date</p> <p>YYYY-MM-DD</p> <p>Leave empty to inherit from milestone dates</p> <p>Due date</p> <p>YYYY-MM-DD</p> <p>Leave empty to inherit from milestone dates</p> <p>Create epic Cancel</p> <p><b>Rajah B-36: Gitlab – Halaman Mewujudkan New Epic</b></p>

Tatacara	Paparan
Paparan halaman <i>Epics</i> [Rajah B-37].	 <p>Rajah B-37: GitLab – Paparan Halaman <i>Epics</i></p>

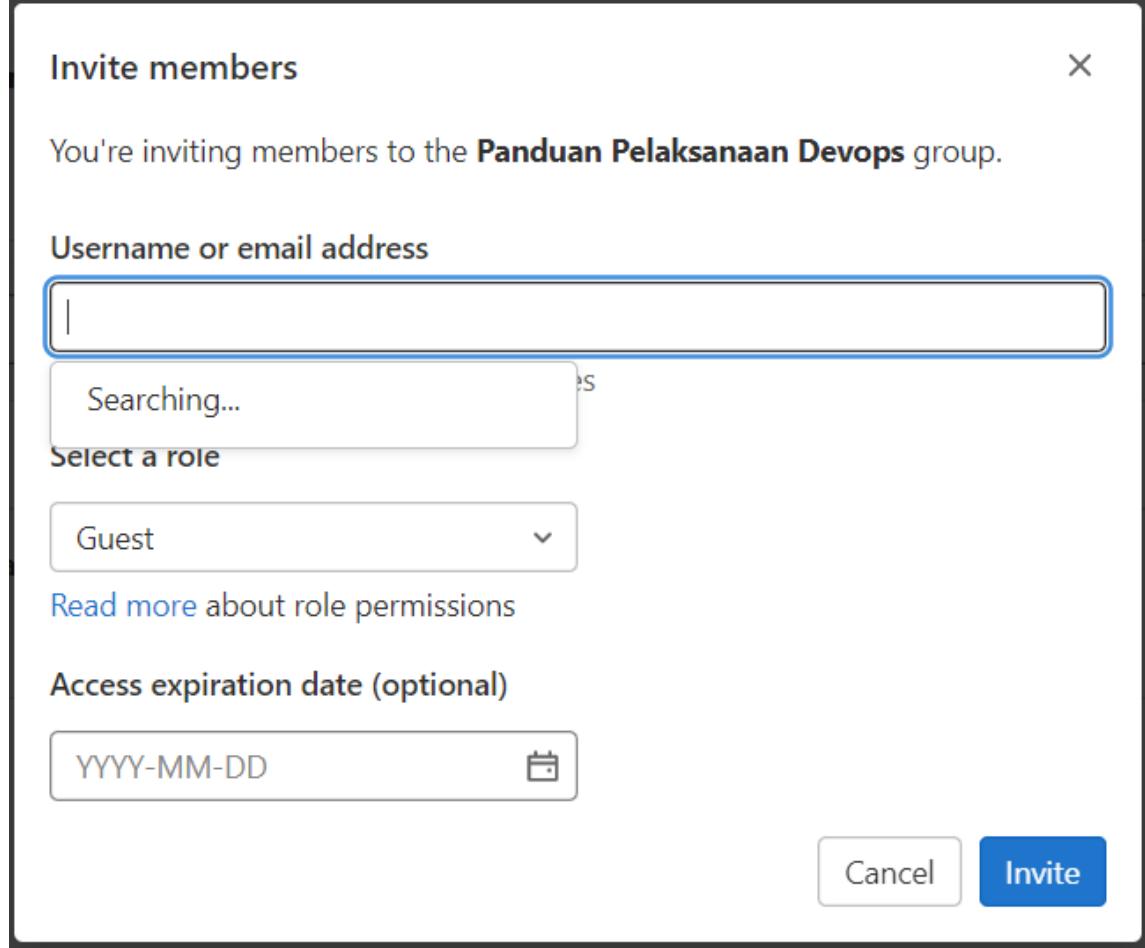
## Lampiran B-5: Menetapkan Ahli Pasukan ke GitLab Group [A4]

Berikut merupakan tatacara untuk menetapkan ahli pasukan ke GitLab Group yang telah diwujudkan berdasarkan Lampiran B-2.

Tatacara	Paparan
<p>Paparan halaman Groups [Rajah B-38] dan [Rajah B-39].</p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Groups</b>.</li><li>3. Pilih <b>View all groups</b>.</li></ol>	 <p>The screenshot shows the GitLab Groups page. At the top, there is a navigation bar with the DevOps logo, a search icon, and various user settings. Below the navigation bar, the main title is "Groups". There is a "Switch to" dropdown menu with options for "Projects" and "Groups", where "Groups" is currently selected. A search bar is present with the placeholder "Search your groups". A section titled "Frequently visited" lists "Groups you visit often will appear here". On the right side, there is a sidebar with a "New group" button and a list of groups: "B 1", "12", "B 3", and "B 1", each with a three-dot menu icon. The left side of the page shows a list of "Your groups" with icons and names like "Pan", "Git", "For", "dev", and "mai". A "View all groups" link is located at the bottom of the main content area.</p> <p><b>Rajah B-38: GitLab – Paparan Halaman Groups</b></p>

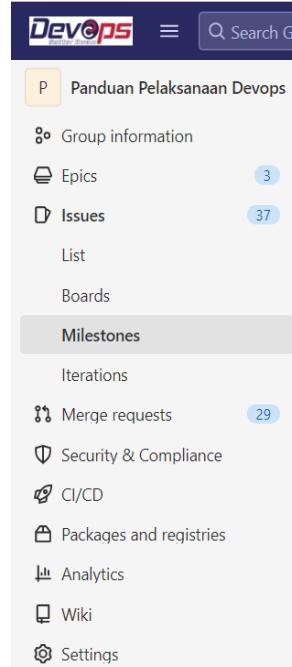
Tatacara	Paparan
	 <p><b>Rajah B-39: GitLab – Paparan Halaman Groups</b></p>
1. Pilih <b>Group information</b> [Rajah B-40].	 <p><b>Rajah B-40: GitLab – Halaman Group Information</b></p>

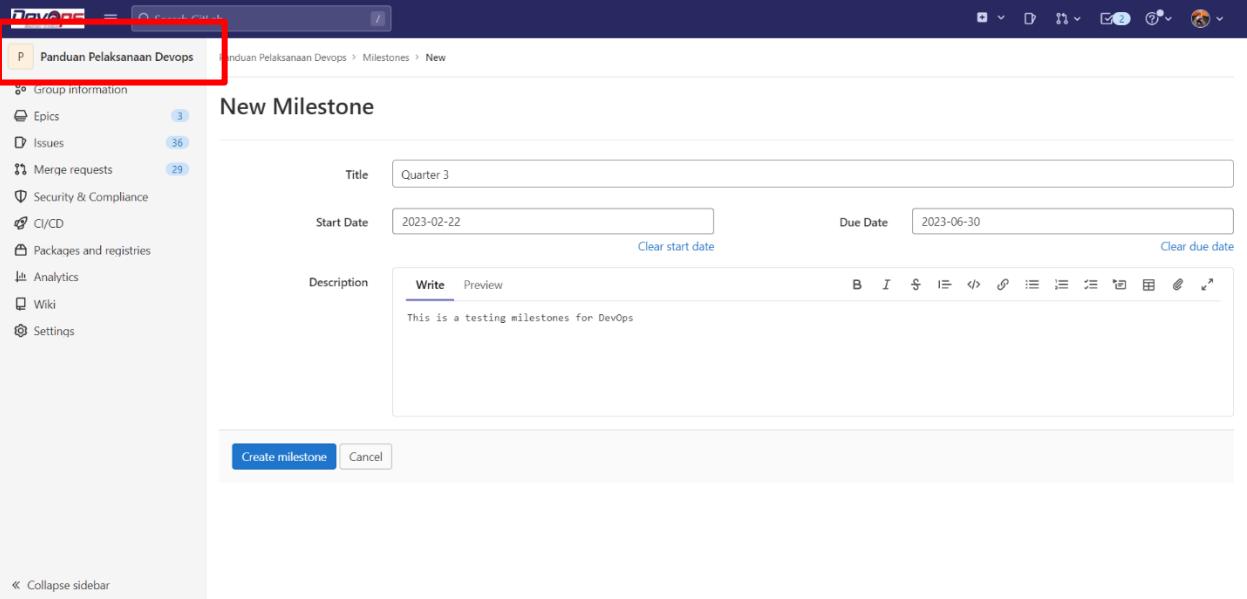
Tatacara	Paparan
1. Pilih <b>Invite members</b> [Rajah B-41].	A screenshot of a web browser showing the GitLab interface. The title bar says 'DevOps' and 'Panduan Pelaksanaan Devops'. The main content area shows the 'Group members' section for the group 'Panduan Pelaksanaan Devops'. It displays a message: 'You're viewing members of Panduan Pelaksanaan Devops.' Below this are two buttons: 'Invite a group' (in a white box) and 'Invite members' (in a blue box). To the left of the main content, there is a sidebar with icons for 'P' (Projects), 'Group members' (a person icon), 'Wiki' (a document icon), and 'Issues' (a bug icon).

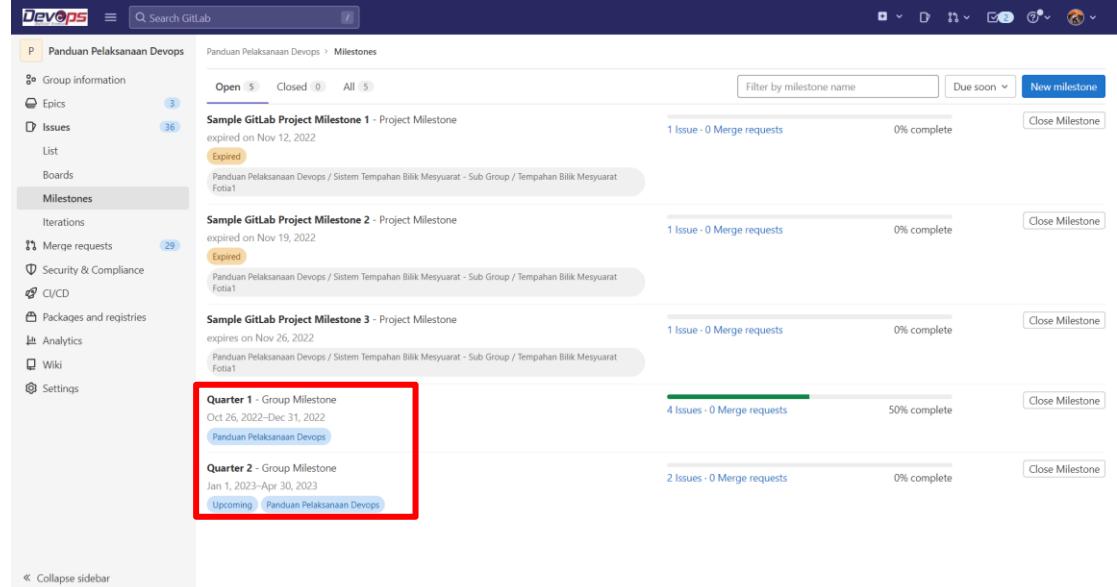
Tatacara	Paparan
<p>Halaman <i>invite members</i> [Rajah B-42].</p> <ol style="list-style-type: none"><li>1. Masukkan <b>username</b> atau emel pengguna.</li><li>2. Pilih <b>role</b> pengguna. <i>Role</i> ini akan digunakan pada semua projek dibawah group.</li><li>3. Masukkan tarikh luput akses sekiranya perlu.</li><li>4. Klik <b>Invite</b>.</li></ol>	 <p>The screenshot displays the 'Invite members' interface from GitLab. At the top, it says 'Invite members' and 'You're inviting members to the <b>Panduan Pelaksanaan Devops</b> group.' Below this, there's a search bar labeled 'Username or email address' with a placeholder 'Searching...' and a dropdown menu labeled 'Select a role' set to 'Guest'. There's also a link 'Read more about role permissions'. At the bottom, there's an optional 'Access expiration date (optional)' field with a calendar icon, and two buttons: 'Cancel' and a blue 'Invite' button.</p> <p><b>Rajah B-42: GitLab – Halaman <i>Invite Members</i></b></p>

## Lampiran B-6: Mewujudkan GitLab **Milestone** [A5]

GitLab *Milestone* boleh didaftarkan samada di bawah *Group* atau *Project*. *Burndown chart* boleh dilihat di bawah *milestone* ini. Berikut merupakan tatacara mewujudkan *Milestone* di bawah *Group*.

Tatacara	Paparan
<p>Mewujudkan Gitlab Milestone [Rajah B-43] dan [Rajah B-44].</p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Group information</b>.</li><li>3. Pilih <b>Issues</b>.</li><li>4. Pilih <b>Milestones</b>.</li><li>5. Klik <b>New Milestone</b>.</li></ol>	 <p>Rajah B-43: GitLab – Halaman Menu Utama</p>

Tatacara	Paparan
<p>Mewujudkan New Milestone [Rajah B-45].</p> <ol style="list-style-type: none"><li>1. Masukkan <b>Title</b>.</li><li>2. Masukkan <b>Start date</b> dan <b>Due date</b>.</li><li>3. Masukkan <b>Description</b>.</li><li>4. Klik <b>Create milestone</b>.</li></ol>	 <p>Rajah B-44: GitLab – Halaman New Milestones</p> <p>Rajah B-45: GitLab – Halaman New Milestone</p>

Tatacara	Paparan
Paparan halaman <b>Milestone</b> [Rajah B-46]. <b>1.</b> Klik pada tajuk <b>Milestone</b> .	 <p>The screenshot shows the 'Milestones' page in a GitLab interface. The sidebar on the left includes links for Group information, Epics, Issues, Boards, Milestones (which is selected), Iterations, Merge requests (29), Security &amp; Compliance, CI/CD, Packages and registries, Analytics, Wiki, and Settings. The main content area displays three project milestones:</p> <ul style="list-style-type: none"><li><b>Sample GitLab Project Milestone 1 - Project Milestone</b>: expires on Nov 12, 2022 (Expired). Contains a note: Panduan Pelaksanaan Devops / Sistem Tempahan Bilik Mesyuarat - Sub Group / Tempahan Bilik Mesyuarat Fota1.</li><li><b>Sample GitLab Project Milestone 2 - Project Milestone</b>: expires on Nov 19, 2022 (Expired). Contains a note: Panduan Pelaksanaan Devops / Sistem Tempahan Bilik Mesyuarat - Sub Group / Tempahan Bilik Mesyuarat Fota1.</li><li><b>Sample GitLab Project Milestone 3 - Project Milestone</b>: expires on Nov 26, 2022. Contains a note: Panduan Pelaksanaan Devops / Sistem Tempahan Bilik Mesyuarat - Sub Group / Tempahan Bilik Mesyuarat Fota1.</li></ul> <p>A specific section for 'Quarter 1 - Group Milestone' is highlighted with a red box. It shows the period from Oct 26, 2022–Dec 31, 2022, and contains a link to 'Panduan Pelaksanaan Devops'. Below it, 'Quarter 2 - Group Milestone' is listed for the period Jan 1, 2023–Apr 30, 2023, with a link to 'Upcoming' and 'Panduan Pelaksanaan Devops'.</p>

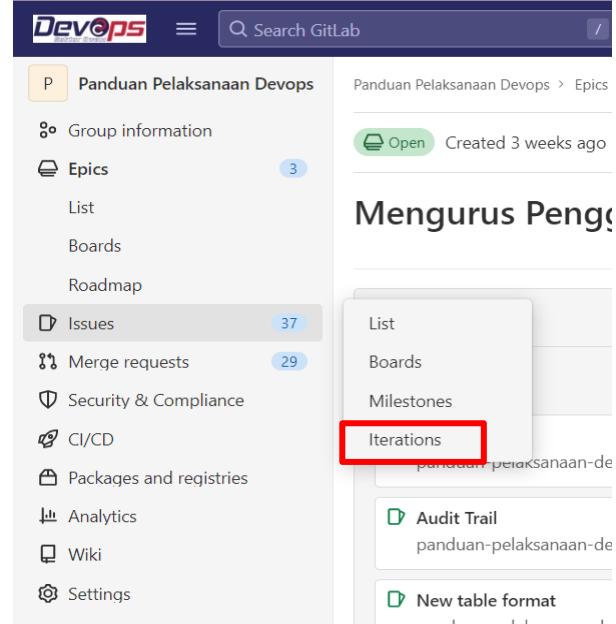
**Rajah B-46: GitLab – Paparan Halaman *Milestone***

Tatacara	Paparan
Paparan halaman <i>burndown chart</i> pada setiap <i>milestone</i> [Rajah B-47].	<p><b>Quarter 1</b></p> <p>All issues for this milestone are closed. You may close the milestone now.</p> <p><b>Burndown chart</b></p> <p><b>Burnup chart</b></p> <p><b>Issues</b></p> <p><b>Remaining</b> <b>Completed</b></p> <p><b>Issues</b> 4 <b>Merge requests</b> 0 <b>Participants</b> 0 <b>Labels</b> 11</p> <p><b>Unstarted Issues (open and unassigned)</b> 0 <b>Ongoing Issues (open and assigned)</b> 0 <b>Completed Issues (closed)</b> 4 □ 20</p> <p><b>Tempahan Bilik Mesyuarat Fotia1</b> · Asperiores rerum necessitatibus et. #10 <b>inquiry</b> <b>edit</b> <b>comment</b> <b>diff</b> <b>revert</b> <b>quidem latrone</b> □ 4</p> <p><b>Tempahan Bilik Mesyuarat Fotia1</b> · Id tempore minus molestiae. #10 <b>inquiry</b> <b>edit</b> <b>comment</b> <b>diff</b> <b>revert</b> □ 8</p> <p><b>Pengurusan Bilik Mesyuarat</b> · New table format #5 <b>inquiry</b> <b>edit</b> <b>comment</b> <b>diff</b> <b>revert</b> <b>Modul Menggunakan Pengguna</b> <b>Sprint Task</b> <b>User Story</b> □ 8</p> <p><b>Pengurusan Bilik Mesyuarat</b> · Install contact page #1 <b>inquiry</b> <b>edit</b> <b>comment</b> <b>diff</b> <b>revert</b> <b>Modul Menggunakan Pengguna</b> <b>Sprint Task</b> <b>User Story</b> □ 8</p>

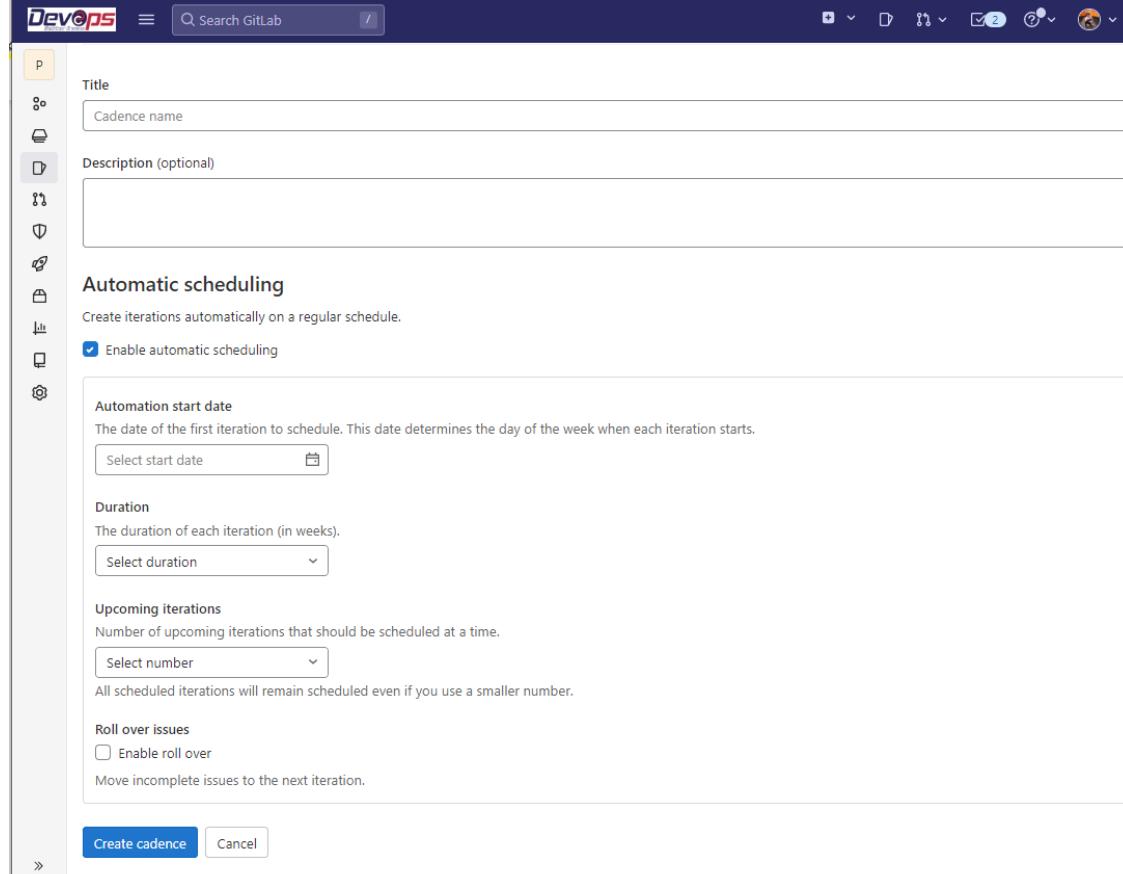
**Rajah B-47: GitLab – Paparan *Burndown Chart***

## Lampiran B-7: Mewujudkan GitLab Iteration [A6]

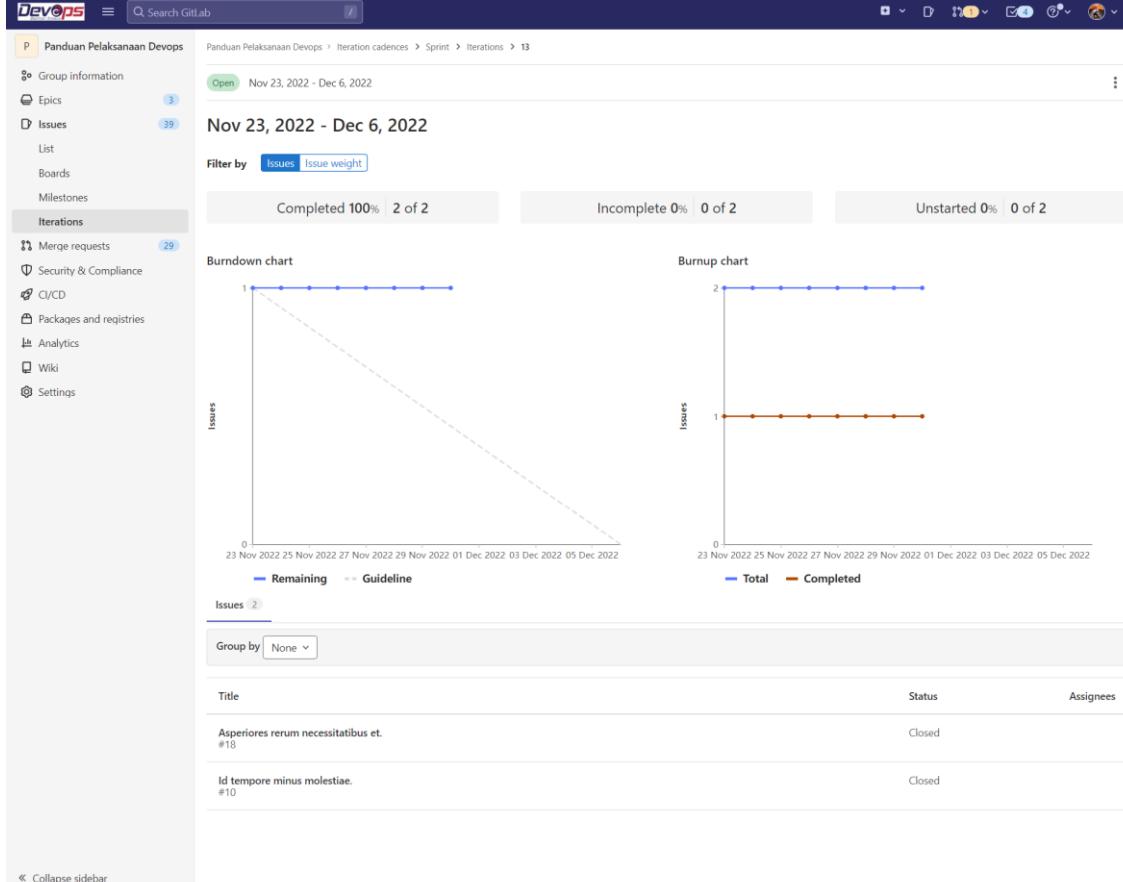
GitLab *Iteration* merupakan durasi *sprint* yang dikenalpasti pada *sprint zero*. Sebagai contoh yang ditetapkan pada *case study* ini iaitu selama 2 minggu. Berikut merupakan tatacara mewujudkan *gitlab iteration*.

Tatacara	Paparan
<ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Groups</b>.</li><li>3. Pilih <b>Issues</b>.</li><li>4. Pilih <b>Iterations</b>.</li><li>5. Klik <b>New iteration cadence</b> [Rajah B-48].</li></ol>	 The screenshot shows the GitLab web interface. At the top, there is a navigation bar with the 'DevOps' logo, a search bar, and a user icon. Below the navigation bar, the main area displays a sidebar for the 'Panduan Pelaksanaan Devops' group. The sidebar includes links for 'Group information', 'Epics' (with a sub-menu for 'List', 'Boards', and 'Roadmap'), 'Issues' (highlighted with a red box), 'Merge requests', 'Security & Compliance', 'CI/CD', 'Packages and registries', 'Analytics', 'Wiki', and 'Settings'. To the right of the sidebar, there is a 'Mengurus Pengguna' section with a 'List' button. Further down, there are sections for 'Audit Trail' and 'New table format'.

Tatacara	Paparan
	<p>Panduan Pelaksanaan Devops &gt; Iteration cadences</p> <p>Open   Done   All</p> <p>New iteration cadence</p> <p><b>Rajah B-48: GitLab – Paparan Menu <i>New Iteration Cadence</i></b></p>

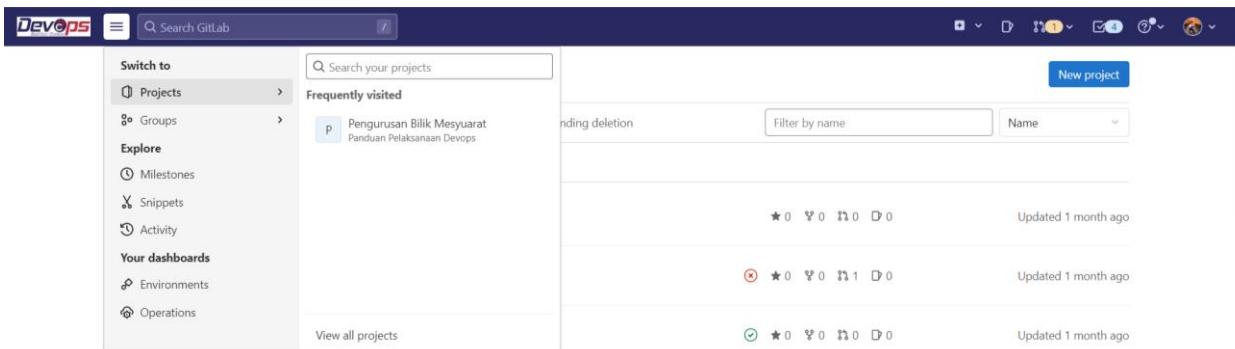
Tatacara	Paparan
<p>Paparan halaman <i>burndown chart</i> pada setiap <i>milestone</i> [Rajah B-49].</p> <ol style="list-style-type: none"> <li>1. Masukkan <b>Title</b>.</li> <li>2. Masukkan <b>Description</b> (jika perlu).</li> <li>3. Jika memilih untuk menguruskan <b>iteration</b> secara manual, buangkan tick jadual secara automatik dan abaikan langkah seterusnya.</li> <li>4. Pilih tarikh bermula secara automatik.</li> <li>5. <b>Duration of each iteration (in weeks)</b>.</li> <li>6. Bilangan <b>iterations</b> yang akan datang sepatutnya dijadualkan pada satu tempoh.</li> <li>7. <b>Enable roll over</b>.</li> <li>8. Klik <b>Create cadence</b>.</li> </ol>	 <p><b>Rajah B-49: GitLab – Paparan Halaman Burndown Chart</b></p>

Tatacara	Paparan
<p>Contoh paparan <i>iteration cadence</i> [Rajah B-50].</p> <p>Klik pada salah satu <b>iteration</b> untuk melihat <i>issue</i> yang ditetapkan pada <i>iteration</i> tersebut.</p>	<p>Panduan Pelaksanaan Devops &gt; Iteration cadences</p> <p>Open   Done   All</p> <p>▼ <u>Sprint</u></p> <p>Nov 23, 2022 - Dec 6, 2022</p> <p>Dec 7, 2022 - Dec 20, 2022</p> <p>Dec 21, 2022 - Jan 3, 2023</p> <p>Jan 4, 2023 - Jan 17, 2023</p> <p>Jan 18, 2023 - Jan 31, 2023</p> <p><b>Rajah B-50: GitLab – Paparan Menu <i>Iteration Cadence</i></b></p>

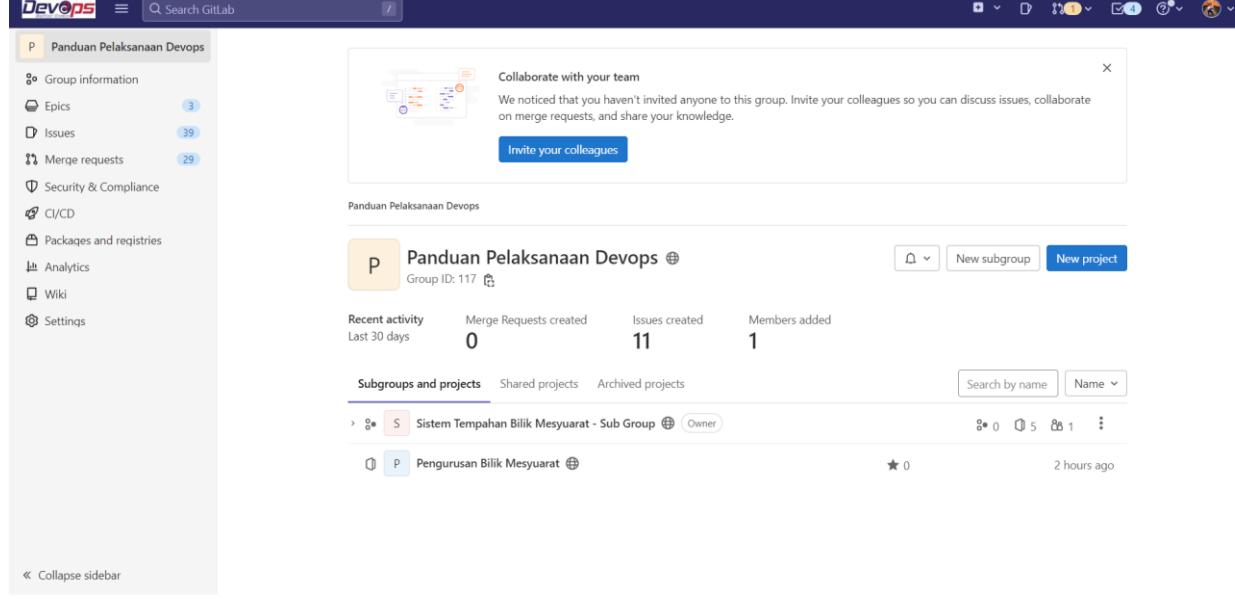
Tatacara	Paparan									
Paparan pada setiap <i>iteration</i> [Rajah B-51].	 <p>The screenshot shows a GitLab interface for a project named "Panduan Pelaksanaan Devops". The sidebar on the left lists various project management sections like Group information, Epics, Issues, Iterations, Merge requests, Security &amp; Compliance, CI/CD, Packages and registries, Analytics, Wiki, and Settings. The main content area displays the iteration details for "Nov 23, 2022 - Dec 6, 2022". It includes two charts: a Burndown chart and a Burnup chart. The Burndown chart shows issues decreasing over time, while the Burnup chart shows issues increasing over time. Below the charts is a table of issues with columns for Title, Status, and Assignees.</p> <table border="1" data-bbox="1033 952 1965 1111"><thead><tr><th>Title</th><th>Status</th><th>Assignees</th></tr></thead><tbody><tr><td>Asperiores rerum necessitatibus et. #18</td><td>Closed</td><td></td></tr><tr><td>Id tempore minus molestiae. #10</td><td>Closed</td><td></td></tr></tbody></table> <p><b>Rajah B-51: GitLab – Paparan Pada Setiap <i>Iteration</i></b></p>	Title	Status	Assignees	Asperiores rerum necessitatibus et. #18	Closed		Id tempore minus molestiae. #10	Closed	
Title	Status	Assignees								
Asperiores rerum necessitatibus et. #18	Closed									
Id tempore minus molestiae. #10	Closed									

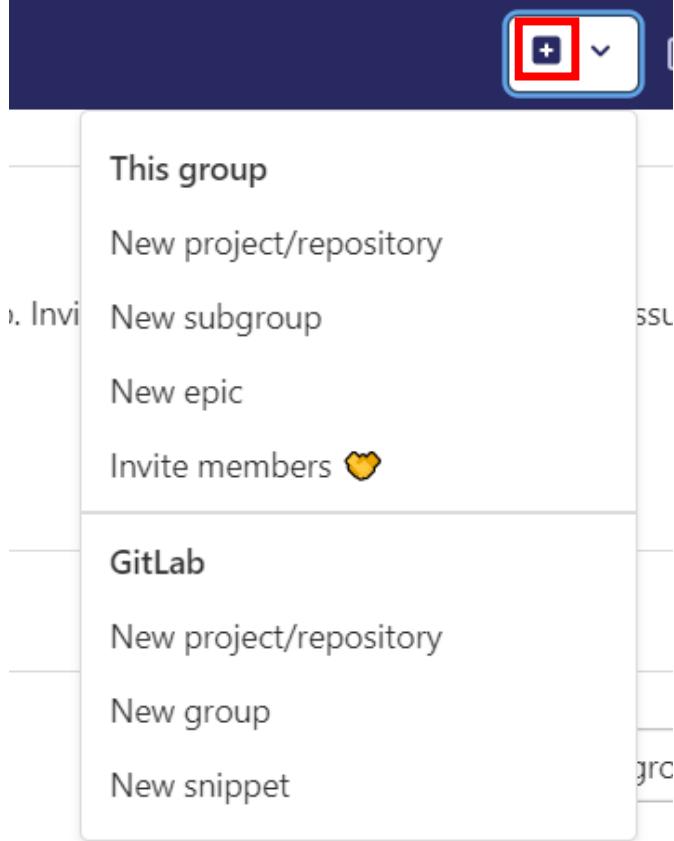
## Lampiran B-8: Mewujudkan GitLab New Project/Repository [A7]

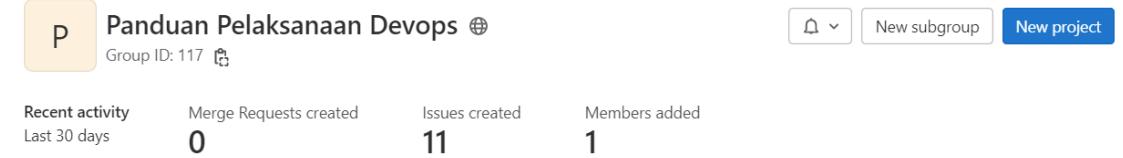
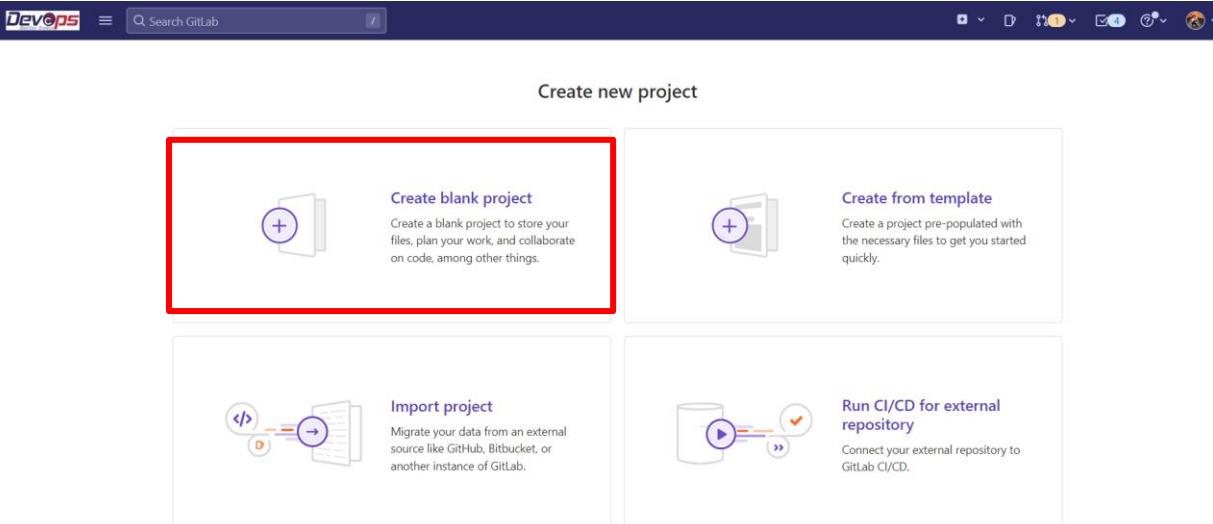
GitLab *Project* digunakan untuk menguruskan projek atau produk dan dijadikan repositori. Pasukan boleh mewujudkan projek untuk menjelak isu, merancang kerja, pengurusan kod sumber dengan terus membina, menguji dan menggunakan *Pipeline* GitLab untuk pembangunan sistem aplikasi. Projek boleh disediakan secara terbuka, dalaman atau persendirian, tanpa had bilangan. Repositori merupakan tempat simpanan kod sumber dan membuat perubahan kod padanya. Setiap perubahan akan dijejaki dengan kawalan versi. Setiap projek di GitLab akan mengandungi repositori tersendiri. Dengan mewujudkan projek baharu, repositori turut akan diwujudkan bersama. Berikut merupakan tatacara mewujudkan project baharu pada GitLab.

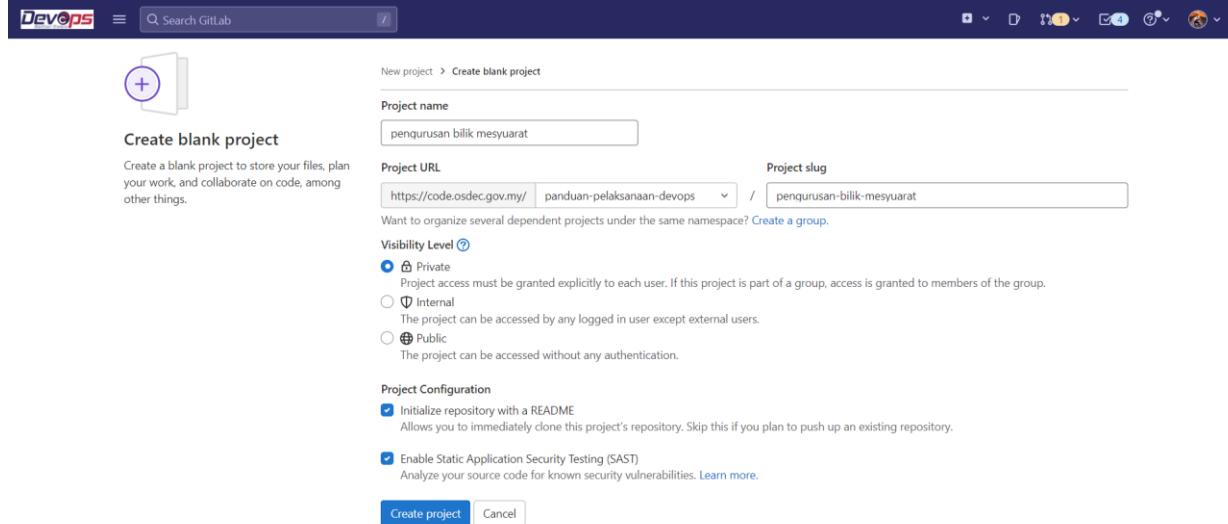
Tatacara	Paparan
<p>Paparan halaman menu utama [Rajah B-52].</p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Projects</b>.</li><li>3. Klik <b>View all projects</b>.</li><li>4. Klik <b>New Project</b>.</li></ol>	 <p>The screenshot shows the GitLab main interface. On the left, a sidebar menu is open under 'Switch to'. The 'Projects' option is highlighted. Other options include 'Groups', 'Explore', 'Milestones', 'Snippets', 'Activity', 'Your dashboards', 'Environments', and 'Operations'. At the bottom of the sidebar, there is a link 'View all projects'. The main area displays a search bar 'Search your projects' and a list of recently visited projects. One project, 'Pengurusan Bilik Mesyuarat Panduan Pelaksanaan Devops', is shown with its status as 'Pending deletion'. There are also three other projects listed below it, each with a star rating, a 'Filter by name' dropdown, and an 'Updated 1 month ago' message. A blue button 'New project' is located in the top right corner of the main area.</p>

Rajah B-52: Gitlab – Paparan Halaman Menu Utama

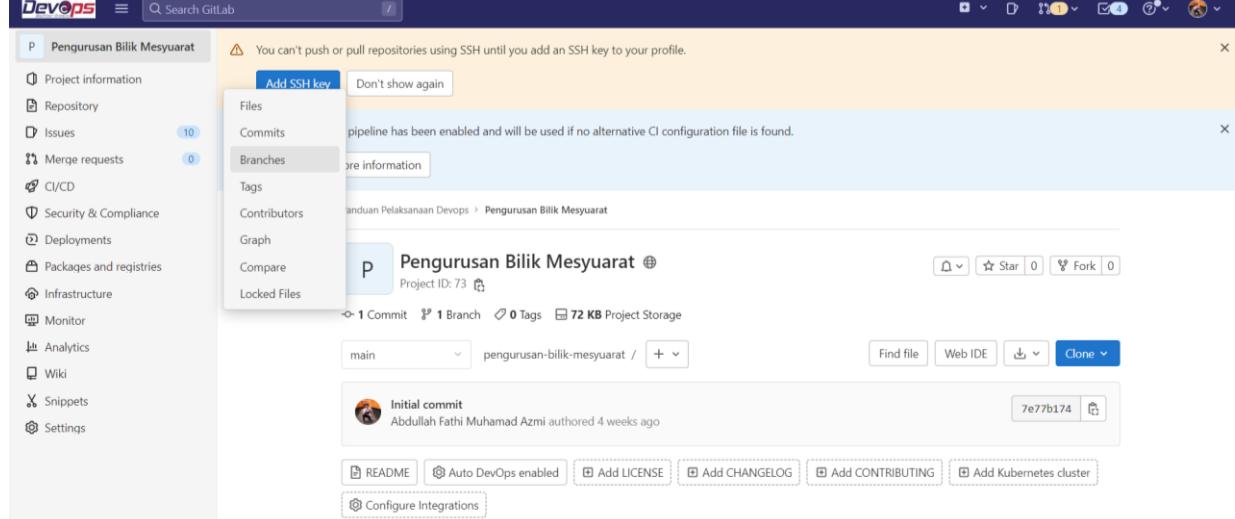
Tatacara	Paparan
Paparan <i>subgroups</i> dan <i>projects</i> [Rajah B-53]. <ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Group</b>.</li><li>3. Pilih <b>group anda</b>.</li><li>4. Klik <b>New project</b>.</li></ol>	 <p><b>Rajah B-53: Gitlab – Paparan Subgroups Dan Projects</b></p>

Tatacara	Paparan
<p>Berikut merupakan paparan untuk mewujudkan <i>New Project/repository</i> [Rajah B-54].</p> <ol style="list-style-type: none"><li>1. Pada panel sebelah kanan klik .</li><li>2. Pilih <b>This group</b>.</li><li>3. Pilih <b>New project/repository</b>.</li></ol> <p>Nota: Mewujudkan projek baharu perlu dipilih dibawah <i>group</i> yang telah diwujudkan sebelum ini.</p>	 <p>The screenshot shows a dark-themed GitLab interface. On the right side, there is a vertical sidebar with several options: "This group", "New project/repository" (which is highlighted with a red rectangle), "New subgroup", "New epic", "Invite members", "GitLab", "New project/repository" (under GitLab), "New group", and "New snippet". The "New project/repository" option under "GitLab" is also highlighted with a red rectangle.</p> <p><b>Rajah B-54: Gitlab – Paparan Menu Mewujudkan New Project/Repository</b></p>

Tatacara	Paparan
<p>1. Klik <b>New project</b> bagi mewujudkan projek baharu [Rajah B-55].</p>	 <p>Panduan Pelaksanaan Devops Group ID: 117</p> <p>Recent activity      Merge Requests created      Issues created      Members added</p> <p>0                    11                    1</p> <p><b>Rajah B-55: Gitlab – Paparan Mewujudkan Projek Baharu</b></p>
<p>Pada halaman <b>create new project</b>, <b>Create from template</b> sekiranya terdapat projek lain sebagai rujukan. Sekiranya tiada, <b>Create blank project</b> [Rajah B-56].</p>	 <p><b>Create new project</b></p> <ul style="list-style-type: none"> <li><b>Create blank project</b>: Create a blank project to store your files, plan your work, and collaborate on code, among other things.</li> <li><b>Create from template</b>: Create a project pre-populated with the necessary files to get you started quickly.</li> <li><b>Import project</b>: Migrate your data from an external source like GitHub, Bitbucket, or another instance of GitLab.</li> <li><b>Run CI/CD for external repository</b>: Connect your external repository to GitLab CI/CD.</li> </ul> <p>You can also create a project from the command line. Show command</p> <p><b>Rajah B-56: Gitlab – Paparan Halaman Create New Project</b></p>

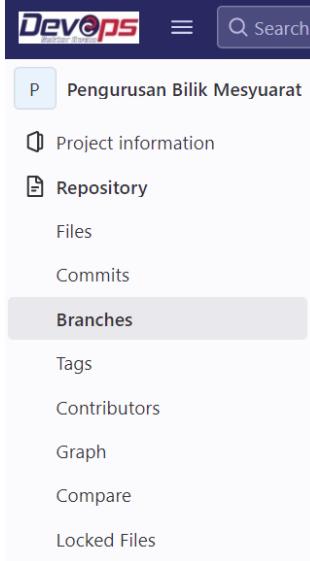
Tatacara	Paparan
<p>Berikut merupakan paparan halaman mewujudkan projek baharu [Rajah B-57].</p> <ol style="list-style-type: none"><li>1. Masukkan <b>Project name</b>.</li><li>2. Masukkan <b>Project URL</b> (pengisian secara automatik berdasarkan nama projek).</li><li>3. Pilih <b>Visibility Level</b>.</li><li>4. Pilih <b>Project Configuration</b>.</li><li>5. Klik <b>Create project</b>.</li></ol>	 <p>New project &gt; Create blank project</p> <p><b>Project name</b>: pengurusan bilik mesyuarat</p> <p><b>Project URL</b>: https://code.osdec.gov.my/panduan-pelaksanaan-devops / pengurusan-bilik-mesyuarat</p> <p><b>Visibility Level</b>: Private</p> <p><b>Project Configuration</b>:</p> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Initialize repository with a README</li><li><input checked="" type="checkbox"/> Enable Static Application Security Testing (SAST)</li></ul> <p><b>Create project</b>   Cancel</p>

Rajah B-57: Gitlab – Paparan Halaman Mewujudkan Halaman Baharu

Tatacara	Paparan
<p>Paparan halaman untuk projek baharu dan <i>Repository</i> bersedia untuk digunakan [Rajah B-58].</p>	 <p><b>Rajah B-58: Gitlab – Paparan Halaman Projek Baharu Dan Repository</b></p>

## Lampiran B-9: Mewujudkan GitLab *Environment Branch* [A9]

GitLab *Environment* menjelaskan tempat dimana kod ditempatkan. *Environment* ini boleh dibuat dengan menggunakan UI atau semasa *pipeline* GitLab. Berikut merupakan tatacara untuk menetapkan *environment* menggunakan UI.

Tatacara	Paparan
<p>Paparan halaman menu utama untuk menetapkan <i>environment branch</i> [Rajah B-59].</p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Projects</b>.</li><li>3. Pilih <b>projek</b>.</li><li>4. Pilih <b>Repository</b> pada menu sebelah kiri.</li><li>5. Pilih <b>Branches</b>.</li></ol>	 <p>Rajah B-59: Gitlab – Paparan Halaman Menu Utama</p>

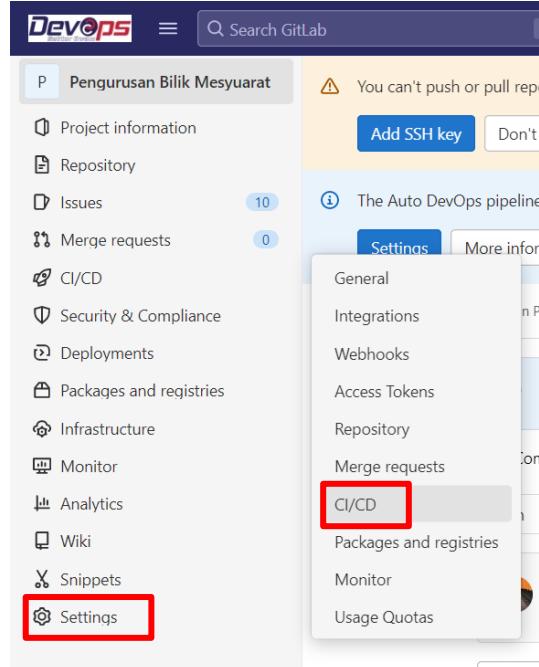
Tatacara	Paparan						
1. Klik <b>New branch</b> [Rajah B-60].	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; Repository &gt; Branches</p> <p>Overview Active Stale All Filter by branch name <input type="text"/> Delete merged branches New branch</p> <p>Active branches</p> <table><tbody><tr><td> main  default </td><td> 6597dac6 - Update .gitlab-ci.yml file · 1 month ago</td><td>  </td></tr><tr><td> feature/update-index </td><td> ae914671 - Update app/index.html · 2 months ago</td><td>   </td></tr></tbody></table> <p>Rajah B-60: Gitlab – Paparan <b>New Branch</b></p>	 main  default 	 6597dac6 - Update .gitlab-ci.yml file · 1 month ago	  	 feature/update-index 	 ae914671 - Update app/index.html · 2 months ago	   
 main  default 	 6597dac6 - Update .gitlab-ci.yml file · 1 month ago	  					
 feature/update-index 	 ae914671 - Update app/index.html · 2 months ago	   					

Tatacara	Paparan
<p>Masukkan butiran berikut [Rajah B-61]:</p> <ol style="list-style-type: none"><li>1. Masukkan <b>Branch Name</b> – nama persekitaran.</li><li>2. Pilih <b>Create from</b> – main branch.</li><li>3. Klik <b>Create branch</b>.</li></ol>	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; New Branch</p> <h2>New Branch</h2> <p>Branch name <input type="text" value="staging"/></p> <p>Create from <input style="width: 150px;" type="text" value="main"/> Existing branch name, tag, or commit SHA</p> <p><input type="button" value="Create branch"/> <input type="button" value="Cancel"/></p> <p><b>Rajah B-61: Gitlab – Paparan Halaman New Environment Branch</b></p>

Tatacara	Paparan															
Paparan <i>Environment Branch</i> [Rajah B-62].	<p>The screenshot shows a GitLab repository interface. At the top, there is a breadcrumb navigation: 'staging' &gt; 'pengurusan-bilik-mesyuarat' &gt; '+'. To the right of the breadcrumb are buttons for 'History', 'Find file', 'Web IDE', a download icon, and a 'Clone' button. Below this is a table showing commit history:</p> <table border="1"><thead><tr><th>Name</th><th>Last commit</th><th>Last update</th></tr></thead><tbody><tr><td>app</td><td>Upload New File</td><td>2 months ago</td></tr><tr><td>.gitignore</td><td>Upload New File</td><td>2 months ago</td></tr><tr><td>.gitlab-ci.yml</td><td>Update .gitlab-ci.yml file</td><td>1 month ago</td></tr><tr><td>README.md</td><td>Initial commit</td><td>4 months ago</td></tr></tbody></table> <p>Below the table, there is a preview of the 'README.md' file content:</p> <pre>README.md</pre> <p><b>Pengurusan Bilik Mesyuarat</b></p> <p style="text-align: center;"><b>Rajah B-62: Gitlab – Paparan Halaman <i>Environment Branch</i></b></p>	Name	Last commit	Last update	app	Upload New File	2 months ago	.gitignore	Upload New File	2 months ago	.gitlab-ci.yml	Update .gitlab-ci.yml file	1 month ago	README.md	Initial commit	4 months ago
Name	Last commit	Last update														
app	Upload New File	2 months ago														
.gitignore	Upload New File	2 months ago														
.gitlab-ci.yml	Update .gitlab-ci.yml file	1 month ago														
README.md	Initial commit	4 months ago														

## Lampiran B-10: Menyediakan GitLab Runner [A10]

Berikut merupakan langkah-langkah untuk *setup runner* untuk sebuah projek.

Tatacara	Paparan
<p>Paparan halaman menu utama [Rajah B-63].</p> <ol style="list-style-type: none"><li>1. Pilih GitLab <i>project repository</i>.</li><li>2. Pilih pada sebelah kiri, klik <b>Settings</b>.</li><li>3. Klik <b>CI/CD</b>.</li></ol>	 <p>The screenshot shows the GitLab main menu. On the left, there is a sidebar with various project management and system settings. At the bottom of this sidebar, the 'Settings' option is highlighted with a red box. To the right of the sidebar, a dropdown menu is open under the 'Settings' tab, listing several categories. The 'CI/CD' option is also highlighted with a red box within this dropdown menu.</p>

Rajah B-63: Gitlab – Paparan Halaman Menu Utama

Tatacara	Paparan
1. Klik <b>Expand Runners</b> [Rajah B-64].	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; CI/CD Settings</p> <p>Search page</p> <p><b>General pipelines</b> Customize your pipeline configuration. <span style="float: right;">Expand</span></p> <p><b>Auto DevOps</b> Automate building, testing, and deploying your applications based on your continuous integration and delivery configuration. <a href="#">How do I get started?</a> <span style="float: right;">Expand</span></p> <p><b>Protected environments</b> Only specified users can execute deployments in a protected environment. <span style="float: right;">Expand</span></p> <p><b>Runners</b> Runners are processes that pick up and execute CI/CD jobs for GitLab. <a href="#">What is GitLab Runner?</a> <span style="float: right; border: 2px solid red; padding: 2px;">Expand</span></p>

**Rajah B-64: Gitlab – Paparan Halaman *Expand Runners***

Tatacara	Paparan				
<p>Dalam bahagian <i>specific Runners</i>, URL dan token (Maklumat ini diperlukan ketika pendaftaran Gitlab <i>Runners</i> ke dalam server) [Rajah B-65].</p>	<p><b>Runners</b></p> <p>Runners are processes that pick up and execute CI/CD jobs for GitLab. <a href="#">What is GitLab Runner?</a></p> <p>Register as many runners as you want. You can register runners as separate users, on separate servers, and on your local machine.</p> <p>Runners are either:</p> <ul style="list-style-type: none"> <li>• <a href="#">active</a> - Available to run jobs.</li> <li>• <a href="#">paused</a> - Not available to run jobs.</li> </ul> <p><b>Specific runners</b></p> <p>These runners are specific to this project.</p> <p><b>Set up a specific runner for a project</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">Install GitLab Runner and ensure it's running.</a></li> <li>2. Register the runner with this URL: <a href="https://code.osdec.gov.my/">https://code.osdec.gov.my/</a></li> </ol> <p>And this registration token: GR1348941yy1GdTtnuQs_T6ffMnZT</p> <p><a href="#">Reset registration token</a></p> <p><a href="#">Show runner installation instructions</a></p> <p><b>Shared runners</b></p> <p>These runners are shared across this GitLab instance.</p> <p>The same shared runner executes code from multiple projects, unless you configure autoscaling with <a href="#">MaxBuilds</a> set to 1 (which it is on GitLab.com).</p> <p>Enable shared runners for this project <input checked="" type="checkbox"/></p> <p><b>Available shared runners: 21</b></p> <table> <tbody> <tr> <td>#13 (KMBk5B55)</td> </tr> <tr> <td>5-ruby2.7 docker runner</td> </tr> <tr> <td><a href="#">docker</a> <a href="#">rancher2</a> <a href="#">ruby2.7</a></td> </tr> <tr> <td>#9 (Mxu2Znd5)</td> </tr> </tbody> </table> <p style="text-align: center;"><b>Rajah B-65: Gitlab – Paparan Halaman Runners</b></p>	#13 (KMBk5B55)	5-ruby2.7 docker runner	<a href="#">docker</a> <a href="#">rancher2</a> <a href="#">ruby2.7</a>	#9 (Mxu2Znd5)
#13 (KMBk5B55)					
5-ruby2.7 docker runner					
<a href="#">docker</a> <a href="#">rancher2</a> <a href="#">ruby2.7</a>					
#9 (Mxu2Znd5)					

GitLab telah menyediakan dokumen yang terperinci tentang cara mendaftar *runner* dalam *Server Operationg System* yang berbeza dan juga *Runner Executors*. Langkah berikut hanya akan menjelaskan pendaftaran *runner* sebagai *shell executor* pada pelayan Ubuntu.

SSH ke *remote server* dan *run* menggunakan command “**sudo gitlab-runner register**”

Berikut adalah soalan yang perlu dijawab apabila execute command diatas:

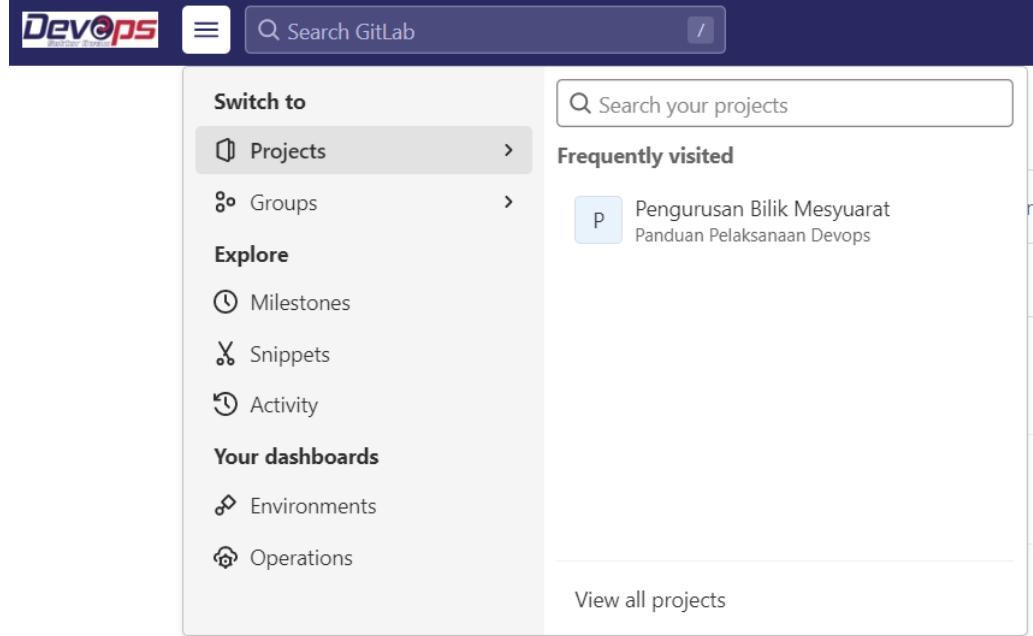
- i. *Enter the following URL for your GitLab instance:* Informasi ini boleh didapati pada langkah diatas **Specific Runners -> URL**
- ii. *For this runner, enter the gitlab-ci token:* Informasi ini boleh didapati pada langkah diatas **Specific Runners -> Token**
- iii. *Enter this runner's GitLab-ci description:* Masukkan nama *runner*. Ini boleh membantu bagi mengenali siapa yang *run*
- iv. *For this runner, fill up the following gitlab-ci tags:* Ini merupakan pilihan samada ingin melancarkan GitLab *runner* dengan mana-mana tag pada yml file
- v. *Here comes the executor:* Senarai executor yang perlu dipilih. Pilih type: *shell*

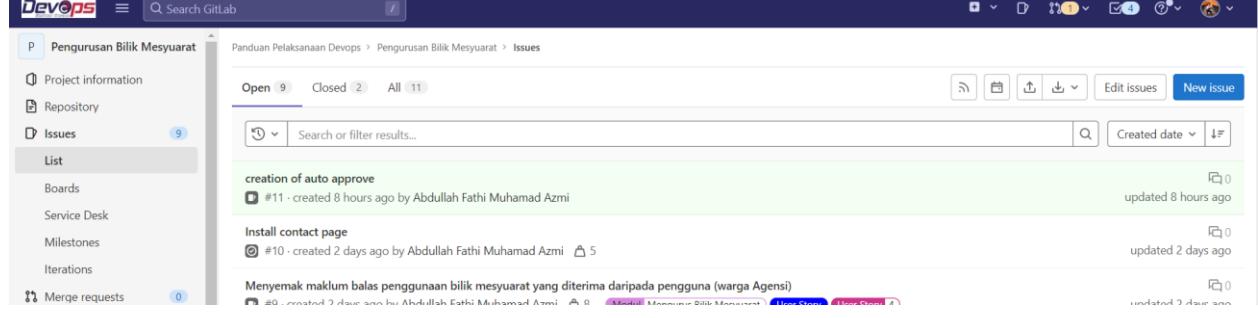
Berikut merupakan Linux *Command* yang boleh digunakan pada GitLab *Runner*

- i. **sudo gitLab-runner stop** - *Runner* mesti dihentikan.
- ii. **sudo gitLab-runner status** – untuk mengetahui status GitLab *runner*.
- iii. **sudo gitLab-runner unregister –name test-runner** – untuk nyahdaftar *runner* projek dan menggantikan *test-runner* menggunakan nama *runner* pengguna, yang boleh didapati dalam fail config.toml (dimana GitLab *runner* itu berada)
- iv. **sudo gitLab-runner unregister –Url <http://gitlab.example.com/> –token t0k3n** – *Runner* boleh dibuang menggunakan URL dan token.
- v. **sudo gitLab-runner unregister –all-runners** Semua *Runner* akan dinyahdaftar
- vi. **sudo gitLab-runner restart** – servis GitLab *Runner* dihentikan dan *restart* menggunakan command ini.

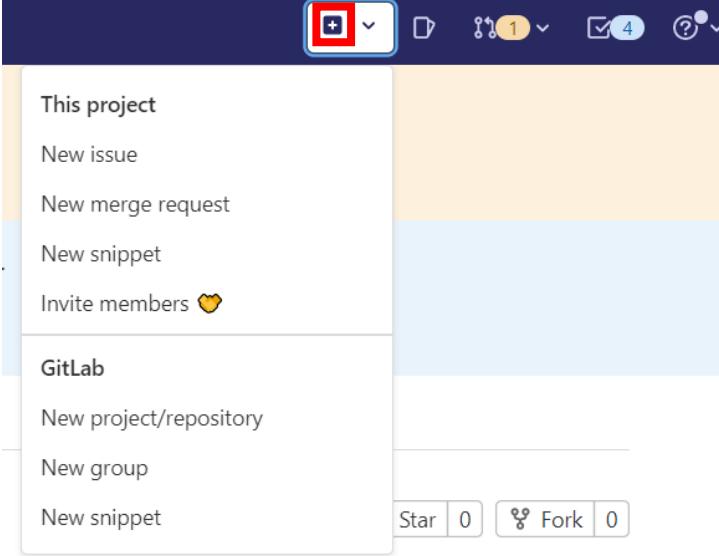
### Lampiran B-11: Mewujudkan Produk *Backlog* dengan GitLab *Issues* [A13]

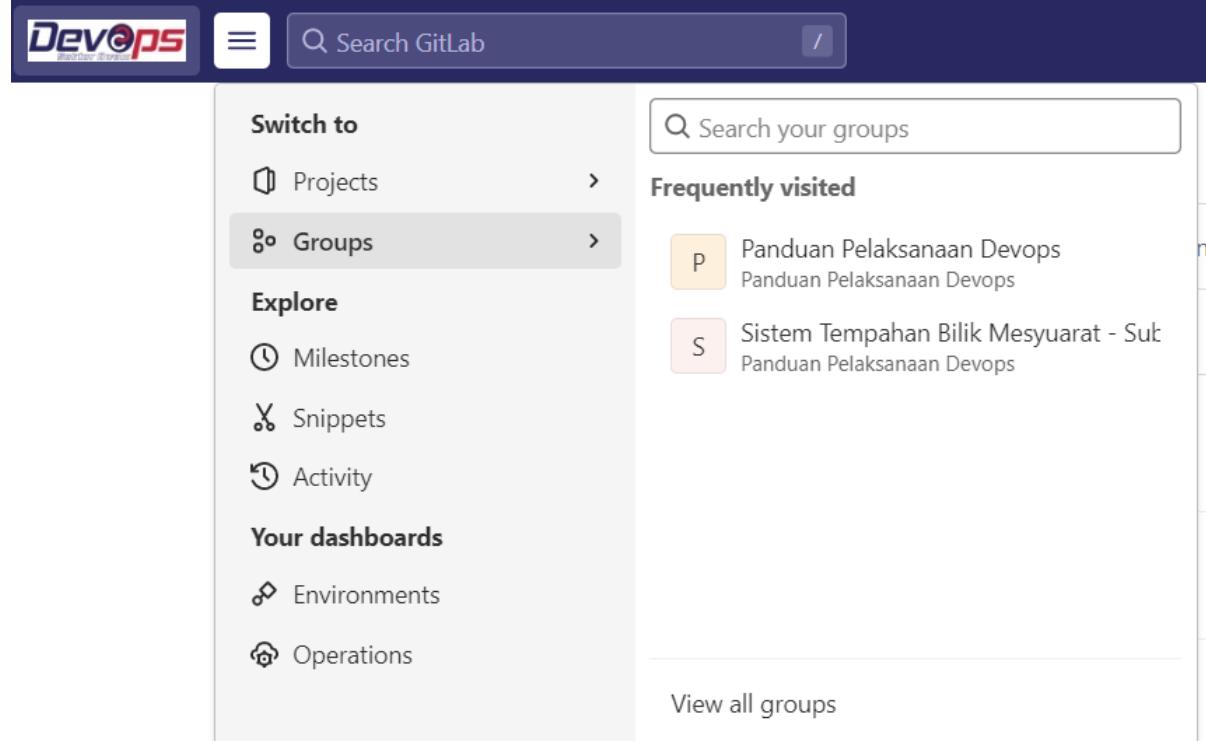
Setiap *user story* dan *product backlog* akan diwujudkan menggunakan *Issue* dan dilabelkan sebagai *user story*. *Issue* juga diwujudkan bagi setiap *sprint task* dan dilabelkan.

Tatacara	Paparan
<p>Jika <b>create issue</b> dari <b>Project</b> [Rajah B-66].</p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Projects</b>.</li><li>3. Pilih <b>projek</b>.</li></ol>	 <p>The screenshot shows the GitLab navigation bar with the 'DevOps' logo and search bar. Below the bar is a dropdown menu titled 'Switch to'. Under 'Switch to', there are two main categories: 'Projects' and 'Groups'. 'Projects' is highlighted with a grey background and a right-pointing arrow. To the right of the dropdown, there is a 'Frequently visited' section featuring a project named 'Pengurusan Bilik Mesyuarat' with a blue icon.</p> <p><b>Rajah B-66: GitLab – Memilih Projek</b></p>

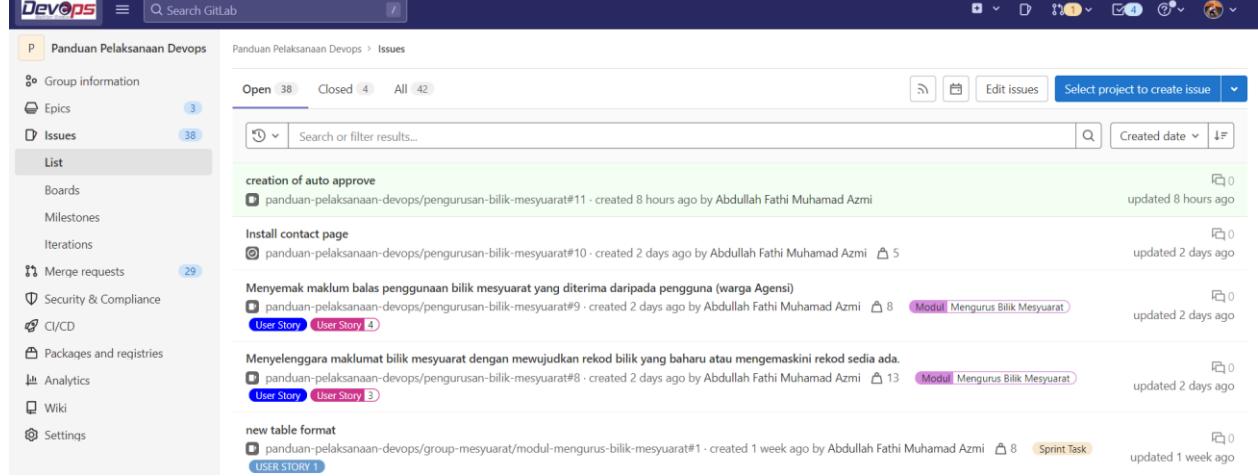
Tatacara	Paparan
<p>1. Pilih <b>Issues</b>. 2. Klik <b>New Issue</b> [Rajah B-67].</p>	 <p>The screenshot shows the GitLab interface for the 'Pengurusan Bilik Mesyuarat' project. The left sidebar has 'Issues' selected under 'List'. The main area displays a list of three open issues:</p> <ul style="list-style-type: none"><li>creation of auto approve #11 · created 8 hours ago by Abdullah Fathi Muhamad Azmi · updated 8 hours ago</li><li>Install contact page #10 · created 2 days ago by Abdullah Fathi Muhamad Azmi · 5 · updated 2 days ago</li><li>Menyemak maklum balas penggunaan bilik mesyuarat yang diterima daripada pengguna (warga Agensi) #9 · created 2 days ago by Abdullah Fathi Muhamad Azmi · 0 · updated 2 days ago</li></ul>

Rajah B-67: GitLab – Menu /issues

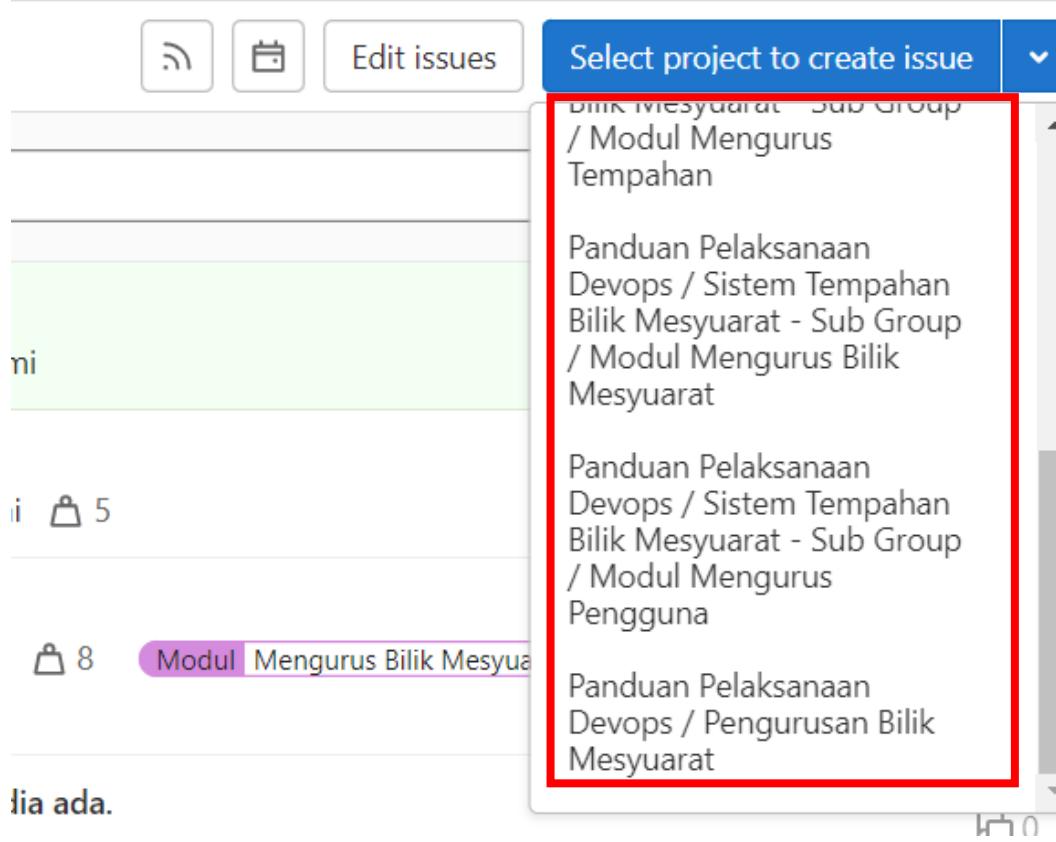
Tatacara	Paparan
<ol style="list-style-type: none"><li>1. Pada sebelah kiri <i>search box</i>, klik pada simbol tambah (+).</li><li>2. Pilih <b>New issue</b> [Rajah B-68].</li></ol>	 <p>The screenshot shows the GitLab interface with a dark header bar. On the far left, there is a search bar and a user icon. To its right is a dropdown menu with the following options:</p> <ul style="list-style-type: none"><li>This project</li><li>New issue</li><li>New merge request</li><li>New snippet</li><li>Invite members 🎁</li></ul> <p>Below this menu, under the heading "GitLab", are the following options:</p> <ul style="list-style-type: none"><li>New project/repository</li><li>New group</li><li>New snippet</li></ul> <p>At the bottom right of the dropdown area, there are two buttons: "Star 0" and "Fork 0".</p> <p><b>Rajah B-68: GitLab – Mewujudkan Issue Baharu</b></p>

Tatacara	Paparan
<p>Jika mewujudkan <i>issue</i> dari <i>group</i> [Rajah B-69].</p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Groups</b>.</li><li>3. Pilih <b>group</b> anda.</li></ol>	 <p>The screenshot shows the GitLab homepage. At the top, there is a navigation bar with the DevOps logo, a search bar containing 'Search GitLab', and a user icon. Below the navigation bar, the main content area has a dark header with the text 'Switch to' and a search bar 'Search your groups'. Underneath this, there is a section titled 'Frequently visited' with two items: 'P Panduan Pelaksanaan Devops' and 'S Sistem Tempahan Bilik Mesyuarat - Suk'. The main content area also includes sections for 'Explore' (Projects, Milestones, Snippets, Activity), 'Your dashboards' (Environments, Operations), and a link 'View all groups'.</p> <p><b>Rajah B-69: GitLab – Memilih Group</b></p>

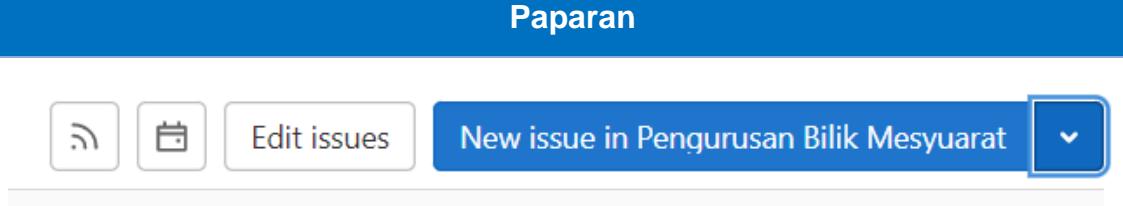
Tatacara	Paparan
<p>1. Pilih <b>Issue</b>. 2. Pilih <b>List</b> [Rajah B-70].</p>	<p>The screenshot shows the GitLab interface for a group named 'Panduan Pelaksanaan Devops'. On the left, there's a sidebar with various project management sections like Group information, Epics, Issues, Merge requests, Security &amp; Compliance, CI/CD, Packages and registries, Analytics, Wiki, and Settings. The main area displays recent activity: 0 merge requests created, 11 issues created, and 1 member added. Below this, there's a section for 'Subgroups and projects' which includes 'Sistem Tempahan Bilik Mesyuarat - Sub Group' and 'Pengurusan Bilik Mesyuarat'. A modal window titled 'Collaborate with your team' is open, prompting the user to invite colleagues. At the bottom right, there's a note about a new issue being created 8 hours ago.</p> <p><b>Rajah B-70: GitLab – Issue List</b></p>

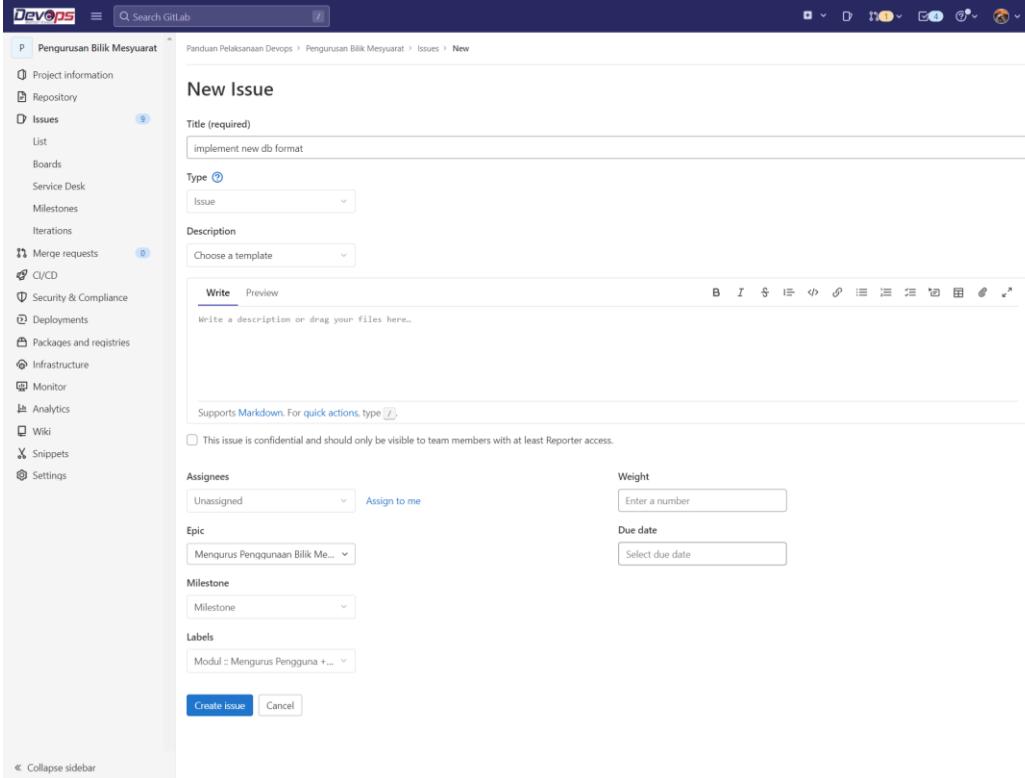
Tatacara	Paparan
<p>1. Klik <b>Select project to create issue</b> [Rajah B-71].</p>	 <p>The screenshot shows the GitLab interface for the 'Panduan Pelaksanaan Devops' group. On the left, there's a sidebar with various project management options like Epics, Issues, Boards, Milestones, Iterations, Merge requests, Security &amp; Compliance, CI/CD, Packages and registries, Analytics, Wiki, and Settings. The 'Issues' option is selected. On the right, the main area displays a list of issues. At the top of this list is an item titled 'creation of auto approve' with a creation date of '8 hours ago'. Below it is an 'Install contact page' item. Further down is a 'Menyemak maklumat bilik mesyuarat yang diterima daripada pengguna (warga Agensi)' item, which includes a 'Modul Mengurus Bilik Mesyuarat' tag. At the bottom of the list is a 'new table format' item, also with a 'Modul Mengurus Bilik Mesyuarat' tag. The 'Select project to create issue' button is located at the top right of the main content area.</p>

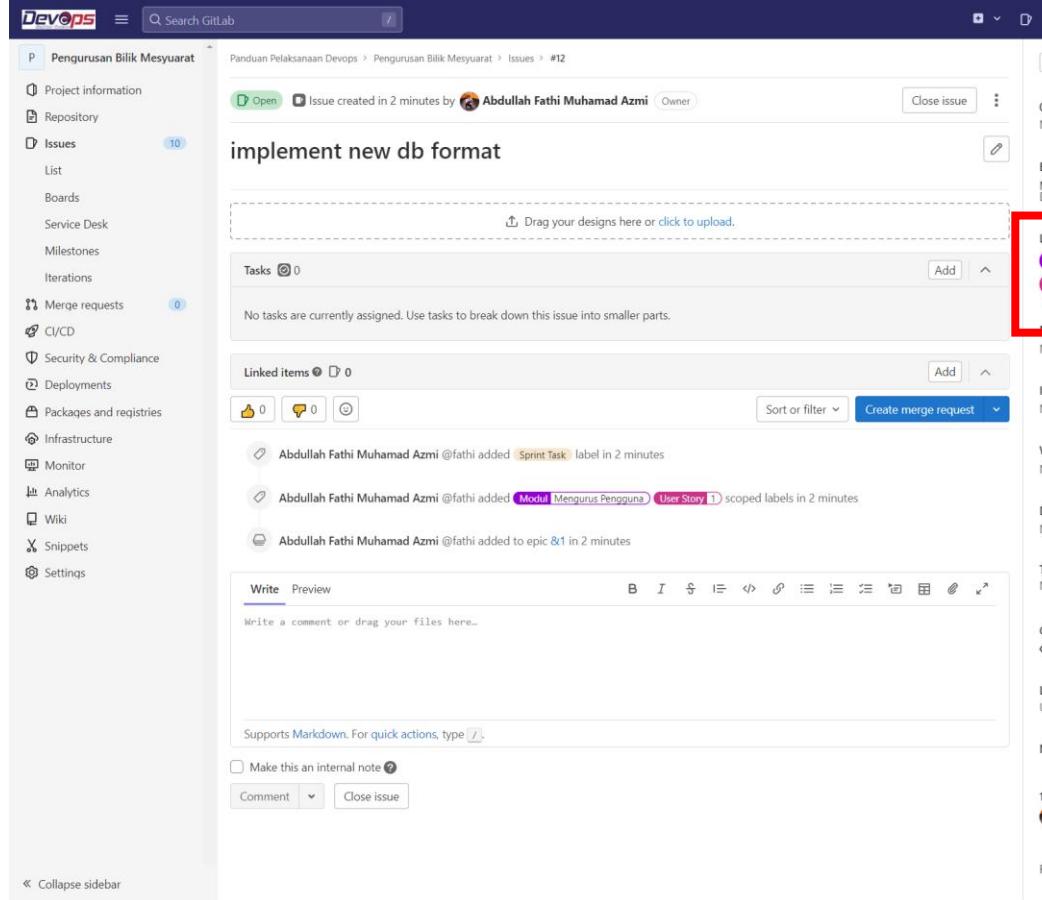
**Rajah B-71: GitLab – Memilih Projek**

Tatacara	Paparan
1. Pilih projek [Rajah B-72].	 <p>Select project to create issue ▾</p> <ul style="list-style-type: none"><li>Bilik Mesyuarat - Sub Group<ul style="list-style-type: none"><li>/ Modul Mengurus Tempahan</li><li>Panduan Pelaksanaan Devops / Sistem Tempahan Bilik Mesyuarat - Sub Group / Modul Mengurus Bilik Mesyuarat</li><li>Panduan Pelaksanaan Devops / Sistem Tempahan Bilik Mesyuarat - Sub Group / Modul Mengurus Pengguna</li><li>Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat</li></ul></li></ul>

Rajah B-72: Gitlab – Memilih Projek

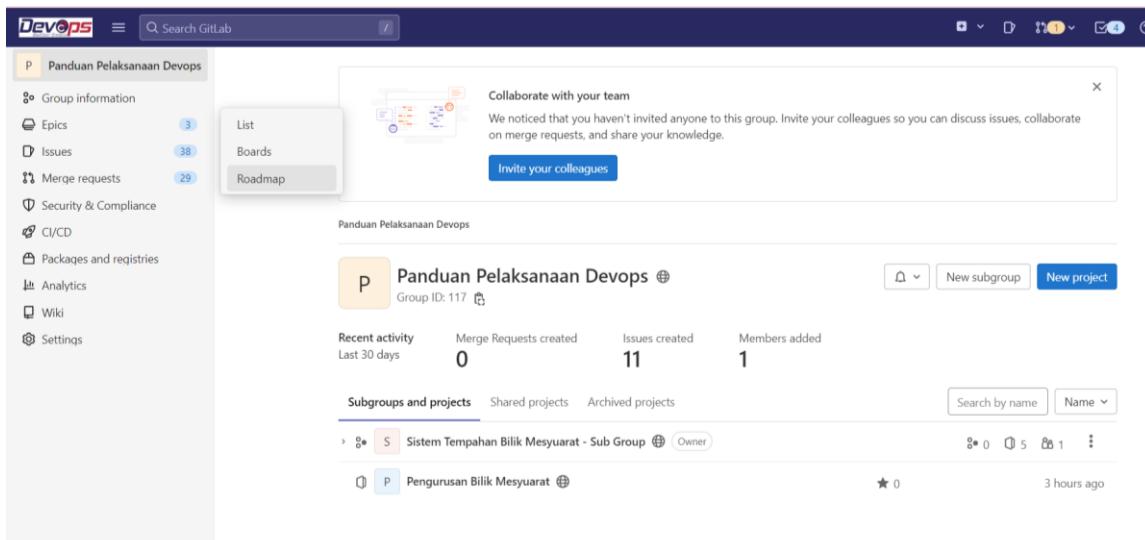
Tatacara	Paparan
Paparan setelah pemilihan projek [Rajah B-73].	 <p>The screenshot shows a GitLab interface with a blue header bar. On the left, under the 'Tatacara' column, there is a text box containing the instruction: 'Paparan setelah pemilihan projek [Rajah B-73]'. On the right, under the 'Paparan' column, there is a screenshot of a GitLab project page. The page has a navigation bar with icons for RSS feed, calendar, and 'Edit issues'. Below the navigation bar, there is a button labeled 'New issue in Pengurusan Bilik Mesyuarat' with a dropdown arrow icon. The main content area of the screenshot displays the heading 'Rajah B-73: Gitlab – Memilih Projek'.</p>

Tatacara	Paparan
<p>Paparan <i>New Issue</i> [Rajah B-74].</p> <ol style="list-style-type: none"><li>1. Masukkan <b>Title</b>.</li><li>2. Masukkan <b>Type</b>.</li><li>3. Masukkan <b>Description</b>.</li><li>4. Masukkan <b>Assignees</b>.</li><li>5. Masukkan <b>Weight</b>.</li><li>6. Masukkan <b>Epic</b>.</li><li>7. Masukkan <b>Due date</b>.</li><li>8. Masukkan <b>Milestone</b>.</li><li>9. Masukkan <b>Labels</b>.</li><li>10. Klik <b>Create issue</b>.</li></ol>	 <p>Rajah B-74: GitLab – Paparan <i>New Issue</i></p>

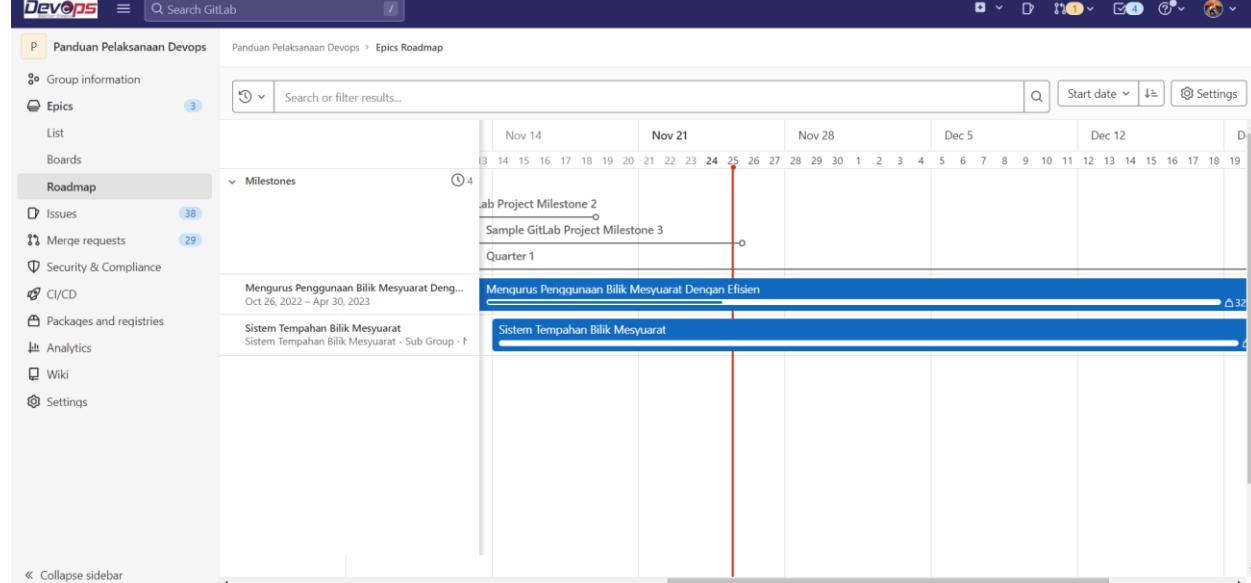
Tatacara	Paparan
<p>Paparan <i>issue</i> yang baharu diwujudkan [Rajah B-75].</p> <ol style="list-style-type: none"> <li>Letakkan label pada <i>issue</i> tersebut bagi memudahkan urusan pengelasan.</li> </ol>	 <p><b>Rajah B-75: GitLab – Paparan New Issue</b></p>

## Lampiran B-12: Melihat Paparan GitLab *Roadmap*

*Epics* dan *milestone* didalam *group* mengandungi tarikh mula dan tarikh siap boleh digambarkan dalam bentuk garis masa (*Gantt chart*). Halaman *roadmap* menunjukkan *epics* dan *milestone* didalam *group* yang sama. Pada bar *epic* akan memaparkan tajuk *epic*, kemajuan dan peratusan *weight* yang telah selesai.

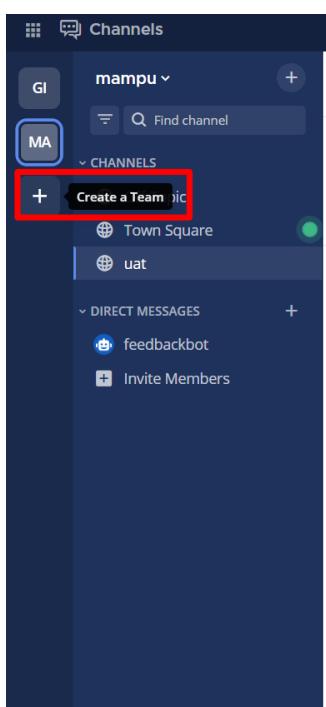
Tatacara	Paparan
<p>Paparan Gitlab <i>Roadmap</i> [Rajah B-76].</p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu</b>.</li><li>2. Pilih <b>Group</b>.</li><li>3. Pilih <b>Group</b>.</li><li>4. Pilih <b>Epics</b>.</li><li>5. Pilih <b>Roadmap</b>.</li></ol>	

Rajah B-76: GitLab – Paparan GitLab *Roadmap*

Tatacara	Paparan
<p>Paparan Gitlab Roadmap [Rajah B-77].</p> <ol style="list-style-type: none"><li>1. Paparan senarai <i>epic</i> dan <i>sub-group</i> dibawah satu <i>group</i>.</li><li>2. Status kemajuan <i>epic</i> berdasarkan <i>weight sprint task/project issue</i> yang telah selesai.</li></ol>	 <p>Rajah B-77: GitLab – Paparan GitLab Roadmap</p>

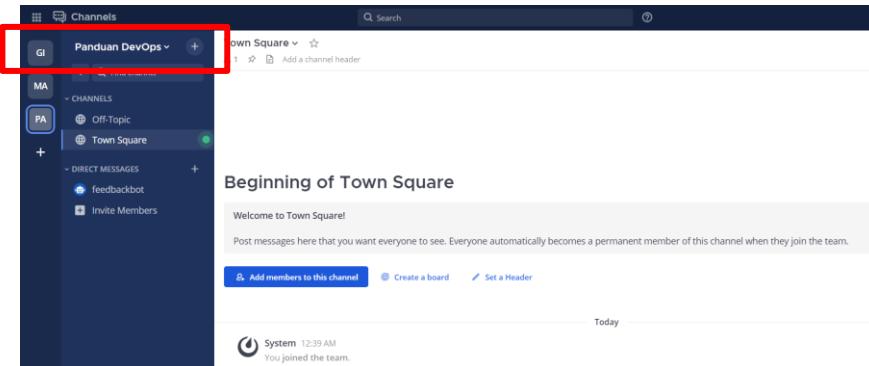
## Lampiran B-13: Mewujudkan Mattermost Team

Team perlu diwujudkan sebelum mewujudkan *channel* dan integrasi dengan GitLab. Berikut merupakan tatacara untuk mewujudkan *team* didalam aplikasi Mattermost.

Tatacara	Paparan
<p>Paparan halaman utama [Rajah B-78].</p> <p>Issue yang baharu diwujudkan Halaman sertai atau mewujudkan <i>Team</i> akan dipaparkan.</p> <p>1. Klik <b>Create a team</b>.</p>	 <p>The screenshot shows the Mattermost interface with a sidebar containing channels like 'mampu', 'MA', 'Town Square', and 'uat'. A red box highlights the '+ Create a Team' button. The main area shows a channel named 'uat' with a message from 'System' indicating two members joined. Below it, a message from 'fathi BOT' creates an issue, followed by another from 'fathi BOT' reporting a successful ChatOps job completion.</p>

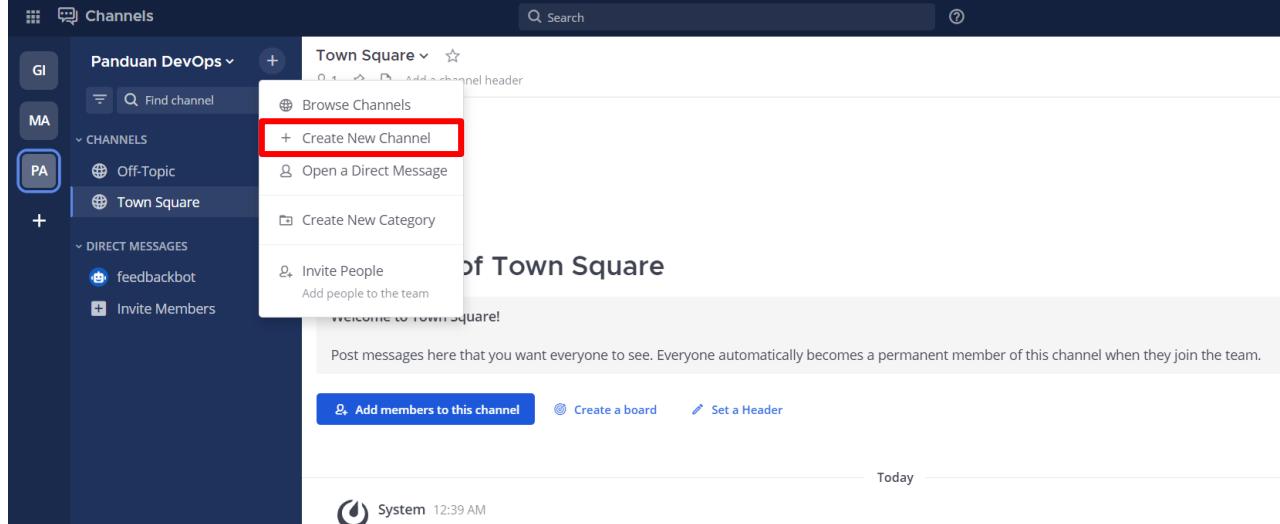
**Rajah B-78: Gitlab – Paparan Halaman Utama**

Tatacara	Paparan
Halaman penjanaan <i>Team</i> akan dipaparkan [Rajah B-79].  1. Klik <b>Create a team</b> .	<h2>GitLab Mattermost</h2> <p>All team communication in one place, searchable and accessible anywhere</p> <p>Teams you can join:</p> <p>No teams are available to join. Please create a new team or ask your administrator for an invite.</p> <p><b>Create a team</b></p> <p><b>Rajah B-79: Gitlab – Paparan Halaman Gitlab Mattermost</b></p>
1. Masukkan <b>Team Name</b> . 2. Klik <b>Next</b> [Rajah B-80].	<h2>GitLab Mattermost</h2> <p>All team communication in one place, searchable and accessible anywhere</p> <p>Team Name</p> <p><b>Panduan DevOps</b></p> <p>Name your team in any language. Your team name shows in menus and headings.</p> <p><b>Next &gt;</b></p> <p><b>Rajah B-80: Gitlab – Halaman Gitlab Mattermost</b></p>

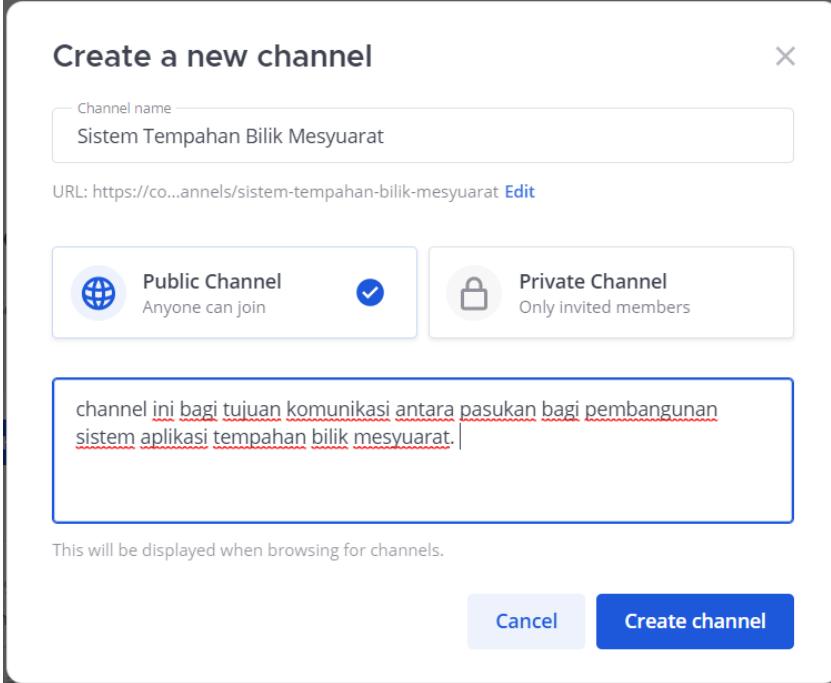
Tatacara	Paparan
<p>1. Team URL akan <i>auto-fill</i> berdasarkan nama kumpulan.</p> <p>2. Klik <b>Finish</b> [Rajah B-81].</p>	<p><b>GitLab Mattermost</b></p> <p>All team communication in one place, searchable and accessible anywhere</p> <p>Team URL</p>  <p>Choose the web address of your new team:</p> <ul style="list-style-type: none"> <li>• Short and memorable is best</li> <li>• Use lowercase letters, numbers and dashes</li> <li>• Must start with a letter and can't end in a dash</li> </ul> <p><b>Finish</b></p> <p><a href="#">Back to previous step</a></p> <p style="text-align: center;"><b>Rajah B-81: Gitlab – Halaman Gitlab Mattermost</b></p>
Paparan nama kumpulan yang baharu diwujudkan [Rajah B-82].	 <p style="text-align: center;"><b>Rajah B-82: Gitlab – Halaman Nama Kumpulan Baharu</b></p>

### Lampiran B-14: Mewujudkan Mattermost Channel

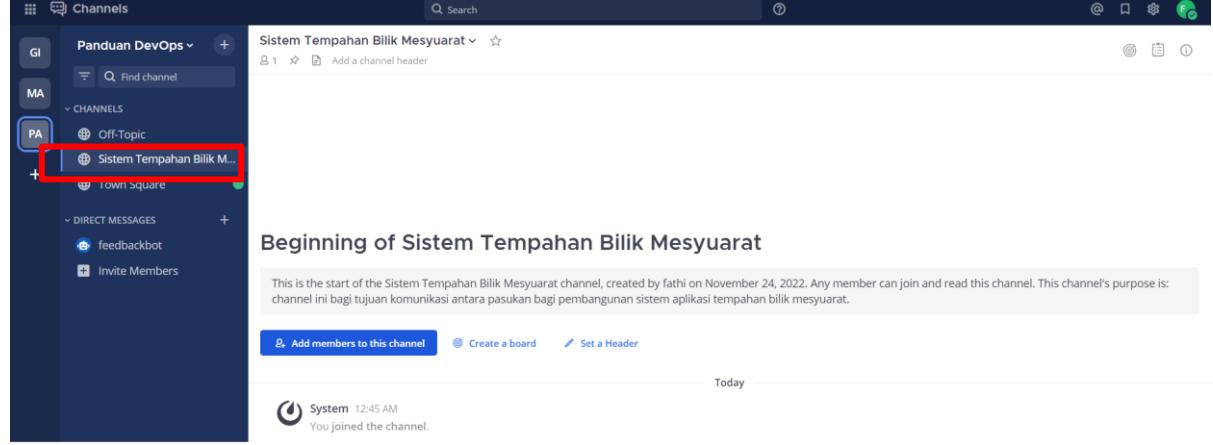
Setelah *Team* diwujudkan atau disertai, *channel* pula perlu diwujudkan sebelum integrasi dengan GitLab. Berikut merupakan tatacara untuk mewujudkan *channel* didalam aplikasi Mattermost.

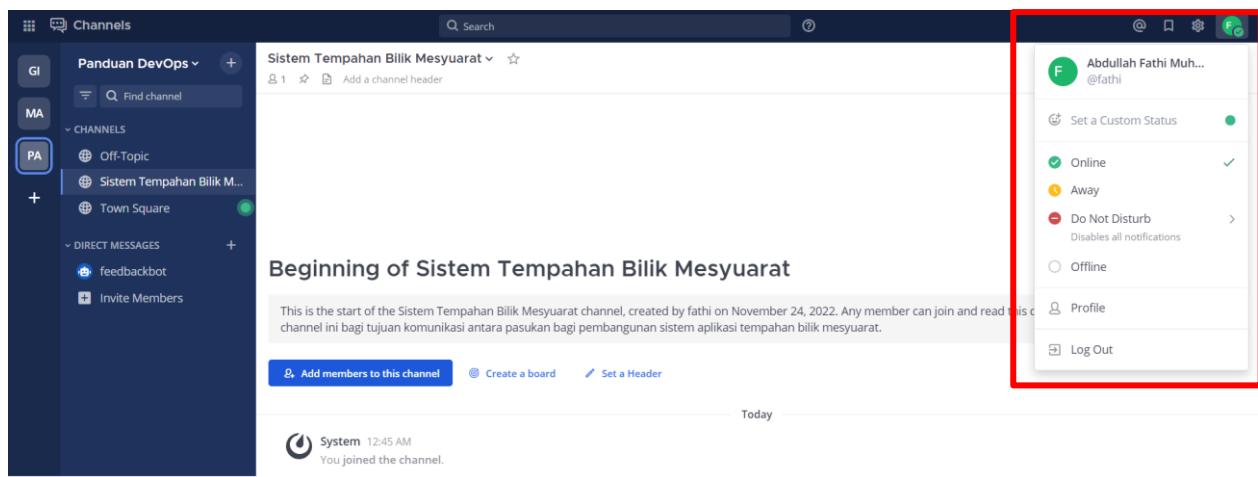
Tatacara	Paparan
<p>Paparan halaman untuk mewujudkan <i>New Channel</i> [Rajah B-83].</p> <ol style="list-style-type: none"><li>1. Halaman utama <b>Mattermost</b> akan dipaparkan &gt; <b>Team</b>.</li><li>2. Klik butang “+” pada menu sisi kiri.</li><li>3. Klik pada menu + <b>Create New Channel</b>.</li></ol>	 <p>The screenshot shows the Mattermost application interface. On the left, there is a sidebar with user icons (GI, MA, PA) and a '+' button. The main area displays a channel named 'Town Square'. A context menu is open over the channel name, with the option '+ Create New Channel' highlighted by a red box. The menu also includes 'Browse Channels', 'Open a Direct Message', 'Create New Category', and 'Invite People'. Below the menu, the 'Town Square' channel page is visible, showing a welcome message and a timestamp from 'System'.</p>

Rajah B-83: Gitlab – Paparan Halaman Menu Utama

Tatacara	Paparan
<p>Paparan halaman mewujudkan halaman baharu [Rajah B-84].</p> <ol style="list-style-type: none"><li>1. Masukkan nama <i>channel</i> pada medan <b>Channel Name</b>.</li><li>2. klik butang <b>Create channel</b>.</li></ol>	 <p>Channel name Sistem Tempahan Bilik Mesyuarat</p> <p>URL: <a href="https://co...annels/sistem-tempahan-bilik-mesyuarat">https://co...annels/sistem-tempahan-bilik-mesyuarat</a> <a href="#">Edit</a></p> <p>Public Channel Anyone can join <input checked="" type="checkbox"/></p> <p>Private Channel Only invited members</p> <p>channel ini bagi tujuan komunikasi antara pasukan bagi pembangunan sistem aplikasi tempahan bilik mesyuarat.</p> <p>This will be displayed when browsing for channels.</p> <p>Cancel Create channel</p>

Rajah B-84: Gitlab – Paparan Halaman Mewujudkan Halaman Baharu

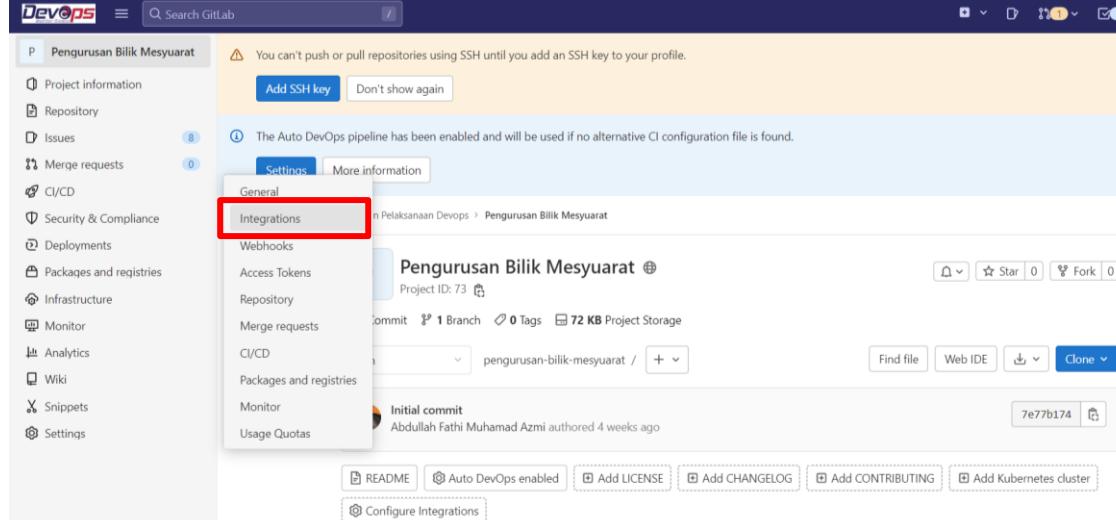
Tatacara	Paparan
Halaman utama Mattermost akan dipaparkan dan <i>channel</i> yang telah dijana dapat dilihat pada senarai <i>channel</i> menu sisi kiri [Rajah B-85].	 <p>The screenshot shows the Mattermost application interface. On the left, there is a sidebar with a list of channels: 'Panduan DevOps' (selected), 'MA', 'PA' (highlighted with a red box), 'Off-Topic', 'Sistem Tempahan Bilik Mesyuarat' (highlighted with a red box), and 'Town Square'. The main area displays the 'Sistem Tempahan Bilik Mesyuarat' channel, which was created by fathi on November 24, 2022. The purpose of the channel is described as "channel ini bagi tujuan komunikasi antara pasukan bagi pembangunan sistem aplikasi tempahan bilik mesyuarat". There is a message from the system stating "You joined the channel." at 12:45 AM.</p> <p><b>Rajah B-85: Gitlab – Paparan Halaman Utama Mattermost</b></p>

Tatacara	Paparan
Paparan nama pengguna yang telah log masuk dapat dilihat dengan klik pada “avatar” ikon pada menu atas kanan [Rajah B-86].	 <p>The screenshot shows the GitLab 'Channels' page. On the left, there's a sidebar with channels like 'Panduan DevOps', 'MA', and 'PA'. The main area shows a channel named 'Sistem Tempahan Bilik Mesyuarat'. On the right, a user profile dropdown menu is open for 'Abdullah Fathi Mu... @fathi'. The menu includes options: 'Set a Custom Status' (green checkmark), 'Online' (green checkmark), 'Away' (yellow), 'Do Not Disturb' (red), 'Offline' (light blue), 'Profile' (person icon), and 'Log Out'. A red box highlights this profile menu.</p>

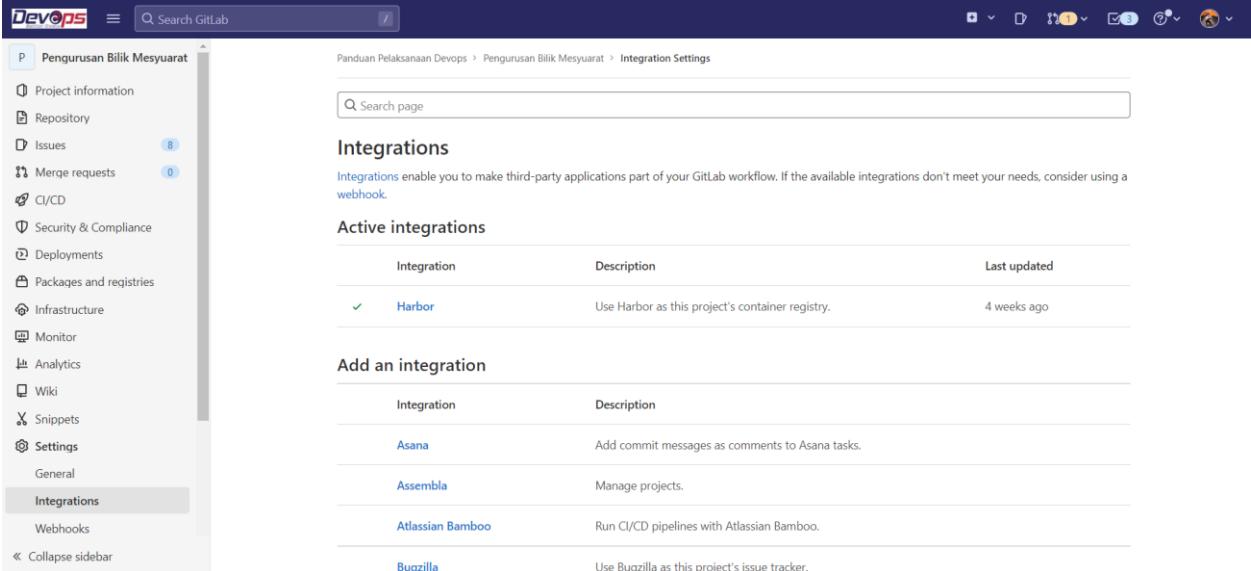
Rajah B-86: Gitlab – Paparan Halaman *Channels*

### Lampiran B-15: Menyediakan Integrasi antara GitLab dan Mattermost [A8]

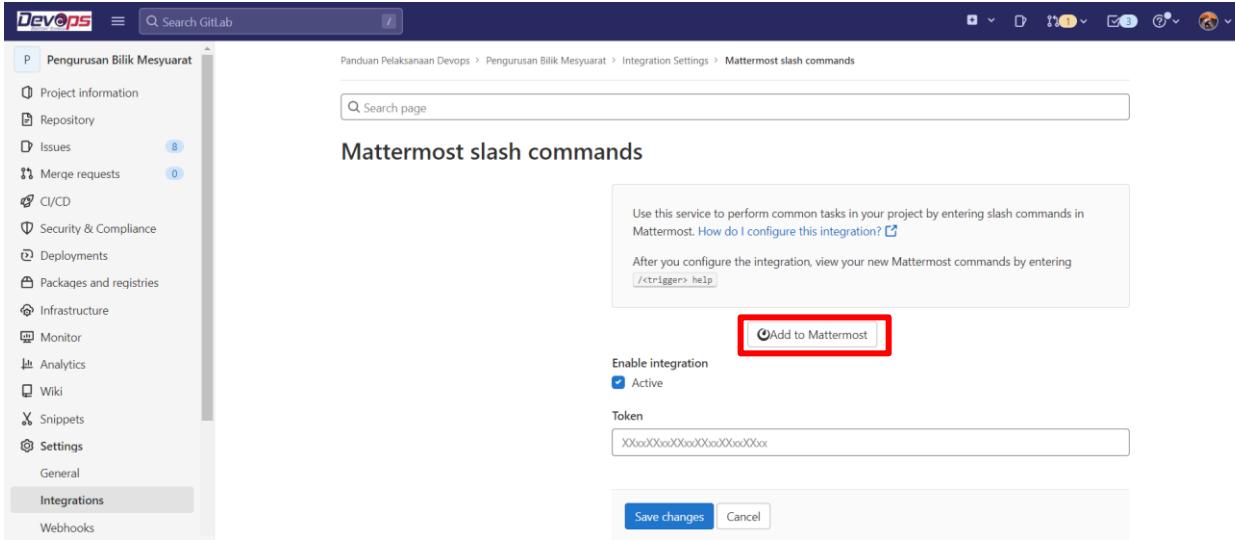
Berikut merupakan tatacara untuk menyediakan integrasi antara GitLab dan Mattermost.

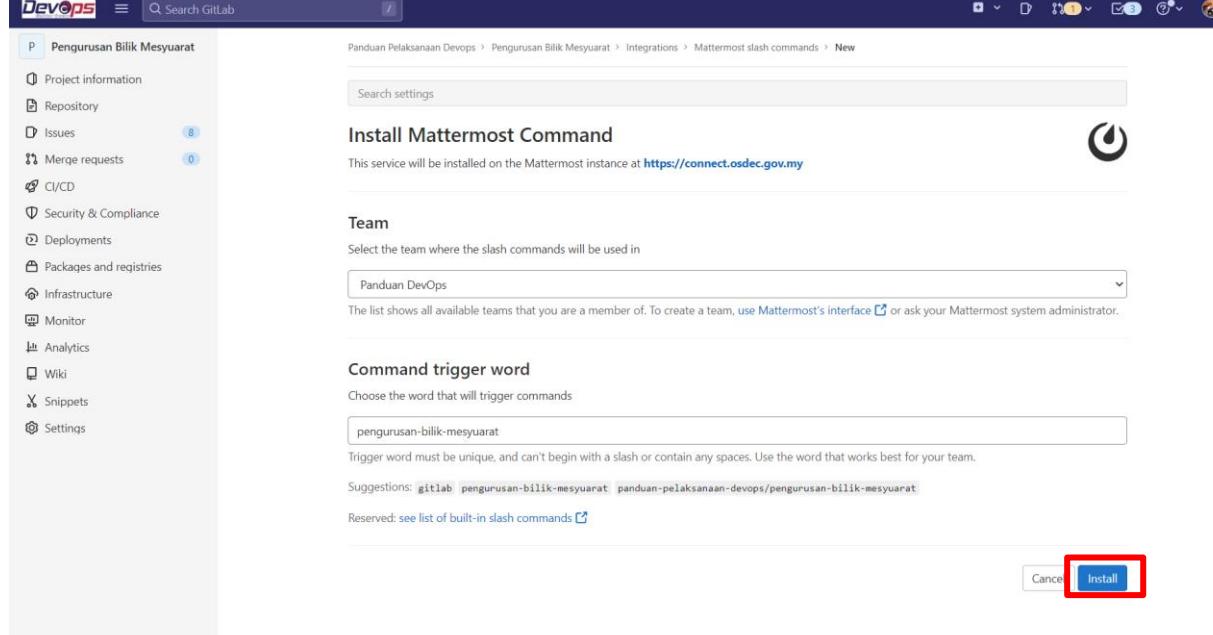
Tatacara	Paparan
<p>Halaman projek <i>repository</i> akan dipaparkan [Rajah B-87].</p> <ol style="list-style-type: none"><li>1. Alikan cursor pada <b>Settings</b>.</li><li>2. klik pada sub-menu <b>Integrations</b>.</li></ol>	 <p>The screenshot shows the GitLab interface for a project titled "Pengurusan Bilik Mesyuarat". The sidebar on the left lists various project management options like Project information, Repository, Issues, Merge requests, CI/CD, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings. The main content area displays basic project statistics: Project ID: 73, Commit: 1, Branch: 0, Tags: 0, Project Storage: 72 KB. Below this is the commit history with one entry: "Initial commit" by Abdullah Fathi Muhamad Azmi 4 weeks ago. At the bottom of the page, there are several buttons for README, Auto DevOps enabled, Add LICENSE, Add CHANGELOG, Add CONTRIBUTING, Add Kubernetes cluster, and Configure Integrations. A red box highlights the "Integrations" link in the sidebar.</p>

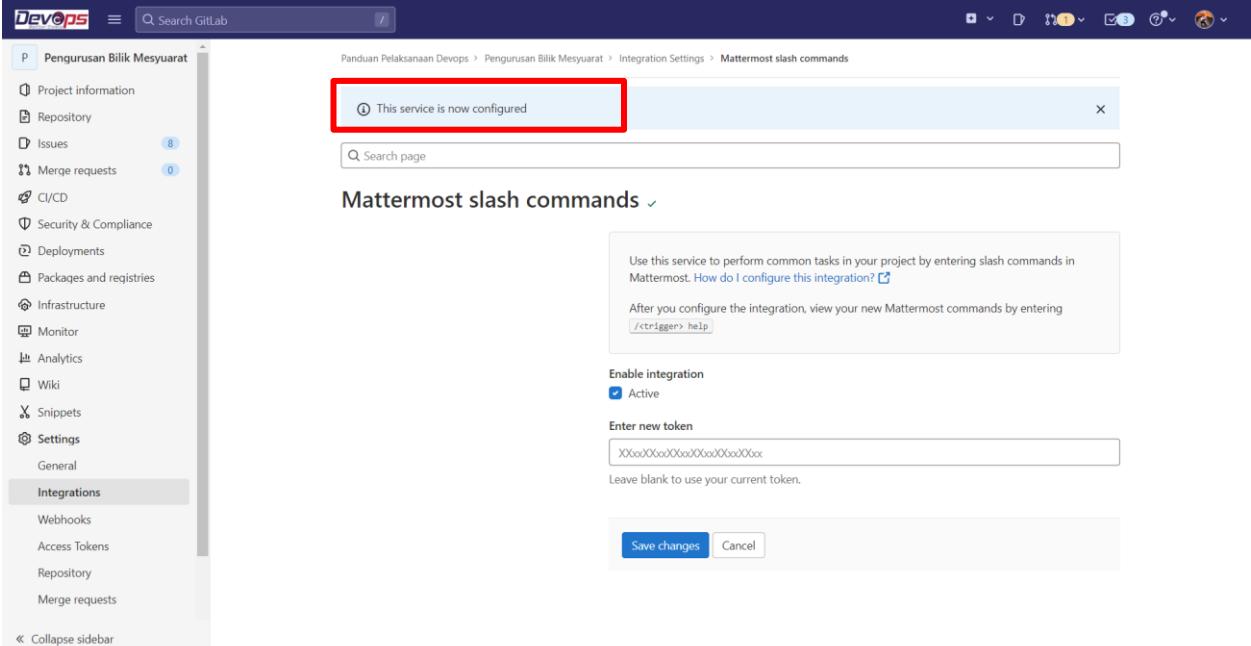
Rajah B-87: Gitlab – Paparan Halaman Projek *Repository*

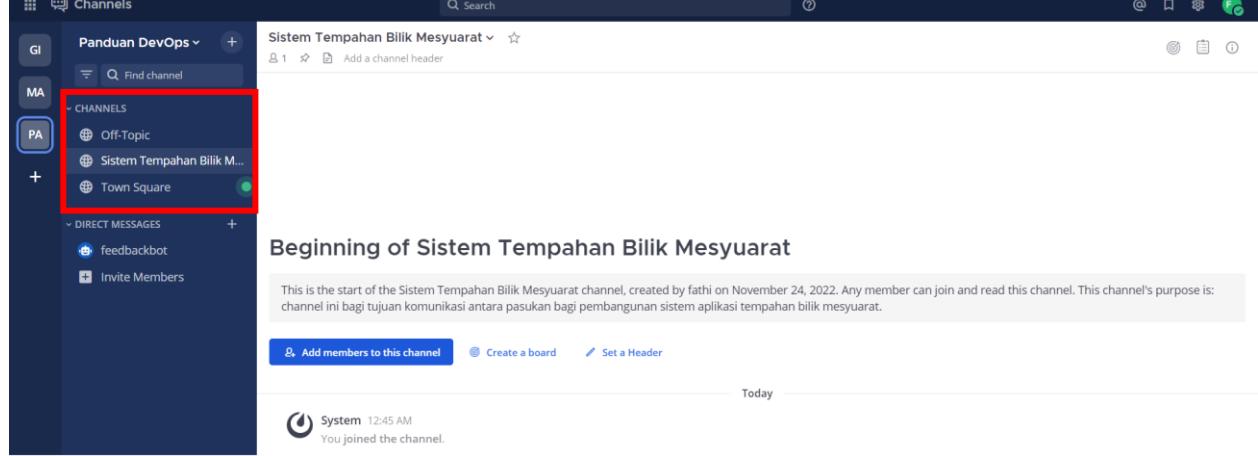
Tatacara	Paparan
<p>Halaman senarai integrasi akan dipaparkan [Rajah B-88].</p>	 <p>The screenshot shows the 'Integration Settings' page in GitLab. The left sidebar has a 'Pengurusan Bilik Mesyuarat' section with various project management options like Project information, Repository, Issues (8), Merge requests (0), CI/CD, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings. The 'Integrations' option under Settings is highlighted. Below the sidebar is a search bar and a breadcrumb navigation path: Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; Integration Settings. The main content area is titled 'Integrations' with a sub-section 'Active integrations'. It lists one active integration: 'Harbor' (checked, last updated 4 weeks ago). Below this is a section titled 'Add an integration' which lists several available integrations: Asana, Assembla, Atlassian Bamboo, and Bugzilla.</p> <p><b>Rajah B-88: Gitlab – Paparan Halaman Integrasi</b></p>

Tatacara	Paparan
1. Skrol halaman kebawah dan klik pada pautan Mattermost <i>slash commands</i> [Rajah B-89].	<p><a href="#">Jenkins</a> Run CI/CD pipelines with Jenkins.</p> <p><a href="#">JetBrains TeamCity</a> Run CI/CD pipelines with JetBrains TeamCity.</p> <p><a href="#">Jira</a> Use Jira as this project's issue tracker.</p> <p><a href="#">Mattermost notifications</a> Send notifications about project events to Mattermost channels.</p> <p><a href="#">Mattermost slash commands</a> <b>Mattermost slash commands</b> Perform common tasks with slash commands.</p> <p><a href="#">Microsoft Teams notifications</a> Send notifications about project events to Microsoft Teams.</p> <p><a href="#">Packagist</a> Keep your PHP dependencies updated on Packagist.</p> <p><a href="#">Pipeline status emails</a> Email the pipeline status to a list of recipients.</p>
<b>Rajah B-89: Gitlab – Paparan Halaman Mattermost <i>Slash Commands</i></b>	

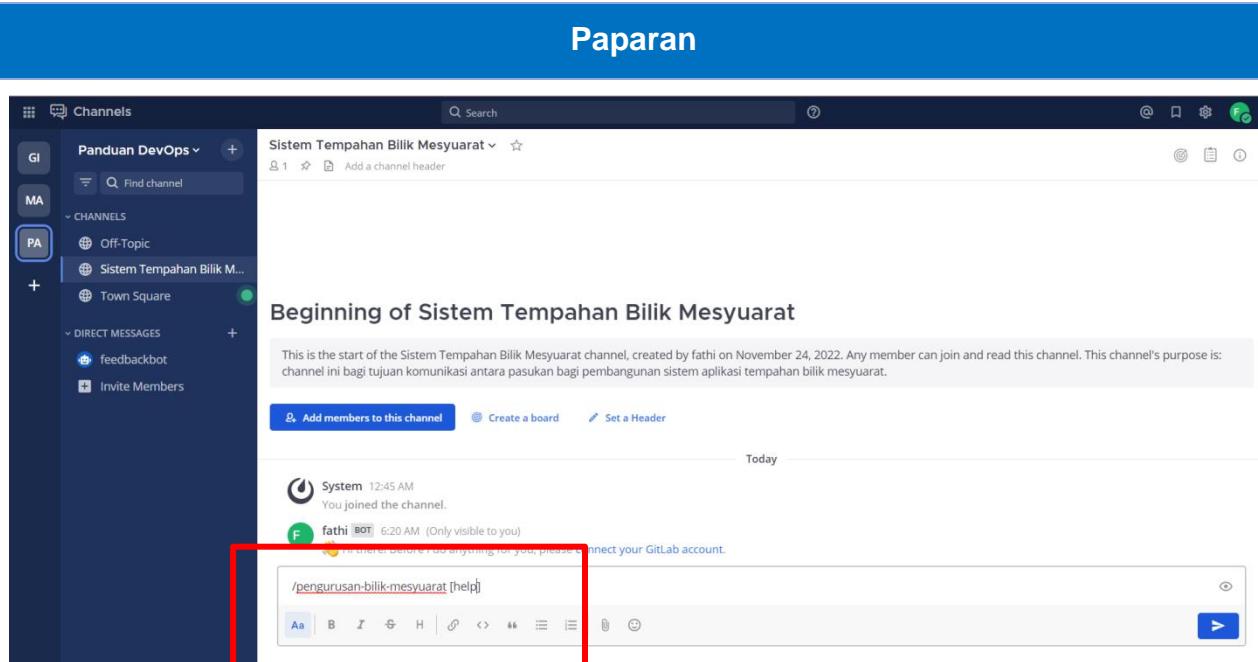
Tatacara	Paparan
<p>Halaman konfigurasi Mattermost <i>slash commands</i> akan dipaparkan [Rajah B-90].</p> <p>1. Klik butang <b>Add to Mattermost</b>.</p>	 <p>Rajah B-90: Gitlab – Paparan Halaman Konfigurasi Mattermost <i>Slash Commands</i></p>

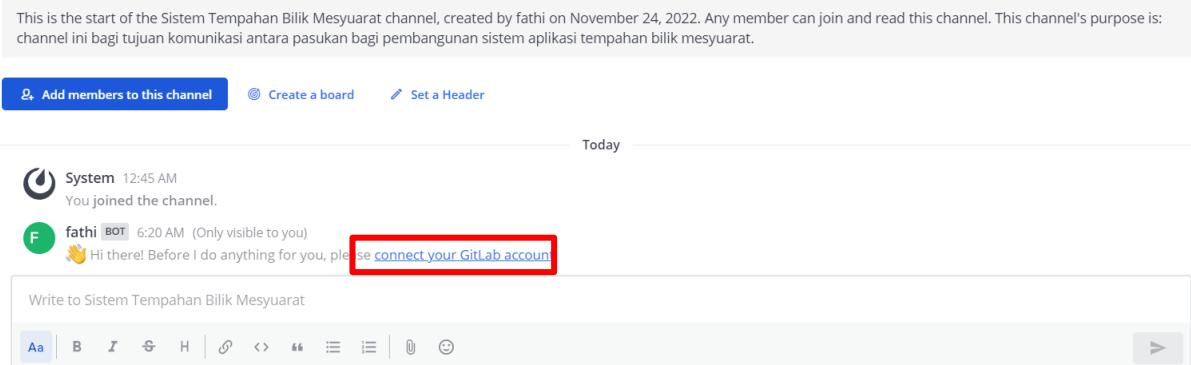
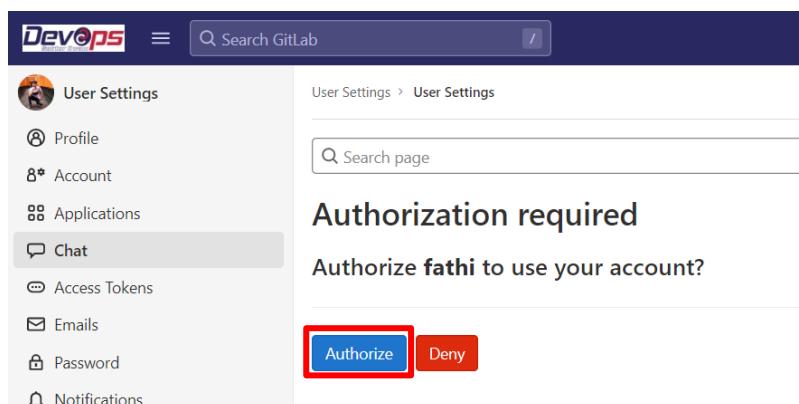
Tatacara	Paparan
<p>Paparan halaman <i>Install Mattermost slash commands</i> dipaparkan [Rajah B-91].</p> <p>1. Klik <b>Install</b>.</p>	 <p><b>Rajah B-91: Gitlab – Paparan <i>Install Mattermost Command</i></b></p>

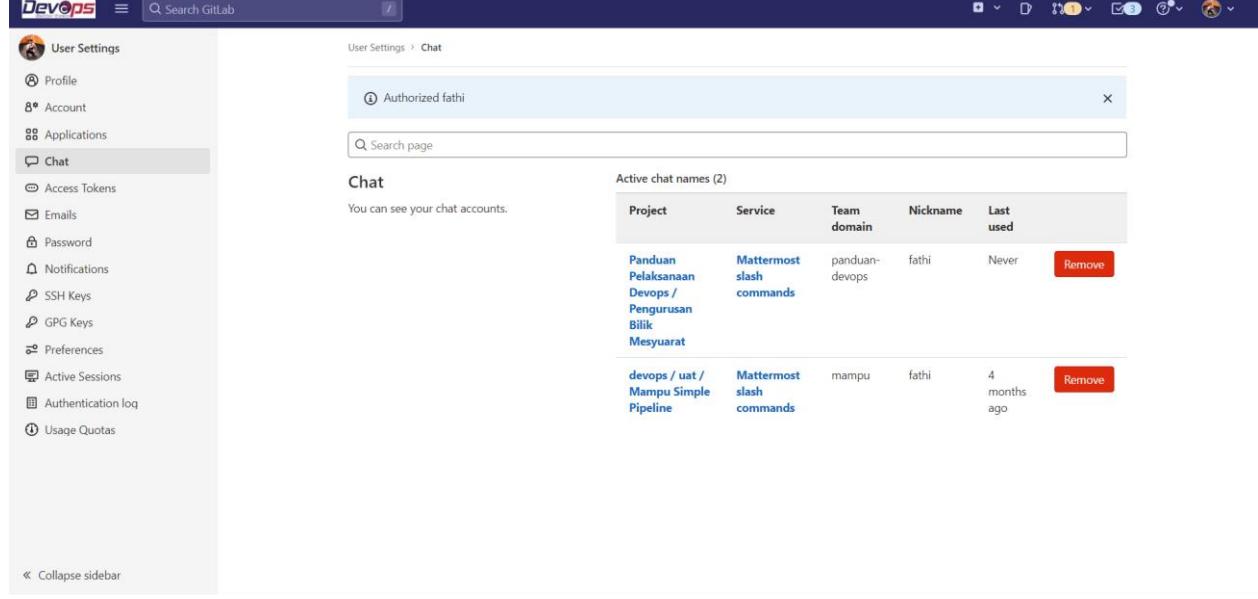
Tatacara	Paparan
<p>Notifikasi “<b>The service is now configured</b>” akan dipaparkan pada bahagian atas halaman [Rajah B-92].</p>	 <p>This service is now configured</p> <p>Mattermost slash commands</p> <p>Use this service to perform common tasks in your project by entering slash commands in Mattermost. How do I configure this integration?</p> <p>After you configure the integration, view your new Mattermost commands by entering <code>/trigger &gt; help</code></p> <p>Enable integration</p> <p><input checked="" type="checkbox"/> Active</p> <p>Enter new token</p> <p>XXooXXooXXooXXooXXooXXooXXoo</p> <p>Leave blank to use your current token.</p> <p>Save changes Cancel</p> <p><b>Rajah B-92: Gitlab – Paparan Halaman Mattermost <i>Slash Commands</i></b></p>

Tatacara	Paparan
<p>Paparan halaman <i>Channels</i> [Rajah B-93].</p> <ol style="list-style-type: none"><li>1. Akses semula pada halaman Mattermost dan klik pada <i>channel</i> yang terlibat.</li></ol>	 <p>The screenshot shows the Mattermost interface. On the left, there's a sidebar with user icons (GI, MA, PA) and a search bar. Below it, under 'CHANNELS', three channels are listed: 'Off-Topic', 'Sistem Tempahan Bilik M...', and 'Town Square'. The 'Sistem Tempahan Bilik M...' channel is highlighted with a red box. The main pane displays the 'Sistem Tempahan Bilik Mesyuarat' channel. It has a header with a star icon and a 'Search' bar. Below the header, it says 'Beginning of Sistem Tempahan Bilik Mesyuarat'. A message from 'fathi' dated November 24, 2022, states: 'This is the start of the Sistem Tempahan Bilik Mesyuarat channel, created by fathi on November 24, 2022. Any member can join and read this channel. This channel's purpose is: channel ini bagi tujuan komunikasi antara pasukan bagi pembangunan sistem aplikasi tempahan bilik mesyuarat.' At the bottom, there are buttons for 'Add members to this channel', 'Create a board', and 'Set a Header'.</p>

**Rajah B-93: Mattermost – Paparan Halaman *Channels***

Tatacara	Paparan
<p>Paparan halaman <i>Channels</i> [Rajah B-94].</p> <ol style="list-style-type: none"><li>1. Masukkan <i>Command trigger word</i> (nama projek berdasarkan maklumat ujian) pada ruangan chat bermula dengan slash('/) disusuli dengan nama <i>project</i> dan <i>command</i> “<i>help</i>”. Contoh: “/pengurusan-bilik-mesyuarat <i>help</i>”.</li></ol>	 <p>The screenshot shows the 'Channels' page in GitLab. On the left, there's a sidebar with user icons (GI, MA, PA) and a search bar. The main area is titled 'Sistem Tempahan Bilik Mesyuarat'. It displays a message from 'fathi' at 6:20 AM: '/pengurusan-bilik-mesyuarat [help]'. This message is highlighted with a red box.</p> <p><b>Rajah B-94: Gitlab – Paparan Halaman <i>Channels</i></b></p>

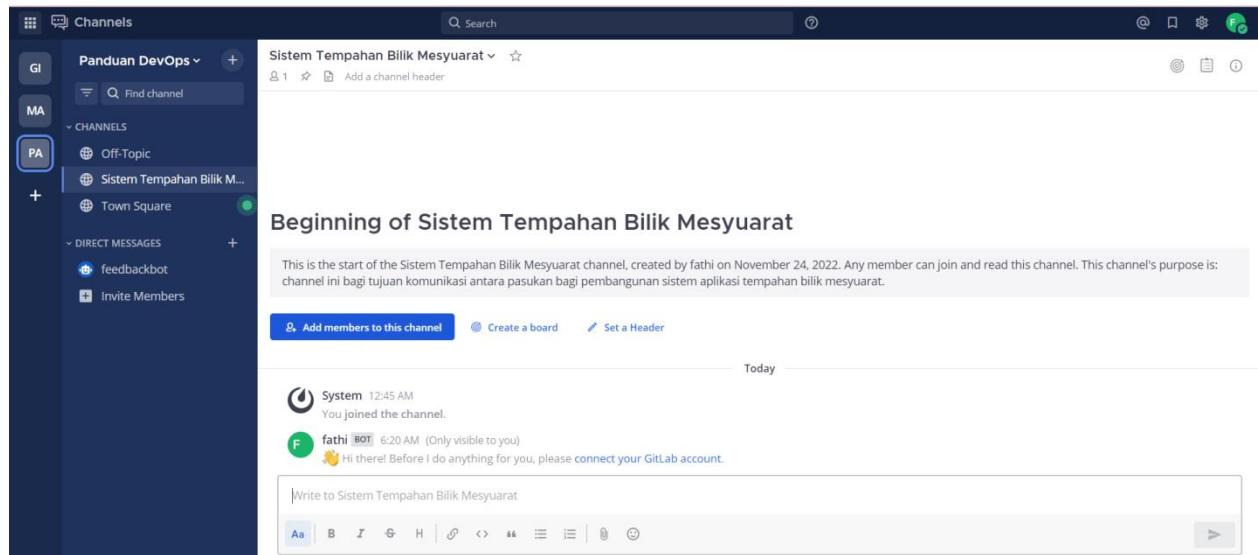
Tatacara	Paparan
<p>Paparan halaman <i>channel</i> [Rajah B-95].</p> <ol style="list-style-type: none"> <li>1. Klik pada pautan “<b>connect your GitLab account</b>”.</li> </ol>	<p><b>Beginning of Sistem Tempahan Bilik Mesyuarat</b></p>  <p>This is the start of the Sistem Tempahan Bilik Mesyuarat channel, created by fathi on November 24, 2022. Any member can join and read this channel. This channel's purpose is: channel ini bagi tujuan komunikasi antara pasukan bagi pembangunan sistem aplikasi tempahan bilik mesyuarat.</p> <p>Add members to this channel   Create a board   Set a Header</p> <p>Today</p> <p>System 12:45 AM You joined the channel.</p> <p>fathi BOT 6:20 AM (Only visible to you) Hi there! Before I do anything for you, please <a href="#">connect your GitLab account</a></p> <p>Write to Sistem Tempahan Bilik Mesyuarat</p> <p>Rajah B-95: Gitlab – Paparan Halaman <i>Channel</i></p>
<p>Halaman pengesahan penggunaan akaun GitLab akan dipaparkan [Rajah B-96].</p> <ol style="list-style-type: none"> <li>1. Klik pada butang <b>Authorize</b>.</li> </ol>	 <p>Search GitLab</p> <p>User Settings &gt; User Settings</p> <p>Search page</p> <p>Authorization required</p> <p>Authorize fathi to use your account?</p> <p>Authorize Deny</p> <p>Rajah B-96: Gitlab – Paparan Halaman Pengesahan Akaun Gitlab</p>

Tatacara	Paparan															
<p>Notifikasi “Authorized &lt;nama team&gt;” akan dipaparkan. Senarai projek yang berintegrasi dengan Mattermost juga dipaparkan pada halaman ini [Rajah B-97]. Projek GitLab tersenarai didalam <i>Active chat</i> dan menggunakan servis <i>Mattermost slash commands</i>.</p>	 <p>The screenshot shows the 'User Settings' page in GitLab, specifically the 'Chat' section. On the left sidebar, 'Chat' is highlighted. The main area displays two active chats:</p> <table border="1"><thead><tr><th>Project</th><th>Service</th><th>Team domain</th><th>Nickname</th><th>Last used</th></tr></thead><tbody><tr><td>Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat</td><td>Mattermost slash commands</td><td>panduan-devops</td><td>fathi</td><td>Never</td></tr><tr><td>devops / uat / Mampu Simple Pipeline</td><td>Mattermost slash commands</td><td>mampu</td><td>fathi</td><td>4 months ago</td></tr></tbody></table> <p>Below the table, there are 'Remove' buttons for each row.</p>	Project	Service	Team domain	Nickname	Last used	Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat	Mattermost slash commands	panduan-devops	fathi	Never	devops / uat / Mampu Simple Pipeline	Mattermost slash commands	mampu	fathi	4 months ago
Project	Service	Team domain	Nickname	Last used												
Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat	Mattermost slash commands	panduan-devops	fathi	Never												
devops / uat / Mampu Simple Pipeline	Mattermost slash commands	mampu	fathi	4 months ago												

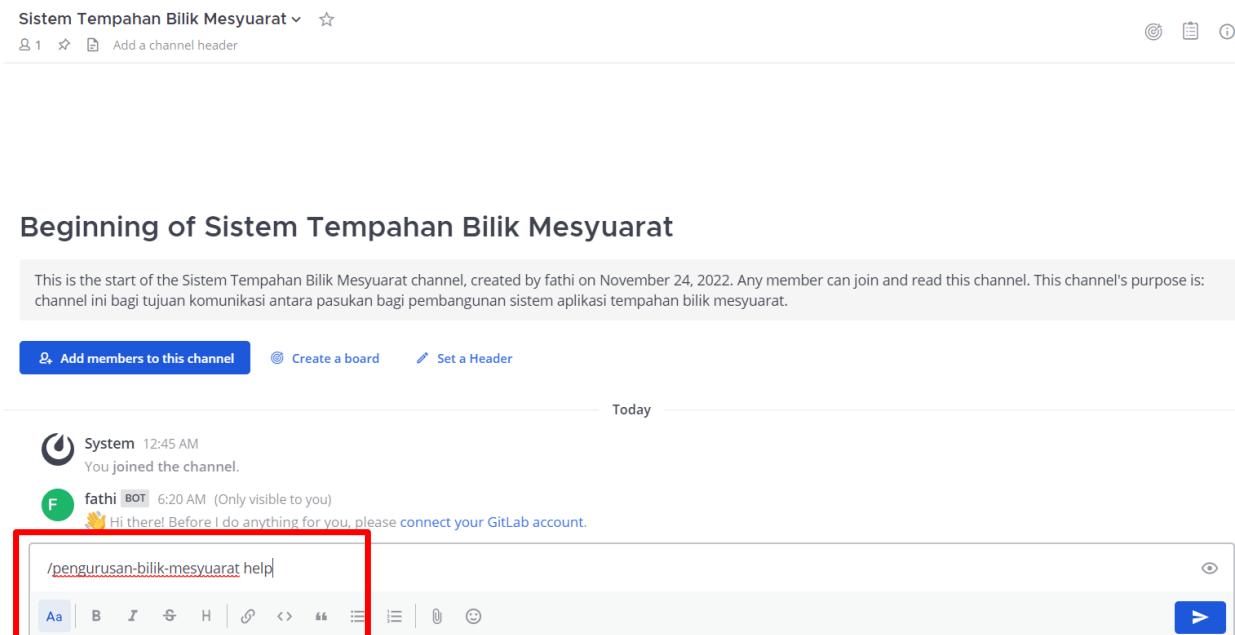
Rajah B-97: Gitlab – Paparan Halaman Menu Utama

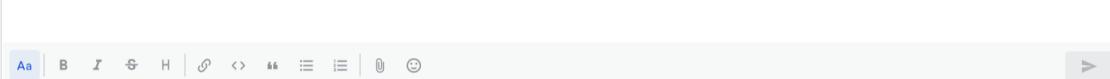
### Lampiran B-16: *Trigger Product Backlog pada Mattermost [A14]*

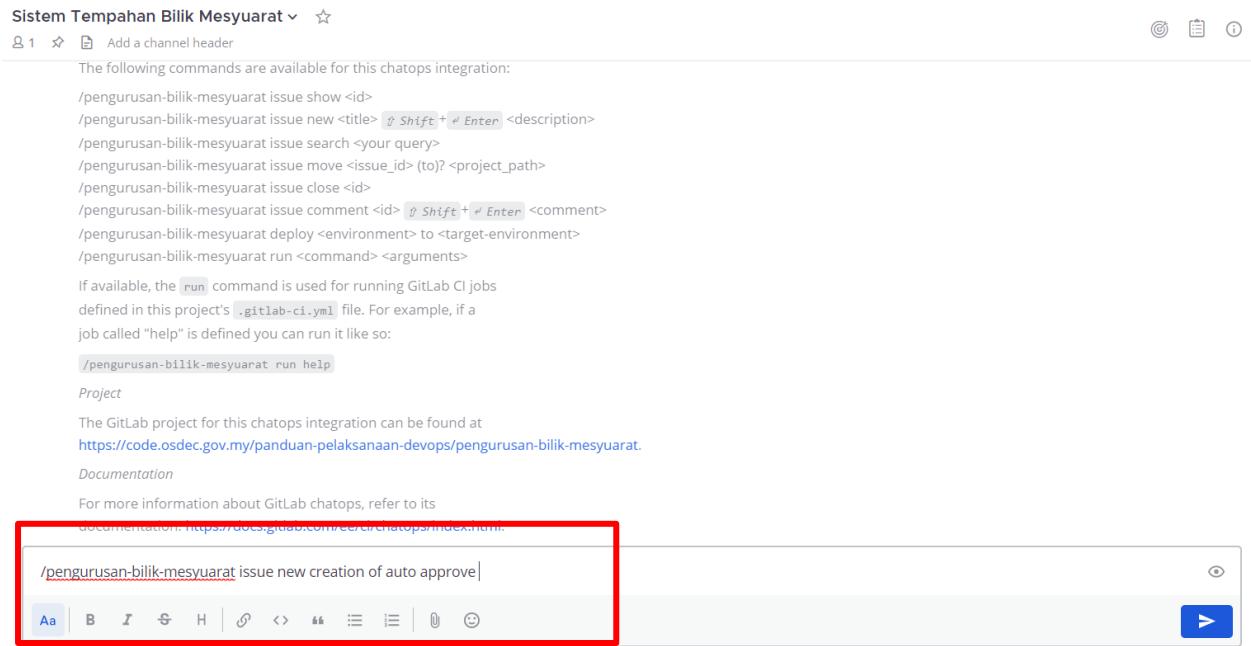
ChatOps Mattermost mempunyai kebolehan untuk *create new GitLab Issues* melalui *command line* pada *channel*. Maka, dengan menggunakan ciri ini, *product backlog* boleh diusulkan oleh ahli pasukan semasa perbincangan pada saluran komunikasi tersebut dan seterusnya GitLab *Issues* akan diwujudkan secara automatik.

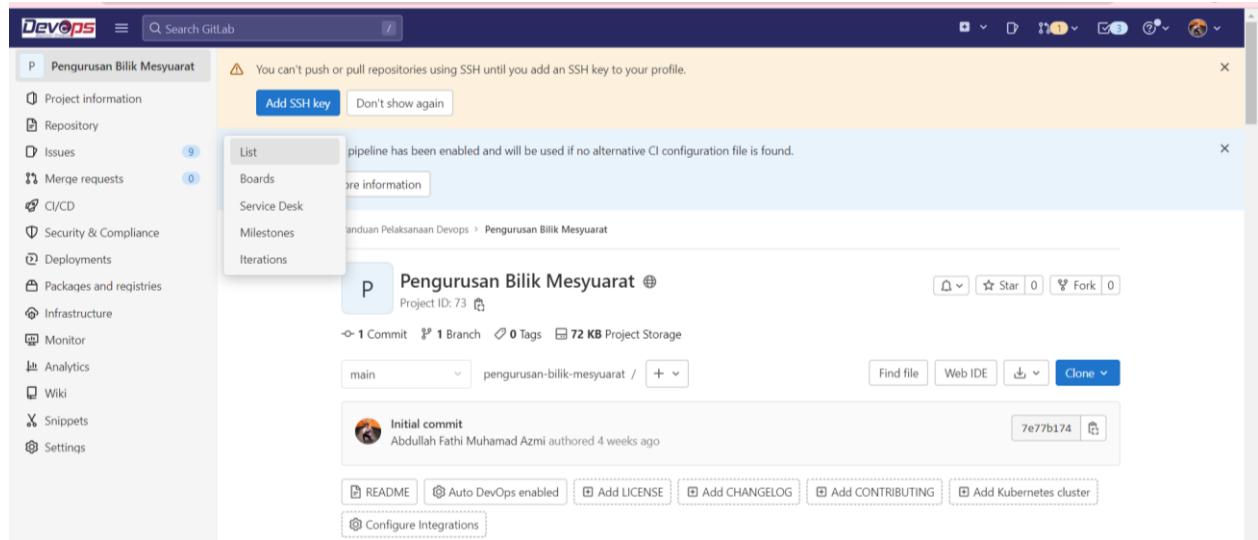
Tatacara	Paparan
Log masuk ke <i>channel</i> pada Mattermost [Rajah B-98].	 <p>Beginning of Sistem Tempahan Bilik Mesyuarat</p> <p>This is the start of the Sistem Tempahan Bilik Mesyuarat channel, created by fathi on November 24, 2022. Any member can join and read this channel. This channel's purpose is: channel ini bagi tujuan komunikasi antara pasukan bagi pembangunan sistem aplikasi tempahan bilik mesyuarat.</p> <p>System 12:45 AM You joined the channel.</p> <p>fathi (@BOT) 6:20 AM (Only visible to you) Hi there! Before I do anything for you, please connect your GitLab account.</p> <p>Write to Sistem Tempahan Bilik Mesyuarat</p>

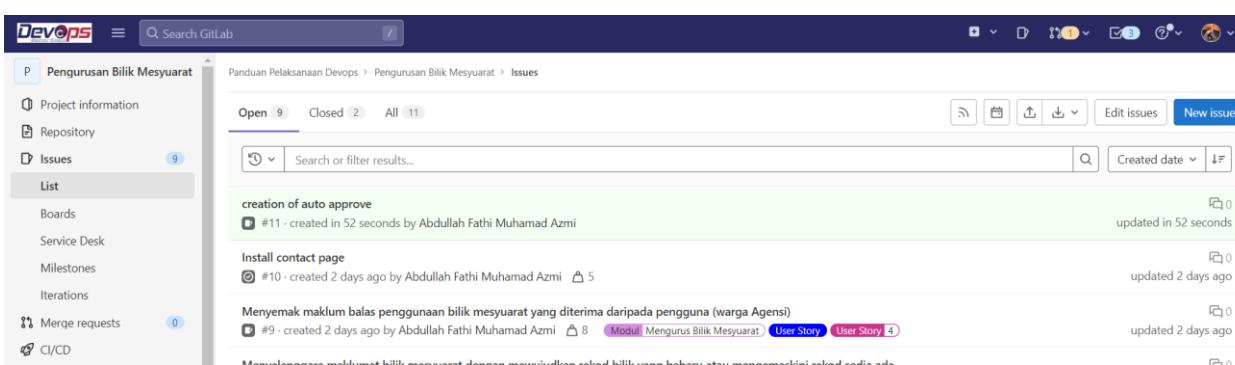
Rajah B-98: Gitlab – Paparan Halaman Channel

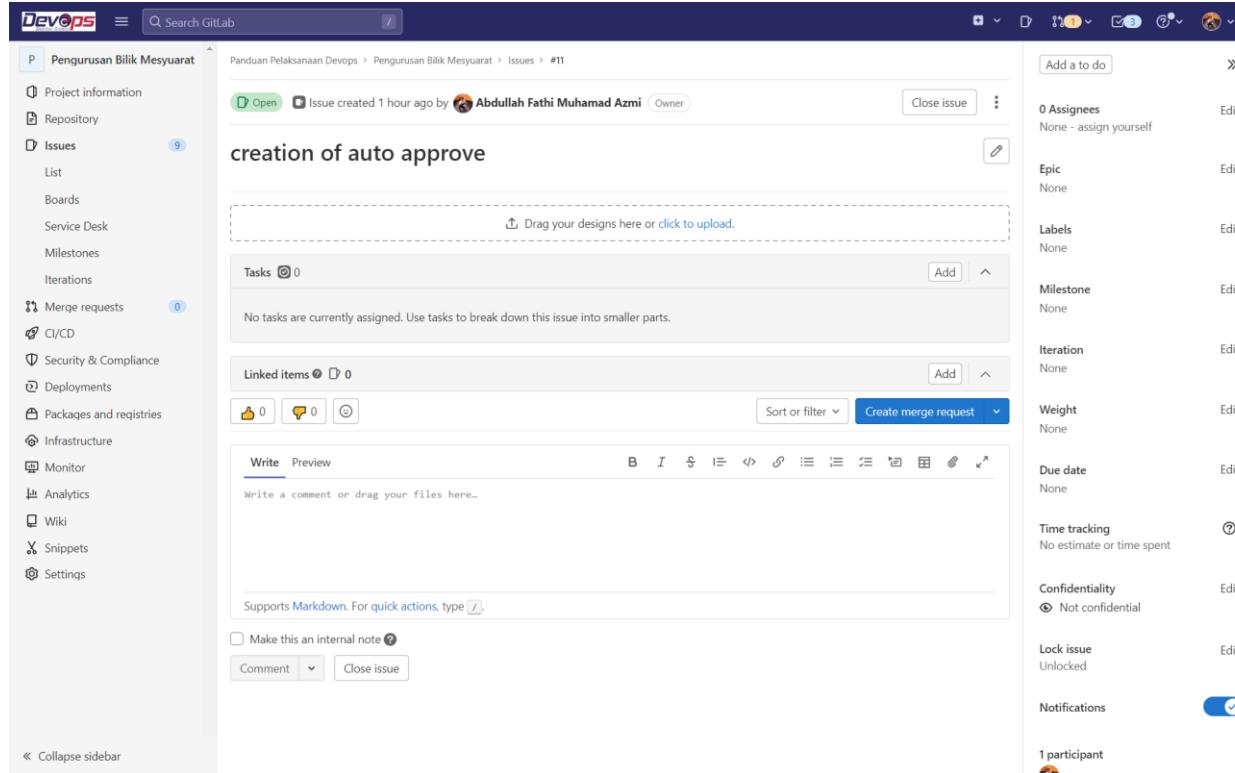
Tatacara	Paparan
<p>Pastikan anda berada pada <i>channel</i> yang dijana [Rajah B-99].</p> <p>1. Masukkan <i>Command trigger word</i> (nama projek berdasarkan maklumat ujian) pada ruangan chat bermula dengan <i>slash(‘/’)</i> disusuli dengan nama <i>project</i> dan <i>command</i> “<i>help</i>”. Contoh: “/pengurusan-bilik-mesyuarat help”.</p>	 <p>Sistem Tempahan Bilik Mesyuarat</p> <p>This is the start of the Sistem Tempahan Bilik Mesyuarat channel, created by fathi on November 24, 2022. Any member can join and read this channel. This channel's purpose is: channel ini bagi tujuan komunikasi antara pasukan bagi pembangunan sistem aplikasi tempahan bilik mesyuarat.</p> <p>/ Add members to this channel Create a board Set a Header</p> <p>System 12:45 AM You joined the channel.</p> <p>fathi BOT 6:20 AM (Only visible to you) Hi there! Before I do anything for you, please connect your GitLab account.</p> <p>/pengurusan-bilik-mesyuarat help</p> <p>Rajah B-99: Gitlab – Paparan Halaman Channel</p>

Tatacara	Paparan
<p>Reply dari BOT akan memparkan senarai <i>command</i> yang boleh digunakan bagi integrasi Mattermost dan GitLab (chatops) ini [Rajah B-100].</p>	<p><b>Beginning of Sistem Tempahan Bilik Mesyuarat</b></p> <p>This is the start of the Sistem Tempahan Bilik Mesyuarat channel, created by fathi on November 24, 2022. Any member can join and read this channel. This channel's purpose is: channel ini bagi tujuan komunikasi antara pasukan bagi pembangunan sistem aplikasi tempahan bilik mesyuarat.</p> <p><a href="#">Add members to this channel</a> <a href="#">Create a board</a> <a href="#">Set a Header</a></p> <p>Today</p> <p> System 12:45 AM You joined the channel.</p> <p> fathi BOT 6:20 AM (Only visible to you) Hi there! Before I do anything for you, please <a href="#">connect your GitLab account</a>.</p> <p> fathi BOT 6:30 AM (Only visible to you) <i>Available commands</i></p> <p>The following commands are available for this chatops integration:</p> <pre>/pengurusan-bilik-mesyuarat issue show &lt;id&gt; /pengurusan-bilik-mesyuarat issue new &lt;title&gt; <i>Shift + Enter</i> &lt;description&gt; /pengurusan-bilik-mesyuarat issue search &lt;your query&gt; /pengurusan-bilik-mesyuarat issue move &lt;issue_id&gt; (to)? &lt;project_path&gt; /pengurusan-bilik-mesyuarat issue close &lt;id&gt; /pengurusan-bilik-mesyuarat issue comment &lt;id&gt; <i>Shift + Enter</i> &lt;comment&gt; /pengurusan-bilik-mesyuarat deploy &lt;environment&gt; to &lt;target-environment&gt; /pengurusan-bilik-mesyuarat run &lt;command&gt; &lt;arguments&gt;</pre> <p>If available, the <code>run</code> command is used for running GitLab CI jobs defined in this project's <code>.gitlab-ci.yml</code> file. For example, if a job called "help" is defined you can run it like so:</p> <pre>/pengurusan-bilik-mesyuarat run help</pre> <p><i>Project</i></p> <p>The GitLab project for this chatops integration can be found at <a href="https://code.osdec.gov.my/panduan-pelaksanaan-devops/pengurusan-bilik-mesyuarat">https://code.osdec.gov.my/panduan-pelaksanaan-devops/pengurusan-bilik-mesyuarat</a>.</p> <p><i>Documentation</i></p> <p>For more information about GitLab chatops, refer to its documentation: <a href="https://docs.gitlab.com/ee/ci/chatops/index.html">https://docs.gitlab.com/ee/ci/chatops/index.html</a>.</p>  <p><b>Rajah B-100: Gitlab – Paparan Dari BOT</b></p>

Tatacara	Paparan
<p>Paparan halaman <i>channel</i> : Gitlab – Paparan Halaman <i>Channel</i> [Rajah B-101].</p> <p>1. Masukkan <i>Command trigger word</i> (nama projek berdasarkan maklumat ujian) pada ruangan chat bermula dengan <i>slash('')</i> disusuli dengan nama projek dan <i>command “issue new create module user”</i> dan. Seterusnya tekan “<b>Enter</b>” pada <i>Keyboard</i> Contoh: “<b>/pengurusan-bilik-mesyuarat issue new creation of auto approve</b>”.</p>	 <p>Sistem Tempahan Bilik Mesyuarat <span style="color: #ccc;">☆</span></p> <p>1 Add a channel header</p> <p>The following commands are available for this chatops integration:</p> <pre>/pengurusan-bilik-mesyuarat issue show &lt;id&gt; /pengurusan-bilik-mesyuarat issue new &lt;title&gt; ⌘ Shift + ⌘ Enter &lt;description&gt; /pengurusan-bilik-mesyuarat issue search &lt;your query&gt; /pengurusan-bilik-mesyuarat issue move &lt;issue_id&gt; (to)? &lt;project_path&gt; /pengurusan-bilik-mesyuarat issue close &lt;id&gt; /pengurusan-bilik-mesyuarat issue comment &lt;id&gt; ⌘ Shift + ⌘ Enter &lt;comment&gt; /pengurusan-bilik-mesyuarat deploy &lt;environment&gt; to &lt;target-environment&gt; /pengurusan-bilik-mesyuarat run &lt;command&gt; &lt;arguments&gt;</pre> <p>If available, the <code>run</code> command is used for running GitLab CI jobs defined in this project's <code>.gitlab-ci.yml</code> file. For example, if a job called "help" is defined you can run it like so:</p> <pre>/pengurusan-bilik-mesyuarat run help</pre> <p><i>Project</i></p> <p>The GitLab project for this chatops integration can be found at <a href="https://code.osdec.gov.my/panduan-pelaksanaan-devops/pengurusan-bilik-mesyuarat">https://code.osdec.gov.my/panduan-pelaksanaan-devops/pengurusan-bilik-mesyuarat</a>.</p> <p><i>Documentation</i></p> <p>For more information about GitLab chatops, refer to its documentation at <a href="https://docs.gitlab.com/ce/chatops/index.html">https://docs.gitlab.com/ce/chatops/index.html</a>.</p> <p>/pengurusan-bilik-mesyuarat issue new creation of auto approve</p>
<p>Reply dari BOT akan dipaparkan pada halaman ini [Rajah B-102].</p>	<p><b>fathi</b> BOT 6:35 AM I created an issue on @fathi's behalf: #11 in Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat</p> <p><b>Rajah B-102: Gitlab – Paparan Dari BOT</b></p>

Tatacara	Paparan
Paparan halaman projek [Rajah B-103]. <ol style="list-style-type: none"><li>1. Pada halaman <i>project</i> di gitlab, halakan cursor pada <b>Issues</b>.</li><li>2. Klik sub-menu <b>List</b>.</li></ol>	 <p><b>Rajah B-103: Gitlab – Paparan Halaman Projek</b></p>

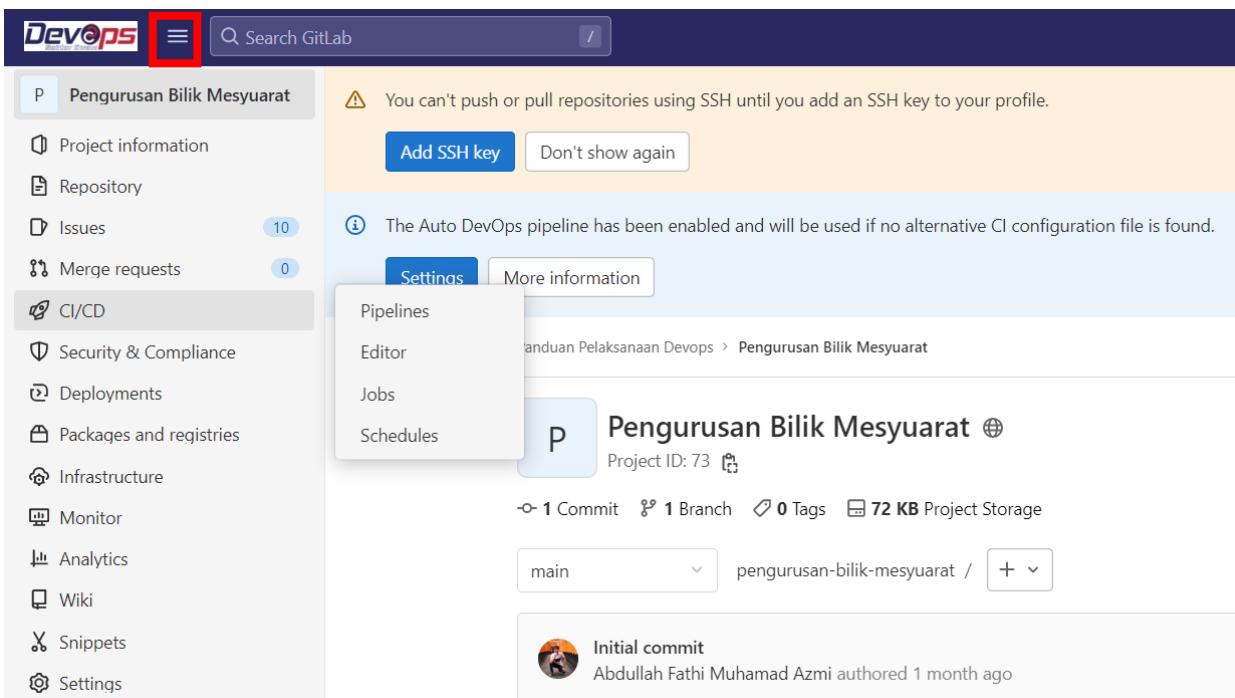
Tatacara	Paparan
Halaman senarai isu akan dipaparkan [Rajah B-104].	 <p>Rajah B-104: Gitlab – Paparan Halaman Senarai Isu</p>

Tatacara	Paparan
Halaman perincian isu memaparkan data berdasarkan chat/input dari Mattermost [Rajah B-105].	 <p>Pengurusan Bilik Mesyuarat</p> <p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; Issues &gt; #11</p> <p>creation of auto approve</p> <p>Tasks 0</p> <p>No tasks are currently assigned. Use tasks to break down this issue into smaller parts.</p> <p>Linked items 0</p> <p>Sort or filter ▾ Create merge request ▾</p> <p>Write Preview</p> <p>Write a comment or drag your files here...</p> <p>Supports Markdown. For quick actions, type /.</p> <p>Make this an internal note ⓘ</p> <p>Comment ▾ Close issue</p> <p>Add a to do ▾</p> <p>0 Assignees None - assign yourself</p> <p>Epic None</p> <p>Labels None</p> <p>Milestone None</p> <p>Iteration None</p> <p>Weight None</p> <p>Due date None</p> <p>Time tracking No estimate or time spent</p> <p>Confidentiality ⓘ Not confidential</p> <p>Lock issue Unlocked</p> <p>Notifications</p> <p>1 participant</p>

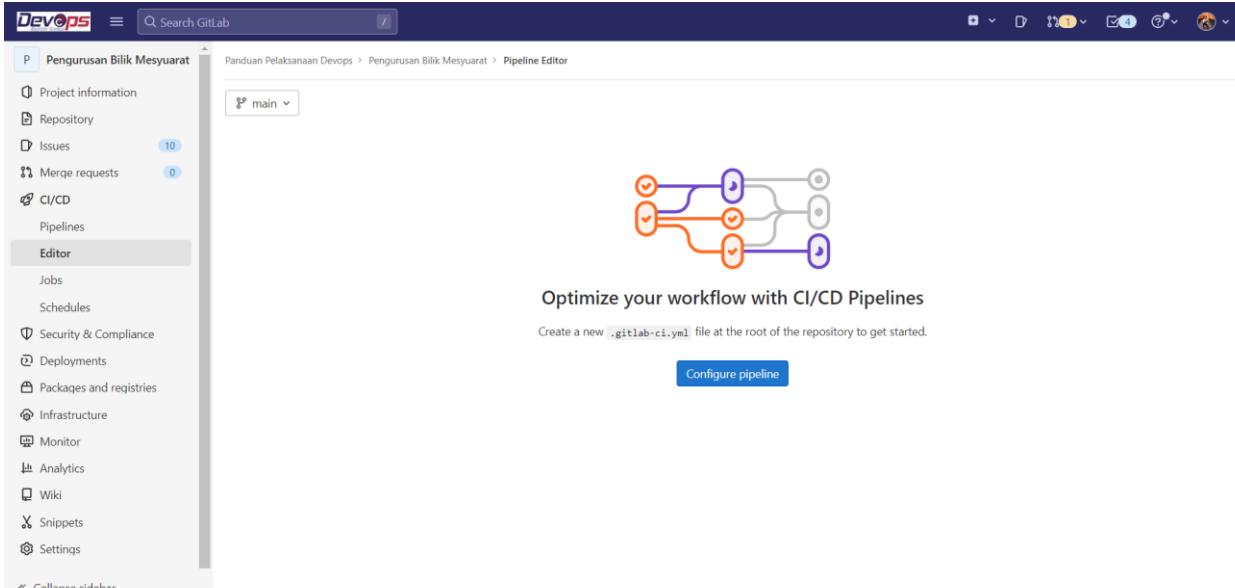
Rajah B-105: Gitlab – Paparan Halaman Data Dari Mattermost

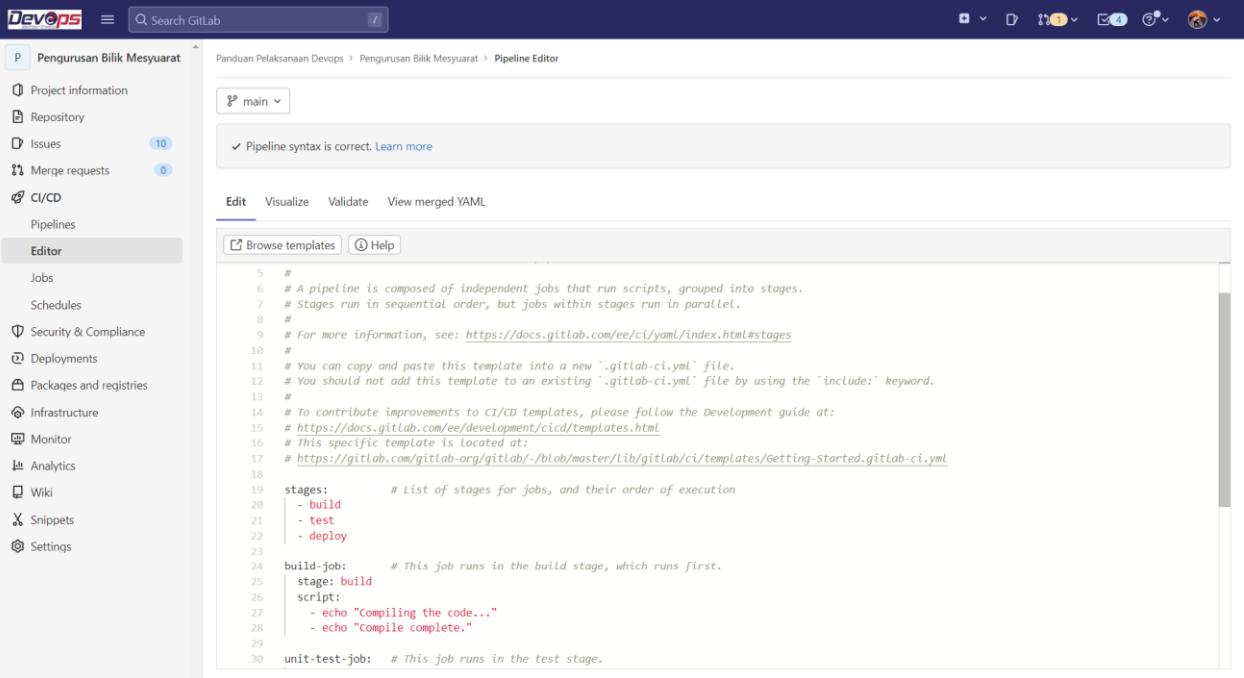
## Lampiran B-17: Perancangan Pelaksanaan *Pipeline CI/CD*

Penggunaan GitLab CI/CD pada para 4.2.4 Peringkat pengekodan. Berikut merupakan tatacara untuk mewujudkan, mengakses dan mengemaskini fail `.gitlab-ci.yml`.

Tatacara	Peranan
<p>Paparan halaman menu utama [Rajah B-106].</p> <ol style="list-style-type: none"> <li>1. Klik <b>Menu</b>.</li> <li>2. Pilih <b>Project</b>.</li> <li>3. Pilih <b>CI/CD</b>.</li> <li>4. Klik <b>Editor</b>.</li> </ol>	 <p>The screenshot shows the GitLab interface. At the top, there is a navigation bar with the 'DevOps' logo, a search bar, and a user profile icon. Below the navigation bar is a sidebar with various project management options: Project information, Repository, Issues (10), Merge requests (0), CI/CD (selected), Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings. The main content area displays a project titled 'Pengurusan Bilik Mesyuarat'. It shows basic project statistics: 1 Commit, 1 Branch, 0 Tags, and 72 KB Project Storage. A commit history is listed under the heading 'Initial commit' by Abdullah Fathi Muhamad Azmi, dated one month ago.</p>

**Rajah B-106: Gitlab – Paparan Halaman Menu Utama**

Tatacara	Peranan
Paparan konfigurasi CI/CD [Rajah B-107]. <b>1. Klik <i>Configure pipeline</i>.</b>	 <p>The screenshot shows the GitLab Pipeline Editor interface. On the left, there is a sidebar with various project management and development tools like Project information, Repository, Issues, Merge requests, CI/CD, Pipelines, and Editor (which is selected). The main area displays a complex CI/CD pipeline diagram with nodes connected by arrows in orange and purple. Below the diagram, the text "Optimize your workflow with CI/CD Pipelines" is displayed, along with a button labeled "Configure pipeline". At the bottom of the page, the caption "Rajah B-107: Gitlab – Paparan Halaman Konfigurasi CI/CD Pipelines" is present.</p> <p>Rajah B-107: Gitlab – Paparan Halaman Konfigurasi CI/CD Pipelines</p>

Tatacara	Peranan
<p>Pengguna boleh menulis skrip pada ruangan editor [Rajah B-108].</p> <ol style="list-style-type: none"> <li>Setelah selesai penulisan skrip, klik <b>Commit changes</b> bagi membenarkan <i>pipeline</i> GitLab menyimpan konfigurasi.</li> </ol>	 <pre> 5  # 6  # A pipeline is composed of independent jobs that run scripts, grouped into stages. 7  # Stages run in sequential order, but jobs within stages run in parallel. 8  # 9  # For more information, see: <a href="https://docs.gitlab.com/ee/ci/yaml/index.html#stages">https://docs.gitlab.com/ee/ci/yaml/index.html#stages</a> 10 # 11 # You can copy and paste this template into a new '.gitlab-ci.yml' file. 12 # You should not add this template to an existing '.gitlab-ci.yml' file by using the 'include:' keyword. 13 # 14 # To contribute improvements to CI/CD templates, please follow the Development guide at: 15 # <a href="https://docs.gitlab.com/ee/development/cicd/templates.html">https://docs.gitlab.com/ee/development/cicd/templates.html</a> 16 # This specific template is located at: 17 # <a href="https://gitlab.com/gitlab-org/gitlab/-/blob/master/lib/gitlab/ci/templates/Getting-Started.gitlab-ci.yml">https://gitlab.com/gitlab-org/gitlab/-/blob/master/lib/gitlab/ci/templates/Getting-Started.gitlab-ci.yml</a> 18 19 stages:          # List of stages for jobs, and their order of execution 20   - build 21   - test 22   - deploy 23 24 build-job:      # This job runs in the build stage, which runs first. 25   stage: build 26   script: 27     - echo "Compiling the code..." 28     - echo "Compile complete." 29 30 unit-test-job:  # This job runs in the test stage. </pre> <p>Commit message: Update .gitlab-ci.yml file</p> <p>Branch: main</p> <p><b>Commit changes</b> Reset</p> <p>&lt;&lt; Collapse sidebar</p> <p><b>Rajah B-108: Gitlab – Paparan Ruangan Editor</b></p>

**Lampiran B-18: Templat Kes Pengujian**

<b>ID Kes Ujian</b>	TC-BF-BM-MP-PR-01		
<b>Nama Kes Ujian</b>	Mendaftar profil pengguna baharu.		
<b>Keterangan Kes Ujian</b>	Sebagai Pengguna (warga MAMPU), saya BOLEH mendaftar profil pengguna baharu SUPAYA pengguna boleh mendaftar masuk sistem tempahan bilik mesyuarat.		
<b>ID Product Backlog</b>	PB-BF-BM-MP-PR-01		
<b>Pra-Syarat</b>	Nama pengguna dan alamat email yang sah untuk didaftarkan.		
<b>Input/ Langkah-Langkah Ujian</b>	<b>Jangkaan Hasil</b>	<b>Hasil Sebenar</b>	<b>Status (Lulus/Gagal)</b>
1. Daftar nama dan email pengguna.	<ul style="list-style-type: none"> <li>• Antara muka daftar pengguna baharu dipaparkan.</li> <li>• Sistem akan memaparkan mesej pop-up “Pendaftaran pengguna baharu berjaya”.</li> </ul>		

## Lampiran B-19: Tahap Kritikal

**Jadual 0-1: Tahap Kritikal. Sumber: Item (g), Langkah 5, Pelan Induk Pengujian [F5.1] KRISA**

Bil.	Tahap Kritikal	Keterangan
1.	Tahap 1 – Tinggi	<ul style="list-style-type: none"> <li>i. <i>Defects</i> yang memberi kesan yang besar kepada fungsi utama, data atau operasi pengguna yang tiada jalan penyelesaian.</li> <li>ii. Ujian manual atau automatik tidak boleh diteruskan lagi dalam kes ujian yang berkenaan (tiada penyelesaian).</li> </ul>
2.	Tahap 2 – Sederhana	<ul style="list-style-type: none"> <li>i. <i>Defects</i> yang memberi kesan yang sederhana kepada fungsi sistem, data atau operasi pengguna dan mempunyai jalan penyelesaian.</li> <li>ii. Kes ujian atau prosedur boleh dilengkapkan, tetapi menghasilkan <i>output</i> yang salah apabila maklumat yang sah atau tidak sah dimasukkan.</li> </ul>
3.	Tahap 3 – Rendah	<ul style="list-style-type: none"> <li>i. <i>Defects</i> yang tidak mempengaruhi fungsi atau data, tidak memerlukan jalan penyelesaian dan tidak memberi kesan kepada produktiviti dan kecekapan pengguna.</li> <li>ii. Semua kes ujian dan prosedur diluluskan seperti yang tertulis, tetapi mungkin terdapat semakan kecil, perubahan kosmetik, format laporan. Kecacatan ini tidak menjelaskan pelaksanaan fungsi sistem.</li> </ul>

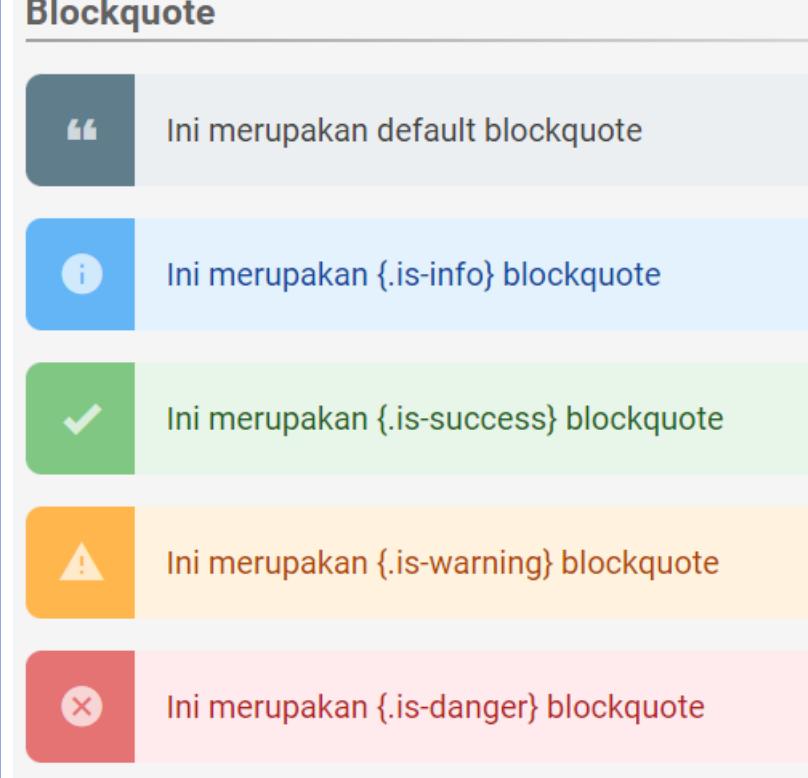
**Lampiran B-20: Templat *Traceability Matrix* Ujian**

ID Scenario Ujian	ID Use Case	ID Kes Ujian	Keterangan Kes Ujian

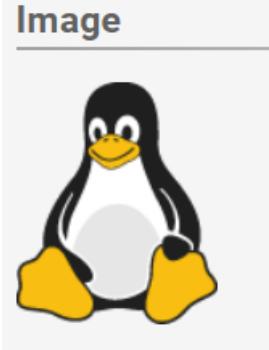
## Lampiran B-21: Markdown Cheat Sheet

Markdown merupakan bahasa *lightweight* markup dengan menggunakan format teks biasa. Markdown adalah sintaks *de-facto* untuk menulis dokumentasi pada repositori GitHub. Wiki.js menyokong spesifikasi CommonMark beserta *extensions* tambahan.

Elemen	Markdown Syntax	Paparan
Tajuk	# TAJUK 1 ## Tajuk 2 ### Tajuk 3	<p><b>Heading</b></p> <hr/> <h1>TAJUK 1</h1> <hr/> <h2>Tajuk 2</h2> <hr/> <h3>Tajuk 3</h3>
Bold	Ayat ini memaparkan contoh <b>teks bold</b>	<p><b>Bold</b></p> <hr/> <p>Ayat ini memaparkan contoh <b>teks bold</b></p>
Italic	Ayat ini memaparkan contoh <i>Teks Italic</i>	<p><b>Italic</b></p> <hr/> <p>Ayat ini memaparkan contoh <i>Teks Italic</i></p>

Elemen	Markdown Syntax	Paparan										
Blockquote	<pre>&gt; Ini merupakan default blockquote  &gt; Ini merupakan {.is-info} blockquote {.is-info}  &gt; Ini merupakan {.is-success} blockquote {.is-success}  &gt; Ini merupakan {.is-warning} blockquote {.is-warning}  &gt; Ini merupakan {.is-danger} blockquote {.is-danger}</pre>	<p><b>Blockquote</b></p>  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #337ab7; color: white; padding: 5px;">“</th> <th style="padding: 5px;">Ini merupakan default blockquote</th> </tr> </thead> <tbody> <tr> <td style="background-color: #66b3ff; color: white; padding: 5px;">i</td> <td style="padding: 5px;">Ini merupakan {.is-info} blockquote</td> </tr> <tr> <td style="background-color: #66cc66; color: white; padding: 5px;">✓</td> <td style="padding: 5px;">Ini merupakan {.is-success} blockquote</td> </tr> <tr> <td style="background-color: #ffcc66; color: white; padding: 5px;">⚠</td> <td style="padding: 5px;">Ini merupakan {.is-warning} blockquote</td> </tr> <tr> <td style="background-color: #ff6666; color: white; padding: 5px;">✖</td> <td style="padding: 5px;">Ini merupakan {.is-danger} blockquote</td> </tr> </tbody> </table>	“	Ini merupakan default blockquote	i	Ini merupakan {.is-info} blockquote	✓	Ini merupakan {.is-success} blockquote	⚠	Ini merupakan {.is-warning} blockquote	✖	Ini merupakan {.is-danger} blockquote
“	Ini merupakan default blockquote											
i	Ini merupakan {.is-info} blockquote											
✓	Ini merupakan {.is-success} blockquote											
⚠	Ini merupakan {.is-warning} blockquote											
✖	Ini merupakan {.is-danger} blockquote											

Elemen	Markdown Syntax	Paparan
Senarai bernombor	<ol style="list-style-type: none"> <li>Perkara pertama</li> <li>Perkara kedua</li> <li>Perkara ketiga</li> </ol>	<p><b>Ordered List</b></p> <ol style="list-style-type: none"> <li>Perkara pertama</li> <li>Perkara kedua</li> <li>Perkara ketiga</li> </ol>
Senarai tidak bernombor	<ul style="list-style-type: none"> <li>- Perkara pertama</li> <li>- Perkara kedua</li> <li>- Perkara ketiga</li> </ul>	<p><b>Unordered List</b></p> <ul style="list-style-type: none"> <li>▶ Perkara pertama</li> <li>▶ Perkara kedua</li> <li>▶ Perkara ketiga</li> </ul>
Kod	Ayat ini memaparkan contoh `kod`	<p><b>Code</b></p> <p>Ayat ini memaparkan contoh <code>kod</code></p>
Garisan melintang	---	<p><b>Horizontal Rule</b></p> <hr/>
Pautan	[Markdown Guide] ( <a href="https://www.markdownguide.org">https://www.markdownguide.org</a> )	<p><b>Link</b></p> <p><a href="https://www.markdownguide.org">Markdown Guide</a></p>

Elemen	Markdown Syntax	Paparan															
Imej	! [alt text] ( <a href="https://www.markdownguide.org/assets/images/tux.png">https://www.markdownguide.org/assets/images/tux.png</a> )	<p><b>Image</b></p> 															
Jadual	<p>Contoh Pertama sekiranya tiada tetapan pada jajaran ayat</p> <pre>  Perkara   Penerangan     -----   -----     Perkara pertama   Penerangan bagi perkara pertama     Perkara kedua   Penerangan bagi perkara kedua   {.dense}</pre> <p>Contoh kedua bagi menetapkan jajaran teks tersebut</p> <pre>  Perkara   Penerangan pertama   Penerangan kedua     Ayat berada pada lajur kiri   Ayat berada pada lajur tengah   Ayat berada pada lajur kanan     Perkara   Penerangan   Penerangan  </pre>	<p><b>Jadual</b></p> <p>Jadual berikut memaparkan contoh bagi paparan jadual</p> <p>Contoh Pertama sekiranya tiada tetapan pada jajaran ayat</p> <table border="1"> <thead> <tr> <th>Perkara</th><th>Penerangan</th></tr> </thead> <tbody> <tr> <td>Perkara pertama</td><td>Penerangan bagi perkara pertama</td></tr> <tr> <td>Perkara kedua</td><td>Penerangan bagi perkara kedua</td></tr> </tbody> </table> <p>Contoh kedua bagi menetapkan jajaran teks tersebut</p> <table border="1"> <thead> <tr> <th>Perkara</th><th>Penerangan pertama</th><th>Penerangan kedua</th></tr> </thead> <tbody> <tr> <td>Ayat berada pada lajur kiri</td><td>Ayat berada pada lajur tengah</td><td>Ayat berada pada lajur kanan</td></tr> <tr> <td>Perkara</td><td>Penerangan</td><td>Penerangan</td></tr> </tbody> </table>	Perkara	Penerangan	Perkara pertama	Penerangan bagi perkara pertama	Perkara kedua	Penerangan bagi perkara kedua	Perkara	Penerangan pertama	Penerangan kedua	Ayat berada pada lajur kiri	Ayat berada pada lajur tengah	Ayat berada pada lajur kanan	Perkara	Penerangan	Penerangan
Perkara	Penerangan																
Perkara pertama	Penerangan bagi perkara pertama																
Perkara kedua	Penerangan bagi perkara kedua																
Perkara	Penerangan pertama	Penerangan kedua															
Ayat berada pada lajur kiri	Ayat berada pada lajur tengah	Ayat berada pada lajur kanan															
Perkara	Penerangan	Penerangan															

Elemen	Markdown Syntax	Paparan
	<pre>  :---   :----:   ---:      Ayat berada pada lajur kiri    Ayat berada pada lajur tengah   Ayat berada pada lajur kanan       Perkara   Penerangan   Penerangan  </pre>	
Content Tabs	<pre>### Tabs {.tabset}  #### Tab Pertama  Perkara berkaitan tab pertama akan dipaparkan disini...  #### Tab Kedua  Perkara berkaitan tab kedua akan dipaparkan disini...  #### Tab Ketiga  Perkara berkaitan tab ketiga akan dipaparkan disini...</pre>	<p><b>Content Tabs</b></p> <p>Berikut merupakan contoh bagi penggunaan Tabs.</p> <div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-around;"> <span>Tab Pertama</span> <span>Tab Kedua</span> <span>Tab Ketiga</span> </div> <p>Perkara berkaitan tab pertama akan dipaparkan disini...</p>

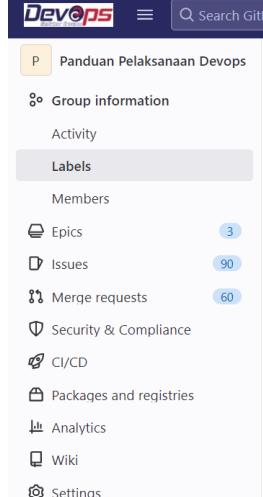
Elemen	Markdown Syntax	Paparan
Fenced Code Block	<pre>```php {     "firstName": "John",     "lastName": "Smith",     "age": 25 } ``` </pre>	<p><b>Fenced Code Block</b></p> <pre> 1   { 2       "firstName": "John", 3       "lastName": "Smith", 4       "age": 25 5   } </pre>
Nota Kaki	<p>Contoh ayat yang mempunyai nota kaki. [^1]</p> <p>[^1]: Ini adalah nota kaki.</p>	<p><b>Footnote</b></p> <p>Contoh ayat yang mempunyai nota kaki. <a href="#">[1]</a></p> <hr/> <p>1. Ini adalah nota kaki. <a href="#">←</a></p>
Strikethrough	Ayat ini perlu ~~dikeluarkan.~~	<p><b>Strikethrough</b></p> <p>Ayat ini perlu <del>dikeluarkan</del>.</p>

Elemen	Markdown Syntax	Paparan
Senarai Tugasan	<ul style="list-style-type: none"> <li>- [x] Tugasan ini telah diselesaikan</li> <li>- [ ] Tugasan ini belum diselesaikan</li> <li>- [ ] Tugasan ini akan diselesaikan</li> </ul>	<p><b>Task List</b></p> <p><input checked="" type="checkbox"/> Tugasan ini telah diselesaikan</p> <p><input type="checkbox"/> Tugasan ini belum diselesaikan</p> <p><input type="checkbox"/> Tugasan ini akan diselesaikan</p>
Emoji	<p>Emoji boleh ditulis dengan menggunakan format `:identifier:`</p> <p>Berikut antara contoh emoji</p> <p>:joy: :fire: :smile: :email: :email: :mailbox: :arrow_forward: :ok:</p> <p>(Sila rujuk [senarai emoji shortcodes] (<a href="https://gist.github.com/rxaviers/7360908">https://gist.github.com/rxaviers/7360908</a>) sebagai panduan)</p>	<p><b>Emoji</b></p> <p>Emoji boleh ditulis dengan menggunakan format <code>:identifier:</code></p> <p>Berikut antara contoh emoji</p> <p>       </p> <p>(Sila rujuk <a href="#">senarai emoji shortcodes</a> sebagai panduan)</p>
Subscript	Molekul air adalah H <sup>2</sup> O	<p><b>Subscript</b></p> <p>Molekul air adalah H<sub>2</sub>O</p>

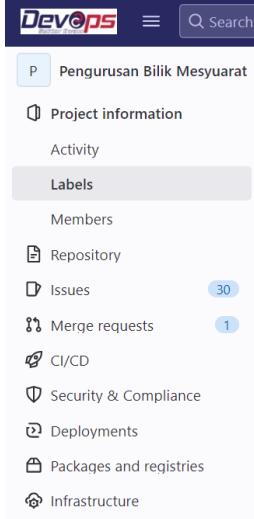
Elemen	Markdown Syntax	Paparan
Superscript	Konsep matematik kuasa dua adalah $X^2$	<b>Superscript</b> Konsep matematik kuasa dua adalah $X^2$

## Lampiran B-22: Mewujudkan GitLab Label

GitLab *Labels* merupakan *feature* daripada GitLab bagi pengelasan *Issue*. *Labels* boleh diperuntukkan pada GitLab *Issues*, *Merge Request* atau *Epic*. Berikut merupakan tatacara mewujudkan GitLab *Labels*:

Tatacara	Paparan
<p>Paparan menu utama mewujudkan Gitlab Label [Rajah B-109].</p> <p>1. Bagi pengelasan <b>Labels</b> pada peringkat <b>Groups</b>, pilih sub-menu <b>Labels</b> dibawah <b>Group Information</b>.</p>	 <p>The screenshot shows the GitLab main menu with the 'Labels' option highlighted under the 'Activity' section. Other options visible include Group information, Activity, Labels (highlighted), Members, Epics (3), Issues (90), Merge requests (60), Security &amp; Compliance, CI/CD, Packages and registries, Analytics, Wiki, and Settings.</p>

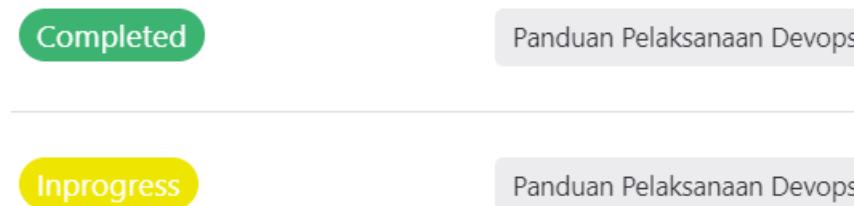
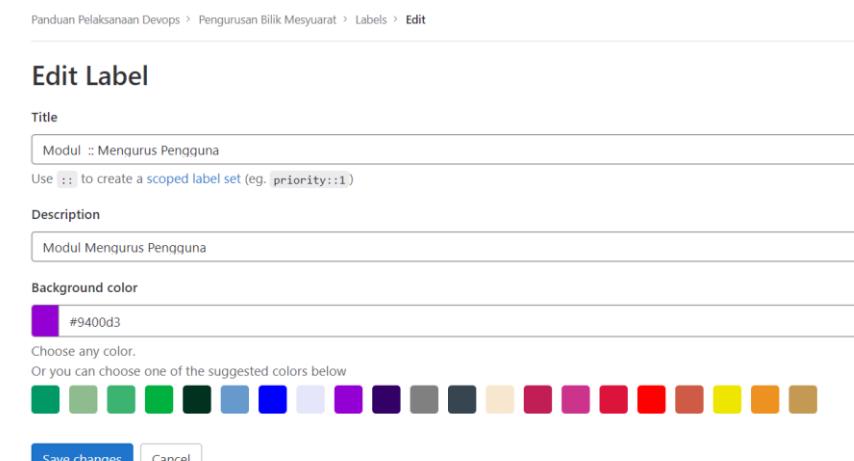
Rajah B-109: Gitlab – Paparan Menu Utama

Tatacara	Paparan
<p>Paparan menu utama mewujudkan Gitlab Label [Rajah B-110].</p> <p>1. Bagi pengelasan <b>Labels</b> pada peringkat <b>Epics</b> atau <b>Project</b>, pilih sub-menu <b>Labels</b> dibawah <b>Project Information</b>.</p>	 <p>The screenshot shows the GitLab interface with the 'Labels' option highlighted in the 'Project Information' section of the sidebar. Other visible options include Activity, Members, Repository, Issues (30), Merge requests (1), CI/CD, Security &amp; Compliance, Deployments, Packages and registries, and Infrastructure.</p> <p><b>Rajah B-110: Gitlab – Paparan Menu Utama</b></p>

Tatacara	Paparan																				
<p>Paparan menu utama mewujudkan Gitlab Label [Rajah B-111].</p> <p>1. Klik <b>New Label</b>.</p>	<p>Panduan Pelaksanaan Devops &gt; Labels</p> <p>All Subscribed Filter Name New label</p> <p>Labels can be applied to issues, merge requests, and epics. Group labels are available for any project within the group.</p> <p><b>Labels</b></p> <table border="1"><thead><tr><th>Label</th><th>Issues · Merge requests · Epics</th><th>⋮</th><th>Subscribe</th></tr></thead><tbody><tr><td>Completed</td><td>Issues · Merge requests · Epics</td><td>⋮</td><td>Subscribe</td></tr><tr><td>Inprogress</td><td>Issues · Merge requests · Epics</td><td>⋮</td><td>Subscribe</td></tr><tr><td>Sprint Task</td><td>Issues · Merge requests · Epics</td><td>⋮</td><td>Subscribe</td></tr><tr><td>User Story</td><td>Issues · Merge requests · Epics</td><td>⋮</td><td>Subscribe</td></tr></tbody></table> <p><b>Rajah B-111: Gitlab – Mewujudkan New Label</b></p>	Label	Issues · Merge requests · Epics	⋮	Subscribe	Completed	Issues · Merge requests · Epics	⋮	Subscribe	Inprogress	Issues · Merge requests · Epics	⋮	Subscribe	Sprint Task	Issues · Merge requests · Epics	⋮	Subscribe	User Story	Issues · Merge requests · Epics	⋮	Subscribe
Label	Issues · Merge requests · Epics	⋮	Subscribe																		
Completed	Issues · Merge requests · Epics	⋮	Subscribe																		
Inprogress	Issues · Merge requests · Epics	⋮	Subscribe																		
Sprint Task	Issues · Merge requests · Epics	⋮	Subscribe																		
User Story	Issues · Merge requests · Epics	⋮	Subscribe																		

Tatacara	Paparan
<p>Paparan menu utama mewujudkan Gitlab Label [Rajah B-111].</p> <ol style="list-style-type: none"><li>1. Masukkan <b>Title</b>.</li><li>2. Masukkan <b>Description</b>.</li><li>3. Pilih warna bagi <b>label</b>.</li><li>4. Klik <b>Create label</b>.</li></ol>	<p>Panduan Pelaksanaan Devops &gt; Labels &gt; New</p> <h3>New Label</h3> <p>Title</p> <input type="text"/> <p>Use <code>::</code> to create a scoped label set (eg. <code>priority::1</code>)</p> <p>Description</p> <input type="text"/> <p>Background color</p> <p>#6699cc</p> <p>Choose any color. Or you can choose one of the suggested colors below</p>  <p><input type="button" value="Create label"/> <input type="button" value="Cancel"/></p>

**Rajah B-112: Gitlab – Paparan New Label.**

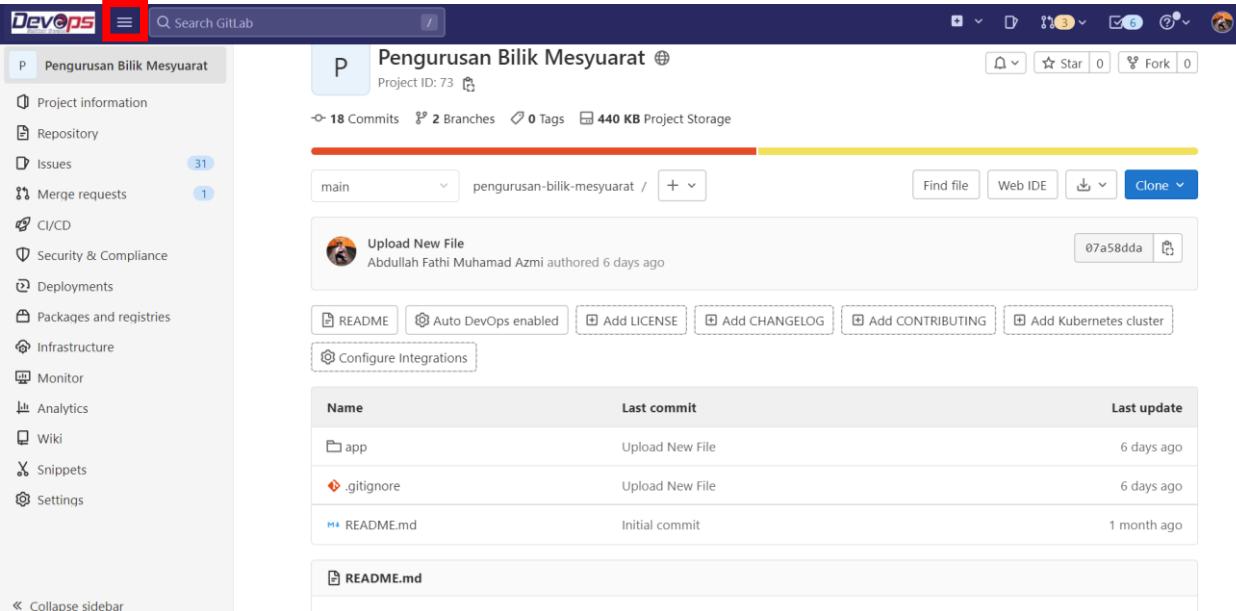
Tatacara	Paparan
Contoh paparan <b>labels</b> [Rajah B-113].	 <p><b>Rajah B-113: Gitlab – Paparan Labels</b></p>
Pasukan boleh menggunakan (⋮) untuk label berskop untuk mencatat <b>issues</b> , <b>merge request</b> dan <b>epics</b> dengan label saling eksklusif [Rajah B-114].	 <p><b>Rajah B-114: Gitlab – Paparan Edit Label</b></p>

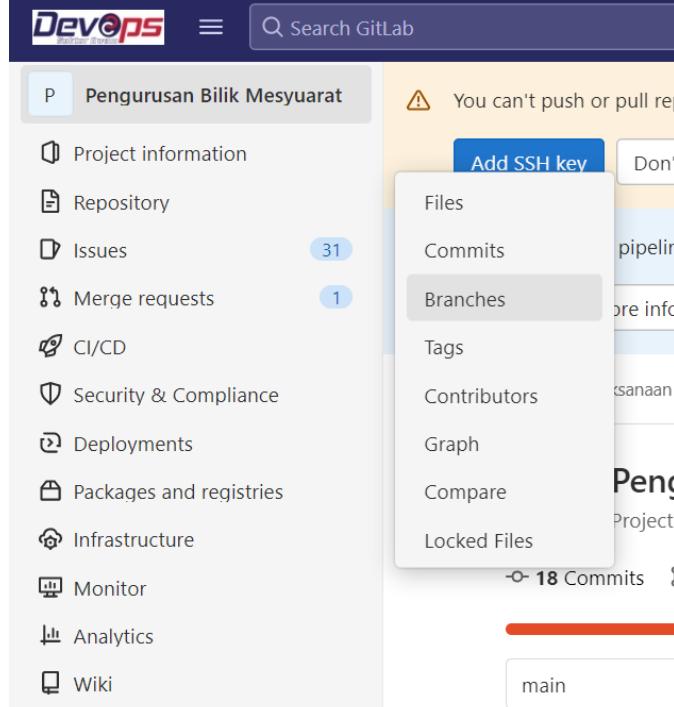
Tatacara	Paparan
Contoh paparan Label berskop [Rajah B-115].	<p>The screenshot shows a GitLab dashboard with four cards:</p> <ul style="list-style-type: none"><li><b>Modul Mengurus Pengguna</b>: Includes a sub-link to "Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat".</li><li><b>Modul Mengurus Bilik Mesyuarat</b>: Includes a sub-link to "Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat".</li><li><b>Modul Mengurus Tempahan</b>: Includes a sub-link to "Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat".</li><li><b>Modul Paparan Dashboard dan Jana Laporan</b>: Includes a sub-link to "Panduan Pelaksanaan Devops / Pengurusan Bilik Mesyuarat".</li></ul> <p><b>Rajah B-115: Gitlab – Paparan Label Berskop</b></p>

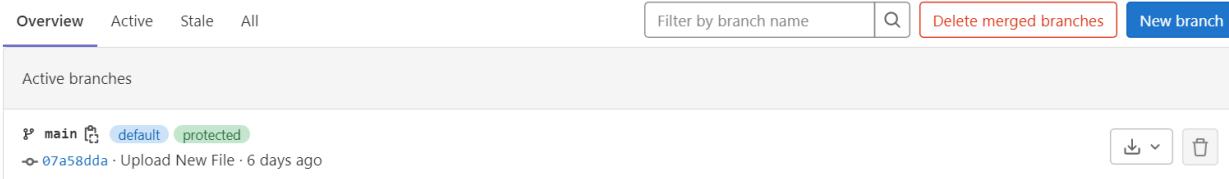
## LAMPIRAN C: PERINGKAT PENGEKODAN

### Lampiran C-1: Mewujudkan *Feature Branch* [B1]

*Feature branch* adalah repositori di mana pasukan pembangun menempatkan kod yang telah dikemaskini sebelum digabungkan ke pangkalan kod sumber utama (main branch).

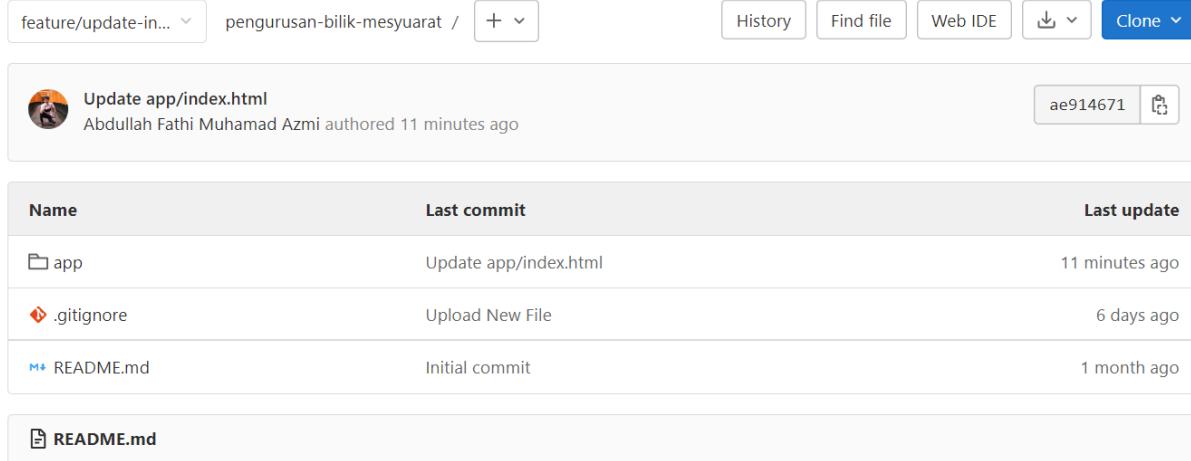
Tatacara	Paparan
<p>Paparan halaman utama projek [Rajah C-116].</p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu</b>.</li> <li>2. Pilih <b>Project</b>.</li> <li>3. Pilih projek yang telah diwujudkan.</li> </ol>	 <p><b>Rajah C-116: GitLab – Paparan Utama Projek Yang Dipilih</b></p>

Tatacara	Paparan
<p>Paparan halaman menu <b>Branches</b> [Rajah C-117].</p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>Repositori</b>.</li> <li>2. Sub-menu akan muncul, Klik <b>Branches</b>.</li> </ol>	 <p>The screenshot shows the GitLab project management interface. At the top, there's a navigation bar with the 'DevOps' logo and a search bar labeled 'Search GitLab'. Below the navigation bar is a sidebar with various project management options: 'Project information', 'Repository', 'Issues' (with 31 notifications), 'Merge requests' (with 1 notification), 'CI/CD', 'Security &amp; Compliance', 'Deployments', 'Packages and registries', 'Infrastructure', 'Monitor', 'Analytics', and 'Wiki'. On the right side of the interface, there's a main content area with a warning message: '⚠ You can't push or pull rep...' and a button 'Add SSH key'. A dropdown menu is open over the 'Repository' option, showing sub-options: 'Files', 'Commits', 'Branches' (which is highlighted in blue), 'Tags', 'Contributors', 'Graph', 'Compare', and 'Locked Files'. At the bottom of the main content area, there's a commit history section with a red progress bar and the text '18 Commits'.</p> <p><b>Rajah C-117: GitLab – Paparan Menu <i>Branches</i></b></p>

Tatacara	Paparan
<p>1. Pada paparan senarai <b>Branch</b>, klik pada <b>New branch</b> [Rajah C-118].</p>	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; Repository &gt; Branches</p>  <p><b>Rajah C-118: GitLab – Paparan Senarai <i>Branch</i></b></p>

Tatacara	Paparan
<p>Paparan halaman <b>Branch baru</b> [Rajah C-119].</p> <ol style="list-style-type: none"><li>1. Halaman <b>New Branch</b> akan dipaparkan.</li><li>2. Taip pada ruangan <b>[Branch name]</b>.</li><li>3. Klik pada <b>Create branch</b>.</li></ol>	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; <b>New Branch</b></p> <h2>New Branch</h2> <p>Branch name <input type="text" value="feature/update-index"/></p> <p>Create from <input style="width: 100px;" type="text" value="main"/> Existing branch name, tag, or commit SHA</p> <p><b>Create branch</b> <b>Cancel</b></p>

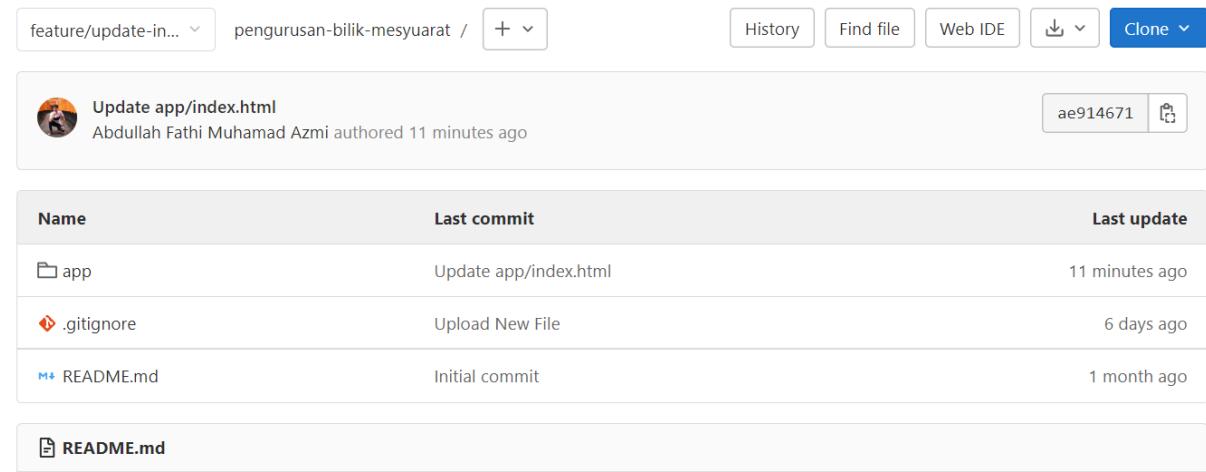
Rajah C-119: GitLab – Mewujudkan **Branch** Baharu

Tatacara	Paparan												
Setelah <b>Branch</b> baharu berjaya diwujudkan, seterusnya halaman <b>repositori projek</b> akan dipaparkan secara automatik [Rajah C-120].	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; Repository</p>  <p>The screenshot shows a GitLab repository interface. At the top, there is a search bar with 'feature/update-in...' and a dropdown, followed by the repository name 'pengurusan-bilik-mesyuarat' and a '+' button. To the right are buttons for 'History', 'Find file', 'Web IDE', a download icon, and a 'Clone' button. Below this is a commit card for 'Update app/index.html' by 'Abdullah Fathi Muhamad Azmi' 11 minutes ago, with a commit ID 'ae914671'. A detailed commit history table follows:</p> <table border="1"><thead><tr><th>Name</th><th>Last commit</th><th>Last update</th></tr></thead><tbody><tr><td>app</td><td>Update app/index.html</td><td>11 minutes ago</td></tr><tr><td>.gitignore</td><td>Upload New File</td><td>6 days ago</td></tr><tr><td>README.md</td><td>Initial commit</td><td>1 month ago</td></tr></tbody></table> <p><b>Rajah C-120: GitLab – Halaman Repositori Projek</b></p>	Name	Last commit	Last update	app	Update app/index.html	11 minutes ago	.gitignore	Upload New File	6 days ago	README.md	Initial commit	1 month ago
Name	Last commit	Last update											
app	Update app/index.html	11 minutes ago											
.gitignore	Upload New File	6 days ago											
README.md	Initial commit	1 month ago											

## Lampiran C-2: Mengemaskini Kod [B2]

Mengemaskini kod merupakan langkah dimana pasukan pembangun membangunkan kod atau mengemaskini kod sumber mereka. Pasukan pembangun boleh *clone* atau *checkout feature branch* ke terminal masing-masing dan kemudian mengemaskini kod menggunakan *Integrated Development Environment* (IDE) yang bersesuaian sebagai contohnya *Visual Studio Code*, Sublime, Eclipse, NetBean dan sebagainya.

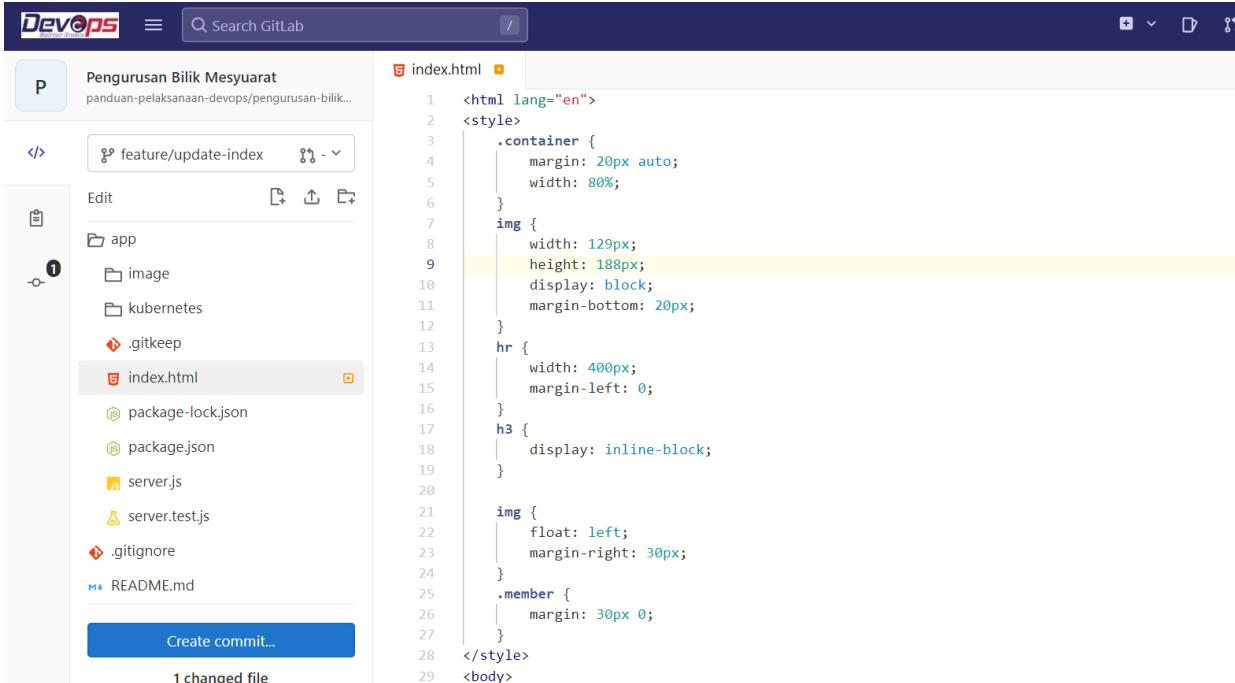
Tatacara berikut menjelaskan cara mengemaskini kod dengan menggunakan GitLab.

Tatacara	Paparan												
<p>Buka <b>feature branch</b> yang telah diwujudkan dan klik pada file yang ingin dikemaskini [Rajah C-121].</p>	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; Repository</p>  <table border="1" data-bbox="788 557 1994 763"><thead><tr><th>Name</th><th>Last commit</th><th>Last update</th></tr></thead><tbody><tr><td>app</td><td>Update app/index.html</td><td>11 minutes ago</td></tr><tr><td>.gitignore</td><td>Upload New File</td><td>6 days ago</td></tr><tr><td>README.md</td><td>Initial commit</td><td>1 month ago</td></tr></tbody></table> <p><b>Rajah C-121: Gitlab – Paparan Halaman <i>Feature Branch</i></b></p>	Name	Last commit	Last update	app	Update app/index.html	11 minutes ago	.gitignore	Upload New File	6 days ago	README.md	Initial commit	1 month ago
Name	Last commit	Last update											
app	Update app/index.html	11 minutes ago											
.gitignore	Upload New File	6 days ago											
README.md	Initial commit	1 month ago											

Tatacara	Paparan
<p>Paparan halaman <b>feature branch</b> [Rajah C-122].</p> <p>1. Klik <b>Open in Web IDE</b>.</p>	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; Repository</p> <p>feature/update-in... pengurusan-bilik-mesyuarat / app / index.html</p> <p>Find file Blame History Permalink</p> <p>Upload New File Abdullah Fathi Muhamad Azmi authored 6 days ago 4790e1e1</p> <p><b>index.html</b> 1.21 KB Open in Web IDE Lock Replace Delete</p> <pre>1 &lt;html lang="en"&gt; 2   &lt;style&gt; 3     .container { 4       margin: 20px auto; 5       width: 80%; 6     } 7     img { 8       width: 128px; 9       height: 187px; 10      display: block; 11      margin-bottom: 20px; 12    }</pre> <p><b>Rajah C-122: Gitlab – Paparan Halaman Feature Branch</b></p>

Tatacara	Paparan
Pembangun boleh mengemaskini kod [Rajah C-123].	 <p>The screenshot shows a GitLab interface with a blue header bar. The left sidebar is titled 'Tatacara' and contains the text: 'Pembangun boleh mengemaskini kod [Rajah C-123]'. The main area is titled 'Paparan' and shows a code editor for the 'index.html' file. The code is as follows:</p> <pre>&lt;html lang="en"&gt; &lt;style&gt; .container {     margin: 20px auto;     width: 80%; } img {     width: 128px;     height: 187px;     display: block;     margin-bottom: 20px; } hr {     width: 400px;     margin-left: 0; } h3 {     display: inline-block; } img {     float: left;     margin-right: 30px; } .member {     margin: 30px 0; } &lt;/style&gt; &lt;/body&gt; &lt;div class='container' id='container'&gt;</pre>

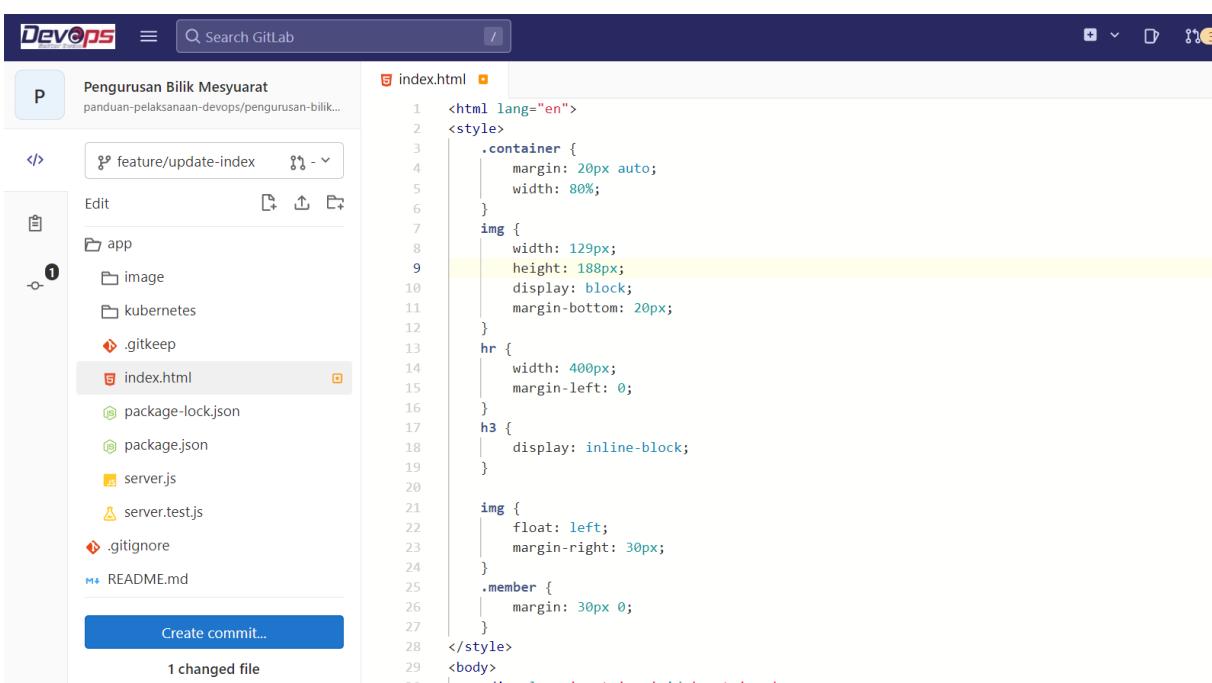
Rajah C-123: Gitlab – Paparan Halaman Konfigurasi Kod

Tatacara	Paparan
<p>Paparan halaman konfigurasi kod [Rajah C-124].</p> <ol style="list-style-type: none"><li>Setelah selesai mengemaskini kod, butang <b>Create Commit</b> akan enable dan pengguna boleh klik <b>create commit</b> bagi menyimpan pengemaskinian kod tersebut.</li></ol>	 <pre>&lt;html lang="en"&gt; &lt;style&gt; .container { margin: 20px auto; width: 80%; } img { width: 129px; height: 188px; display: block; margin-bottom: 20px; } hr { width: 400px; margin-left: 0; } h3 { display: inline-block; } img { float: left; margin-right: 30px; } .member { margin: 30px 0; } &lt;/style&gt; &lt;body&gt; &lt;div class='container' id='container'&gt;</pre>

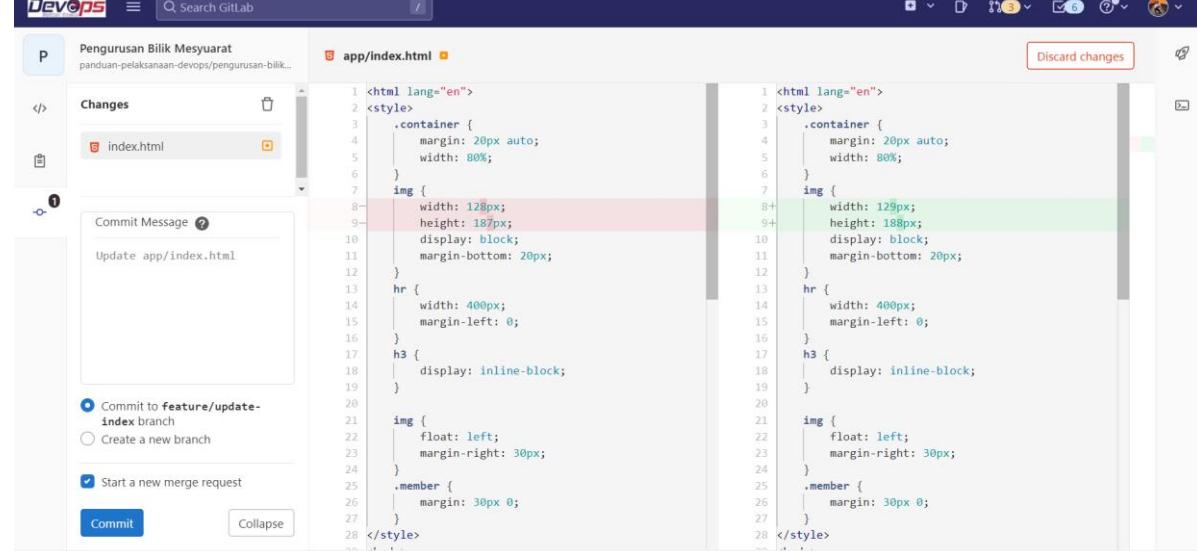
Rajah C-124: Gitlab – Paparan Halaman Konfigurasi Kod

### Lampiran C-3: Commit dan Push [B3]

Setelah pembangun selesai mengemaskini kod, pembangun boleh *commit* dan *push* perubahan kod tersebut daripada *feature branch* ke *main branch*. Tatacara berikut menjelaskan penggunaan pengemaskinian kod pada GitLab.

Tatacara	Paparan
<p>Paparan halaman kofigurasi kod [Rajah C-125].</p> <p>1. Pembangun mengemaskini kod dan klik <b>Create commit</b>.</p>	 <p>The screenshot shows the GitLab interface for a repository named "Pengurusan Bilik Mesyuarat". The left sidebar lists files: app, image, kubernetes, .gitkeep, index.html (selected), package-lock.json, package.json, server.js, server.test.js, .gitignore, and README.md. At the bottom of the sidebar is a "Create commit..." button. The main area displays the content of index.html:</p> <pre>index.html 1 &lt;html lang="en"&gt; 2 &lt;style&gt; 3   .container { 4     margin: 20px auto; 5     width: 80%; 6   } 7   img { 8     width: 129px; 9     height: 188px; 10    display: block; 11    margin-bottom: 20px; 12  } 13  hr { 14    width: 400px; 15    margin-left: 0; 16  } 17  h3 { 18    display: inline-block; 19  } 20 21  img { 22    float: left; 23    margin-right: 30px; 24  } 25  .member { 26    margin: 30px 0; 27  } 28 &lt;/style&gt; 29 &lt;body&gt; 30   &lt;div class='container' id='container'&gt;</pre>

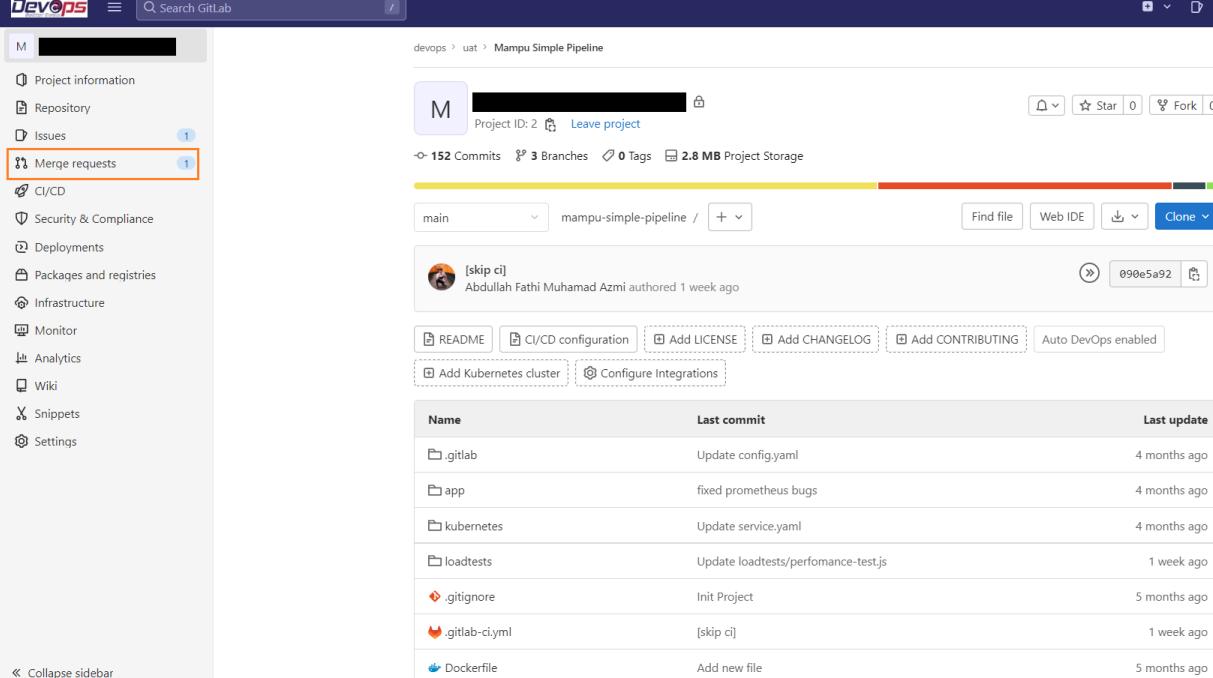
Rajah C-125: Gitlab – Paparan Halaman Konfigurasi Kod

Tatacara	Paparan
<p>Paparan perubahan kod akan dipaparkan [Rajah C-126].</p> <p>Pengguna boleh membuat pilihan samada ingin terus membuat permohonan untuk menggabungkan ke <b>main branch</b> atau sekadar menyimpan perubahan kod tersebut.</p>	 <p>Rajah C-126: Gitlab – Paparan Halaman Konfigurasi Kod</p>

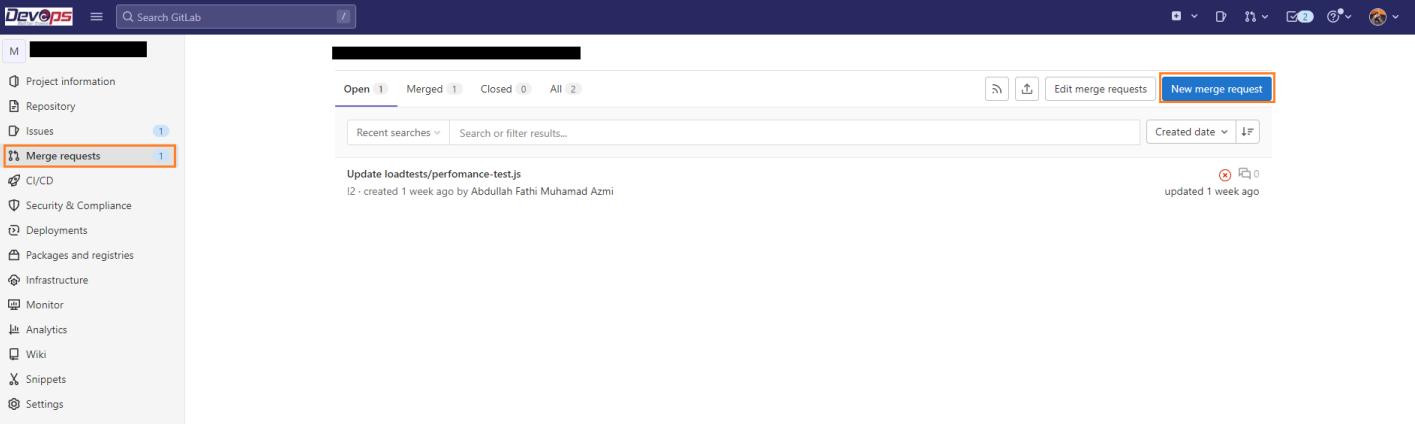
Tatacara	Paparan
<p>Sekiranya pembangun ingin terus menggabungkan perubahan kod ke <b>main branch</b>, satu <b>merge request</b> akan diwujudkan secara automatik namun pembangun perlu memasukkan maklumat yang diperlukan pada borang <b>merge request</b>. Tatacara <i>merge request</i> akan diterangkan pada langkah seterusnya [Rajah C-127].</p>	<p>Panduan Pelaksanaan Devops &gt; Pengurusan Bilik Mesyuarat &gt; Merge requests &gt; New</p> <h3>New merge request</h3> <p>From <code>feature/update-index</code> into <code>main</code> <a href="#">Change branches</a></p> <p>Title (required)</p> <p><code>Update app/index.html</code></p> <p><small>Start the title with <code>Draft:</code> to prevent a merge request draft from merging before it's ready.</small></p> <p>Description</p> <p><a href="#">Choose a template</a></p> <p><small>Write Preview</small></p> <p><small>Describe the goal of the changes and what reviewers should be aware of.</small></p> <p><small>Supports <a href="#">Markdown</a>. For <a href="#">quick actions</a>, type <code>/</code>.</small></p> <p><b>Rajah C-127: Gitlab – Paparan Halaman <i>New Merge Request</i></b></p>

### **Lampiran C-4: *Merge Request [B4]***

*Merge request* adalah langkah dimana pembangun membuat permohonan menggabungkan kod yang telah diubahsuai ke *main branch*. Tatacara berikut akan menjelaskan bagaimana permohonan *merge request* dibuat.

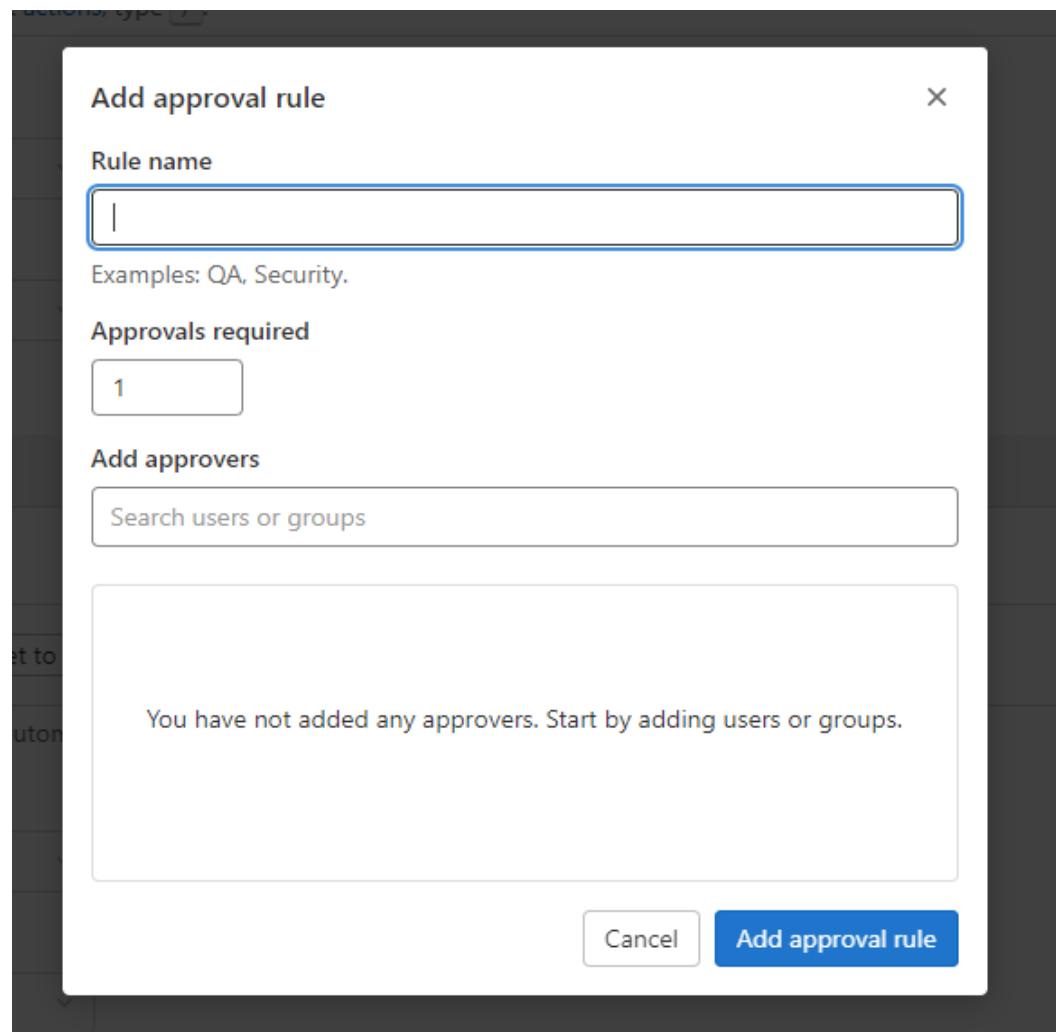
Tatacara	Paparan																								
<p>Paparan halaman <b>merge requests</b> [Rajah C-128].</p> <ol style="list-style-type: none"> <li>1. Pilih Projek <b>Repository</b> di dalam GitLab.</li> <li>2. Pada Menu sebelah kiri, klik <b>Merge requests</b>.</li> </ol>	 <table border="1" data-bbox="1057 716 1859 992"> <thead> <tr> <th>Name</th> <th>Last commit</th> <th>Last update</th> </tr> </thead> <tbody> <tr> <td>.gitlab</td> <td>Update config.yaml</td> <td>4 months ago</td> </tr> <tr> <td>app</td> <td>fixed prometheus bugs</td> <td>4 months ago</td> </tr> <tr> <td>kubernetes</td> <td>Update service.yaml</td> <td>4 months ago</td> </tr> <tr> <td>loadtests</td> <td>Update loadtests/performance-test.js</td> <td>1 week ago</td> </tr> <tr> <td>.gitignore</td> <td>Init Project</td> <td>5 months ago</td> </tr> <tr> <td>.gitlab-ci.yml</td> <td>[skip ci]</td> <td>1 week ago</td> </tr> <tr> <td>Dockerfile</td> <td>Add new file</td> <td>5 months ago</td> </tr> </tbody> </table>	Name	Last commit	Last update	.gitlab	Update config.yaml	4 months ago	app	fixed prometheus bugs	4 months ago	kubernetes	Update service.yaml	4 months ago	loadtests	Update loadtests/performance-test.js	1 week ago	.gitignore	Init Project	5 months ago	.gitlab-ci.yml	[skip ci]	1 week ago	Dockerfile	Add new file	5 months ago
Name	Last commit	Last update																							
.gitlab	Update config.yaml	4 months ago																							
app	fixed prometheus bugs	4 months ago																							
kubernetes	Update service.yaml	4 months ago																							
loadtests	Update loadtests/performance-test.js	1 week ago																							
.gitignore	Init Project	5 months ago																							
.gitlab-ci.yml	[skip ci]	1 week ago																							
Dockerfile	Add new file	5 months ago																							

Rajah C-128: Gitlab – Paparan Halaman **Merge Requests**

Tatacara	Paparan
<p>1. Klik <b>Merge Request</b> [Rajah C-129].</p>	 <p>Rajah C-129: Gitlab – Paparan Halaman Merge Request</p>
<p>Pastikan <i>source branch</i> merupakan <i>feature branch</i> dimana pembangun telah membuat pengemaskinian manakala <i>target branch</i> adalah <i>main branch</i> [Rajah C-130].</p> <p>1. Klik <b>Compare branches and continue</b>.</p>	<p>New merge request</p> <p>Source branch: feature/update-readme-note</p> <p>Target branch: main</p> <p>Compare branches and continue</p> <p>Rajah C-130: Gitlab – Paparan Halaman New Merge Request</p>

Tatacara	Paparan
<p>2. Masukkan <b>Title merge request dan description.</b> Assignees merupakan reviewer yang akan menyemak perubahan kod.</p> <p>3. Klik <b>Create Merge Request.</b></p>	<p>New merge request</p> <p>From <code>feature/update-readme-note</code> into <code>main</code> <a href="#">Change branches</a></p> <p>Title (required)</p> <div style="border: 2px solid orange; padding: 5px;">Update README.md</div> <p><small>Start the title with <code>Draft:</code> to prevent a merge request draft from merging before it's ready.</small></p> <p>Description</p> <div style="border: 2px solid orange; padding: 5px;">Choose a template</div> <p><small>Write Preview</small></p> <p><small>Describe the goal of the changes and what reviewers should be aware of.</small></p> <p><small>Supports <a href="#">Markdown</a>. For quick actions, type <code>/</code>.</small></p> <p>Assignees</p> <div style="border: 2px solid orange; padding: 5px;">Abdullah Fathi Muhamad Azmi</div>

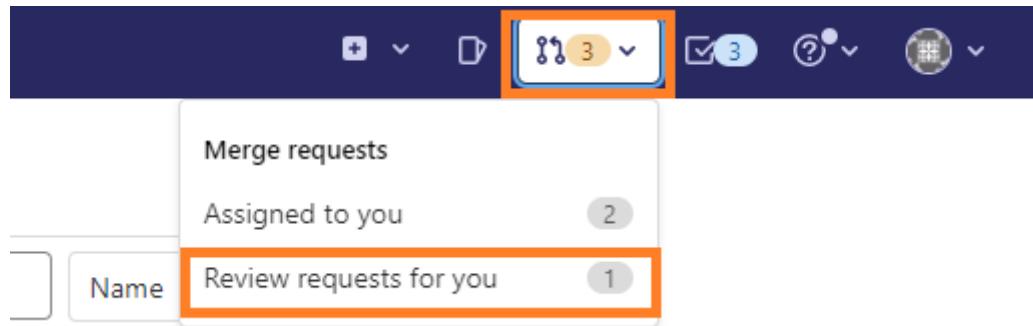
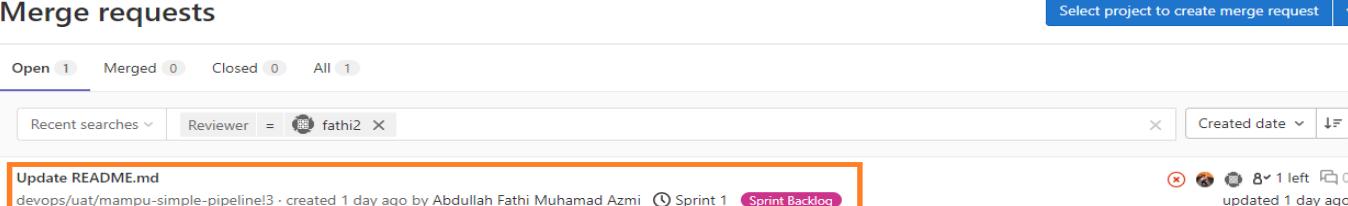
Tatacara	Paparan
	<p>Reviewers</p> <p>fathi2</p> <p>Approvals are optional.</p> <p><input checked="" type="checkbox"/> Approval rules</p> <p>Approvers</p> <p>All eligible users <a href="#">?</a></p> <p>Approvals required</p> <p>0</p> <p><a href="#">Add approval rule</a> <a href="#">Reset to project defaults</a></p> <p>Tip: add a <a href="#">CODEOWNERS</a> to automatically add approvers based on file paths and file types.</p> <p>Milestone</p> <p>Milestone</p> <p>Labels</p> <p>Labels</p> <p>Merge request dependencies</p> <p>Enter merge request URLs or references (e.g. path/to/project!merge_request_id)</p> <p>List the merge requests that must be merged before this one.</p> <p>Merge options</p> <p><input checked="" type="checkbox"/> Delete source branch when merge request is accepted.</p> <p><input type="checkbox"/> Squash commits when merge request is accepted. <a href="#">?</a></p> <p><a href="#">Create merge request</a> <a href="#">Cancel</a></p>

Tatacara	Paparan
	 <p>The screenshot shows a modal dialog titled "Add approval rule". It contains fields for "Rule name" (empty), "Approvals required" (set to 1), and a "Search users or groups" input field. A message at the bottom states, "You have not added any approvers. Start by adding users or groups." At the bottom right are "Cancel" and "Add approval rule" buttons.</p>

Tatacara	Paparan
Paparan setelah <i>merge request</i> diwujudkan [Rajah C-131].	<p><b>Update README.md</b></p> <p>Open Abdullah Fathi Muhamad Azmi requested to merge <a href="#">feature/update-readme-note</a> into <a href="#">main</a> 1 hour ago</p> <p>Overview 0 Commits 1 Pipelines 1 Changes 1</p> <p><b>Merge request pipeline #2223 passed for 27083e82 1 hour ago</b></p> <p>Requires 1 approval from Team Lead.</p> <p>Accessibility scanning detected 3 issues for the source branch only</p> <p>Browser performance test metrics: 6 changes 0 degraded, 4 same, and 2 improved</p> <p>Test summary contained no changed test results out of 3 total tests</p> <p>Merge blocked: all required approvals must be given.</p> <ul style="list-style-type: none"><li>1 commit and 1 merge commit will be added to main.</li><li>Source branch will be deleted.</li></ul> <p>Sort or filter ▾</p> <p><b>Rajah C-131: Gitlab – Paparan Halaman Merge Request</b></p>

## Lampiran C-5: Code Review [B5]

*Code review* merupakan kaedah manual daripada penilai yang berkepakaran dalam menilai kualiti kod. GitLab menyediakan *features* atau ujian bagi membantu penilai untuk menilai perubahan kod yang dibuat oleh pembangun.

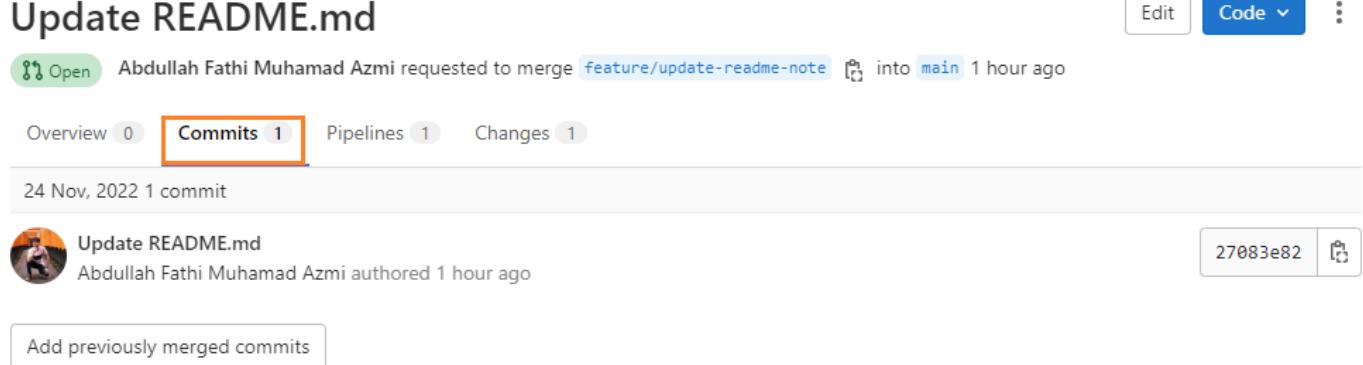
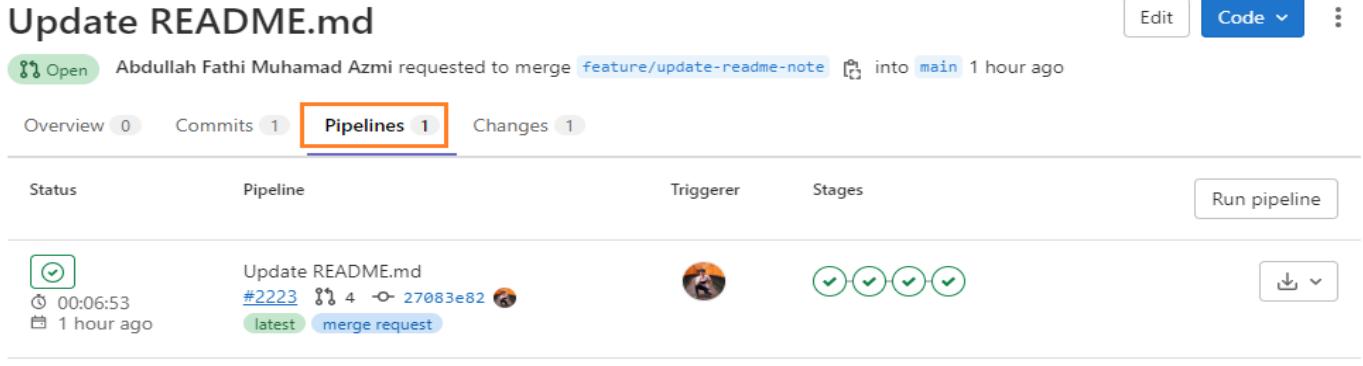
Tatacara	Paparan
Lihat pada notifikasi, <b>review requests for you</b> merupakan notifikasi pada pegawai untuk menyemak permohonan <b>merge request</b> oleh pasukan pembangun [Rajah C-132].	 <p>Rajah C-132: Gitlab – Paparan Halaman Merge Request</p>
Paparan halaman merge request [Rajah C-133].	 <p>Rajah C-133: Gitlab – Paparan Halaman Merge Request</p>

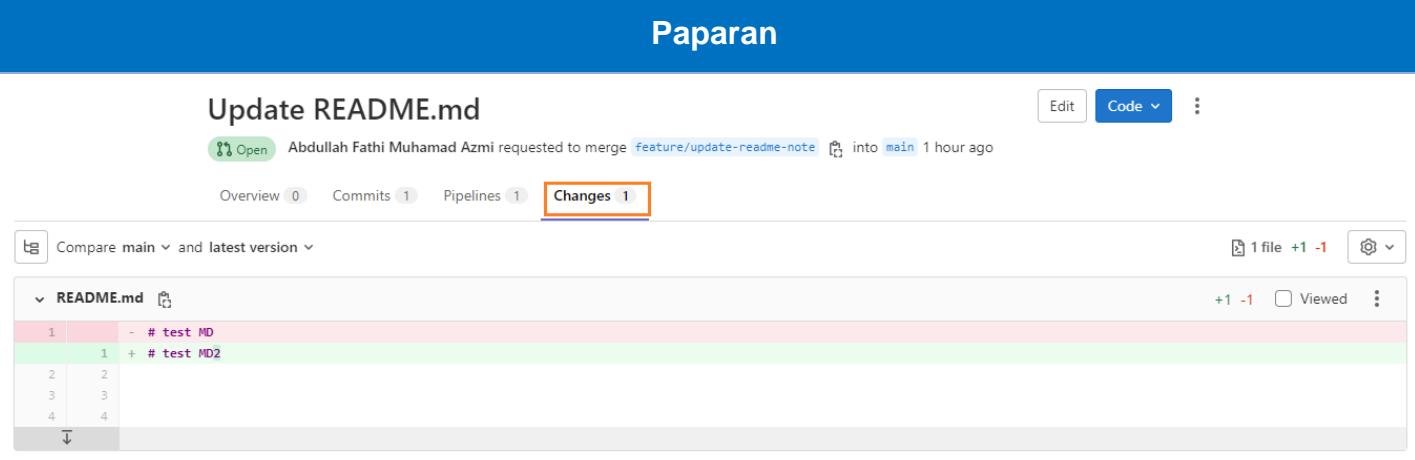
Tatacara	Paparan
Pegawai yang menyemak boleh melihat hasil ujian yang dijalankan oleh GitLab CI/CD bagi membantu sesi semakan [Rajah C-134].	<p><b>Update README.md</b></p> <p>Open Abdullah Fathi Muhamad Azmi requested to merge <a href="#">feature/update-readme-note</a> into <a href="#">main</a> 1 hour ago</p> <p><a href="#">Edit</a> <a href="#">Code</a> <a href="#">⋮</a></p> <p><a href="#">Overview 0</a> <a href="#">Commits 1</a> <a href="#">Pipelines 1</a> <a href="#">Changes 1</a></p> <div style="border: 2px solid orange; padding: 10px;"><p> Merge request pipeline #2223 passed for 27083e82 1 hour ago <a href="#">View exposed artifact</a> <a href="#">Approve</a> Requires 1 approval from Team Lead. <a href="#">View eligible approvers</a></p><p> Accessibility scanning detected 3 issues for the source branch only</p><p> Browser performance test metrics: 6 changes 0 degraded, 4 same, and 2 improved</p><p> Test summary contained no changed test results out of 3 total tests <a href="#">View full report</a> <a href="#">Expand</a></p><p> Merge blocked: all required approvals must be given.<ul style="list-style-type: none"><li>1 commit and 1 merge commit will be added to main.</li><li>Source branch will be deleted.</li></ul></p></div> <p><a href="#">Sort or filter</a></p>

Tatacara	Paparan																			
	<p>✓ Merge request pipeline #2223 passed for 27083e82 1 hour ago</p> <p>↙ Collapse</p> <table border="1"><thead><tr><th>Artifact</th><th>Job</th></tr></thead><tbody><tr><td>Accessibility Reports</td><td>a11y</td></tr></tbody></table> <p>8✓ Approve Requires 1 approval from Team Lead.</p> <p>↙ Collapse</p> <table border="1"><thead><tr><th>Approvers</th><th>Approvals</th><th>Commented by</th><th>Approved by</th></tr></thead><tbody><tr><td>All eligible users ?</td><td>Optional</td><td></td><td></td></tr><tr><td>Team Lead</td><td></td><td>0 of 1</td><td></td></tr></tbody></table> <p>1 Accessibility scanning detected 3 issues for the source branch only</p> <table border="1"><tbody><tr><td>● The accessibility scanning found an error of the following type: WCAG2AA.Principle2.Guideline2_4_2_4_2.H25.1.NoTitleElLearn more Message: A title should be provided for the document, using a non-empty title element in the head section.</td></tr><tr><td>● The accessibility scanning found an error of the following type: WCAG2AA.Principle2.Guideline2_4_2_4_2.H25.1.NoTitleElLearn more Message: A title should be provided for the document, using a non-empty title element in the head section.</td></tr><tr><td>● The accessibility scanning found an error of the following type: WCAG2AA.Principle3.Guideline3_1_3_1_1.H57.2Learn more Message: The html element should have a lang or xml:lang attribute which describes the language of the document.</td></tr></tbody></table>	Artifact	Job	Accessibility Reports	a11y	Approvers	Approvals	Commented by	Approved by	All eligible users ?	Optional			Team Lead		0 of 1		● The accessibility scanning found an error of the following type: WCAG2AA.Principle2.Guideline2_4_2_4_2.H25.1.NoTitleElLearn more Message: A title should be provided for the document, using a non-empty title element in the head section.	● The accessibility scanning found an error of the following type: WCAG2AA.Principle2.Guideline2_4_2_4_2.H25.1.NoTitleElLearn more Message: A title should be provided for the document, using a non-empty title element in the head section.	● The accessibility scanning found an error of the following type: WCAG2AA.Principle3.Guideline3_1_3_1_1.H57.2Learn more Message: The html element should have a lang or xml:lang attribute which describes the language of the document.
Artifact	Job																			
Accessibility Reports	a11y																			
Approvers	Approvals	Commented by	Approved by																	
All eligible users ?	Optional																			
Team Lead		0 of 1																		
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Tatacara	Paparan
	<p>💡 Browser performance test metrics: 6 changes 0 degraded, 4 same, and 2 improved</p> <div style="border: 2px solid orange; padding: 5px;"><ul style="list-style-type: none"><li>✓ First Contentful Paint: 385 (-495) (-56%) in /</li><li>✓ Largest Contentful Paint: 385 (-495) (-56%) in /</li><li>⌚ Total Score: 98 in /</li><li>⌚ Requests: 2 in /</li></ul></div> <p>🕒 Last updated: 1 day ago</p> <p>✓ Test summary contained no changed test results out of 3 total tests</p> <p>✓ unit-test-job found no changed test results out of 3 total tests</p> <p>✗ Merge blocked: all required approvals must be given.</p> <ul style="list-style-type: none"><li>• 1 commit and 1 merge commit will be added to main.</li><li>• Source branch will be deleted.</li></ul> <p>Sort or filter ▾</p>

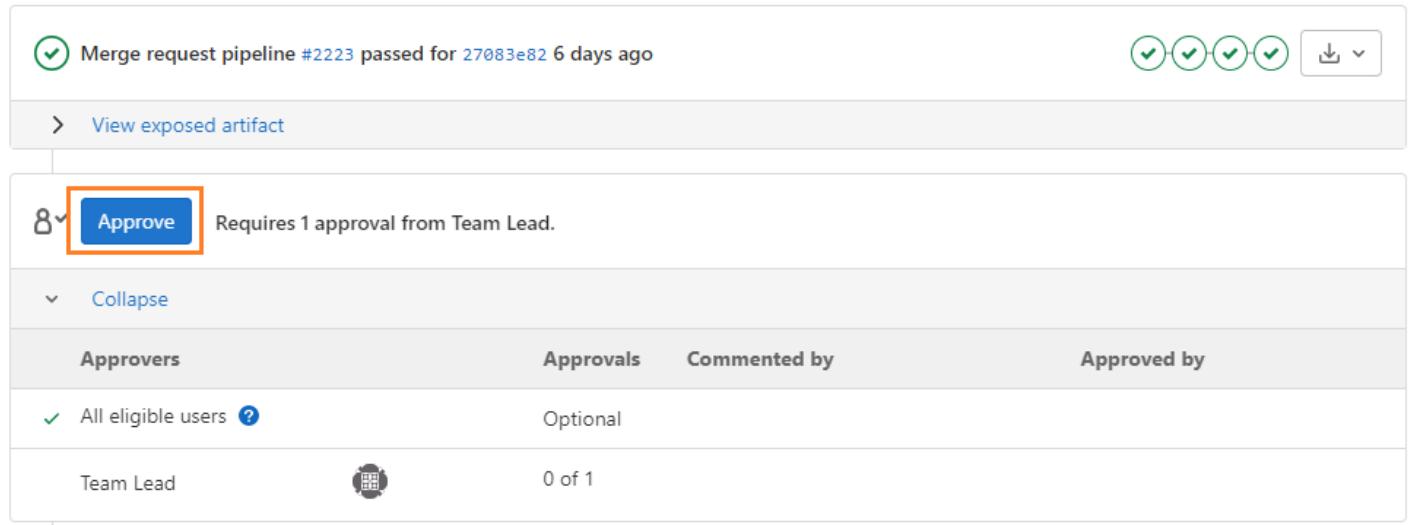
Rajah C-134: Gitlab – Paparan Halaman *Merge Request*

Tatacara	Paparan
<p>Tab <i>commits</i> menyenaraikan aktiviti <i>commit</i> yang telah dibuat oleh pasukan pembangun [Rajah C-135].</p>	 <p><b>Rajah C-135: Gitlab – Paparan Halaman Update README.md</b></p>
<p>Tab <i>Pipelines</i> menyenaraikan status <i>pipeline</i> yang berkaitan dengan <i>merge request</i> tersebut [Rajah C-136].</p>	 <p><b>Rajah C-136: Gitlab – Paparan Halaman Update README.md</b></p>

Tatacara	Paparan												
Tab <i>Changes</i> memaparkan perubahan kod yang berlaku pada permohonan <i>merge request</i> tersebut [Rajah C-137].	 <p>The screenshot shows a GitLab merge request titled "Update README.md". The "Changes" tab is selected, indicated by a red box. The changes are listed in a diff view:</p> <table border="1"><thead><tr><th>Line</th><th>Change</th></tr></thead><tbody><tr><td>1</td><td>- # test MD</td></tr><tr><td>1</td><td>+ # test MD2</td></tr><tr><td>2</td><td>2</td></tr><tr><td>3</td><td>3</td></tr><tr><td>4</td><td>4</td></tr></tbody></table> <p>At the bottom right of the changes view, there is a summary: "+1 -1" and "Viewed".</p> <p><b>Rajah C-137: Gitlab – Paparan Halaman Update README.md</b></p>	Line	Change	1	- # test MD	1	+ # test MD2	2	2	3	3	4	4
Line	Change												
1	- # test MD												
1	+ # test MD2												
2	2												
3	3												
4	4												

### Lampiran C-6: Meluluskan *Merge Request* [B6]

Setelah penilai menilai perubahan kod yang dibuat oleh pembangun, penilai tersebut boleh meluluskan permohonan tersebut. Sekiranya permohonan tidak diluluskan, penilai boleh memberikan komen pada ruangan komen yang disediakan.

Tatacara	Paparan
Penilai klik <b>Approve</b> bagi meluluskan permohonan <i>merge request</i> [Rajah C-138].	 <p>The screenshot shows a GitLab merge request page. At the top, there is a message indicating a pipeline has passed. Below this, there is a section for approvals. A button labeled "Approve" is highlighted with an orange box. To the right of the button, it says "Requires 1 approval from Team Lead". Below this, there is a table with columns for Approvers, Approvals, Commented by, and Approved by. Under "Approvers", it shows "All eligible users" with a question mark icon. Under "Approvals", it says "Optional". Under "Approved by", there is a placeholder for "Team Lead" with a user icon and the text "0 of 1".</p> <p>Rajah C-138: Gitlab – Paparan Halaman <i>Merge Request</i></p>

## Lampiran C-7: Konfigurasi *Pipeline CI/CD* Sistem Aplikasi Web

Berikut merupakan antara contoh skrip `/.gitlab-ci.yml` bagi *pipeline* CI/CD berdasarkan *architecture* yang diterangkan pada bab 4.1.5.3.

Tatacara	Paparan
Contoh konfigurasi <code>/.gitlab-ci.yml</code> file bagi Basic Pipeline	<pre>stages:   - build   - test   - deploy  image: alpine  build_a:   stage: build   script:     - echo "This job builds something."  build_b:   stage: build   script:     - echo "This job builds something else."</pre>

Tatacara	Paparan
	<pre>test_a:   stage: test   script:     - echo "This job tests something. It will only run when all jobs in the"     - echo "build stage are complete."  test_b:   stage: test   script:     - echo "This job tests something else. It will only run when all jobs in the"     - echo "build stage are complete too. It will start at about the same time as test_a."  deploy_a:   stage: deploy   script:     - echo "This job deploys something. It will only run when all jobs in the"     - echo "test stage complete."   environment: production  deploy_b:   stage: deploy</pre>

Tatacara	Paparan
	<pre>script:   - echo "This job deploys something else. It will only run when all jobs in the"   - echo "test stage complete. It will start at about the same time as deploy_a." environment: production</pre>
Contoh konfigurasi <i>/.gitlab-ci.yml</i> file bagi <i>Pipeline DAG</i>	<pre>stages:   - build   - test   - deploy  image: alpine  build_a:   stage: build   script:     - echo "This job builds something quickly."  build_b:   stage: build   script:     - echo "This job builds something else slowly."</pre>

Tatacara	Paparan
	<pre>test_a:   stage: test   needs: [build_a]   script:     - echo "This test job will start as soon as build_a finishes."     - echo "It will not wait for build_b, or other jobs in the build stage, to finish.  test_b:   stage: test   needs: [build_b]   script:     - echo "This test job will start as soon as build_b finishes."     - echo "It will not wait for other jobs in the build stage to finish.  deploy_a:   stage: deploy   needs: [test_a]   script:     - echo "Since build_a and test_a run quickly, this deploy job can run much earlier."     - echo "It does not need to wait for build_b or test_b."</pre>

Tatacara	Paparan
	<pre> environment: production  deploy_b:   stage: deploy   needs: [test_b]   script:     - echo "Since build_b and test_b run slowly, this deploy job will run much later." environment: production </pre>
Contoh konfigurasi <code>/gitlab-ci.yml</code> file bagi <i>Pipeline Parent</i> .	<pre> stages:   - triggers  trigger_a:   stage: triggers   trigger:     include: a/.gitlab-ci.yml   rules:     - changes:         - a/*  trigger_b:   stage: triggers </pre>

Tatacara	Paparan
	<pre> trigger:   include: b/.gitlab-ci.yml  rules:   - changes:     - b/*   </pre>
Contoh konfigurasi <i>child pipeline</i> yang terletak pada /a/.gitlab- ci.yml	<pre> stages:   - build   - test   - deploy  image: alpine  build_a:   stage: build   script:     - echo "This job builds something."  test_a:   stage: test   needs: [build_a]   </pre>

Tatacara	Paparan
	<pre> script:   - echo "This job tests something." </pre> <pre> deploy_a:   stage: deploy   needs: [test_a]   script:     - echo "This job deploys something."   environment: production </pre>
Contoh konfigurasi <i>child b pipeline yang terletak pada /b/.gitlab-ci.yml</i>	<pre> stages:   - build   - test   - deploy  image: alpine  build_b:   stage: build   script: </pre>

Tatacara	Paparan
	<pre> - echo "This job builds something else."  test_b:   stage: test   needs: [build_b]   script:     - echo "This job tests something else."  deploy_b:   stage: deploy   needs: [test_b]   script:     - echo "This job deploys something else."   environment: production </pre>
Contoh konfigurasi fail /.gitlab-ci.yml penuh	<pre> workflow:   rules:     - if: \$CI_COMMIT_BRANCH != "main" &amp;&amp; \$CI_PIPELINE_SOURCE != "merge_request_event"       when: never     - when: always   include: </pre>

Tatacara	Paparan
	<pre>- template: Jobs/SAST.gitlab-ci.yml - template: Code-Quality.gitlab-ci.yml - template: "Verify/Accessibility.gitlab-ci.yml" - template: Verify/Load-Performance-Testing.gitlab-ci.yml # - template: Verify/Browser-Performance.gitlab-ci.yml  variables:   a11y_urls: "&lt;your application url&gt;"   NODE_APP: node-app   SERVICE_PORT: 3000   SERVICE_VERSION: "node-1.5"   REPLICAS: 2   SERVICE_NODEPORT: 30123   IMAGE_REPOSITORY: "&lt;your image repository&gt;"   PROJECT_URL: "&lt;your project url&gt;  stages:   - build   - test   - deploy   - accessibility   - performance  # Unit Test</pre>

Tatacara	Paparan
	<pre>unit-test-job:   image: node:17-alpine3.14   stage: test   cache:     key: "\$CI_COMMIT_REF_NAME"     paths:       - app/node_modules   before_script:     - cd app     - npm install   script:     - npm test   artifacts:     when: always     paths:       - app/junit.xml   reports:     junit: app/junit.xml #Static Application Security Test (SAST) sast:   stage: test</pre>

Tatacara	Paparan
	<pre>#newman test  newman_tests:   stage: test   image:     name: dannydainton/htmlextra     entrypoint: [""]   script:     - newman --version     - newman run newman/Working-with-data-files-ramen.postman_collection.json -d newman/ramen.json --reporters cli,htmlextra --reporter-htmlextra-export testReport.html   artifacts:     when: always     paths:       - testReport.html  # CODE QUALITY check code_quality:   services:      # Shut off Docker-in-Docker   tags:     - cq-sans-dind   artifacts:     paths: [gl-code-quality-report.json]</pre>

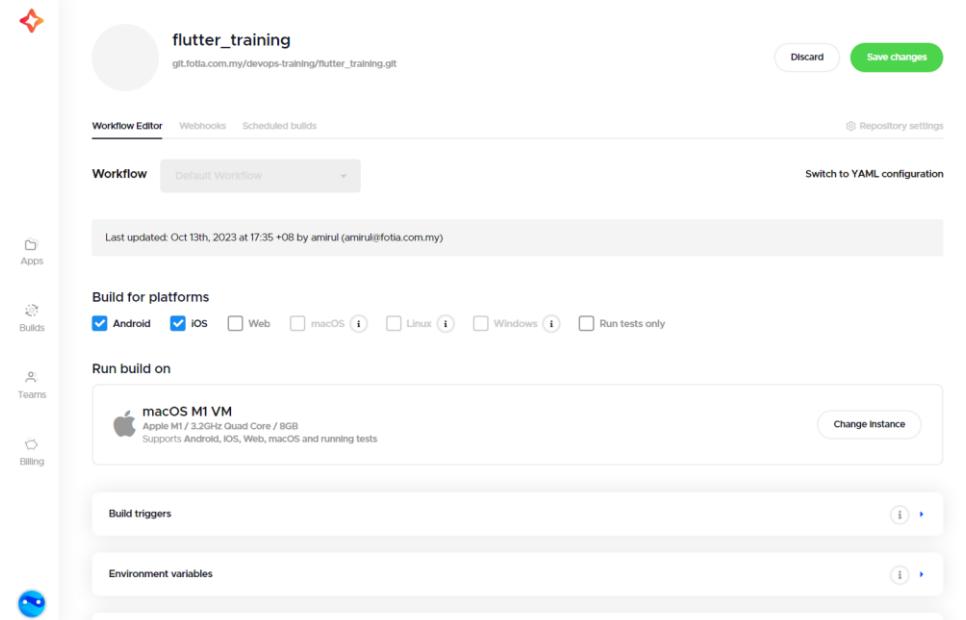
Tatacara	Paparan
	<pre>build_image:   stage: build   tags:     - rancher2     - shared     - shell   script:     - docker build -t \$IMAGE_REPOSITORY:\$SERVICE_VERSION .  push_image:   stage: build   needs:     - build_image   tags:     - rancher2     - shared     - shell   before_script:     - docker login -u \$REGISTRY_USER -p \$REGISTRY_PASS docker.io   script:     - docker push \$IMAGE_REPOSITORY:\$SERVICE_VERSION</pre>

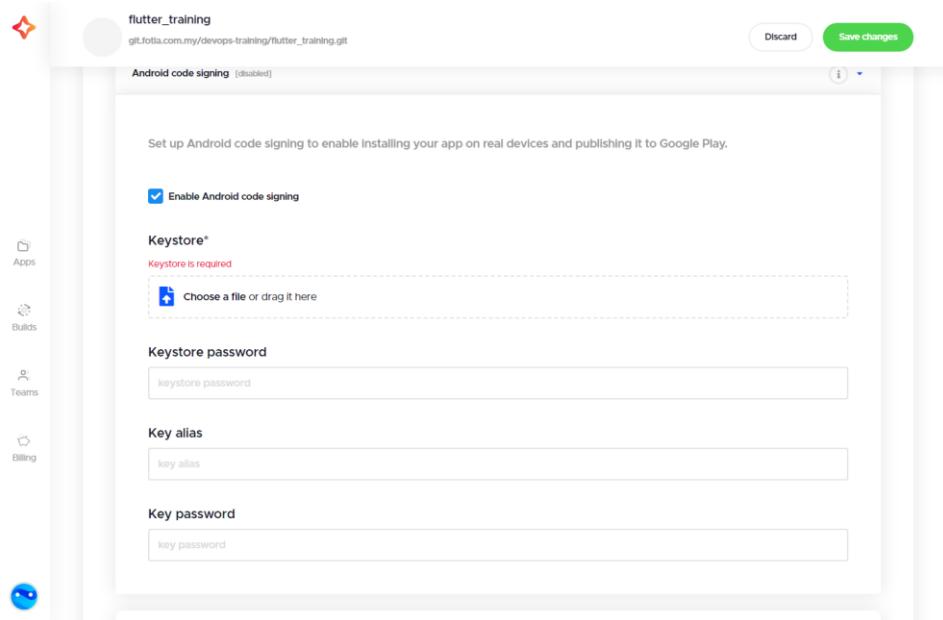
Tatacara	Paparan
	<pre># Load Test (k6) load_performance:   image:     name: loadimpact/k6:latest     entrypoint: []   stage: performance   script:     - echo "executing local k6 in k6 container..."     - k6 run ./loadtests/performace-test.js  # browser_performance: # variables:  browser_performance:   stage: performance   image: docker:20.10.16   variables:     URL: "&lt;your application url&gt;"     SITESPEED_VERSION: 14.1.0     SITESPEED_OPTIONS: ''     DOCKER_HOST: tcp://docker:2375/</pre>

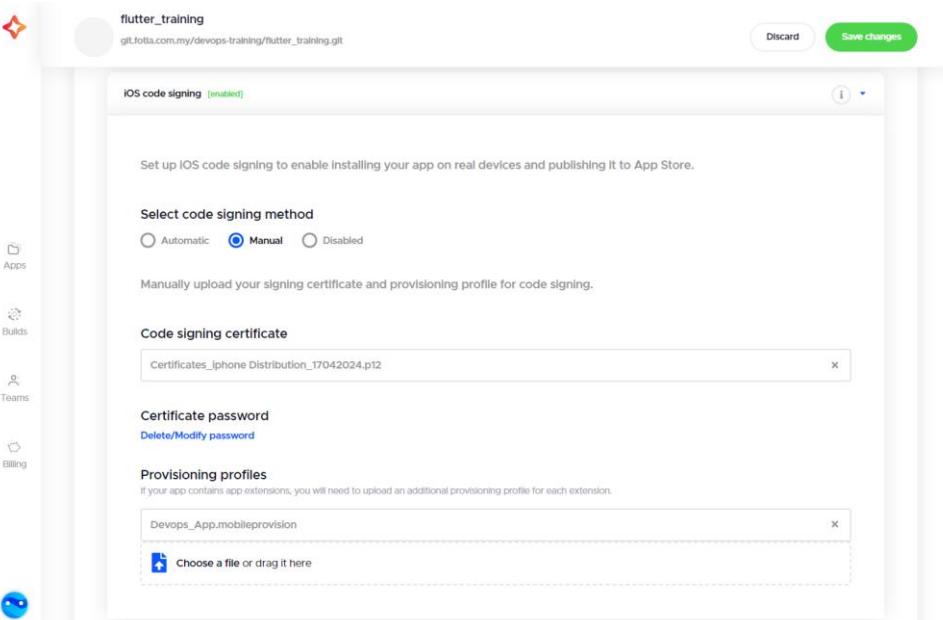
Tatacara	Paparan
	<pre> DOCKER_DRIVER: overlay2 DOCKER_TLS_CERTDIR: ""  services:   - docker:20.10.16-dind     # - name: docker:20.10.16-dind     #   alias: docker     #   command: ["--tls=false"]  script:   - mkdir gitlab-exporter   - wget -O ./gitlab-exporter/index.js https://gitlab.com/gitlab-org/gl- performance/raw/1.1.0/index.js   - mkdir sitespeed-results   - docker run --shm-size=1g --rm -v "\$(pwd)":/sitespeed.io sitespeedio/sitespeed.io:\$SITESPEED_VERSION --plugins.add ./gitlab-exporter -- outputFolder sitespeed-results \$URL \$SITESPEED_OPTIONS   - mv sitespeed-results/data/performance.json performance.json  artifacts:   paths:     - performance.json     - sitespeed-results/  reports:   performance: performance.json </pre>

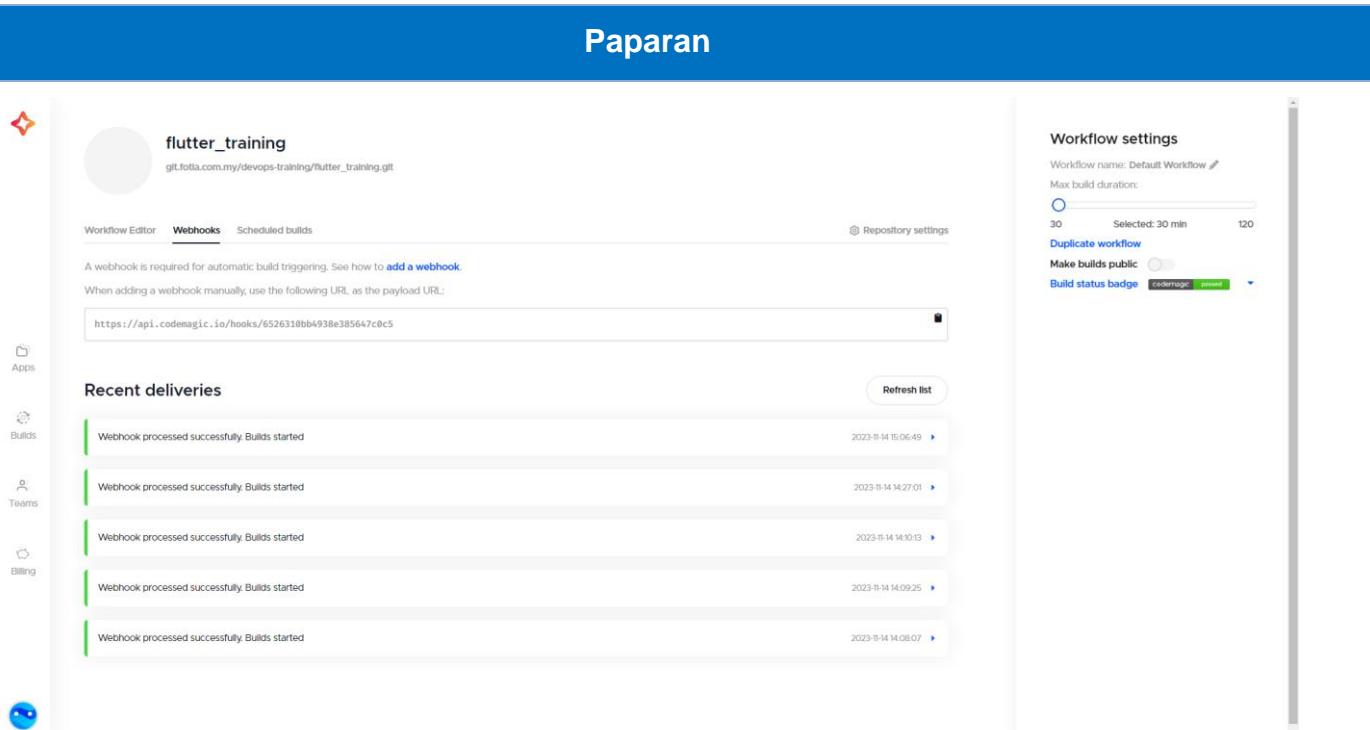
## Lampiran C-8: Konfigurasi Pipeline CI/CD Untuk Sistem Aplikasi Mudah Alih

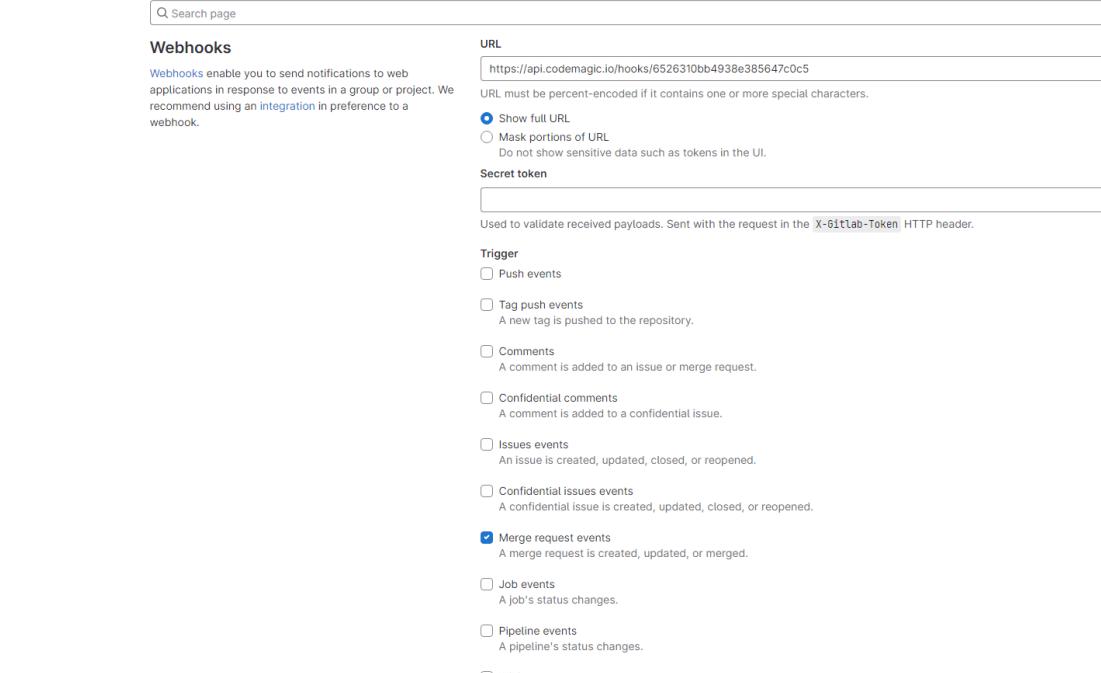
Berikut merupakan antara contoh skrip `/.gitlab-ci.yml` bagi *pipeline* CI/CD berdasarkan *architecture* yang diterangkan pada bab 4.1.5.3.

Tatacara	Paparan
<p><b>Paparan halaman <i>Workflow Editor</i> [Rajah C-139].</b></p> <p>1. Pemilihan <b>Build for platforms</b> boleh dibuat dengan memilih <b>Android</b> dan <b>iOS</b>.</p>	 <p>Rajah C-139: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i></p>

Tatacara	Paparan
<p><b>Paparan halaman <i>Workflow Editor</i> [Rajah C-140].</b></p> <p>1. Tandakan <b><i>Enable Android code signing.</i></b></p>	 <p><b>Rajah C-140: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i></b></p>

Tatacara	Paparan
<p><b>Paparan halaman <i>Workflow Editor</i> [Rajah C-141].</b></p> <ol style="list-style-type: none"><li>1. Pilih <b>Manual</b> pada bahagian <b>Select signing method</b>.</li><li>2. Tekan butang <b>Save changes</b>.</li></ol>	 <p>The screenshot displays the 'iOS code signing' configuration screen within the Mobile Flutter Workflow Editor. At the top, it shows the repository 'flutter_training' and the URL 'git.folla.com.my/devops-training/flutter_training.git'. Below this, there's a heading 'Set up iOS code signing to enable installing your app on real devices and publishing it to App Store.' Underneath, there's a section titled 'Select code signing method' with three radio button options: 'Automatic' (unchecked), 'Manual' (checked), and 'Disabled' (unchecked). A note below says 'Manually upload your signing certificate and provisioning profile for code signing.' There are two input fields: one for 'Code signing certificate' containing 'Certificates_iPhone Distribution_17042024.p12' and another for 'Provisioning profiles' containing 'Devops_App.mobileprovision'. Both fields have an 'X' icon to clear them. At the bottom right of the editor interface, there are 'Discard' and 'Save changes' buttons.</p> <p><b>Rajah C-141: Mobile Flutter – Paparan Halaman <i>Workflow Editor</i></b></p>

Tatacara	Paparan
<p><b>Paparan halaman Webhooks [Rajah C-142].</b></p>	 <p><b>Rajah C-142: Mobile Flutter – Paparan Halaman Workflow Editor</b></p>

Tatacara	Paparan
<p><b>Paparan halaman Webhooks [Rajah C-143].</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>show full URL</b>.</li> <li>2. Pilih <b>Merge request event</b>.</li> </ol>	 <p><b>Webhooks</b> Webhooks enable you to send notifications to web applications in response to events in a group or project. We recommend using an integration in preference to a webhook.</p> <p><b>URL</b> <code>https://api.codemagic.io/hooks/6526310bb4938e385647c0c5</code> URL must be percent-encoded if it contains one or more special characters.</p> <p><input checked="" type="radio"/> Show full URL  <input type="radio"/> Mask portions of URL    Do not show sensitive data such as tokens in the UI.</p> <p><b>Secret token</b> Used to validate received payloads. Sent with the request in the <code>X-Gitlab-Token</code> HTTP header.</p> <p><b>Trigger</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Push events</li> <li><input type="checkbox"/> Tag push events A new tag is pushed to the repository.</li> <li><input type="checkbox"/> Comments A comment is added to an issue or merge request.</li> <li><input type="checkbox"/> Confidential comments A comment is added to a confidential issue.</li> <li><input type="checkbox"/> Issues events An issue is created, updated, closed, or reopened.</li> <li><input type="checkbox"/> Confidential issues events A confidential issue is created, updated, closed, or reopened.</li> <li><input checked="" type="checkbox"/> Merge request events A merge request is created, updated, or merged.</li> <li><input type="checkbox"/> Job events A job's status changes.</li> <li><input type="checkbox"/> Pipeline events A pipeline's status changes.</li> <li>...</li> </ul>

**Rajah C-143: Mobile Flutter – Paparan Halaman *Workflow Editor***

Tatacara	Paparan									
<p><b>Paparan halaman Webhooks [Rajah C-144].</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>SSL verification</b> - : <b>Enable SSL verification.</b></li> <li>2. Tekan butang <b>Add webhook.</b></li> </ol>	<p>Issue is created, updated, closed, or reopened.</p> <p><input type="checkbox"/> Confidential issue events A confidential issue is created, updated, closed, or reopened.</p> <p><input checked="" type="checkbox"/> Merge request events A merge request is created, updated, or merged.</p> <p><input type="checkbox"/> Job events A job's status changes.</p> <p><input type="checkbox"/> Pipeline events A pipeline's status changes.</p> <p><input type="checkbox"/> Wiki page events A wiki page is created or updated.</p> <p><input type="checkbox"/> Deployment events A deployment starts, finishes, fails, or is canceled.</p> <p><input type="checkbox"/> Feature flag events A feature flag is turned on or off.</p> <p><input type="checkbox"/> Releases events A release is created or updated.</p> <p>SSL verification</p> <p><input checked="" type="checkbox"/> Enable SSL verification</p> <p><b>Add webhook</b></p> <table border="1"> <thead> <tr> <th colspan="3">Project Hooks (1)</th> </tr> </thead> <tbody> <tr> <td>https://api.codemagic.io/hooks/6526310bb4938e385647c0c5</td> <td>Test</td> <td>Edit</td> </tr> <tr> <td>Push events</td> <td>SSL Verification: enabled</td> <td>Delete</td> </tr> </tbody> </table>	Project Hooks (1)			https://api.codemagic.io/hooks/6526310bb4938e385647c0c5	Test	Edit	Push events	SSL Verification: enabled	Delete
Project Hooks (1)										
https://api.codemagic.io/hooks/6526310bb4938e385647c0c5	Test	Edit								
Push events	SSL Verification: enabled	Delete								

**Rajah C-144: Mobile Flutter – Paparan Halaman *Workflow Editor***

## Lampiran C-9: Kawalan Kualiti Kod

Pengujian awal di dalam *pipeline* GitLab adalah proses semakan awal secara automatik dengan menggunakan templat sedia ada. Berikut merupakan tatacara penyediaan skrip pengujian bagi kawalan kualiti kod.

Tatacara	Paparan
GitLab CI/CD ada menyediakan templat bagi pengujian unit.	# Unit Test unit-test-job: image: node:17-alpine3.14 stage: test cache: key: "\$CI_COMMIT_REF_NAME" paths: - app/node_modules before_script: - cd app - npm install script: - npm test artifacts: when: always paths: - app/junit.xml
Contoh skrip pengujian unit.	

Tatacara	Paparan
	<pre>reports:   junit: app/junit.xml</pre>
GitLab CI/CD ada menyediakan templat bagi pengujian SAST.  Contoh skrip SAST menggunakan templat dari GitLab	<pre>#include SAST template in your CI configuration include:   - template: Security/SAST.gitlab-ci.yml  #Static Application Security Test (SAST)  sast:   stage: test</pre>
GitLab CI/CD ada menyediakan templat bagi pengujian kod kualiti.  Contoh skrip kualiti kod menggunakan GitLab dan menghasilkan laporan dalam bentuk json file.	<pre># include code quality template in your CI configuration include:   - template: Code-Quality.gitlab-ci.yml  # CODE QUALITY check code_quality:   services:      # Shut off Docker-in-Docker   tags:</pre>

Tatacara	Paparan
	<ul style="list-style-type: none"> <li>- cq-sans-dind</li> </ul> <p>artifacts:</p> <pre>paths: [gl-code-quality-report.json] #report artifacts downloadable page</pre>
GitLab CI/CD ada menyediakan templat bagi pengujian kod kualiti. Contoh skrip kualiti kod menggunakan GitLab dan menghasilkan laporan dalam bentuk html file.	<pre># include code quality template in your CI configuration</pre> <pre>include:   - template: Code-Quality.gitlab-ci.yml</pre> <pre># CODE QUALITY check</pre> <pre>code_quality_html:   extends: code_quality</pre> <pre>variables:   REPORT_FORMAT: html</pre> <pre>artifacts:   paths: [gl-code-quality-report.html] #report artifacts downloadable page</pre>



## LAMPIRAN D: PERINGKAT PEMBANGUNAN

### Lampiran D-1: *Compile Code [C1]*

Code compiler pula pembinaan code yang bergantung kepada bahasa pengaturcaraan. Berikut antara contoh skrip bagi *code build* berdasarkan bahasa pengaturcaraan yang digunakan.

Tatacara	Paparan
Contoh skrip yang digunakan untuk <i>compile</i> Java.	<code>mvn clean install</code>
Contoh skrip yang digunakan untuk <i>compile</i> Angular.	<code>ng build prod</code>
Contoh skrip yang digunakan untuk <i>compile</i> Laravel.	<code>Composer install</code>

## Lampiran D-2: Package Code [C2]

Package code yang dibina akan disimpan di *Package Registry*. GitLab *Package Registry* adalah koleksi *package* yang membantu dalam pencarian, konfigurasi, dan pemasangan pakej. Dengan menggunakan GitLab *Package Registry*, pasukan boleh menggunakan sebagai *private* atau *public registry* untuk mengurus pelbagai pakej yang disokong. Antara contoh *build automation tools* adalah npm. Sebelum *publish package* pada GitLab *Project*, proses *authentikasi* perlu dilaksanakan dan token perlu diperolehi. Tatacara berikut akan memberikan beberapa contoh penggunaan *Package Registry*.

Tatacara	Paparan
<p><b>Autentikasi menggunakan fail .npmrc .</b></p> <p>Fail .npmrc diwujudkan pada direktori yang sama pada fail package.json di GitLab Project. masukkan skrip berikut pada fail .npmrc .</p> <p>Gantikan @scope dengan <i>root level group</i> pada projek yang hendak dipaparkan pakej tersebut.</p> <p>#{CI_PROJECT_ID} dan #{CI_JOB_TOKEN} merupakan pembolehubah yang telah ditetapkan pada <i>pipeline</i> dan tidak perlu diubah.</p>	<pre>@scope:registry=https://your_domain_name/api/v4/projects/your_project_id/packages/npm/ //your_domain_name/api/v4/projects/\${CI_PROJECT_ID}/packages/npm/:_authToken=\${CI_JOB_TOKEN}</pre>

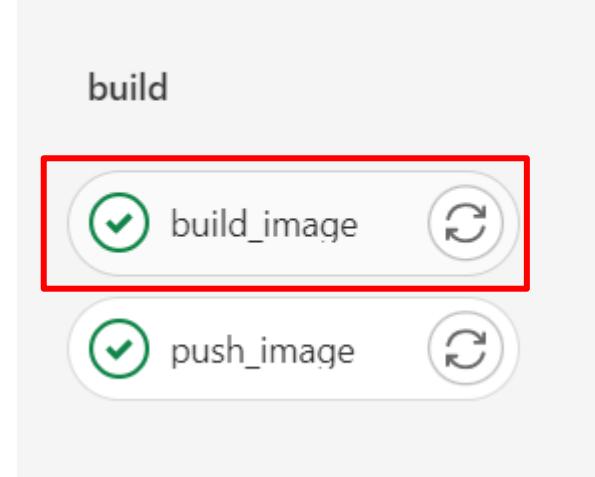
Tatacara	Paparan
<p><b><i>Publishing package menggunakan pipeline GitLab.</i></b></p> <p>Gunakan skrip berikut bagi memaparkan pakej pada <i>Package Registry</i> setelah <i>pipeline</i> GitLab dijalankan.</p>	<pre>image: node:latest stages:   - deploy  deploy:   stage: deploy   script:     - echo       "//\${CI_SERVER_HOST}/api/v4/projects/\${CI_PROJECT_ID}/packages/npm/:_authToken=\${CI_JOB_TOKEN}"&gt;.npmrc     - npm publish</pre>

### Lampiran D-3: Membina Imej Container [C3]

GitLab CI/CD boleh digunakan dengan Docker untuk membina imej Docker. Sebelum menggunakan Docker command pada CI/CD jobs, GitLab Runner perlu dikonfigurasikan untuk menyokong docker command. Tatacara berikut akan menerangkan cara untuk enable Docker command menggunakan shell executor seterusnya contoh skrip untuk membina imej Docker.

Tatacara	Paparan
Pada GitLab Runner, register runner dan pilih shell executor.	<pre>sudo gitlab-runner register -n \ --url https://gitlab.com/ \ --registration-token REGISTRATION_TOKEN \ --executor shell \ --description "My Runner"</pre>
Pada pelayan dimana GitLab Runner diinstall, install Docker Engine. Tambah user gitlab-runner ke docker group.	<pre>sudo usermod -aG docker gitlab-runner</pre>
Bagi memastikan gitlab-runner mempunyai akses ke Docker.	<pre>sudo -u gitlab-runner -H docker info</pre>
Dockerfile perlu diwujudkan pada repositori Masukkan skrip seperti paparan	<pre>FROM node:16-alpine WORKDIR /usr/src/app  COPY ./app/package*.json ./</pre>

Tatacara	Paparan
	<pre>RUN npm install COPY ./app .  EXPOSE 3000 CMD ["npm", "start"]</pre>
<p>Pada GitLab CI/CD, masukkan skrip berikut untuk membina imej docker.</p> <p>Contoh skrip <i>build image</i>.</p>	<pre>stage:   - build  image: alpine  build_image:   stage: build   tags:     - rancher2     - shared     - shell    script:     - docker build -t \$IMAGE_REPOSITORY:\$SERVICE_VERSION</pre>

Tatacara	Paparan
Paparan pada <i>pipeline</i> GitLab sekiranya <i>build image</i> pada <i>stage build</i> berjaya [Rajah D-145].	 <p>The screenshot shows the GitLab Pipeline Editor interface. At the top, it says "build". Below that, there are two stages: "build_image" and "push_image". Both stages have green checkmarks indicating they were successful. Each stage has a circular icon with a refresh symbol next to it. A red rectangular box highlights the "build_image" stage.</p> <p>Rajah D-145: GitLab – Editor <i>Pipeline</i> GitLab</p>

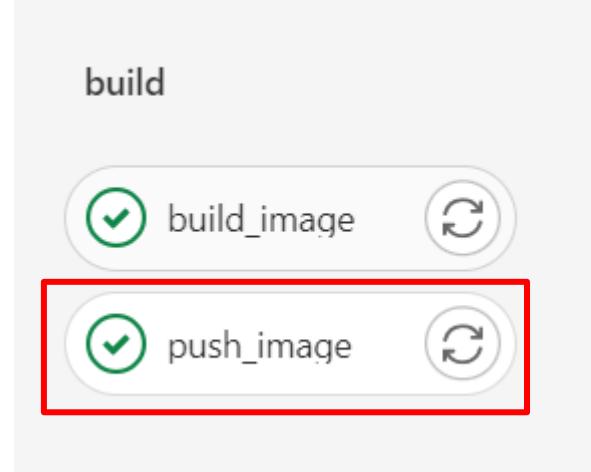
### Lampiran D-4: Push Imej ke Container Registry [C4]

Setelah imej Docker dibina, imej tersebut perlu dihantar ke *container registry*. Tatacara berikut akan menerangkan contoh skrip untuk push imej Docker ke *container registry*.

Tatacara	Paparan
Contoh skrip <i>push image</i> ke docker.	<pre>stage:   - build  push_image:   stage: build   needs:     - build_image   tags:     - rancher2     - shared     - shell   before_script:     - docker login -u \$REGISTRY_USER -P \$REGISTRY_PASS docker.io   script:     - docker push \$IMAGE_REPOSITORY:\$SERVICE_VERSION</pre>

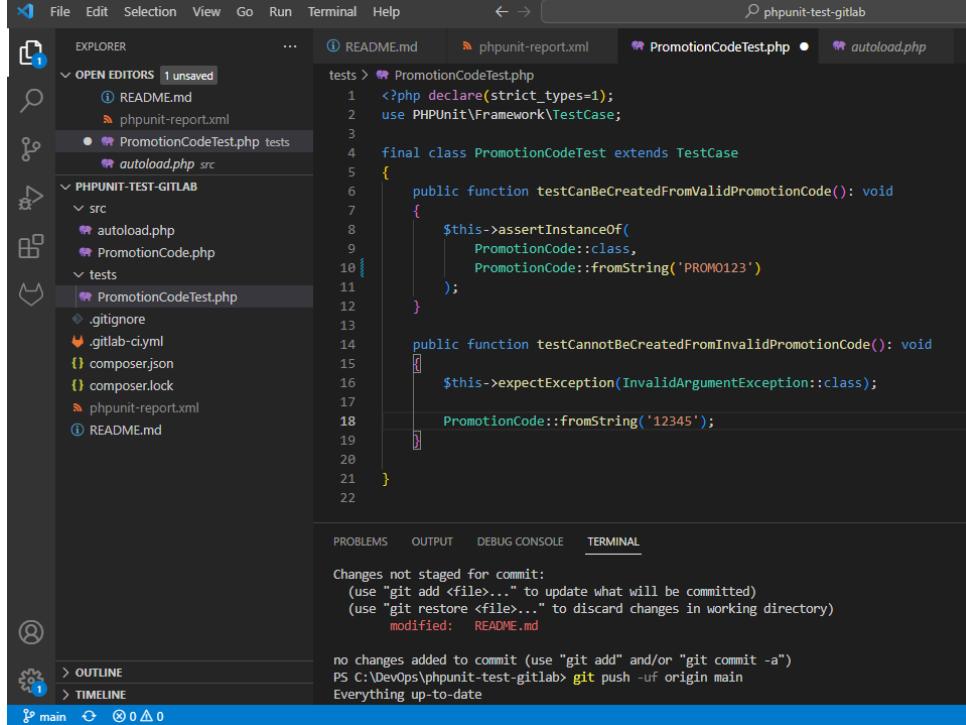
Tatacara	Paparan
Contoh skrip <i>push image ke Harbor.</i>	<pre>stage:   - build  # build docker image with artifacts  build-image:   stage: build   before_script:     - export FILEVERSION=\$(cat app/package.json   jq -r .version)     - export VERSION=\$FILEVERSION.\$CI_PIPELINE_ID     - echo \$VERSION     - echo \$VERSION &gt; version-file.txt   script:     - docker build -t \$IMAGE_REPOSITORY:\$VERSION .   artifacts:     paths:       - version-file.txt  # push docker image to Harbor  push_image:   stage: build</pre>

Tatacara	Paparan
	<pre>needs:   - build_image  before_script:   - export VERSION=\$(cat version-file.txt)  script:   - echo \$HARBOR_USERNAME   - echo -n \$HB_TOKEN   docker login -u \$HB_USERNAME --password-stdin hub &lt;your hub&gt;   - docker push \$IMAGE_REPOSITORY:\$SERVICE_VERSION</pre>

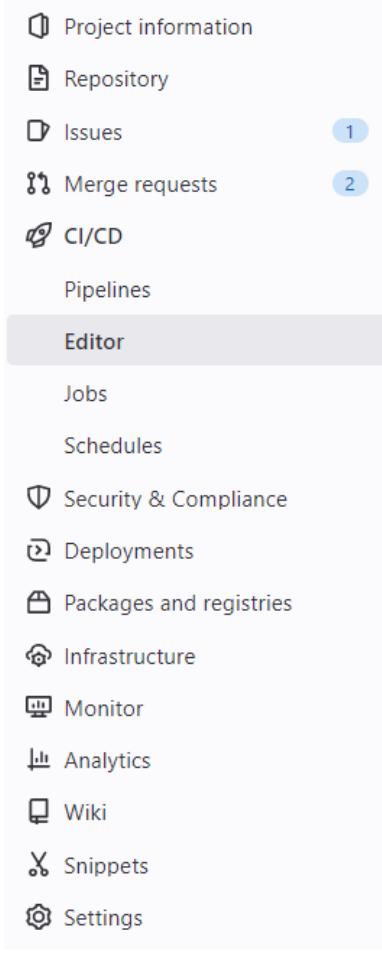
Tatacara	Paparan
Paparan pada <i>pipeline</i> GitLab sekiranya <i>push image</i> pada <i>stage build</i> berjaya [Rajah D-146].	 <p>The screenshot shows the GitLab Pipeline Editor interface. At the top, it says "build". Below that, there are two tasks in a horizontal row. The first task is "build_image" with a green checkmark icon and a circular refresh icon to its right. The second task is "push_image" with a green checkmark icon and a circular refresh icon to its right. A red rectangular box highlights the "push_image" task.</p> <p>Rajah D-146: GitLab – Editor <i>Pipeline</i> GitLab</p>

## LAMPIRAN E: PERINGKAT PENGUJIAN

### Lampiran E-1: Pengujian Unit

Tatacara	Paparan
<p><b>Membangun dan menjalankan skrip pengujian unit.</b></p> <ol style="list-style-type: none"> <li>Skrip pengujian unit dibangunkan oleh pembangun pada persekitaran pengekodan pembangun menggunakan IDE seperti <i>Visual Studio Code</i> [Rajah E-147].</li> <li>Setelah pengekodan dan pengujian pada persekitaran pembangun selesai, pembangun akan <i>commit</i> dan <i>push</i> kod sumber ke repositori GitLab.</li> </ol>	 <p>The screenshot shows the Visual Studio Code interface. The code editor displays a PHP test file named 'PromotionCodeTest.php' with the following code:</p> <pre> 1 &lt;?php declare(strict_types=1); 2 use PHPUnit\Framework\TestCase; 3 4 final class PromotionCodeTest extends TestCase 5 { 6     public function testCanBeCreatedFromValidPromotionCode(): void 7     { 8         \$this-&gt;assertInstanceOf( 9             PromotionCode::class, 10            PromotionCode::fromString('PROMO123') 11        ); 12    } 13 14    public function testCannotBeCreatedFromInvalidPromotionCode(): void 15    { 16        \$this-&gt;expectException(InvalidArgumentException::class); 17 18        PromotionCode::fromString('12345'); 19    } 20 21 } </pre> <p>The terminal at the bottom shows the command line output:</p> <pre> Changes not staged for commit:   (use "git add &lt;file&gt;..." to update what will be committed)   (use "git restore &lt;file&gt;..." to discard changes in working directory)     modified:   README.md  no changes added to commit (use "git add" and/or "git commit -a") PS C:\DevOps\phpunit-test-gitlab&gt; git push -uf origin main Everything up-to-date </pre>

Rajah E-147: *Visual Studio Code – Fail Kod Sumber Untuk Pengujian Unit*

Tatacara	Paparan
<p><b>Konfigurasi skrip pengujian unit ke dalam <i>pipeline</i> GitLab.</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu</b>.</li> <li>2. Pilih <b>Project</b>.</li> <li>3. Pilih projek yang telah diwujudkan.</li> <li>4. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>5. Sub-menu akan muncul.</li> <li>6. Klik menu <b>Editor</b> [Rajah E-148].</li> <li>7. Paparan <i>Pipeline</i> Editor yang memaparkan <i>.gitlab-ci.yml</i> akan muncul.</li> </ol>	 <p>The screenshot shows the GitLab main menu on the left side of the interface. The 'CI/CD' section is expanded, and the 'Editor' option is highlighted with a grey background. Other options visible include Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), Pipelines, Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p>

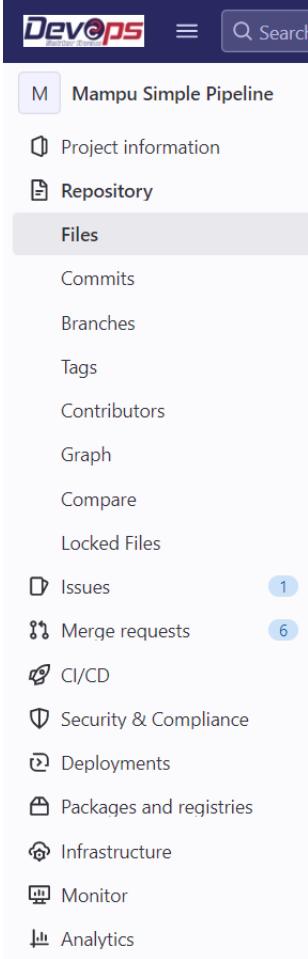
Rajah E-148: Gitlab – Paparan Menu Utama

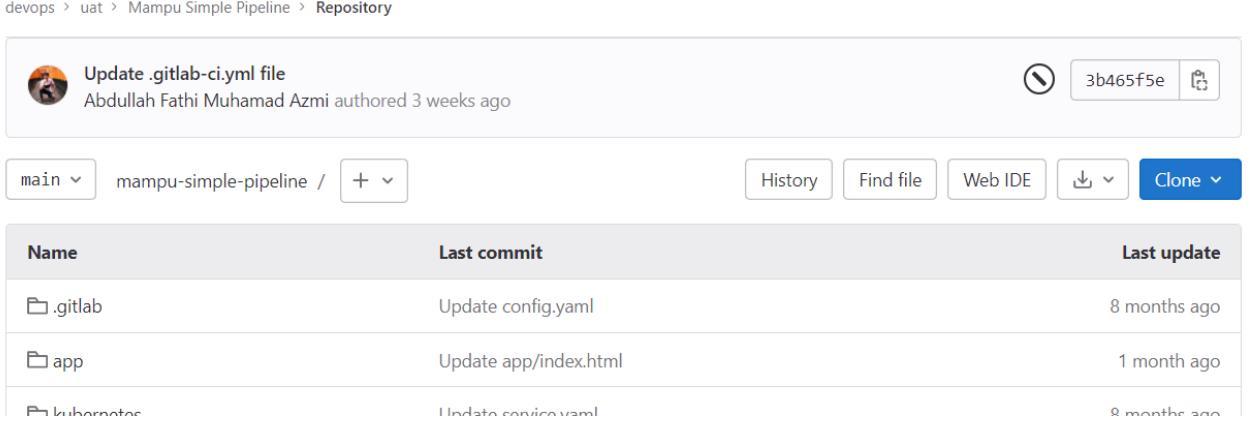
Tatacara	Paparan
8. Masukkan syntax berikut ke dalam fail .gitlab-ci.yml.	<pre>image: php:8.0.12-cli  cache:   paths:     - vendor/  before_script:   - test -d vendor    apt-get update -yqq   - test -d vendor    apt-get install -yqq curl git libpq-dev libcurl4-gnutls-dev libicu-dev libvpx-dev libjpeg-dev libpng-dev libxpm-dev zlib1g-dev libfreetype6-dev libxml2-dev libexpat1-dev libbz2-dev libgmp3-dev libldap2-dev unixodbc-dev libsqlite3-dev libaspell-dev libsnmp-dev libpcre3-dev libtidy-dev libonig-dev libzip-dev   - test -d vendor    docker-php-ext-install mbstring pdo_pgsql curl intl gd xml zip bz2   - test -d vendor    curl -sS https://getcomposer.org/installer   php   - test -d vendor    php composer.phar install  Unit-test:   script:</pre>

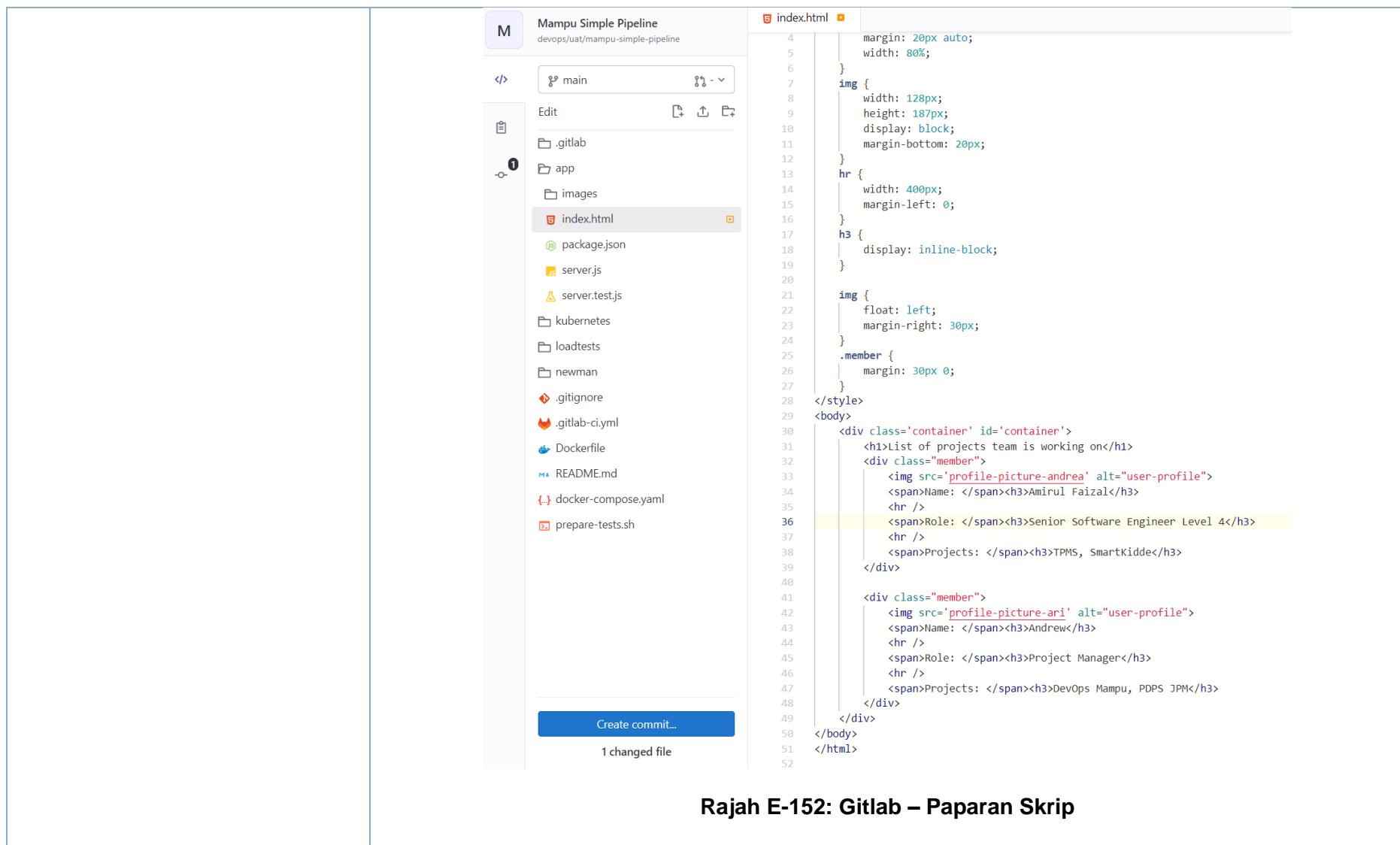
Tatacara	Paparan
	<pre> - vendor/bin/phpunit --bootstrap src/autoload.php --colors=never --log-junit phpunit-report.xml tests allow_failure: true artifacts: when: always reports: junit: phpunit-report.xml </pre>
<p>9. Masukkan mesej pada ruangan <i>commit message</i> seperti</p> <p>Kemaskini pengujian unit pada pipeline</p> <p>Commit changes</p> <p>10. Klik untuk menyimpan dan mengemaskini file <i>.gitlab-ci.yml</i>.</p> <p>11. Pipeline GitLab telah dikemaskini dengan job SAST.</p>	 <pre> # See https://docs.gitlab.com/ee/ci/variables/#cicd-variable-precedence image: php:8.0.12-cli cache:   paths:     - vendor/ before_script:   - test -d vendor    apt-get update &gt;/dev/null   - test -d vendor    apt-get install -y curl git libcurl4-gnutls-dev libcurl-dev libvpx-dev libpng-dev libxml2-dev libfreetype6-dev libxml2-dev libexpat1-dev libbz2-dev libmpg3-dev libldap2-dev unixodbc-dev libsqlite3-dev libspell-dev   - test -d vendor    docker-php-ext-install mysqli pdo_mysql curl intl gd xml zip bzip2   - test -d vendor    curl -sS https://getcomposer.org/installer   php   - test -d vendor    php composer.phar install test:   script:     - vendor/bin/phpunit --bootstrap src/autoload.php --colors=never --log-junit phpunit-report.xml tests allow_failure: true artifacts: when: always reports: junit: phpunit-report.xml </pre> <p>Commit message: Update .gitlab-ci.yml file</p> <p>Branch: main</p> <p>Commit changes Reset</p>

Tatacara	Paparan
<p><i>Push kod sumber dari IDE.</i></p> <p><i>Pipeline GitLab akan dijalankan secara automasi [Rajah E-149].</i></p>	<p>The screenshot shows a pipeline interface with the following details:</p> <ul style="list-style-type: none"><li><b>Status:</b> running (In progress)</li><li><b>Pipeline:</b> Test Parameter Changes #2371 (main -&gt; 772a637b)</li><li><b>Triggerer:</b> latest</li><li><b>Stages:</b> (No stages visible)</li></ul>

**Rajah E-149: Gitlab – Paparan Pipeline GitLab**

Tatacara	Paparan
<p><b>Menjalankan <i>pipeline</i> GitLab secara automasi untuk pengujian unit.</b></p> <p><i>Pipeline</i> GitLab boleh dijalankan secara automasi dengan <i>commit</i> perubahan ke <i>branch</i> repositori projek [Rajah E-150].</p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu</b>.</li> <li>2. Pilih <b>Repository</b>.</li> <li>3. Pilih <b>Files</b>.</li> <li>4. Paparan <i>Repository</i> fail akan muncul.</li>   <div style="border: 1px solid #ccc; padding: 5px; display: inline-block;"> <span style="color: #0072bc;">Web IDE</span> </div> <li>5. Klik <b>Web IDE</b>, paparan editor yang memaparkan senarai <i>file</i> akan muncul [Rajah E-151].</li> <li>6. Dalam senarai fail repositori, pilih dan kemaskini fail.</li> <li>7. Setelah fail selesai dikemaskini. Klik <b>Create commit...</b> [Rajah E-152].</li> </ol>	 <p><b>Rajah E-150: Gitlab – Paparan Menu Utama</b></p>

Tatacara	Paparan												
<p>8. Masukkan mesej pada ruangan <i>commit message</i> seperti</p> <p style="background-color: #f2e0d7; padding: 5px;"><b>Kemaskini fail</b></p> <p>9. Klik <b>Commit</b> untuk menyimpan dan mengemaskini file pada repositori.</p> <p>10. Paparan <i>New merge request</i> akan muncul.</p> <p>11. Masukkan maklumat pada paparan <i>New merge request</i>.</p> <p>12. Klik <b>Create merge request</b> untuk mewujudkan <i>merge request</i>.</p> <p>13. <i>Pipeline</i> GitLab akan dijalankan secara automasi setelah menerima arahan semasa <i>Merge Request</i> [Rajah E-153].</p>	 <p>The screenshot shows a GitLab repository named 'mampu-simple-pipeline'. At the top, there's a commit from 'Abdullah Fathi Muhamad Azmi' dated three weeks ago, titled 'Update .gitlab-ci.yml file'. Below the commit, there's a navigation bar with 'main' selected, a search bar, and buttons for 'History', 'Find file', 'Web IDE', and 'Clone'. The main area displays a table of files with their last commit details:</p> <table border="1" data-bbox="743 525 1994 727"> <thead> <tr> <th>Name</th> <th>Last commit</th> <th>Last update</th> </tr> </thead> <tbody> <tr> <td>.gitlab</td> <td>Update config.yaml</td> <td>8 months ago</td> </tr> <tr> <td>app</td> <td>Update app/index.html</td> <td>1 month ago</td> </tr> <tr> <td>ci-kubernetes</td> <td>Update service.yaml</td> <td>8 months ago</td> </tr> </tbody> </table> <p><b>Rajah E-151: Gitlab – Paparan Repository Files</b></p>	Name	Last commit	Last update	.gitlab	Update config.yaml	8 months ago	app	Update app/index.html	1 month ago	ci-kubernetes	Update service.yaml	8 months ago
Name	Last commit	Last update											
.gitlab	Update config.yaml	8 months ago											
app	Update app/index.html	1 month ago											
ci-kubernetes	Update service.yaml	8 months ago											



Mampu Simple Pipeline  
devops/ut/mampu-simple-pipeline

index.html

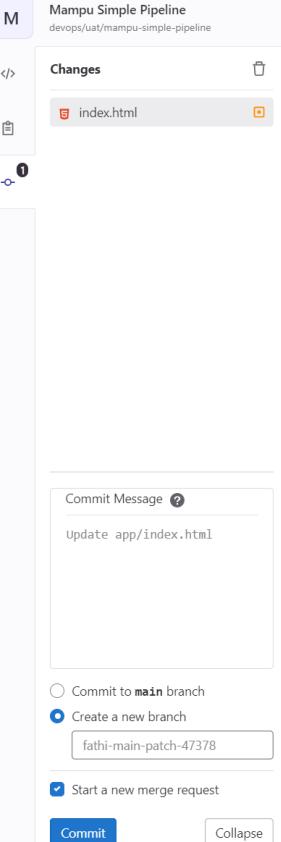
```
4 margin: 20px auto;
5 width: 80%;
6 }
7 img {
8 width: 128px;
9 height: 187px;
10 display: block;
11 margin-bottom: 20px;
12 }
13 hr {
14 width: 400px;
15 margin-left: 0;
16 }
17 h3 {
18 display: inline-block;
19 }
20 }
21 img {
22 float: left;
23 margin-right: 30px;
24 }
25 .member {
26 margin: 30px 0;
27 }
28 
```

</style>

```
29 <body>
30 <div class='container' id='container'>
31 <h1>List of projects team is working on</h1>
32 <div class="member">
33 <img src='profile-picture-andrea' alt="user-profile">
34 <span>Name: </span><h3>Amirul Faizal</h3>
35 <hr />
36 <span>Role: </span><h3>Senior Software Engineer Level 4</h3>
37 <hr />
38 <span>Projects: </span><h3>TPMS, SmartKidde</h3>
39 </div>
40 <div class="member">
41 <img src='profile-picture-ari' alt="user-profile">
42 <span>Name: </span><h3>Andrew</h3>
43 <hr />
44 <span>Role: </span><h3>Project Manager</h3>
45 <hr />
46 <span>Projects: </span><h3>DevOps Mampu, PDPS JPM</h3>
47 </div>
48 </div>
49 </body>
50 </html>
```

Create commit...  
1 changed file

Rajah E-152: Gitlab – Paparan Skrip

Tatacara	Paparan
	 <pre>1 &lt;html lang="en"&gt; 2   &lt;style&gt; 3     .container { 4       margin: 20px auto; 5       width: 80%; 6     } 7     img { 8       width: 128px; 9       height: 187px; 10      display: block; 11      margin-bottom: 20px; 12    } 13    hr { 14      width: 400px; 15      margin-left: 0; 16    } 17    h3 { 18      display: inline-block; 19    } 20 21    img { 22      float: left; 23      margin-right: 30px; 24    } 25    .member { 26      margin: 30px 0; 27    } 28  &lt;/style&gt; 29  &lt;body&gt; 30    &lt;div class='container' id='container'&gt; 31      &lt;h1&gt;List of projects team is working on&lt;/h1&gt; 32      &lt;div class='member'&gt; 33        &lt;img src='profile-picture-andrea' alt='user-profile'&gt; 34        &lt;span&gt;Name: &lt;/span&gt;&lt;h3&gt;Amirul Faizal&lt;/h3&gt; 35        &lt;hr /&gt; 36        &lt;span&gt;Role: &lt;/span&gt;&lt;h3&gt;Senior Software Engineer Level 5&lt;/h3&gt; 37        &lt;hr /&gt; 38        &lt;span&gt;Projects: &lt;/span&gt;&lt;h3&gt;TPMS, SmartKidde&lt;/h3&gt; 39      &lt;/div&gt; 40 41      &lt;div class='member'&gt; 42        &lt;img src='profile-picture-ari' alt='user-profile'&gt; 43        &lt;span&gt;Name: &lt;/span&gt;&lt;h3&gt;Andrew&lt;/h3&gt; 44        &lt;hr /&gt; 45        &lt;span&gt;Role: &lt;/span&gt;&lt;h3&gt;Project Manager&lt;/h3&gt; 46        &lt;hr /&gt; 47        &lt;span&gt;Projects: &lt;/span&gt;&lt;h3&gt;DevOps Mampu, PDPS JPM&lt;/h3&gt;</pre>

New merge request

From Fathi-main-patch-74283 into main Change branches

Title (required)

Update app/index.html

Start the title with [Draft](#) to prevent a merge request draft from merging before it's ready.

Description

Choose a template

Write Preview

Describe the goal of the changes and what reviewers should be aware of.

Supports Markdown. For quick actions, type [/](#).

Assignees

Unassigned Assign to me

Reviewers

Unassigned

Approvals are optional.  
» Approval rules

Milestone

Select milestone

Labels

Labels

Merge request dependencies

Enter merge request URLs or references (e.g. path/to/projectmerge\_request\_id)

List the merge requests that must be merged before this one.

Merge options

Delete source branch when merge request is accepted.

Squash commits when merge request is accepted. [?](#)

Create merge request Cancel

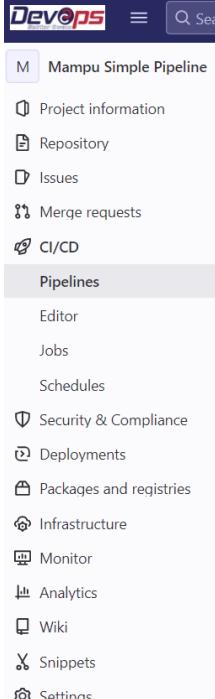
Commits 1 Changes 1

12 Jan, 2023 1 commit

 Update app/index.html  
Abdullah Fathi Muhamad Azmi authored just now

f3c6dd13 

Tatacara	Paparan								
	<p>devops &gt; uat &gt; Mampu Simple Pipeline &gt; Pipelines</p> <p>All 209    Finished    Branches    Tags</p> <p>Clear runner caches    CI lint    Run pipeline</p> <p>Filter pipelines <input type="text"/> <input type="button" value="Search"/> Show Pipeline ID <input type="button" value="▼"/></p> <table border="1"><thead><tr><th>Status</th><th>Pipeline</th><th>Triggerer</th><th>Stages</th></tr></thead><tbody><tr><td><span>running</span> <input checked="" type="checkbox"/> In progress</td><td>Update app/index.html #2382 11 7 → f3c6dd13 <small>latest merge request</small></td><td></td><td></td></tr></tbody></table> <p>Rajah E-153: Gitlab – Paparan <i>New Merge Request</i></p>	Status	Pipeline	Triggerer	Stages	<span>running</span> <input checked="" type="checkbox"/> In progress	Update app/index.html #2382 11 7 → f3c6dd13 <small>latest merge request</small>		
Status	Pipeline	Triggerer	Stages						
<span>running</span> <input checked="" type="checkbox"/> In progress	Update app/index.html #2382 11 7 → f3c6dd13 <small>latest merge request</small>								

Tatacara	Paparan
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk pengujian unit.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b>.</li> <li>2. Klik butang pada ruangan Status. Status tugas <i>pipeline</i> akan dipaparkan [Rajah E-155]. Klik pada ikon  pada tugasan untuk melihat log terperinci bagi setiap tugasan.</li> <li>3. Status log tugas pengujian sistem akan dipaparkan [Rajah E-156].</li> </ol>	 <p>Rajah E-154: Gitlab – Paparan Menu Utama</p>  <p>Rajah E-155: Gitlab – Status Tugasan Untuk <i>Pipeline</i> GitLab</p>

**Tatacara**

```

35 3 high severity vulnerabilities
36 To address issues that do not require attention, run:
37   npm audit fix
38 To address all issues, run:
39   npm audit fix --force
40 Run 'npm audit' for details.
41 $ npm test
42 > bootcamp-node-project@1.0 test
43 > jest --ci --reporters=default --reporters=jest-junit
44 PASS ./server.test.js
45   ✓ main index.html file exists (3 ms)
46   ✓ Dockerfile exists
47   ✓ .gitignore file exists (8 ms)
48 Test Suites: 1 passed, 1 total
49 Tests:       3 passed, 3 total
50 Snapshots:  0 total
51 Time:        1.602 s
52 Ran all test suites.
53 Saving cache for successful job
54 Creating cache main-2-protected...
55 app/node_modules: found 8828 matching files and directories
56 No URL provided, cache will not be uploaded to shared cache server. Cache will be stored only locally.
57 Created cache
58 Uploading artifacts for successful job
59 Uploading artifacts...
60 app/junit.xml: found 1 matching files and directories
61 Uploading artifacts as "archive" to coordinator... 201 Created id=12845 responseStatus=201 Created token=XCB7PB1Z
62 app/junit.xml: found 1 matching files and directories
63 Uploading artifacts as "junit" to coordinator... 201 Created id=12845 responseStatus=201 Created token=XCB7PB1Z
64 Uploading artifacts...
65 app/junit.xml: found 1 matching files and directories
66 Uploading artifacts as "junit" to coordinator... 201 Created id=12845 responseStatus=201 Created token=XCB7PB1Z
67 Cleaning up project directory and file based variables
68 Job succeeded
    
```

**Paparan**

unit-test-job

Duration: 19 seconds  
Finished: 3 days ago  
Queued: 52 seconds  
Timeout: 1h (from project)  
Runner: #27 (slobEYFk) 18-gitlab-server ruby2.7 docker executor

Job artifacts

These artifacts are the latest. They will not be deleted (even if expired) until newer artifacts are available.

Keep Download Browse

Commit bc91e42b  
Update .gitlab-ci.yml file

Pipeline #2434 for main

test

- code\_quality
- newman\_tests
- nodejs-scan-sast
- semgrep-sast

**Rajah E-156: Gitlab – Status Log Tugasan**

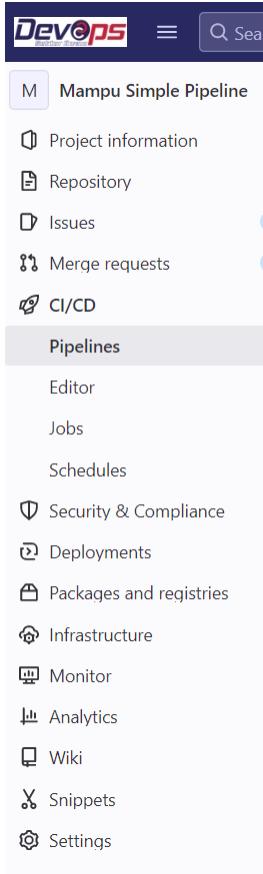
## Lampiran E-2: Pengujian Integrasi

Pengujian integrasi dilaksanakan menggunakan dua kaedah berikut:

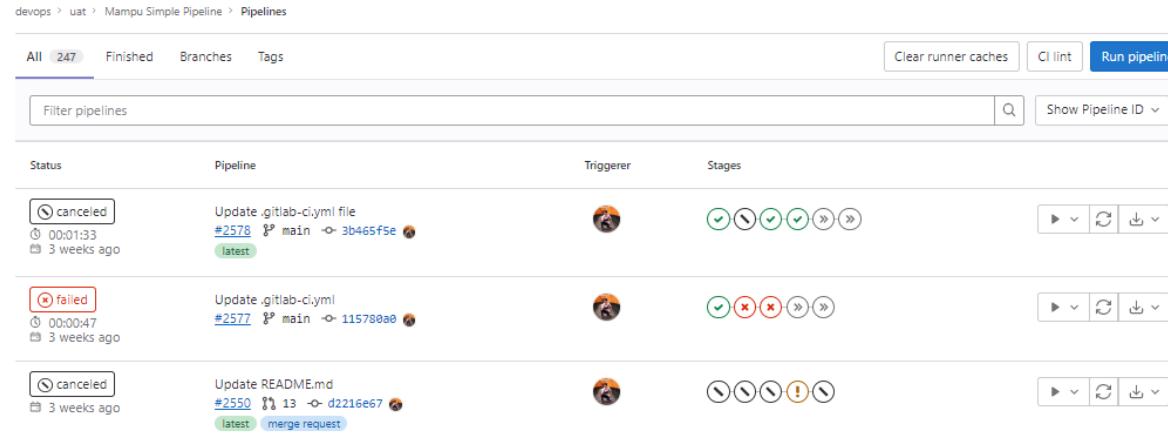
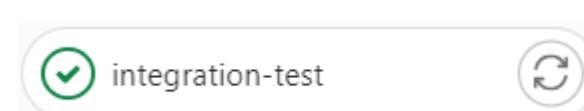
- Pengujian integrasi di antara komponen-komponen menggunakan skrip pengujian integrasi.
- Pengujian integrasi API menggunakan Newman.

Tatacara	Paparan
<p><b>Pengujian integrasi di antara komponen-komponen menggunakan skrip pengujian integrasi.</b></p> <p><b>Konfigurasi skrip pengujian integrasi ke dalam <i>pipeline</i> GitLab.</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah mewujudkan.</li> <li>2. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>3. Sub-menu akan muncul</li> <li>4. Klik menu <b>Editor</b>.</li> <li>5. Paparan <i>Pipeline</i> Editor yang memaparkan <code>.gitlab-ci.yml</code> akan muncul.</li> <li>6. Masukkan <i>syntax</i> berikut ke dalam fail <code>.gitlab-ci.yml</code>.</li> </ol>	<pre>image: php:8.0.12-cli  cache:   paths:     - vendor/  before_script:   - test -d vendor    apt-get update -yqq   - test -d vendor    apt-get install -yqq curl git libpq-dev libcurl4-gnutls-dev libicu-dev libvpx-dev libjpeg-dev libpng-dev libxpm-dev zlib1g-dev libfreetype6-dev libxml2-dev libexpat1-dev libbz2-dev libgmp3-dev libldap2-dev unixodbc-dev libssqlite3-dev libaspell-dev libsnmp-dev libpcre3-dev libtidy-dev libonig-dev libzip-dev</pre>

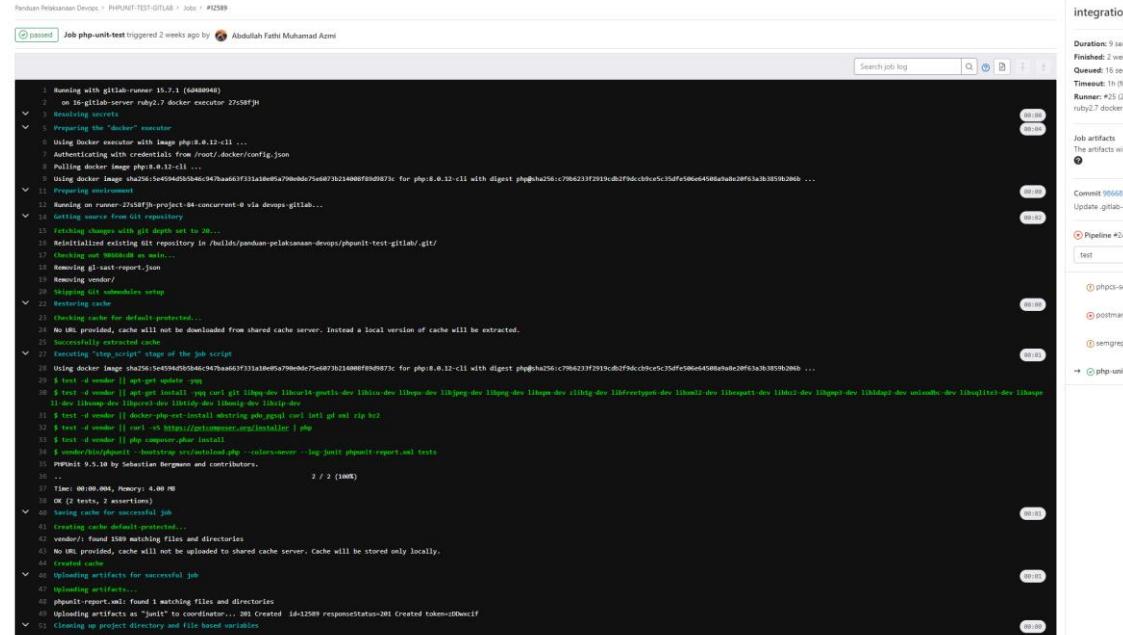
<b>Pengujian integrasi di antara komponen-komponen menggunakan skrip pengujian integrasi.</b>	
<b>Tatacara</b>	<b>Paparan</b>
<p>7. Masukkan mesej pada ruangan <i>commit</i> seperti</p> <p style="background-color: #f2e0d7; padding: 5px;"><b>Kemaskini skrip pengujian integrasi pada pipeline</b></p> <p style="text-align: center;"><b>Commit changes</b></p> <p>8. Klick <b>Commit changes</b> untuk menyimpan dan mengemaskini file <i>.gitlab-ci.yml</i>.</p> <p>9. <i>Pipeline</i> GitLab telah dikemaskini dengan job pengujian integrasi.</p>	<pre>- test -d vendor    docker-php-ext-install mbstring pdo_pgsql curl intl gd xml zip bz2 - test -d vendor    curl -sS https://getcomposer.org/installer   php - test -d vendor    php composer.phar install</pre> <p>Integration-test:</p> <pre>script: - vendor/bin/phpunit --bootstrap src/autoload.php --colors=never --log-junit phpintegration-report.xml tests</pre> <p>allow_failure: true</p> <p>artifacts:</p> <pre>when: always</pre> <p>reports:</p> <pre>junit: integrationtest-report.xml</pre>
<p><b>Menjalankan <i>pipeline</i> GitLab untuk pengujian integrasi</b></p> <p>1. Rujuk pada para pengujian unit, menjalankan <i>pipeline</i> GitLab secara automasi.</p>	

Tatacara	Paparan
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk pengujian integrasi.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b> [Rajah E-157].</li> <li>2. Klik butang pada ruangan <b>Status</b>.</li> <li>3. Status tugas <i>pipeline</i> akan dipaparkan [Rajah E-158].</li> <li>4. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugas [Rajah E-159].</li> <li>5. Status log tugas pengujian sistem akan dipaparkan [Rajah E-160].</li> </ol>	 <p>Rajah E-157: Gitlab – Paparan Menu Utama</p>

**Pengujian integrasi di antara komponen-komponen menggunakan skrip pengujian integrasi.**

Tatacara	Paparan
	 <p>The screenshot shows the GitLab Pipelines interface with three pipeline runs listed:</p> <ul style="list-style-type: none"><li><b>Update .gitlab-ci.yml file #2578</b>: Status: canceled (00:01:33, 3 weeks ago). Triggered by main branch. Stages: passed, passed, passed, passed, passed, passed.</li><li><b>Update .gitlab-ci.yml #2577</b>: Status: failed (00:00:47, 3 weeks ago). Triggered by main branch. Stages: passed, failed, failed, failed, passed, passed.</li><li><b>Update README.md #2550</b>: Status: canceled (3 weeks ago). Triggered by merge request. Stages: failed, failed, failed, failed, failed.</li></ul> <p><b>Rajah E-158: Gitlab – Paparan Pipeline GitLab</b></p>  <p><b>Rajah E-159: Gitlab – Status Tugasan Untuk Pipeline GitLab</b></p>

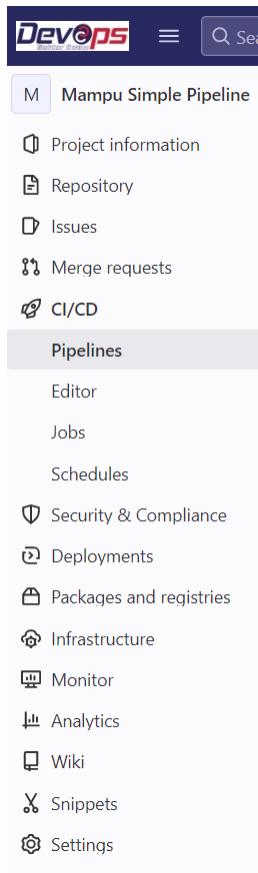
## Pengujian integrasi di antara komponen-komponen menggunakan skrip pengujian integrasi.

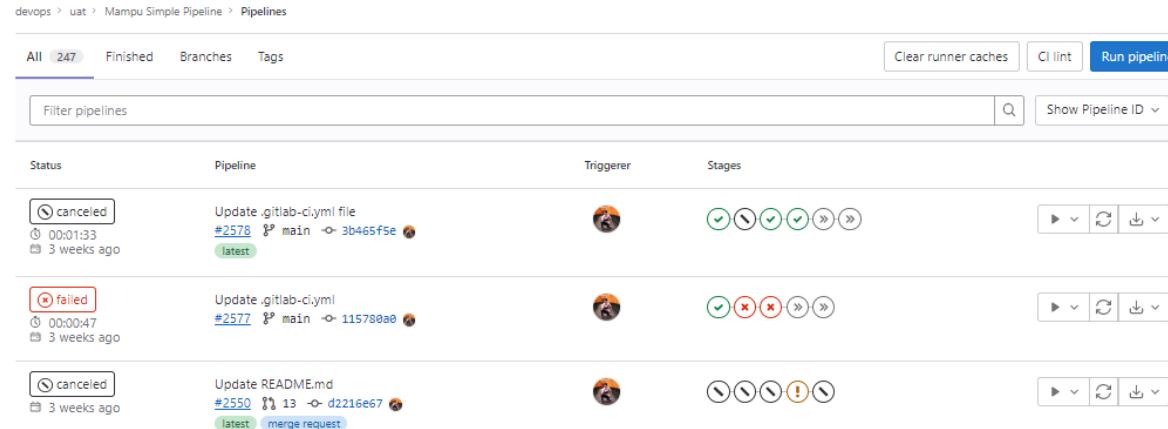
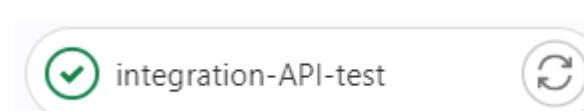
Tatacara	Paparan
	 <p>The screenshot shows a GitLab CI pipeline log for a job named "Job php-unit-test". The log details the execution of a script to run PHP unit tests. The log output includes commands like "git fetch", "composer install", and "phpunit -v --coverage-clover", followed by the test results and coverage report generation. The pipeline status is "Success" with a duration of 9 seconds, completed 2 weeks ago. The pipeline ID is #2409, and the commit hash is 906600f0ff. Artifacts from the "test" stage include "php-security-audit-sast", "postman_test", "semgrep-test", and "php-unit-test".</p>

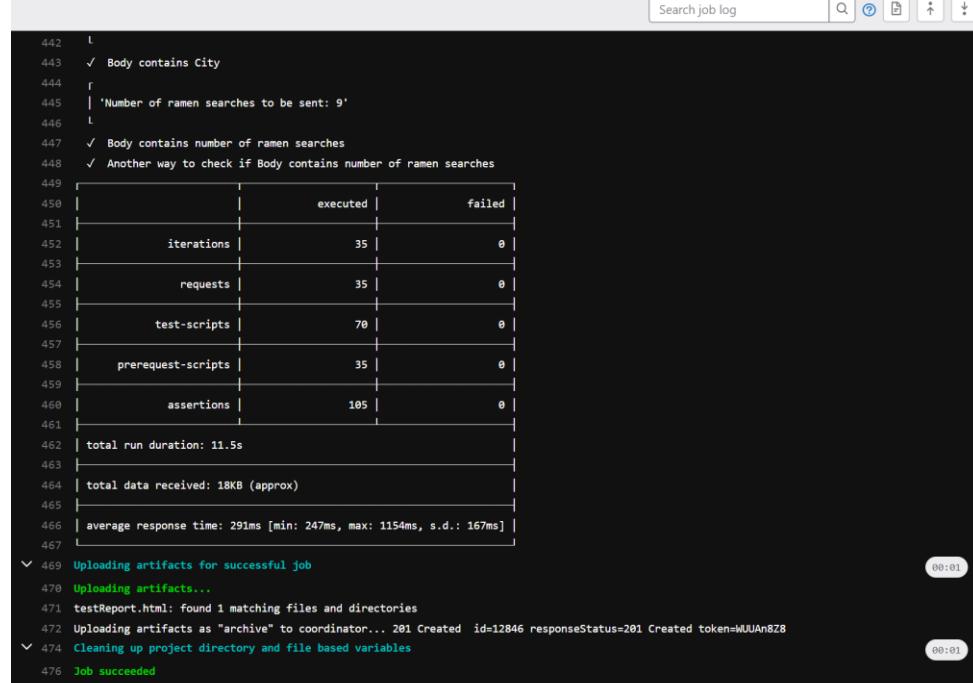
Rajah E-160: Gitlab – Status Log Tugasan

Tatacara	Paparan
<p><b>Pengujian API menggunakan Newman.</b></p> <p><b>Konfigurasi skrip pengujian integrasi API ke dalam pipeline GitLab.</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan.</li> <li>2. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>3. Sub-menu akan muncul.</li> <li>4. Klik menu <b>Editor</b>.</li> <li>5. Paparan <i>Pipeline Editor</i> yang memaparkan <code>.gitlab-ci.yml</code> akan muncul.</li> <li>6. Masukkan syntax berikut ke dalam fail <code>.gitlab-ci.yml</code>.</li> <li>7. Masukkan mesej pada ruangan <i>commit</i> seperti <b>Kemaskini skrip pengujian integrasi API pada pipeline</b></li>   <div style="background-color: #f2e0d2; padding: 5px; border-radius: 5px; width: fit-content; margin-left: auto; margin-right: 0;"> <span style="color: #007bff; border: 1px solid #007bff; padding: 2px 10px; border-radius: 5px;">Commit changes</span> </div> <li>8. Klik <b>Commit changes</b> untuk menyimpan dan mengemaskini file <code>.gitlab-ci.yml</code>.</li> </ol>	<pre># API test With Newman start  newman_api_test:   stage: test   image:     name: dannydainton/htmlextra     entrypoint: [""]    script:     - newman --version     - npm install -g newman-reporter-html     - newman run postman-tests/collection.json --reporters cli,html,junit --reporter-html-export report.html --reporter-junit-export report.xml    artifacts:     when: always     paths:       - report.html    reports:     junit: report.xml  # API test With Newman end</pre>

<b>Pengujian integrasi API menggunakan Newman</b>	
<b>Tatacara</b>	<b>Paparan</b>
9. <i>Pipeline</i> GitLab telah dikemaskini dengan job pengujian integrasi API.	
<b>Menjalankan <i>pipeline</i> GitLab untuk pengujian integrasi API.</b> 1. Rujuk pada para pengujian unit, menjalankan <i>pipeline</i> GitLab secara automasi.	

Pengujian integrasi API menggunakan Newman	
Tatacara	Paparan
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk pengujian integrasi API.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b> [Rajah E-161].</li> <li>2. Klik butang pada ruangan <b>Status</b>. Status tugas <i>pipeline</i> akan dipaparkan [Rajah E-162].</li> <li>3. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugas [Rajah E-163].</li> <li>4. Status log tugas dipaparkan [Rajah E-164].</li> </ol>	 <p><b>Rajah E-161: Gitlab – Paparan Menu Utama</b></p>

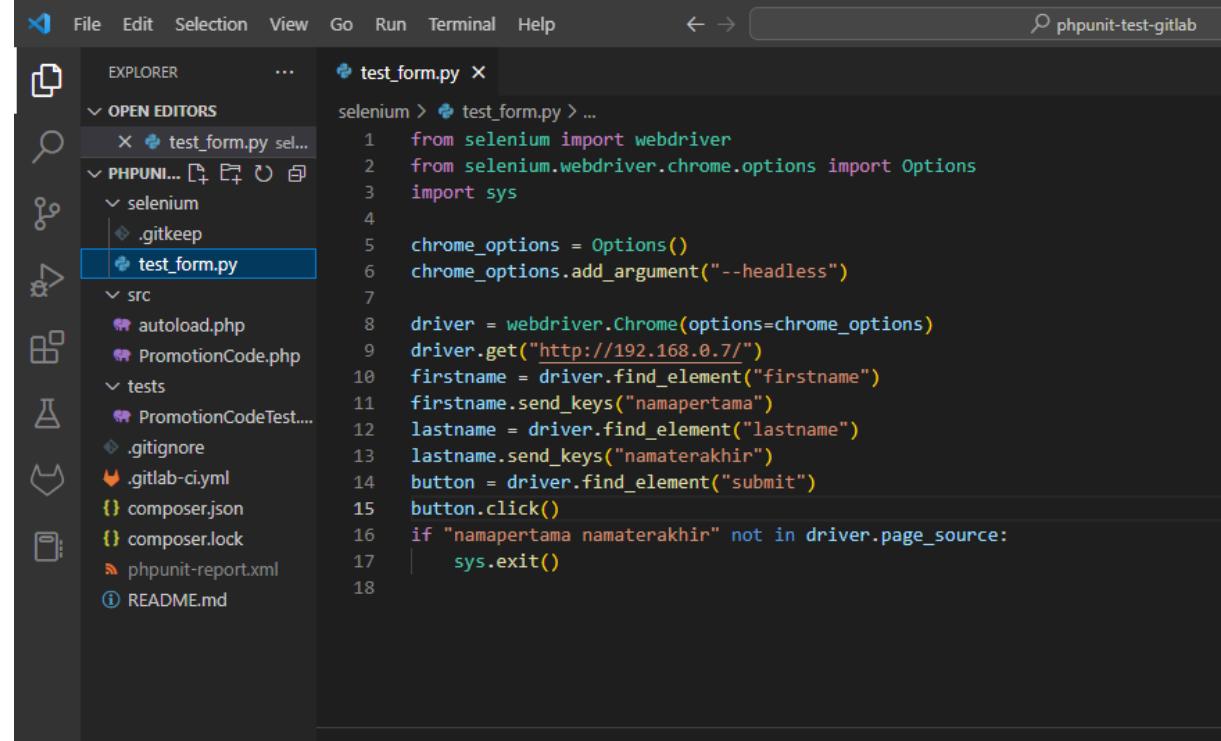
<b>Pengujian integrasi API menggunakan Newman</b>	
Tatacara	Paparan
	 <p>The screenshot shows the GitLab Pipeline interface for the 'uat' project under the 'Mampu Simple Pipeline' namespace. It displays three pipeline runs:</p> <ul style="list-style-type: none"><li><b>Update .gitlab-ci.yml file #2578</b>: Status: canceled, Triggered by main branch at 3b465f5e, 3 weeks ago.</li><li><b>Update .gitlab-ci.yml #2577</b>: Status: failed, Triggered by main branch at 115780a0, 3 weeks ago.</li><li><b>Update README.md #2550</b>: Status: succeeded, Triggered by merge request d2216e67, 3 weeks ago.</li></ul> <p>Each pipeline run has a detailed view button, a refresh button, and a dropdown menu.</p> <p><b>Rajah E-162: Gitlab – Paparan Pipeline GitLab</b></p>  <p><b>Rajah E-163: Gitlab – Status Tugasan Untuk Pipeline GitLab</b></p>

<b>Pengujian integrasi API menggunakan Newman</b>																			
Tatacara	Paparan																		
	 <p>The screenshot shows the Newman test results in a terminal-like interface. The results are summarized in a table:</p> <table border="1"> <thead> <tr> <th></th> <th>executed</th> <th>failed</th> </tr> </thead> <tbody> <tr> <td>iterations</td> <td>35</td> <td>0</td> </tr> <tr> <td>requests</td> <td>35</td> <td>0</td> </tr> <tr> <td>test-scripts</td> <td>78</td> <td>0</td> </tr> <tr> <td>prerequest-scripts</td> <td>35</td> <td>0</td> </tr> <tr> <td>assertions</td> <td>105</td> <td>0</td> </tr> </tbody> </table> <p>Summary statistics:</p> <ul style="list-style-type: none"> <li>total run duration: 11.5s</li> <li>total data received: 18KB (approx)</li> <li>average response time: 291ms [min: 247ms, max: 1154ms, s.d.: 167ms]</li> </ul> <p>Job artifacts:</p> <ul style="list-style-type: none"> <li>Uploading artifacts for successful job</li> <li>Uploading artifacts...</li> <li>testReport.html: found 1 matching files and directories</li> <li>Uploading artifacts as "archive" to coordinator... 201 Created id=12846 responseStatus=201 Created token=MUUAu8Z8</li> <li>Cleaning up project directory and file based variables</li> <li>Job succeeded</li> </ul> <p>On the right side of the interface, there is a summary of the job details:</p> <ul style="list-style-type: none"> <li><b>newman_tests</b></li> <li><b>Duration:</b> 22 seconds</li> <li><b>Finished:</b> 3 days ago</li> <li><b>Queued:</b> 1 minute 11 seconds</li> <li><b>Timeout:</b> 1h (from project)</li> <li><b>Runner:</b> #28 (1xSTR8Jg) 19-gitlab-server alpinelatest docker executor</li> </ul> <p><b>Job artifacts</b>: These artifacts are the latest. They will not be deleted (even if expired) until newer artifacts are available.</p> <p>Buttons: Keep, Download, Browse</p> <p>Commit bc91e42b   Update .gitlab-ci.yml file</p> <p>Pipeline #2434 for main: test</p> <ul style="list-style-type: none"> <li>code_quality</li> <li>newman_tests (green checkmark)</li> <li>nodejs-scan-sast</li> <li>semgrep-sast</li> <li>unit-test-inh</li> </ul>		executed	failed	iterations	35	0	requests	35	0	test-scripts	78	0	prerequest-scripts	35	0	assertions	105	0
	executed	failed																	
iterations	35	0																	
requests	35	0																	
test-scripts	78	0																	
prerequest-scripts	35	0																	
assertions	105	0																	

**Rajah E-164: Gitlab – Status Log Tugasan**

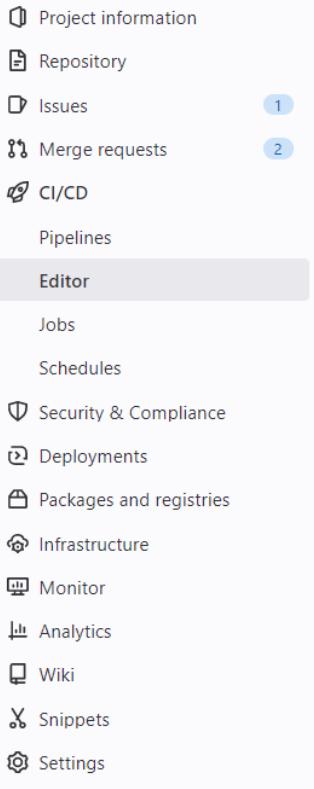
### **Lampiran E-3: Pengujian Sistem**

Selenium *Runner* yang dipasang pada *pipeline* CID/CD akan mengakses aplikasi yang telah dipasang pada Docker Container. Selenium *Runner* akan melaksanakan pengujian secara antara muka pengguna dengan memasukkan input data secara automasi, melaksanakan kes ujian berdasarkan skrip dan mengeluarkan *output* pengujian.

Tatacara	Paparan
<p><b>Membangun dan menjalankan skrip pengujian sistem.</b></p> <ol style="list-style-type: none"><li>1. Skrip pengujian fungsian dibangunkan oleh pembangun pada persekitaran pengekodan pembangun menggunakan IDE seperti <i>Visual Studio Code</i> [Rajah E-165]. Bahasa pengaturcaraan yang digunakan ialah python.</li><li>2. Setelah pengekodan dan pengujian pada persekitaran pembangun selesai, pembangun akan <i>commit</i> dan <i>push</i> kod sumber ke repositori GitLab [Rajah E-166].</li></ol>	 <pre>selenium &gt; test_form.py &gt; ... 1  from selenium import webdriver 2  from selenium.webdriver.chrome.options import Options 3  import sys 4 5  chrome_options = Options() 6  chrome_options.add_argument("--headless") 7 8  driver = webdriver.Chrome(options=chrome_options) 9  driver.get("http://192.168.0.7/") 10 firstname = driver.find_element("firstname") 11 firstname.send_keys("namapertama") 12 lastname = driver.find_element("lastname") 13 lastname.send_keys("namaterakhir") 14 button = driver.find_element("submit") 15 button.click() 16 if "namapertama namaterakhir" not in driver.page_source: 17     sys.exit()</pre>

Rajah E-165: *Visual Studio Code – Fail Kod Sumber Untuk Pengujian Fungsian*

Tatacara	Paparan												
	<p>Panduan Pelaksanaan Devops &gt; PHPUNIT-TEST-GITLAB &gt; Repository</p> <p>The screenshot shows a GitLab repository interface. At the top, there's a navigation bar with 'Panduan Pelaksanaan Devops', 'PHPUNIT-TEST-GITLAB', and 'Repository'. Below the navigation is a commit card for 'pypython test file' by 'hanif' from 21 hours ago. The commit hash is '6fc32f21'. Below the commit card is a navigation bar with 'main' (selected), 'phpunit-test-gitlab / selenium /', a '+' button, and various actions like 'Lock', 'History', 'Find file', 'Web IDE', and 'Clone'. The main area displays a table of files with columns 'Name', 'Last commit', and 'Last update'. The table contains three rows: an empty row with two dots, a row for '.gitkeep' with 'Add new directory' commit from 22 hours ago, and a row for 'test_form.py' with 'pypython test file' commit from 21 hours ago.</p> <table border="1"><thead><tr><th>Name</th><th>Last commit</th><th>Last update</th></tr></thead><tbody><tr><td>..</td><td></td><td></td></tr><tr><td>.gitkeep</td><td>Add new directory</td><td>22 hours ago</td></tr><tr><td>test_form.py</td><td>pypython test file</td><td>21 hours ago</td></tr></tbody></table> <p><b>Rajah E-166: Gitlab – Repotori Fail GitLab</b></p>	Name	Last commit	Last update	..			.gitkeep	Add new directory	22 hours ago	test_form.py	pypython test file	21 hours ago
Name	Last commit	Last update											
..													
.gitkeep	Add new directory	22 hours ago											
test_form.py	pypython test file	21 hours ago											

Tatacara	Paparan
<p><b>Konfigurasi skrip pengujian sistem ke dalam pipeline GitLab</b> [Rajah E-167].</p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan.</li> <li>2. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>. Sub-menu akan muncul. Klik menu <b>Editor</b>. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan muncul.</li> </ol>	 <p>The screenshot shows the left sidebar of the GitLab interface. The 'Editor' option under the 'CI/CD' section is highlighted with a grey background. Other options visible include 'Project information', 'Repository', 'Issues' (with 1 notification), 'Merge requests' (with 2 notifications), 'CI/CD', 'Pipelines', 'Jobs', 'Schedules', 'Security &amp; Compliance', 'Deployments', 'Packages and registries', 'Infrastructure', 'Monitor', 'Analytics', 'Wiki', 'Snippets', and 'Settings'.</p>
<p>3. Masukkan <i>syntax</i> berikut ke dalam fail <i>.gitlab-ci.yml</i>.</p>	<pre data-bbox="795 1224 1118 1359"> uitest:   stage: uitest   when: on_success </pre>

Rajah E-167: Gitlab – Paparan Menu Utama

Tatacara	Paparan
	<pre>only:   - master  image: selenium/standalone-chrome  services:   - docker:dind  script:   - pwd   - ls -la   - sudo apt-get update   - sudo apt-get install python3-pip -y   - pip3 install selenium   - python3 selenium/test_form.py</pre>

4. Masukkan mesej pada ruangan *commit message* seperti

Kemaskini pengujian sistem pada pipeline

**Commit changes**

5. Klik **Commit changes** untuk menyimpan dan mengemaskini file *.gitlab-ci.yml*.
6. Pipeline GitLab telah dikemaskini dengan job SAST.

The screenshot shows the GitLab CI pipeline interface. At the top, it displays a success message: "Pipeline #2387 passed for 6fc32f21: python test file". Below this, it says "Pipeline syntax is correct. Learn more". The interface includes tabs for "Edit", "Visualize", "Validate", and "View merged YAML". The "View merged YAML" tab is selected, showing the following code:

```

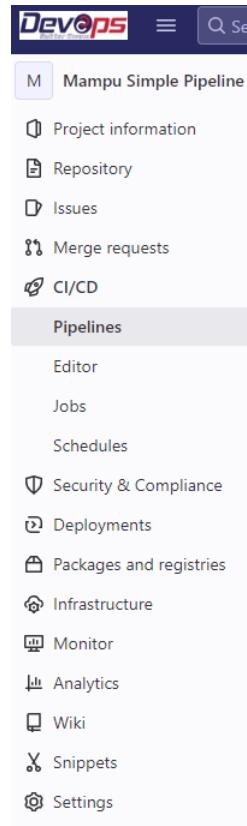
33 php-unit-test:
34   script:
35     | - vendor/bin/phpunit --bootstrap src/autoload.php --colors=never --log-junit phpunit-report.xml tests
36   allow_failure: true
37 artifacts:
38   when: always
39   reports:
40     | - junit: phpunit-report.xml
41
42
43 uitest:
44   stage: uitest
45   when: on_success
46   only:
47     | - master
48   image: selenium/standalone-chrome
49   services:
50     | - docker:dind
51   script:
52     | - pwd
53     | - ls -la
54     | - sudo apt-get update
55     | - sudo apt-get install python3-pip -y
56     | - pip3 install selenium
57     | - python3 selenium/test_form.py
58

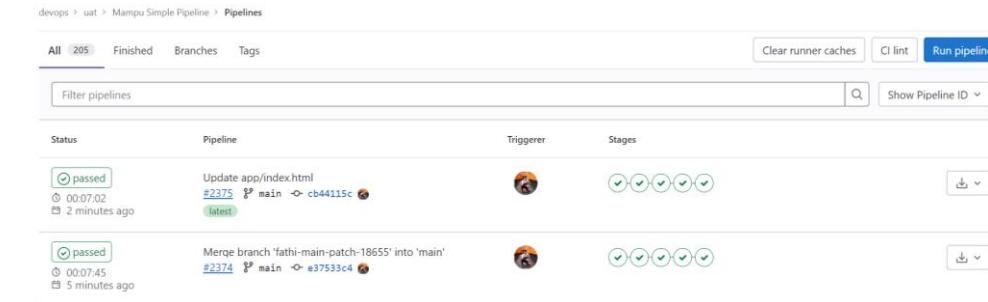
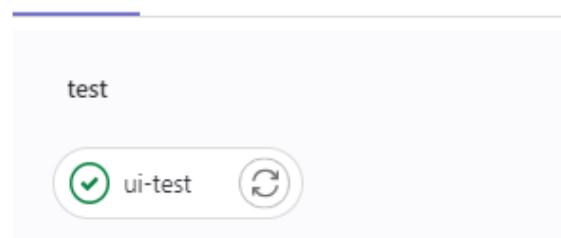
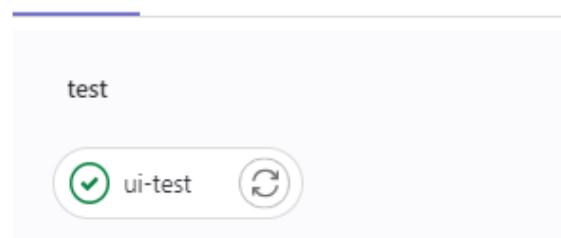
```

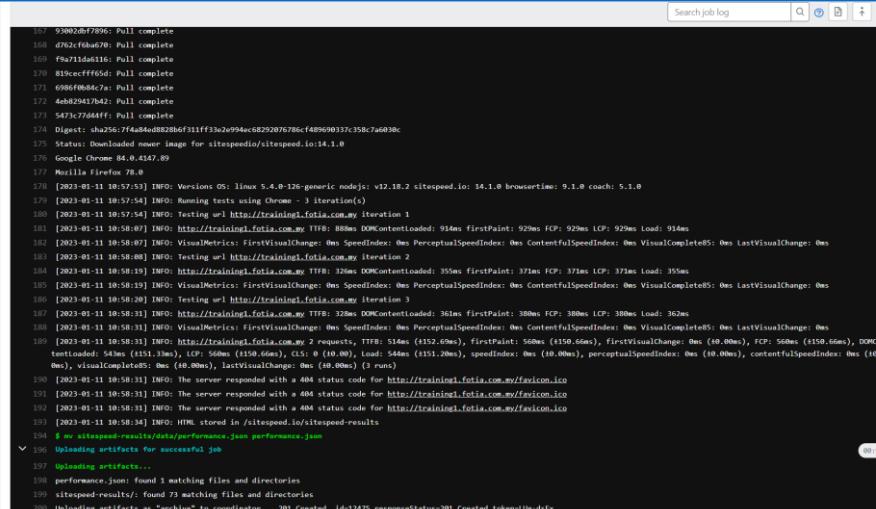
Below the code editor, there are fields for "Commit message" containing "Update .gitlab-ci.yml file" and "Branch" set to "main". At the bottom, there are "Commit changes" and "Reset" buttons.

**Rajah E-168: Gitlab – Paparan Skrip**

Tatacara	Paparan
<p><b>Menjalankan <i>pipeline</i> GitLab untuk pengujian sistem.</b></p> <ol style="list-style-type: none"><li>1. Rujuk pada para pengujian sistem, menjalankan <i>pipeline</i> GitLab secara automasi.</li></ol>	

Tatacara	Paparan
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk pengujian sistem.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b> [Rajah E-169].</li> <li>2. Klik butang pada ruangan Status. Status tugas senarai <i>pipeline</i> akan dipaparkan [Rajah E-170].</li> <li>3. Klik pada ikon  pada tugasan untuk melihat log terperinci bagi setiap tugas [Rajah E-171].</li> <li>4. Status log tugas pengujian sistem akan dipaparkan [Rajah E-172].</li> </ol>	 <p><b>Rajah E-169: Gitlab – Paparan Menu Utama</b></p>

Tatacara	Paparan														
	 <p>The screenshot shows the GitLab Pipelines interface. At the top, there are tabs for All (205), Finished, Branches, and Tags. On the right, there are buttons for Clear runner caches, CI lint, and Run pipeline. Below this is a search bar labeled 'Filter pipelines' and a dropdown for 'Show Pipeline ID'. The main area displays two completed pipelines:</p> <table border="1"><thead><tr><th>Status</th><th>Pipeline</th><th>Triggerer</th><th>Stages</th></tr></thead><tbody><tr><td>passed</td><td>Update app/index.html #2375 ➔ main -&gt; cb44115c (latest)</td><td>0 00:07:02 2 minutes ago</td><td>Passed</td></tr><tr><td>passed</td><td>Merge branch 'fathi-main-patch-18655' into 'main' #2374 ➔ main -&gt; e37533c4</td><td>0 00:07:45 5 minutes ago</td><td>Passed</td></tr></tbody></table> <p><b>Rajah E-170: Gitlab – Senarai Status Tugas Pipeline Gitlab</b></p> <td></td> <td><p>The screenshot shows the details of a pipeline named 'test'. At the top, there are tabs for Pipeline (selected), Needs, Jobs (1), and Tests (2). The main area shows a single job named 'ui-test' which has passed.</p><p><b>Rajah E-171: Gitlab – Status Tugasan Untuk Pipeline GitLab</b></p></td>	Status	Pipeline	Triggerer	Stages	passed	Update app/index.html #2375 ➔ main -> cb44115c (latest)	0 00:07:02 2 minutes ago	Passed	passed	Merge branch 'fathi-main-patch-18655' into 'main' #2374 ➔ main -> e37533c4	0 00:07:45 5 minutes ago	Passed		 <p>The screenshot shows the details of a pipeline named 'test'. At the top, there are tabs for Pipeline (selected), Needs, Jobs (1), and Tests (2). The main area shows a single job named 'ui-test' which has passed.</p> <p><b>Rajah E-171: Gitlab – Status Tugasan Untuk Pipeline GitLab</b></p>
Status	Pipeline	Triggerer	Stages												
passed	Update app/index.html #2375 ➔ main -> cb44115c (latest)	0 00:07:02 2 minutes ago	Passed												
passed	Merge branch 'fathi-main-patch-18655' into 'main' #2374 ➔ main -> e37533c4	0 00:07:45 5 minutes ago	Passed												

Tatacara	Paparan
	 <pre> 169 930020e77896: Pull complete 169 d762cf6ba670: Pull complete 169 f9711da6d16: Pull complete 170 819ccfcf6fd: Pull complete 171 6986f08467e: Pull complete 172 4eb29457b42: Pull complete 173 5473c77d4aff: Pull complete 174 Digest: sha256:7f4a84ed08283bf311ff33e2e994ec6829207678cf489690137c35b7a603b 175 Status: Downloaded newer image for sitespeedio/sitespeed:in:14.1.0 176 Google Chrome 84.0.4147.89 177 Mozilla Firefox 78.0 178 [2023-01-11 10:57:53] INFO: Versions OS: linux 5.4.0-126-generic nodejs: v12.18.2 sitespeed.io: 14.1.0 browsersuite: 9.1.0 coach: 5.1.0 179 [2023-01-11 10:57:54] INFO: Running tests using Chrome - 3 iteration(s) 180 [2023-01-11 10:57:54] INFO: Testing w1 https://training1.fotia.com.my iteration 1 181 [2023-01-11 10:58:07] INFO: http://training1.fotia.com.my TTFB: 80ms DOMContentLoaded: 91ms FirstPaint: 92ms FCP: 92ms Load: 91ms 182 [2023-01-11 10:58:07] INFO: VisualMetrics: FirstVisualChange: 0ms SpeedIndex: 0ms PerceptualSpeedIndex: 0ms ContentfulSpeedIndex: 0ms VisualCompleted: 0ms LastVisualChange: 0ms 183 [2023-01-11 10:58:08] INFO: Testing w1 https://training1.fotia.com.my iteration 2 184 [2023-01-11 10:58:19] INFO: http://training1.fotia.com.my TTFB: 33ms DOMContentLoaded: 35ms FirstPaint: 37ms FCP: 37ms Load: 35ms 185 [2023-01-11 10:58:19] INFO: VisualMetrics: FirstVisualChange: 0ms SpeedIndex: 0ms PerceptualSpeedIndex: 0ms ContentfulSpeedIndex: 0ms VisualCompleted: 0ms LastVisualChange: 0ms 186 [2023-01-11 10:58:20] INFO: Testing w1 https://training1.fotia.com.my iteration 3 187 [2023-01-11 10:58:31] INFO: http://training1.fotia.com.my TTFB: 22ms DOMContentLoaded: 36ms FirstPaint: 38ms FCP: 38ms Load: 36ms 188 [2023-01-11 10:58:31] INFO: VisualMetrics: FirstVisualChange: 0ms SpeedIndex: 0ms PerceptualSpeedIndex: 0ms ContentfulSpeedIndex: 0ms VisualCompleted: 0ms LastVisualChange: 0ms 189 [2023-01-11 10:58:31] INFO: http://training1.fotia.com.my 2 requests, TTFB: 51ms (352.50ms), FirstPaint: 50ms (410.50ms), FirstVisualChange: 0ms (40.00ms), FCP: 56ms (410.50ms), DOMContentLoaded: 54ms (351.10ms), Load: 50ms (419.60ms), speedIndex: 0ms (10.00ms), visualComplete: 0ms (40.00ms), lastVisualChange: 0ms (40.00ms) (2 runs) 190 [2023-01-11 10:58:31] INFO: The server responded with a 404 status code for http://training1.fotia.com.my/favicon.ico 191 [2023-01-11 10:58:31] INFO: The server responded with a 404 status code for http://training1.fotia.com.my/favicon.ico 192 [2023-01-11 10:58:31] INFO: The server responded with a 404 status code for http://training1.fotia.com.my/favicon.ico 193 [2023-01-11 10:58:34] INFO: HTML stored in /sitespeed/results 194 \$ mv sitespeed-results/data/performance.json performance.json 195 Uploading artifacts for successful job 196 Uploading artifacts... 197 Uploading artifacts... 198 performance.json: found 1 matching files and directories 199 sitespeed-results/: found 73 matching files and directories 200 Uploading artifacts as "archive" to coordinator... 201 Created id:12475 responseStatus:201 Created Token:Ulg-dsfx </pre>

Rajah E-172: Gitlab – Status Log Tugasan

## Lampiran E-4: Templat Laporan Ujian Penerimaan Pengguna



# UJIAN PENERIMAAN PENGGUNA (UAT)

## NAMA SISTEM

(Sertakan nama modul di bawah nama sistem sekiranya dokumen disediakan secara berasingan bagi setiap modul di bawah sistem yang sama)

<b>NAMA AGENSI</b>	:	
<b>NAMA AGENSI INDUK</b>	:	
<b>TARIKH DOKUMEN</b>	:	
<b>VERSI DOKUMEN</b>	:	
<b>SPRINT NUMBER</b>	:	

**DOKUMEN DISEDIAKAN OLEH**

Nama	Jawatan	Tandatangan	Tarikh

**DOKUMEN DISEMAK OLEH**

Nama	Jawatan	Tandatangan	Tarikh

**DOKUMEN DISAHKAN OLEH**

Nama	Jawatan	Tandatangan	Tarikh

## KETERANGAN DOKUMEN

- 1. Fungsi Dokumen**
- 2. Objektif**
- 3. Senario yang diuji**

## **DEFINITION OF DONE**

Senarai Semak Definition of Done	
<b>Functional Testing Completed</b>	
<b>Non - Functional Testing Completed</b>	
<b>Deployment</b>	
<b>Dokumentasi</b>	

## **ACCEPTANCE CRITERIA**

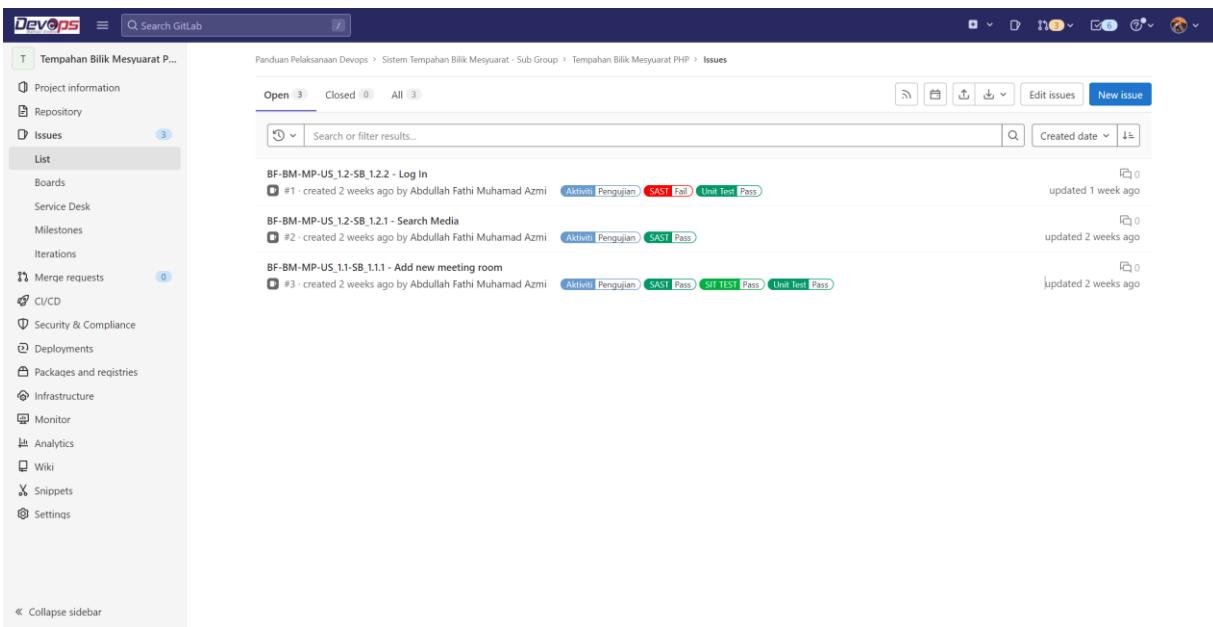
### **1. Mengurus Modul Pengguna**

#### **a. Daftar Profil Pengguna Baharu**

<b>ID Kes Ujian</b>	TC-BF-BM-MP-PR-01		
<b>Nama Kes Ujian</b>	Mendaftar profil pengguna baharu.		
<b>Keterangan Kes Ujian</b>	Sebagai Pengguna (warga MAMPU), saya BOLEH mendaftar profil pengguna baharu SUPAYA pengguna boleh mendaftar masuk sistem tempahan bilik mesyuarat.		
<b>ID Product Backlog</b>	PB-BF-BM-MP-PR-01		
<b>Pra-Syarat</b>	Nama pengguna dan alamat email yang sah untuk didaftarkan.		
<b>Input/ Langkah-Langkah Ujian</b>	<b>Jangkaan Hasil</b>	<b>Hasil Sebenar</b>	<b>Status (Lulus/Gagal)</b>
3. Daftar nama dan email pengguna.	<ul style="list-style-type: none"> <li>• Antara muka daftar pengguna baharu dipaparkan.</li> <li>• Sistem akan memaparkan mesej pop-up “Pendaftaran pengguna baharu berjaya”.</li> </ul>		

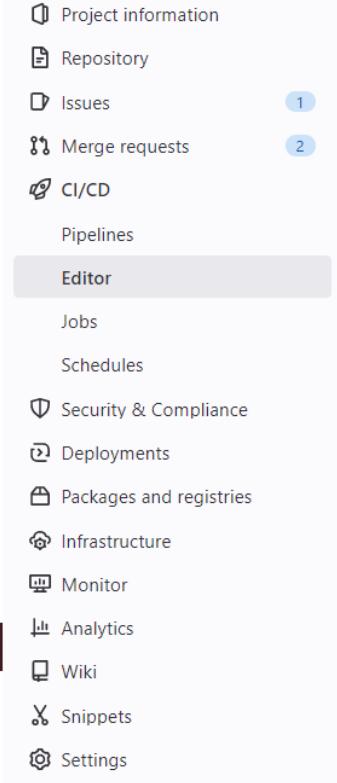
## Lampiran E-5: Pengujian Penerimaan Pengguna (UAT)

Pengujian penerimaan pengguna dilaksanakan secara manual. Pengguna akan mengakses sistem aplikasi melalui *browser* dan melaksanakan pengujian fungsian berdasarkan kes ujian yang telah ditetapkan. Tatacara penggunaan *tool* dibawah adalah untuk mengeksport senarai *issue* ke format fail csv untuk penyediaan kes ujian. Senarai *issue* yang juga dikenali sebagai *product backlog* akan dipindahkan ke dalam templat kes ujian seperti pada Lampiran A-8: Templat Laporan Ujian Penerimaan Pengguna.

Tatacara	Paparan
<p><b>Export senarai product backlog ke excel</b> [Rajah E-173].</p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project &gt;</b> Pilih projek yang telah diwujudkan.</li> <li>2. Klik pada <b>Issues &gt; List Issues</b>. Senarai <i>issues</i> akan dipaparkan. Senarai <i>issues</i> adalah <i>product backlog</i> yang telah dimasukkan semasa permulaan setiap sprint.</li> <li>3. Klik menu <b>export as CSV</b> pada sebelah kanan paparan untuk memuat turun senarai <i>issues</i>.</li> </ol>	 <p><b>Rajah E-173: Gitlab – Senarai Product Backlog</b></p>

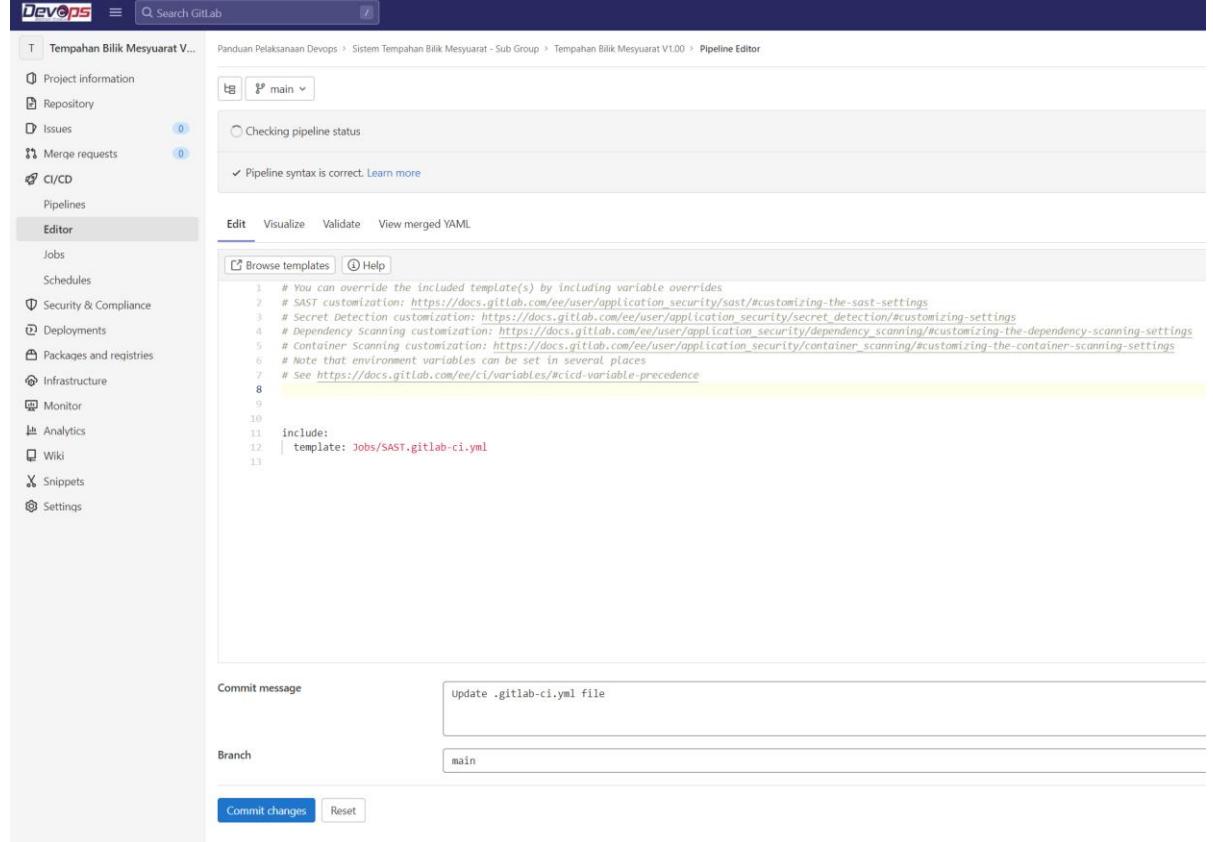
Tatacara	Paparan
4. Masukkan maklumat dari <i>file csv</i> yang dimuat turus ke templat dokumen UAT seperti Lampiran A-11: Templat Laporan Ujian Penerimaan Pengguna.	

## Lampiran E-6: Kualiti Kod

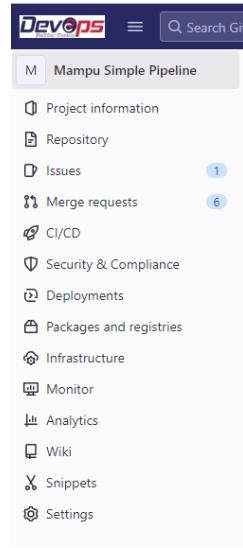
Tatacara	Paparan
<p><b>Konfigurasi skrip kawalan kualiti kod ke dalam <i>pipeline</i> GitLab.</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan.</li> <li>2. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah E-174].</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <code>.gitlab-ci.yml</code> akan muncul.</li> </ol>	 <p>The screenshot shows the GitLab main menu on the left side of the interface. The 'Editor' option under the 'Pipelines' section is highlighted with a grey background. Other menu items include Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), CI/CD, Pipelines, Editor (highlighted), Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p>

Rajah E-174: Gitlab – Paparan Menu Utama

Tatacara	Paparan
4. Masukkan <i>syntax</i> berikut ke dalam fail .gitlab-ci.yml	<pre># include code quality template in your CI configuration  include:   - template: Code-Quality.gitlab-ci.yml  # CODE QUALITY check  code_quality:   services:      # Shut off Docker-in-Docker   tags:     - cq-sans-dind   artifacts:     paths: [gl-code-quality-report.json] #report artifacts downloadable page</pre>

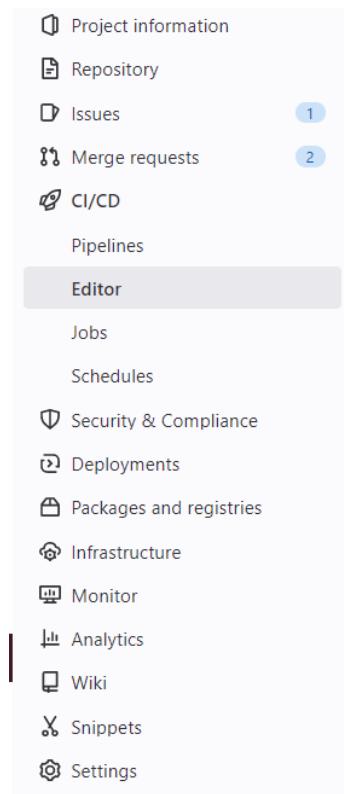
Tatacara	Paparan
<p>5. Masukkan mesej pada ruangan <i>commit message</i> seperti <b>Kemaskini Kawalan Kualiti Kod pada pipeline</b></p> <p>6. Klik <b>Commit changes</b> untuk menyimpan dan mengemaskini file <i>.gitlab-ci.yml</i>.</p> <p>7. <i>Pipeline</i> GitLab telah dikemaskini dengan job SAST.</p> <p>Paparan konfigurasi skrip [Rajah E-175].</p>	 <p>The screenshot shows the GitLab Pipeline Editor interface. The left sidebar lists project navigation options like Project information, Repository, Issues, Merge requests, CI/CD, Pipelines, and more. The Pipelines section is selected. The main area displays a YAML configuration file:</p> <pre> 1  # You can override the included template(s) by including variable overrides 2  # SAST customization: https://docs.gitlab.com/ee/user/application_security/sast/#customizing-the-sast-settings 3  # Secret Detection customization: https://docs.gitlab.com/ee/user/application_security/secret_detection/#customizing-settings 4  # Dependency Scanning customization: https://docs.gitlab.com/ee/user/application_security/dependency_scanning/#customizing-the-dependency-scanning-settings 5  # Container Scanning customization: https://docs.gitlab.com/ee/user/application_security/container_scanning/#customizing-the-container-scanning-settings 6  # Note that environment variables can be set in several places 7  # See https://docs.gitlab.com/ee/ci/variables/#ciid-variable-precedence 8 9 10 11 include: 12   template: Jobs/SAST.gitlab-ci.yml 13 </pre> <p>Below the code editor, there are fields for Commit message (containing "update .gitlab-ci.yml file") and Branch (set to "main"). At the bottom are "Commit changes" and "Reset" buttons.</p>

Rajah E-175: Gitlab – Paparan Konfigurasi Skrip

Tatacara	Paparan
<p><b>Menjalankan <i>pipeline</i> GitLab untuk skrip kawalan kualiti kod.</b></p> <ol style="list-style-type: none"> <li>1. Rujuk pada para pengujian unit, menjalankan <i>pipeline</i> GitLab secara automasi.</li> </ol>	
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk skrip kawalan kualiti kod.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b>.</li> <li>2. Klik butang pada ruangan <b>Status</b>. Status tugas <i>pipeline</i> akan dipaparkan</li> </ol> <p>Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugas [Rajah E-177].</p> <ol style="list-style-type: none"> <li>3. Status log tugas pengujian sistem akan dipaparkan [Rajah E-178].</li> </ol>	 <p><b>Rajah E-176: Gitlab – Paparan Menu Utama</b></p> 

Tatacara	Paparan
	<p><b>Rajah E-177: Gitlab – Status Tugasan Untuk Pipeline GitLab</b></p> <p>Pipeline   Needs   Jobs 142   Failed Jobs 1   Tests 160956   Security   Licenses 23   <b>Code Quality</b></p> <hr/> <p>! Found 10488 code quality issues This report contains all Code Quality issues in the source branch.</p> <hr/> <ul style="list-style-type: none"><li>✖ ◆ Critical - Consider simplifying this complex logical expression. in <a href="#">scripts/frontend/stylelint/stylelint-utils.js:15</a></li><li>✖ ◆ Critical - Consider simplifying this complex logical expression. in <a href="#">app/assets/javascripts/projects/settings/access_dropdown.js:248</a></li><li>✖ ◆ Critical - CSRF vulnerability in OmniAuth's request phase in <a href="#">Gemfile.lock:810</a></li><li>✖ ▼ Major - Function 'buildConfig' has 7 return statements (exceeds 4 allowed). in <a href="#">workhorse/main.go:67</a></li><li>✖ ▼ Major - Function 'run' has 8 return statements (exceeds 4 allowed). in <a href="#">workhorse/main.go:152</a></li><li>✖ ▼ Major - Method 'Resizer.Inject' has 5 return statements (exceeds 4 allowed). in <a href="#">workhorse/internal/imageresizer/image_resizer.go:164</a></li></ul> <p><b>Rajah E-178: Gitlab – Status Pengujian Kualiti Kod</b></p>

## Lampiran E-7: Static Application Security Test (SAST)

Tatacara	Paparan
<p><b>Paparan halaman menu utama [Rajah E-179]. Konfigurasi skrip pengujian SAST ke dalam pipeline GitLab.</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan.</li> <li>2. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>. Sub-menu akan muncul. Klik menu <b>Editor</b>.</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <code>.gitlab-ci.yml</code> akan muncul.</li> </ol>	 <p>The screenshot shows the GitLab main menu on the left side. The 'Editor' option under the 'Pipelines' section is highlighted with a light gray background. Other options visible include Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), CI/CD, Pipelines, Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p>

**Rajah E-179: Gitlab – Paparan Menu Utama**

4. Masukkan *syntax* berikut ke dalam fail .gitlab-ci.yml

5. Masukkan mesej pada ruangan *commit message* seperti

**Kemaskini SAST pada pipeline**

6. Klik **Commit changes** untuk menyimpan dan mengemaskini file .gitlab-ci.yml.  
 7. *Pipeline* GitLab telah dikemaskini dengan job SAST.

Paparan halaman konfigurasi skrip [Rajah E-180].

include:

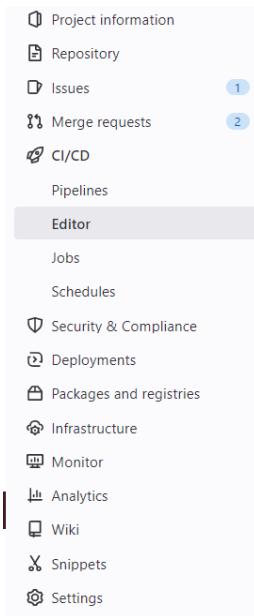
template: **Jobs/SAST.gitlab-ci.yml**

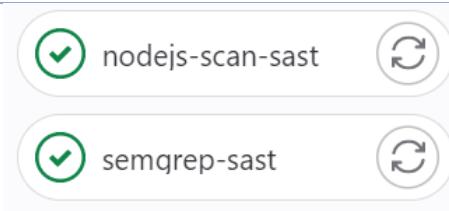
```

1 # You can override the included template(s) by including variable overrides
2 # SAST customization: https://docs.gitlab.com/ee/user/application_security/sast/#customizing-the-sast-settings
3 # Secret Detection customization: https://docs.gitlab.com/ee/user/application_security/secret_detection/#customizing-settings
4 # Dependency Scanning customization: https://docs.gitlab.com/ee/user/application_security/dependency_scanning/#customizing-the-dependency-scanning-settings
5 # Container Scanning customization: https://docs.gitlab.com/ee/user/application_security/container_scanning/#customizing-the-container-scanning-settings
6 # Note that environment variables can be set in several places
7 # See https://docs.gitlab.com/ee/ci/variables/#cicd-variable-precedence
8
9
10
11 include:
12 | template: Jobs/SAST.gitlab-ci.yml
13

```

**Rajah E-180: Gitlab – Paparan Halaman Konfigurasi Skrip**

<p><b>Menjalankan <i>pipeline</i> GitLab untuk pengujian SAST.</b></p> <ol style="list-style-type: none"> <li>1. Rujuk pada para pengujian unit, menjalankan <i>pipeline</i> GitLab secara automasi.</li> </ol>	
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk pengujian SAST.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b> [Rajah E-181].</li> <li>2. Klik butang pada ruangan <b>Status</b>. Status tugas <i>pipeline</i> akan dipaparkan. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugas [Rajah E-182].</li> <li>3. Status log tugas pengujian sistem akan dipaparkan [Rajah E-183].</li> </ol>	 <p>Rajah E-181: Gitlab – Paparan Menu Utama</p>



Rajah E-182: Gitlab – Status Tugasan Untuk *Pipeline GitLab*

The image shows a detailed view of the 'semgrep-sast' pipeline job log. The log is a text-based timeline of events:

```

1 Running with gitlab-runner 15.7.1 (6d488948)
2 on 17-gitlab-server alpinelatest docker executor wsCHBXAY
3 Resolving secrets
4 Preparing the "docker" executor
5 Using Docker executor with image registry.gitlab.com/security-products/semgrep:3 ...
6 Pulling docker image registry.gitlab.com/security-products/semgrep:3 ...
7 Using docker image sha256:34beac77484269ac97acbc74a64d8b79436a8bb28da7b864037029818d32d3df for registry.gitlab.com/security-products/semgrep:3
8 with digest registry.gitlab.com/security-products/semgrep@sha256:517bed9b51e4eb513aacc0da2b7871b60a01857f2e7c367be282704a7fe2ba31 ...
9 Preparing environment
10 Running on runner-wschbxay-project-2-concurrent-0 via devops-gitlab...
11 Getting source from Git repository
12 Fetching changes with git depth set to 20...
13 Reinitialized existing Git repository in /builds/devops/uat/mampu-simple-pipeline/.git/
14 Checking out bc91e42b as main...
15 Removing gl-sast-report.json
16 Removing semgrep.sarif
17 Skipping Git submodules setup
18 Executing "step_script" stage of the job script
19 Using docker image sha256:34beac77484269ac97acbc74a64d8b79436a8bb28da7b864037029818d32d3df for registry.gitlab.com/security-products/semgrep:3
20 with digest registry.gitlab.com/security-products/semgrep@sha256:517bed9b51e4eb513aacc0da2b7871b60a01857f2e7c367be282704a7fe2ba31 ...
21 $ /analyzer run
22 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Gitlab Semgrep analyzer v3.12.1
23 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Detecting project
24 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Analyzer will attempt to analyze all projects in the repository
25 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Running analyzer
26 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Creating report
27 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Uploading artifacts for successful job
28 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Uploading artifacts...
29 gl-sast-report.json: found 1 matching files and directories
30 Uploading artifacts as "sast" to coordinator... 201 Created id=12843 responseStatus=201 Created token=fDTYjJCb
31 Cleaning up project directory and file based variables
32 Job succeeded
  
```

On the right side of the log, there is a summary for the 'semgrep-sast' job:

- Duration:** 16 seconds
- Finished:** 3 days ago
- Queued:** 36 seconds
- Timeout:** 1h (from project)
- Runner:** #26 (wsCHBXAY) 17-gitlab-server alpinelatest docker executor

Below the log, under 'Job artifacts', it says: 'These artifacts are the latest. They will not be deleted (even if expired) until newer artifacts are available.'

Commit [bc91e42b](#): Update .gitlab-ci.yml file

Pipeline #2434 for main: test

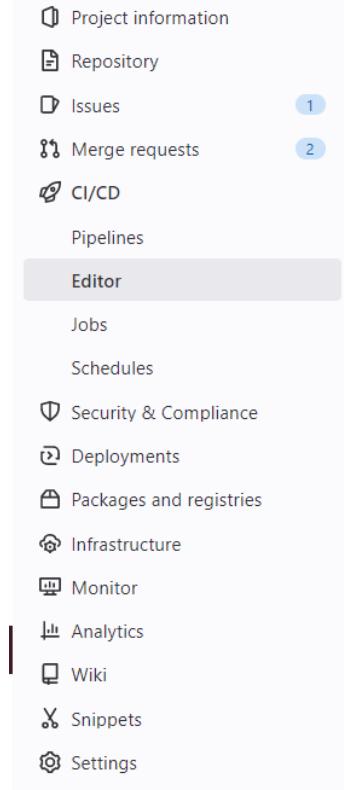
Artifacts:
 

- code\_quality
- newman\_tests
- nodejs-scan-sast
- semgrep-sast → (selected)
- unit-test-job

Rajah E-183: Gitlab – Status Log Tugasan

## Lampiran E-8: Software Composition Analysis (SCA)

Tatacara konfigurasi pengujian SCA adalah seperti berikut.

Tatacara	Paparan
<p><b>Paparan halaman menu utama [Rajah E-184].</b></p> <p><b>Konfigurasi skrip pengujian SCA dalam pipeline GitLab.</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan.</li> <li>2. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>. Sub-menu akan muncul. Klik menu <b>Editor</b>.</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan muncul.</li> </ol>	 <p>Rajah E-184: Gitlab – Paparan Menu Utama</p>

4. Masukkan <i>syntax</i> berikut ke dalam fail .gitlab-ci.yml	<pre>stages:   - dependency-check  dependency-check:   stage: dependency-check   image: owasp/dependency-check:latest   script:     - dependency-check.sh --project "My Project" --format "ALL" --out . --scan /path/to/your/project   artifacts:     paths:       - dependency-check-report.html       - dependency-check-report.xml       - dependency-check-report.json   reports:     dependency_scanning: dependency-check-report.json   only:     - main     - merge_requests</pre>
Konfigurasi skrip imbasan dan format output pengujian SCA.	<pre>stages:   - dependency-check</pre>

5. Pada fail .gitlab-ci.yml, semak konfigurasi imbasan dan format output.

```
dependency-check:  
  stage: dependency-check  
  image: owasp/dependency-check:latest  
  before_script:  
    - apt-get update -y  
    - apt-get install -y openjdk-11-jre wget unzip  
    - wget https://github.com/jeremylong/DependencyCheck/releases/download/v6.5.1/dependency-check-6.5.1-release.zip  
    - unzip dependency-check-6.5.1-release.zip  
    - export PATH=$PATH:$CI_PROJECT_DIR/dependency-check/bin  
  script:  
    - dependency-check.sh --project "My Project" --format "ALL" --out . --scan /path/to/your/project  
  artifacts:  
    paths:  
      - dependency-check-report.html  
      - dependency-check-report.xml  
      - dependency-check-report.json  
  reports:  
    dependency_scanning: dependency-check-report.json
```

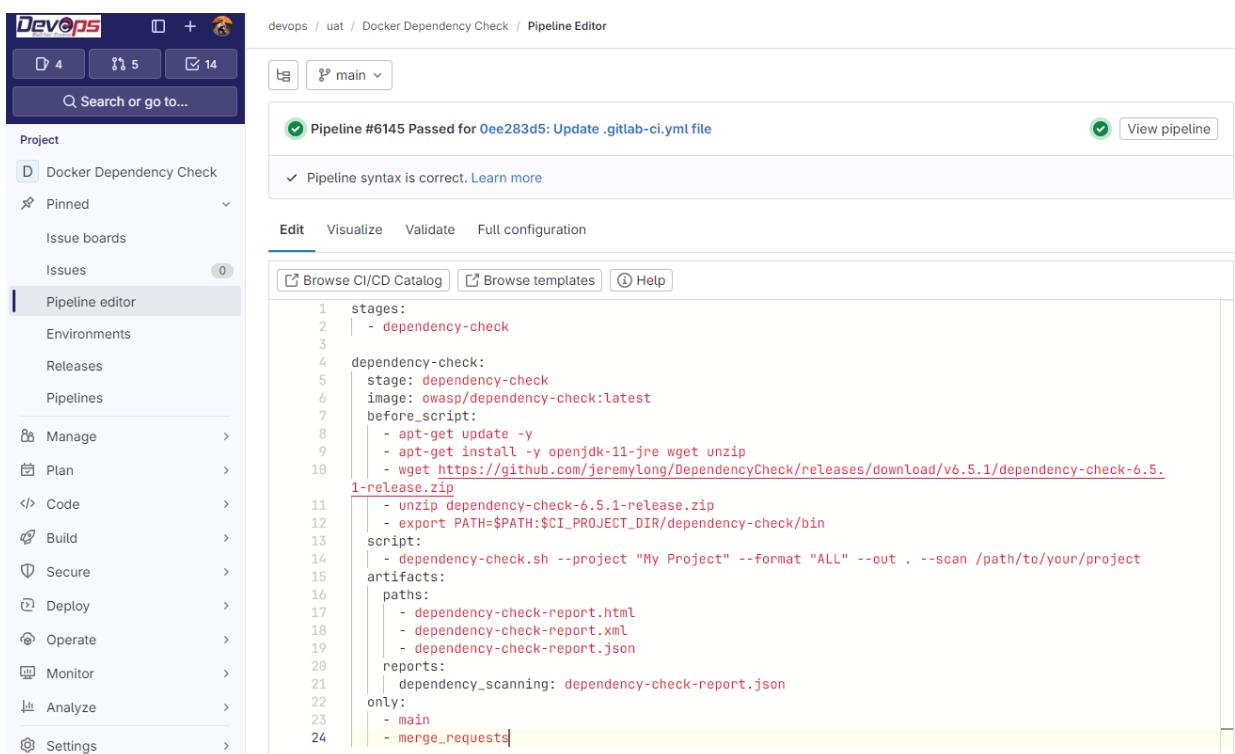
	<p>only:</p> <ul style="list-style-type: none"><li>- main</li><li>- merge_requests</li></ul>
--	--

6. Masukkan mesej pada ruangan *commit message* seperti

**Kemaskini SCA pada pipeline**

7. Klik **Commit changes** untuk menyimpan dan mengemaskini file *.gitlab-ci.yml*.
8. *Pipeline* GitLab telah dikemaskini dengan job SCA.

Paparan halaman konfigurasi skrip [Rajah E-185].



The screenshot shows the GitLab Pipeline Editor interface. At the top, it displays a success message: "Pipeline #6145 Passed for Oee283d5: Update .gitlab-ci.yml file" and "Pipeline syntax is correct. Learn more". Below this, there are tabs for Edit, Visualize, Validate, and Full configuration. The main area shows the pipeline script:

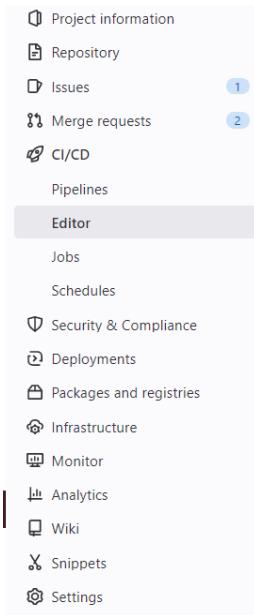
```

1 stages:
2 | - dependency-check
3
4 dependency-check:
5   stage: dependency-check
6   image: owasp/dependency-check:latest
7   before_script:
8     - apt-get update -y
9     - apt-get install -y openjdk-11-jre wget unzip
10    - wget https://github.com/jeremylong/DependencyCheck/releases/download/v6.5.1/dependency-check-6.5.1-release.zip
11    - unzip dependency-check-6.5.1-release.zip
12    - export PATH=$PATH:$CI_PROJECT_DIR/dependency-check/bin
13   script:
14     - dependency-check.sh --project "My Project" --format "ALL" --out . --scan /path/to/your/project
15   artifacts:
16     paths:
17       - dependency-check-report.html
18       - dependency-check-report.xml
19       - dependency-check-report.json
20   reports:
21     dependency_scanning: dependency-check-report.json
22   only:
23     - main
24     - merge_requests

```

Below the script, there are fields for Commit message ("Update .gitlab-ci.yml file"), Branch ("main"), and a large blue button labeled "Commit changes".

**Rajah E-185: Gitlab – Paparan Halaman Konfigurasi Skrip**

<p><b>Menjalankan <i>pipeline</i> GitLab untuk pengujian SCA.</b></p> <ol style="list-style-type: none"><li>1. Rujuk pada para pengujian unit, menjalankan <i>pipeline</i> GitLab secara automasi.</li></ol>	
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk pengujian SCA.</b></p> <ol style="list-style-type: none"><li>4. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b> [Rajah E-186].</li><li>5. Klik butang pada ruangan <b>Status</b>. Status tugas <i>pipeline</i> akan dipaparkan. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugas [Rajah E-187].</li><li>6. Status log tugas pengujian sistem akan dipaparkan [Rajah E-188].</li></ol>	 <p>Rajah E-186: Gitlab – Paparan Menu Utama</p>

**dependency-check**

dependency-check

Rajah E-187: Gitlab – Status Tugasan Untuk *Pipeline GitLab*

```
46 -n,--noupdate          Disables the automatic updating of the
47                                         NVD-CVE, hosted-suppressions and RetireJS
48                                         data.
49   --nvdApiKey <apiKey>    The API Key to access the NVD API.
50   -o,--out <path>         The folder to write reports to. This
51                                         defaults to the current directory. It is
52                                         possible to set this to a specific file
53                                         name if the format argument is not set to
54                                         ALL.
55   --prettyPrint           When specified the JSON and XML report
56                                         formats will be pretty printed.
57   --project <name>        The name of the project being scanned.
58   -s,--scan <path>        The path to scan - this option can be
59                                         specified multiple times. Ant style paths
60                                         are supported (e.g. 'path/**/*.jar'); if
61                                         using Ant style paths it is highly
62                                         recommended to quote the argument value.
63   --suppression <file>    The file path to the suppression XML file.
64                                         This can be specified more than once to
65                                         utilize multiple suppression files
66   -v,--version            Print the version information.

67 Uploading artifacts for successful job                                00:01
68 Uploading artifacts...
69 WARNING: dependency-check-report.html: no matching files. Ensure that the artifact path is relative to the working directory (/builds/devops/uat/docker-dependency-check)
70 WARNING: dependency-check-report.xml: no matching files. Ensure that the artifact path is relative to the working directory (/builds/devops/uat/docker-dependency-check)
71 WARNING: dependency-check-report.json: no matching files. Ensure that the artifact path is relative to the working directory (/builds/devops/uat/docker-dependency-check)
72 ERROR: No files to upload
73 Uploading artifacts...
74 WARNING: dependency-check-report.json: no matching files. Ensure that the artifact path is relative to the working directory (/builds/devops/uat/docker-dependency-check)
75 ERROR: No files to upload
76 Cleaning up project directory and file based variables                00:01
77 Job succeeded
```

Duration: 9 seconds  
Finished: 21 minutes ago  
Queued: 0 seconds  
Timeout: 1h (from project) [?](#)  
Runner: #161 (FahQaXb1b)

Commit 0ee283d5 [View](#)  
Update .gitlab-ci.yml file

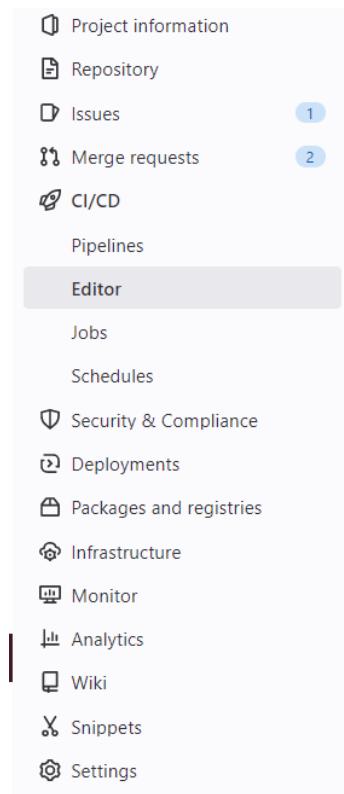
Pipeline #6145 Passed for main [View](#)  
dependency-check

Related jobs

→ ✓ dependency-check

**Rajah E-188: Gitlab – Status Log Tugasan**

## Lampiran E-9: *Dynamic Application Security Testing (DAST)*

Tatacara	Paparan
<p><b>Paparan halaman menu utama [Rajah E-189].</b></p> <p><b>Konfigurasi skrip pengujian DAST dalam pipeline GitLab.</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan.</li> <li>2. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>. Sub-menu akan muncul. Klik menu <b>Editor</b>.</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <code>.gitlab-ci.yml</code> akan muncul.</li> </ol>	 <p>The screenshot shows the GitLab main menu with the following items:</p> <ul style="list-style-type: none"> <li>Project information</li> <li>Repository</li> <li>Issues (1)</li> <li>Merge requests (2)</li> <li>CI/CD</li> <li>Pipelines</li> <li><b>Editor</b> (highlighted with a gray box)</li> <li>Jobs</li> <li>Schedules</li> <li>Security &amp; Compliance</li> <li>Deployments</li> <li>Packages and registries</li> <li>Infrastructure</li> <li>Monitor</li> <li>Analytics</li> <li>Wiki</li> <li>Snippets</li> <li>Settings</li> </ul>

**Rajah E-189: Gitlab – Paparan Menu Utama**

4. Masukkan *syntax* berikut ke dalam fail .gitlab-ci.yml

**Konfigurasi pemboleh ubah berikut mengikut persekitaran pengujian.**

5. ZAP\_BASE\_URL: ganti <http://your-application-url> dengan URL sebenar aplikasi yang akan diuji.  
 6. ZAP\_TARGET: ganti dengan URL aplikasi sasaran yang betul.

```

stages:
  - test
  - dast

variables:
  ZAP_BASE_URL: "http://url-applikasi"
  ZAP_TIMEOUT: "600"
  ZAP_SCAN_MODE: "baseline" # Other modes: "fullscan", "api"
  ZAP_TARGET: "http:// url-applikasi "

dast:
  stage: dast
  image: owasp/zap2docker-stable
  script:
    - zap-baseline.py -t $ZAP_TARGET -r zap_report.html -w zap_report.md -d -m 5
      -I #zap-baseline.py untuk imbasan asas
    - zap-full-scan.py -t $ZAP_TARGET -r zap_report.html -w zap_report.md #zap-full-scan.py untuk imbasan penuh
    - zap-api-scan.py -t $ZAP_TARGET -r zap_report.html -w zap_report.md -f
      openapi #zap-full-scan.py untuk imbasan API
  artifacts:
    paths:

```

	<ul style="list-style-type: none"><li>- zap_report.html</li><li>- zap_report.md</li></ul> <p>only:</p> <ul style="list-style-type: none"><li>- main</li><li>- merge_requests</li></ul>
--	--

7. Masukkan mesej pada ruangan *commit message* seperti

**Kemaskini DAST pada pipeline**

8. Klik **Commit changes** untuk menyimpan dan mengemaskini file *.gitlab-ci.yml*.
9. *Pipeline* GitLab telah dikemaskini dengan job DAST.

Paparan halaman konfigurasi skrip [Rajah E-190].

The screenshot shows the GitLab Pipeline editor interface. On the left, a sidebar lists various project sections like Docker Dependency Check, Pinned, Issue boards, Issues, Pipeline editor (which is selected), Environments, Releases, Manage, Plan, Code, Build, Secure, Deploy, Operate, Monitor, Analyze, and Settings. At the bottom of the sidebar is a Help button. The main area displays a code editor with a syntax-highlighted .gitlab-ci.yml file. The file contains several stages: dependency-check, test, and dast. It also defines variables for ZAP\_BASE\_URL, ZAP\_TIMEOUT, ZAP\_SCAN\_MODE, and ZAP\_TARGET. The dast stage uses an image of 'owasp/zap2docker-stable' and runs scripts for baseline, full scan, and API scans. Artifacts are saved as zap\_report.html and zap\_report.md. The commit message field is set to 'Update .gitlab-ci.yml file'. The branch dropdown is set to 'main'. At the bottom right are 'Commit changes' and 'Reset' buttons. A status bar at the top right indicates 'Pipeline syntax is correct. Learn more'.

```

stages:
- dependency-check
- test
- dast

variables:
ZAP_BASE_URL: "http://your-application-url"
ZAP_TIMEOUT: "600"
ZAP_SCAN_MODE: "baseline" # Other modes: "fullscan", "api"
ZAP_TARGET: "http://your-application-url"

dast:
stage: dast
image: owasp/zap2docker-stable
script:
- zap-baseline.py -t $ZAP_TARGET -r zap_report.html -w zap_report.md -d -m 5 -I #zap-baseline.py untuk imbasan asas
- zap-full-scan.py -t $ZAP_TARGET -r zap_report.html -w zap_report.md #zap-full-scan.py untuk imbasan penuh
- zap-api-scan.py -t $ZAP_TARGET -r zap_report.html -w zap_report.md -f openapi #zap-full-scan.py untuk imbasan API

artifacts:
paths:
- zap_report.html
- zap_report.md
only:
- main
- merge_requests

```

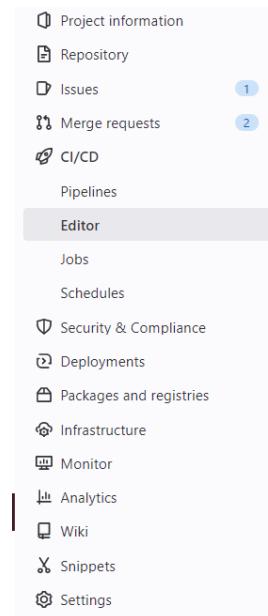
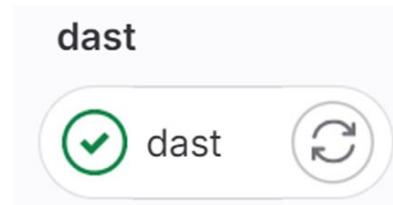
**Rajah E-190: Gitlab – Paparan Halaman Konfigurasi Skrip**

Menjalankan *pipeline* GitLab untuk pengujian DAST.

1. Rujuk pada para pengujian unit, menjalankan *pipeline* GitLab secara automasi.

**Melihat status tugas *pipeline* GitLab untuk pengujian DAST.**

1. Pada menu sebelah kiri projek, pilih pada **CI/CD > Pipeline** [Rajah E-191].
2. Klik butang pada ruangan **Status**. Status tugas *pipeline* akan dipaparkan. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugasan [Rajah E-192].
3. Status log tugas pengujian sistem akan dipaparkan [Rajah E-193].

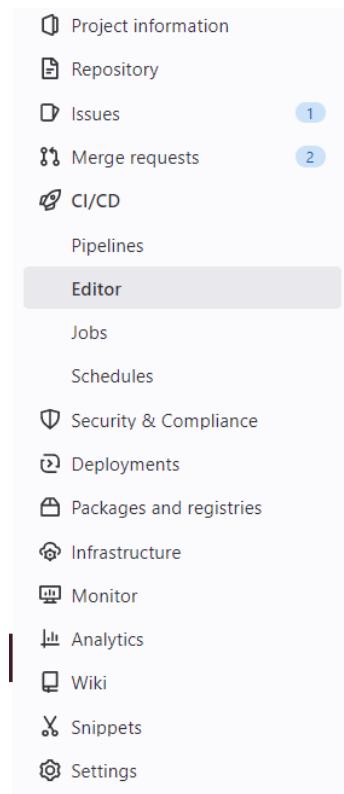
**Rajah E-191: Gitlab – Paparan Menu Utama****Rajah E-192: Gitlab – Status Tugasan Untuk *Pipeline* GitLab**

The screenshot shows a terminal window with a black background and white text, displaying a command-line interface for a dependency check. The log includes detailed descriptions of command-line options and their effects. It ends with a summary of artifacts uploaded and a success message.

```
42      considered a failure when generating the
43      junit report. The default is 0.
44      -l,<file> The file path to write verbose logging
45      information.
46      -n,<path> Disables the automatic updating of the
47      NVD-CVE, hosted-suppressions and RetireJS
48      data.
49      --nvdApiKey <apiKey> The API Key to access the NVD API.
50      -o,<path> The folder to write reports to. This
51      defaults to the current directory. It is
52      possible to set this to a specific file
53      name if the format argument is not set to
54      ALL.
55      --prettyPrint When specified the JSON and XML report
56      formats will be pretty printed.
57      --project <name> The name of the project being scanned.
58      -s,<path> The path to scan - this option can be
59      specified multiple times. Ant style paths
60      are supported (e.g. 'path/**/*.jar'); if
61      using Ant style paths it is highly
62      recommended to quote the argument value.
63      --suppression <file> The file path to the suppression XML file.
64      This can be specified more then once to
65      utilize multiple suppression files
66      -v,<version> Print the version information.
67  Uploading artifacts for successful job 00:01
68  Uploading artifacts...
69  WARNING: dependency-check-report.html: no matching files. Ensure that the artifact path is relativ
70  e to the working directory (/builds/devops/uat/docker-dependency-check)
71  WARNING: dependency-check-report.xml: no matching files. Ensure that the artifact path is relative
72  to the working directory (/builds/devops/uat/docker-dependency-check)
73  ERROR: No files to upload
74  Uploading artifacts...
75  WARNING: dependency-check-report.json: no matching files. Ensure that the artifact path is relativ
76  e to the working directory (/builds/devops/uat/docker-dependency-check)
77  ERROR: No files to upload
78  Cleaning up project directory and file based variables 00:01
79  Job succeeded
```

**Rajah E-193: Gitlab – Status Log Tugasan**

## Lampiran E-10: *Secret Detection*

Tatacara	Paparan
<p><b>Paparan halaman menu utama [Rajah E-194]. Konfigurasi skrip pengujian <i>secret detection</i> dalam <i>pipeline</i> GitLab.</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan.</li> <li>2. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>. Sub-menu akan muncul. Klik menu <b>Editor</b>.</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan muncul.</li> </ol>	 <p>The screenshot shows the main menu of a GitLab project. The sidebar on the left has several options: Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), CI/CD, Pipelines, Editor (which is highlighted with a grey background), Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings. The title of the page is "Rajah E-194: Gitlab – Paparan Menu Utama".</p>

**Rajah E-194: Gitlab – Paparan Menu Utama**

4. Masukkan *syntax* berikut ke dalam fail .gitlab-ci.yml

```
include:  
  template: Jobs/Secret-Detection.gitlab-ci.yml
```

5. Masukkan mesej pada ruangan *commit message* seperti

Kemaskini *secret detection* pada pipeline

6. Klik **Commit changes** untuk menyimpan dan mengemaskini file *.gitlab-ci.yml*.
7. Pipeline GitLab telah dikemaskini dengan job *secret detection*.

Paparan halaman konfigurasi skrip [Rajah E-195].

```

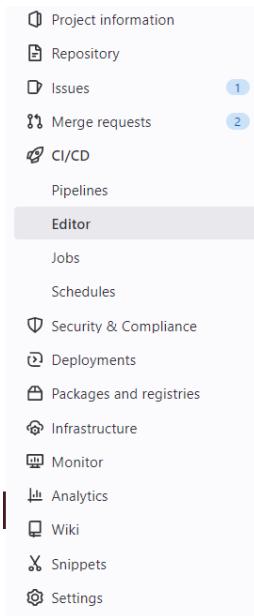
1 # This file is a template, and might need editing before it works on your project.
2 # This template moved to Jobs/Dependency-Scanning.gitlab-ci.yml in GitLab 14.8
3 # Issue: https://gitlab.com/gitlab-org/gitlab/-/issues/292977
4
5 include:
6   - template: Jobs/Secret-Detection.gitlab-ci.yml
7
8
  
```

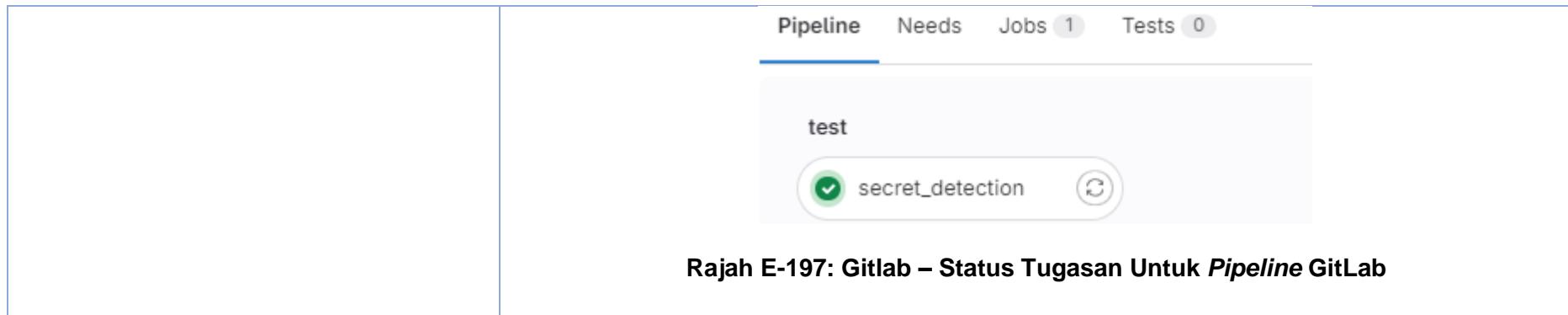
Commit message  
Update .gitlab-ci.yml file

Branch  
main

**Commit changes** **Reset**

Rajah E-195: Gitlab – Paparan Halaman Konfigurasi Skrip

<p><b>Menjalankan <i>pipeline</i> GitLab untuk pengujian <i>secret detection</i>.</b></p> <ol style="list-style-type: none"> <li>1. Rujuk pada para pengujian unit, menjalankan <i>pipeline</i> GitLab secara automasi.</li> </ol>	
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk pengujian <i>secret detection</i>.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b> [Rajah E-196].</li> <li>2. Klik butang pada ruangan <b>Status</b>. Status tugas <i>pipeline</i> akan dipaparkan. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugas [Rajah E-197].</li> <li>3. Status log tugas pengujian sistem akan dipaparkan [Rajah E-198].</li> </ol>	 <p>Rajah E-196: Gitlab – Paparan Menu Utama</p>



The screenshot shows the GitLab interface for a project named "Mampu Simple Pipeline". The left sidebar navigation includes sections for Project, Issues, Merge requests, Repository, Manage, Plan, Code, Build, Pipelines, Jobs, Pipeline editor, Pipeline schedules, Artifacts, Secure, Deploy, Operate, Monitor, Analyze, Settings, and Help. The "Jobs" section is currently selected. On the right, a detailed log of a pipeline job is displayed, showing the command-line output of the job script. The log starts with fetching changes and initializing a Git repository, followed by executing a step script, running an analyzer, and finally uploading artifacts. The pipeline status is shown as "Passed".

```

devops / uat / Mampu Simple Pipeline / Jobs / #25682

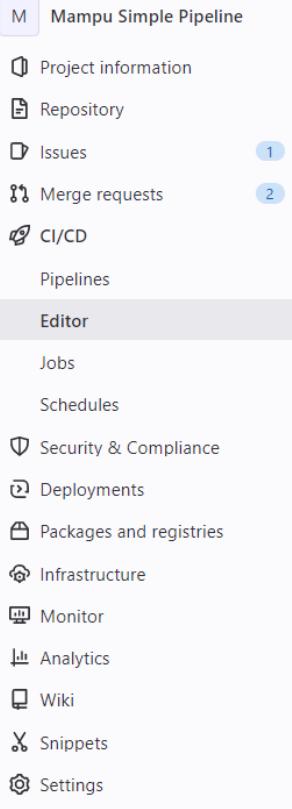
Search job log

11 Fetching changes with git depth set to 50...
12 Initialized empty Git repository in /builds/devops/uat/mampu-simple-pipeline/.git/
13 Created fresh repository.
14 Checking out beb2196b as detached HEAD (ref is main)...
15 Skipping Git submodules setup
16 Executing "step_script" stage of the job script
17 Using docker image sha256:c3d021a0c765e9178360ae4811b4270b02c5cccd85cf77ed13ef1e4e2119541
for registry.gitlab.com/security-products/secrets:5 with digest registry.gitlab.com/security-products/secrets@sha256:13ab9d49bbe76f08a324465f858a088ddbcdaaf4fc6cbd1d7ae43829b826baa
8 ...
18 $ /analyzer run
19 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶ Gitlab secrets analyzer v5.2.7
20 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶ Detecting project
21 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶ Analyzer will attempt to analyze all projects in the repository
22 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶ Loading ruleset for /builds/devops/uat/mampu-simple-pipeline
23 [WARN] [secrets] [2024-05-12T05:03:07Z] ▶ /builds/devops/uat/mampu-simple-pipeline/.gitlab/secret-detection-ruleset.toml not found, ruleset support will be disabled.
24 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶ Running analyzer
25 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶
26 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶
27 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶
28 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶
29 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶
30 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶   gitLeaks
31 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶
32 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶ 5:03AM INF scan completed in 21.3ms
33 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶ 5:03AM INF no leaks found
34 [INFO] [secrets] [2024-05-12T05:03:07Z] ▶ Creating report
35 Uploading artifacts for successful job
36 Uploading artifacts...
37 gl-secret-detection-report.json: found 1 matching artifact files and directories
38 Uploading artifacts as "secret_detection" to coordinator... 201 Created id=25682 response Status=201 Created token=64_Me9Ac
39 Cleaning up project directory and file based variables
40 Job succeeded

```

**Rajah E-198: Gitlab – Status Log Tugasan**

## Lampiran E-11: Pengujian Prestasi

Tatacara	Paparan
<p><b>Konfigurasi pengujian <i>load</i> menggunakan k6.</b></p> <p>Paparan menu fungsi Gitlab [Rajah E-199].</p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b>.</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan muncul.</li> </ol>	 <p>The screenshot shows the GitLab main menu on the left side. The 'Editor' option under the CI/CD section is highlighted with a grey background. Other options visible include Mampu Simple Pipeline, Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), CI/CD, Pipelines, Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p>

Rajah E-199: Gitlab – Paparan Menu Utama

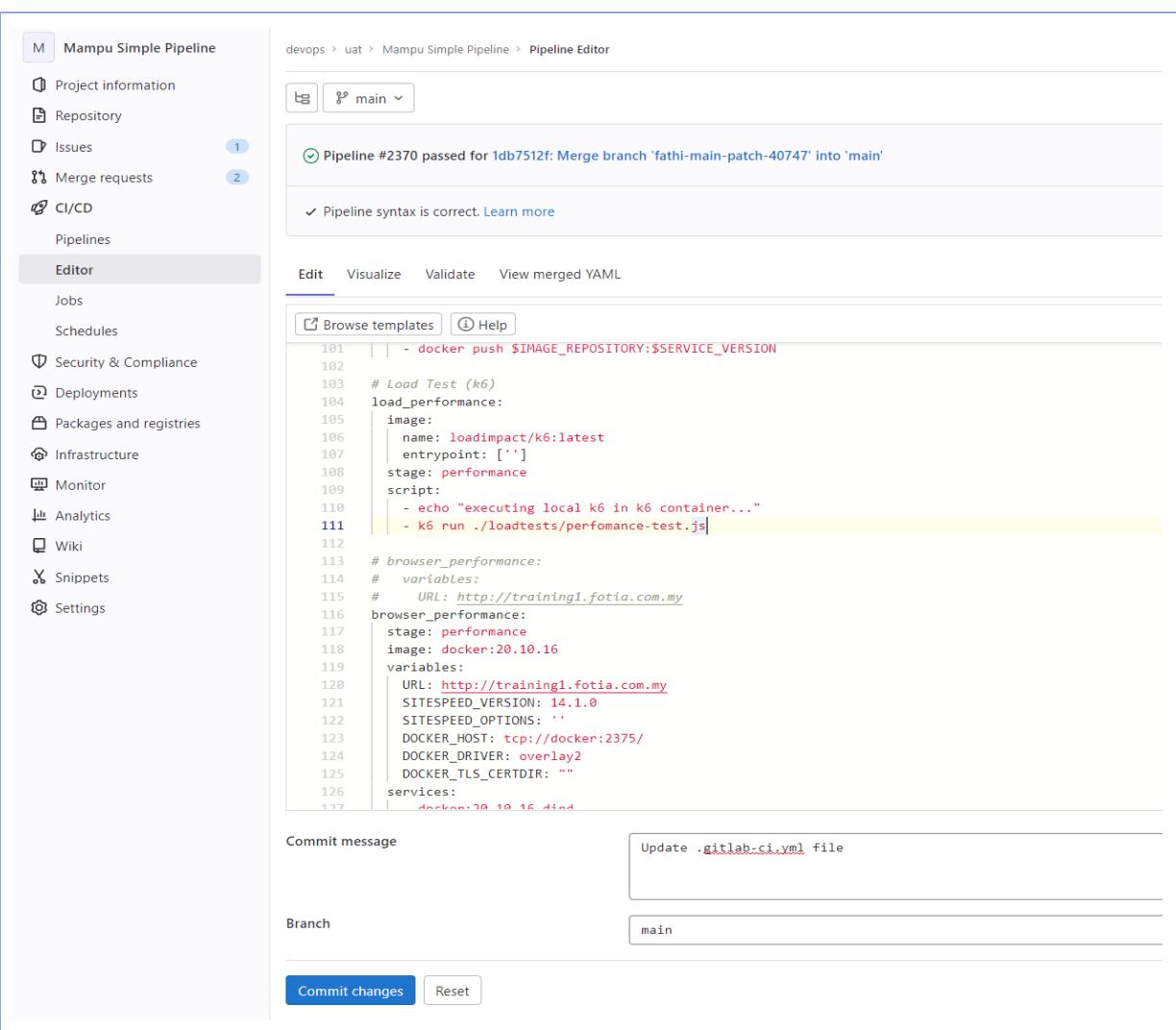
Tatacara	Paparan
4. Masukkan <i>syntax</i> berikut ke dalam fail .gitlab-ci.yml 5. Untuk pengujian <i>smoke</i> , pengujian <i>stress</i> dan pengujian <i>soak</i> , pengguna hanya perlu mengubah konfigurasi <i>syntax</i> kepada pengujian yang hendak dilaksanakan.	<pre># Load Test (k6) load_performance:   image:     name: loadimpact/k6:latest     entrypoint: []   stage: performance   script:     - echo "executing local k6 in k6 container..."     - k6 run ./loadtests/perfomance-test.js</pre>

7. Masukkan mesej pada ruangan *commit* seperti

**Konfigurasi *load performance test* kepada pipeline**

8. Klik **Commit changes** untuk menyimpan dan mengemaskini file *.gitlab-ci.yml*.
9. *Pipeline* GitLab telah dikemaskini dengan job SAST.

Paparan konfigurasi load performance [Rajah E-200].



The screenshot shows the GitLab Pipeline Editor interface. On the left, a sidebar lists various project sections: Project information, Repository, Issues, Merge requests, CI/CD, Pipelines, Editor (which is selected), Jobs, Schedules, Security & Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings. The main area displays a pipeline named "main" which has passed for merge branch "fathi-main-patch-40747" into "main". It also indicates that the pipeline syntax is correct. Below this, the pipeline configuration code is shown in YAML:

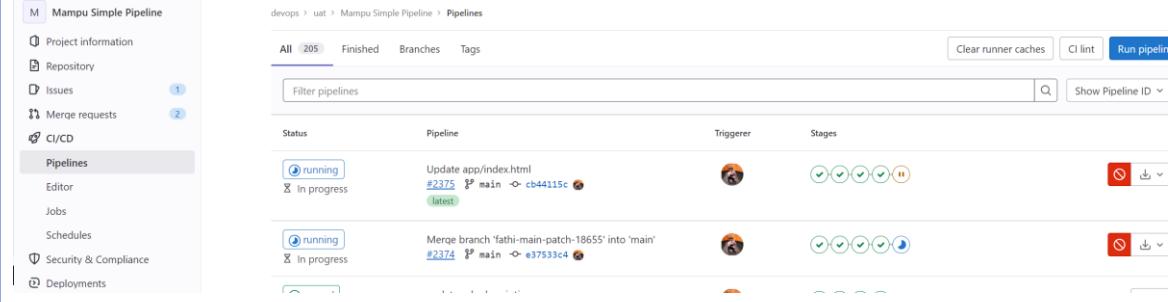
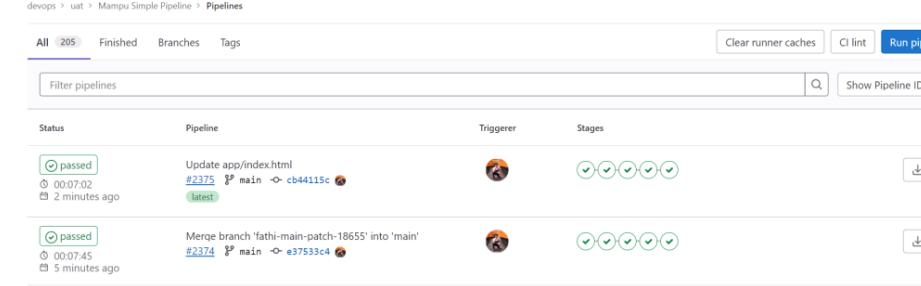
```

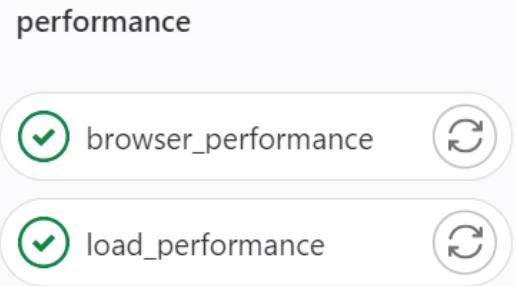
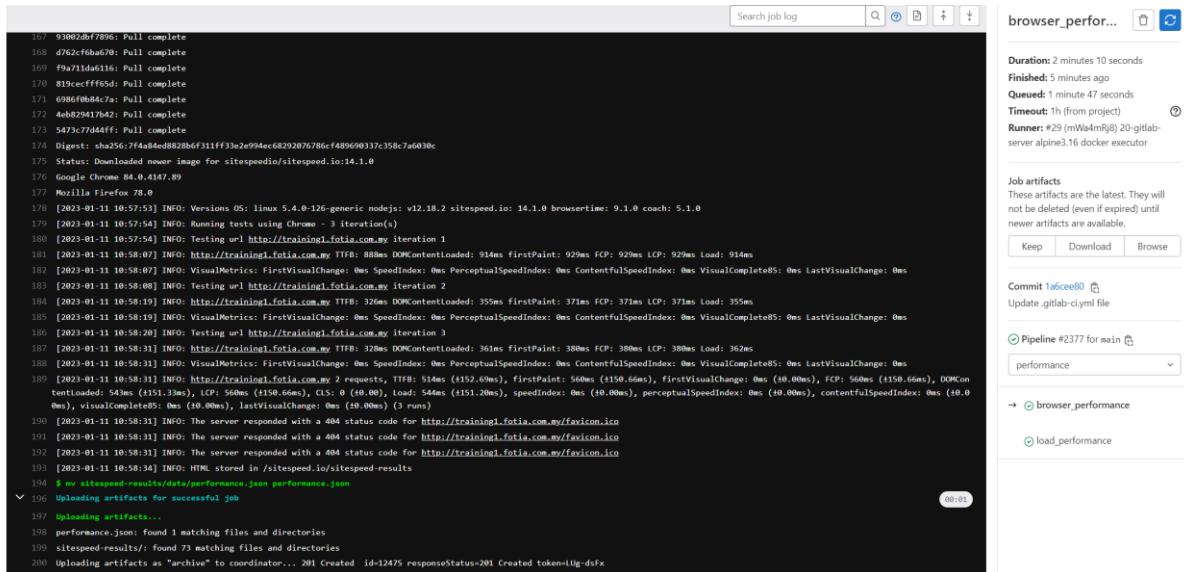
101  |  - docker push $IMAGE_REPOSITORY:$SERVICE_VERSION
102
103  # Load Test (k6)
104  load_performance:
105    image:
106      name: loadimpact/k6:latest
107      entrypoint: []
108      stage: performance
109      script:
110        - echo "executing local k6 in k6 container..."
111        - k6 run ./loadtests/perfomance-test.js
112
113  # browser_performance:
114  #   variables:
115  #     URL: http://training1.fotia.com.my
116  browser_performance:
117    stage: performance
118    image: docker:20.10.16
119    variables:
120      URL: http://training1.fotia.com.my
121      SITESPEED_VERSION: 14.1.0
122      SITESPEED_OPTIONS: ''
123      DOCKER_HOST: tcp://docker:2375/
124      DOCKER_DRIVER: overlay2
125      DOCKER_TLS_CERTDIR: ""
126      services:
127        docker:20.10.16 dind

```

Below the code editor, there are fields for "Commit message" (containing "Update .gitlab-ci.yml file"), "Branch" (set to "main"), and buttons for "Commit changes" and "Reset".

**Rajah E-200: Gitlab – Paparan Konfigurasi Load Performance**

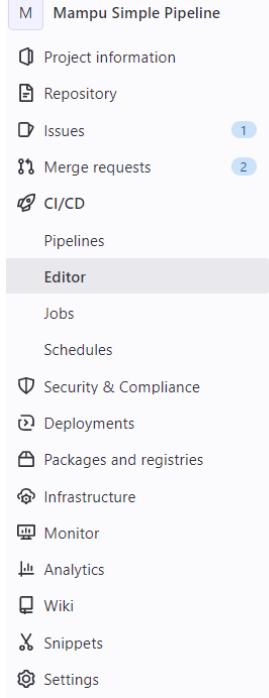
Tatacara	Paparan
<p><b>Menjalankan pipeline GitLab untuk pengujian <i>load performance</i> [Rajah E-201].</b></p> <ol style="list-style-type: none"> <li>1. Rujuk pada para pengujian unit, menjalankan <i>pipeline</i> GitLab secara automasi.</li> </ol>	 <p style="text-align: center;"><b>Rajah E-201: Gitlab – Paparan Pipeline</b></p>
<p><b>Melihat status tugas pipeline GitLab untuk pengujian <i>load performance</i> [Rajah E-202].</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b>.</li> <li>2. Klik butang pada ruangan <b>Status</b>.</li> <li>3. Status tugas <i>pipeline</i> akan dipaparkan. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugas [Rajah E-203Rajah E-202].</li> <li>4. Status log tugas pengujian fungsian akan dipaparkan [Rajah E-204].</li> </ol>	 <p style="text-align: center;"><b>Rajah E-202: Gitlab – Paparan Pipeline</b></p>

Tatacara	Paparan
	<p>performance</p>  <p><b>Rajah E-203: Gitlab – Status Tugasan Untuk Pipeline GitLab.</b></p>  <p><b>Rajah E-204: Gitlab – Status Log Tugasan</b></p>

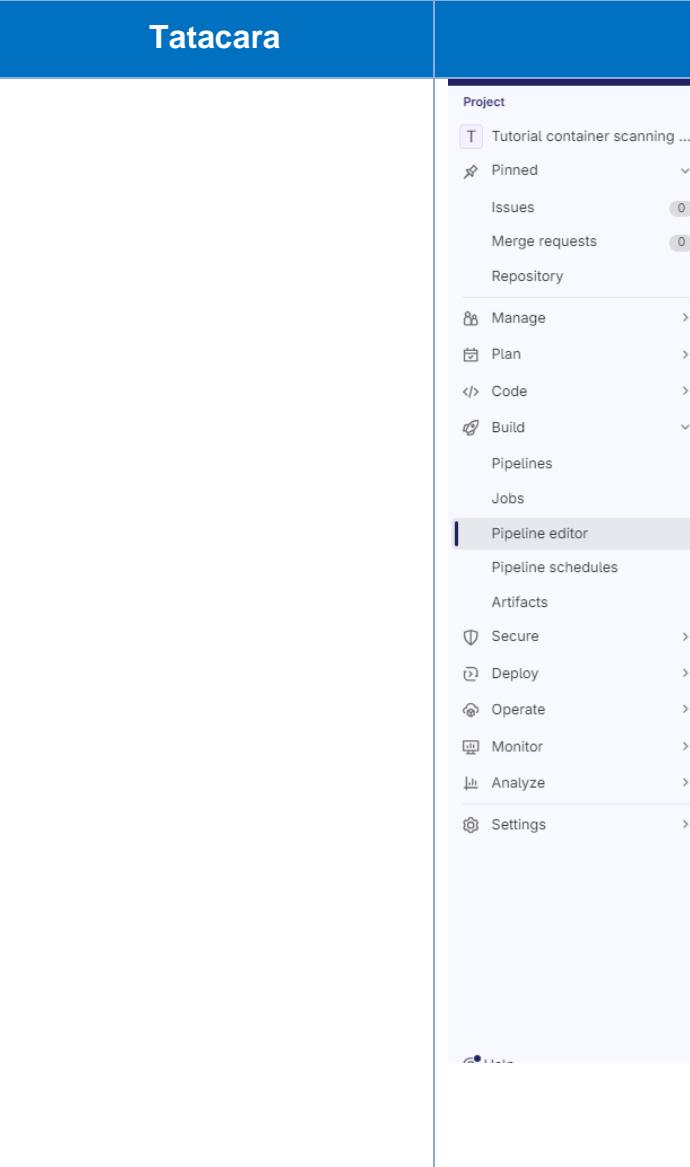
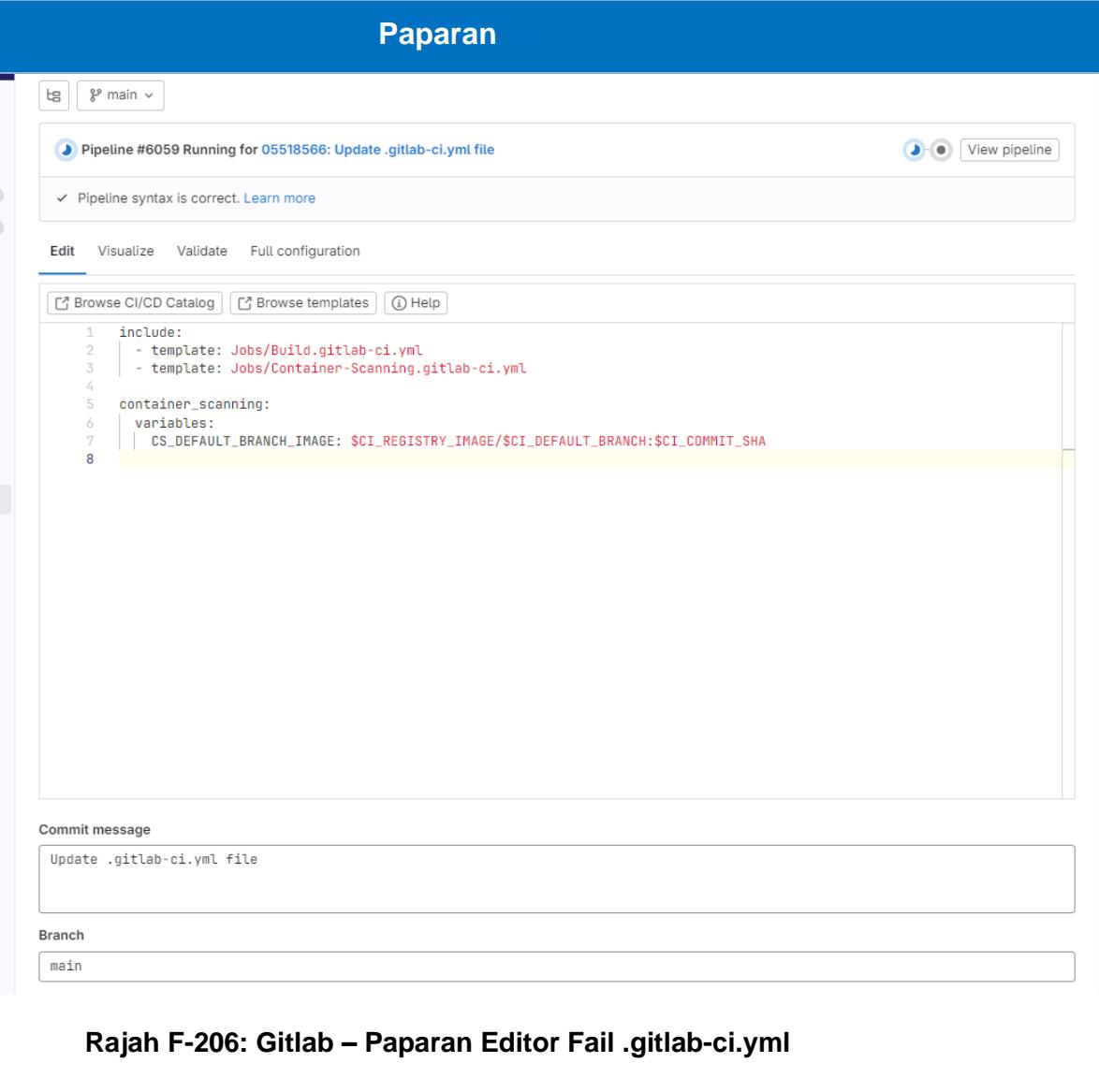
## **LAMPIRAN F: PERINGKAT PELEPASAN**

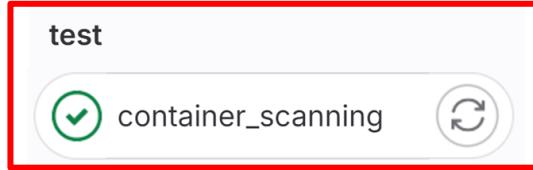
### **Lampiran F-1: Pengimbasan Imej Container**

Berikut merupakan tatacara pengimbasan imej *container* menggunakan *Pipeline GitLab*

Tatacara	Paparan
<p><b>Konfigurasi skrip pengimbasan imej container dalam pipeline GitLab.</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu &gt; Project &gt;</b> Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah F-205].</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <code>.gitlab-ci.yml</code> akan diperolehi [Rajah F-206].</li> </ol>	 <p>The screenshot shows the GitLab main menu with various options like Project information, Repository, Issues, Merge requests, CI/CD, Pipelines, and Editor. The 'Editor' option is highlighted, indicating it is the active section.</p>

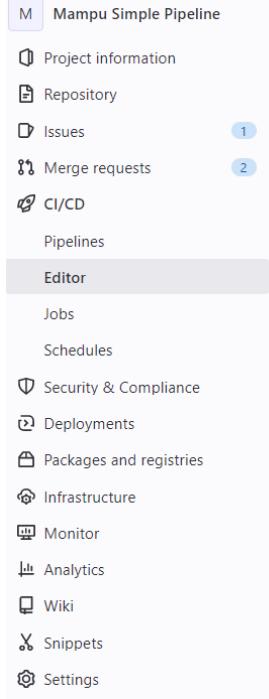
Rajah F-205: Gitlab – Paparan Menu Utama

Tatacara	Paparan
	 <p>Rajah F-206: Gitlab – Paparan Editor Fail .gitlab-ci.yml</p>

Tatacara	Paparan
<p>4. Masukkan syntax berikut ke dalam fail <code>.gitlab-ci.yml</code> untuk pengimbasan imej <i>container</i>.</p> <p>Contoh skrip pengimbasan imej <i>container</i>.</p>	<pre>include:   - template: Jobs/Build.gitlab-ci.yml   - template: Jobs/Container-Scanning.gitlab-ci.yml  container_scanning:   variables:     CS_DEFAULT_BRANCH_IMAGE: \$CI_REGISTRY_IMAGE/\$CI_DEFAULT_BRANCH:\$CI_COMMIT_SHA</pre>
<p>5. Paparan pada <i>Pipeline</i> GitLab sekiranya pengimbasan imej <i>container</i> berjaya [Rajah F-207].</p>	 <p>Rajah F-207: GitLab – Editor <i>Pipeline</i> GitLab</p>

## Lampiran F-2: Pelepasan ke Persekutaran Pembangunan

Berikut merupakan tatacara pelepasan ke persekitaran pembangunan menggunakan *pipeline* GitLab.

Tatacara	Paparan
<p><b>Konfigurasi skrip pelepasan sistem aplikasi ke persekitaran pembangunan dalam <i>pipeline</i> GitLab.</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu &gt; Project &gt;</b> Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah F-208].</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan diperolehi [Rajah F-209].</li> </ol>	 <p>Rajah F-208: Gitlab – Paparan Menu Utama</p>

The screenshot shows the GitLab CI Editor interface. At the top, it displays "Pipeline #2384 running for f1a0b3cd: Update app/index.html" and a message "✓ Pipeline syntax is correct. Learn more". Below this is a toolbar with "Edit", "Visualize", "Validate", and "View merged YAML". The main area contains the CI configuration file:

```
1 workflow:
2   rules:
3     - if: $CI_COMMIT_BRANCH != "main" && $CI_PIPELINE_SOURCE != "merge_request_event"
4       | when: never
5     - when: always
6
7
8   include:
9     - template: Jobs/SAST.gitlab-ci.yml
10    - template: Code-Quality.gitlab-ci.yml
11    - template: Verify/Accessibility.gitlab-ci.yml
12    - template: Verify/Load-Performance-Testing.gitlab-ci.yml
13    # - template: Verify/Browser-Performance.gitlab-ci.yml
14
15   variables:
16     a11y_urls: "http://10.29.209.89:30123 http://10.29.209.89:30123/metrics"
17     NODE_APP: node-app
18     SERVICE_PORT: 3000
19     SERVICE_VERSION: "node-1.5"
20     REPLICAS: 2
21     SERVICE_NODEPORT: 30123
22     IMAGE_REPOSITORY: fathich3k/devops-mampu
23     PROJECT_URL: http://10.29.209.89:30123
24
25   stages:
26     - build
```

Below the code editor, there are fields for "Commit message" containing "Update .gitlab-ci.yml file" and "Branch" set to "main". At the bottom are "Commit changes" and "Reset" buttons.

**Rajah F-209: Gitlab – Paparan Fail Editor .gitlab-ci.yml.**

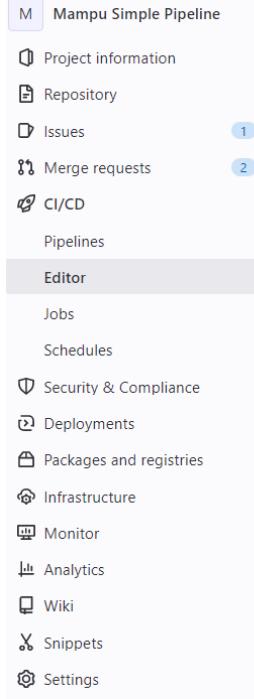
Tatacara	Paparan
<p>4. Masukkan syntax berikut ke dalam fail .gitlab-ci.yml untuk pelepasan sistem aplikasi ke persekitaran pembangunan.</p> <p>Contoh skrip pelepasan sistem aplikasi ke persekitaran pembangunan.</p>	<pre>variables:   a11y_urls: Your URL   NODE_APP: node-app   SERVICE_PORT: 3000   SERVICE_VERSION: "node-1.7"   REPLICAS: 2   SERVICE_NODEPORT: 30123   IMAGE_REPOSITORY: fathich3k/devops-mampu   PROJECT_URL: Your URL   STAGING_PROJECT_URL: Your URL   TAG_VERSION: "1.0.0"  deploy_development:   stage: deploy   tags:     - cloud     - remote     - staging   needs: []   before_script:</pre>

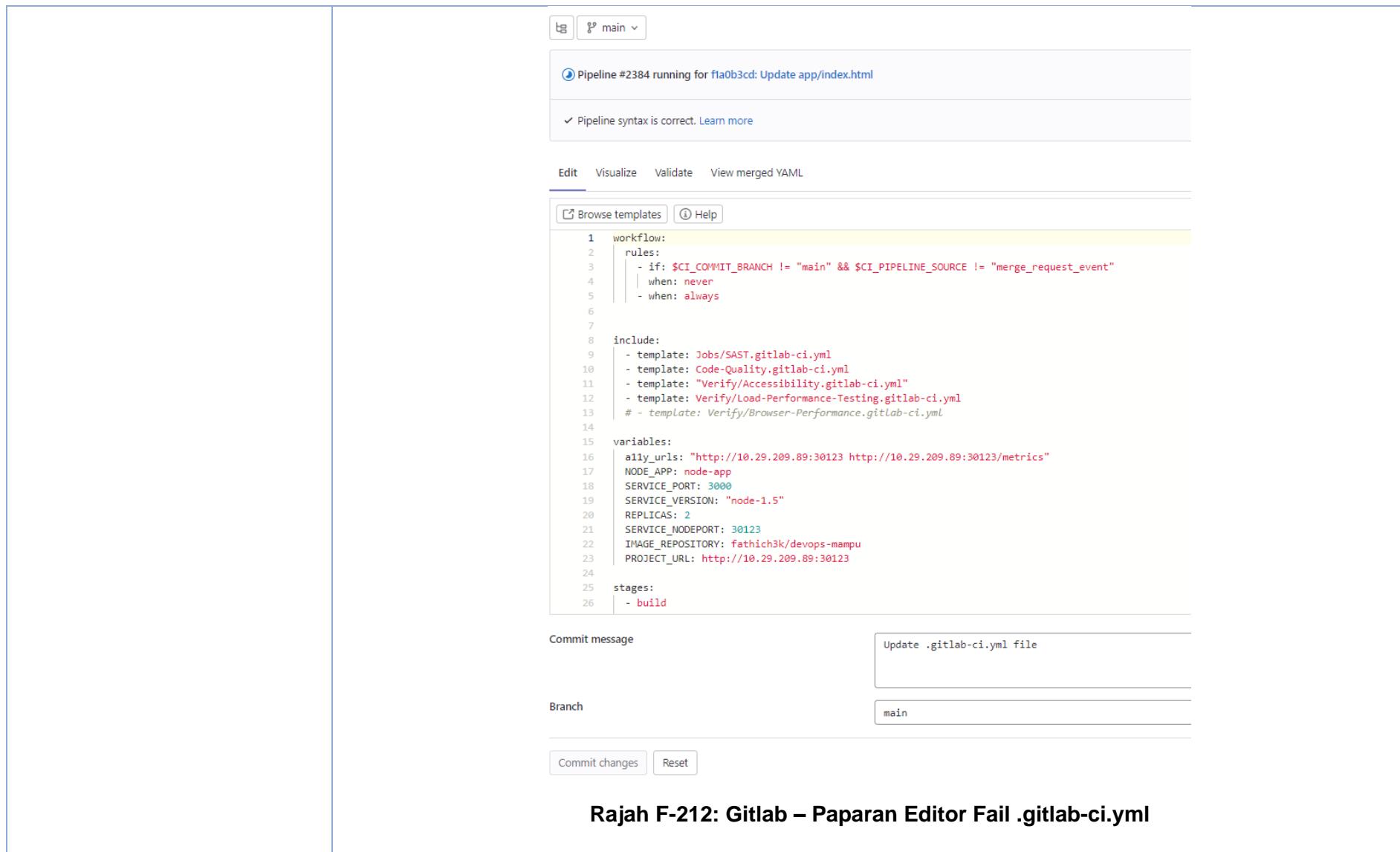
Tatacara	Paparan
	<pre> - sudo cp -r -u * /opt/project/mampu-simple-pipeline - cd /opt/project/mampu-simple-pipeline/app  script: - sudo npm install - pm2 stop /opt/project/mampu-simple-pipeline/app/server.js - pm2 start /opt/project/mampu-simple-pipeline/app/server.js  # after_script: #   - systemctl restart nginx  release:   name: '\$TAG_VERSION-DEV+\$CI_PIPELINE_IID'   tag_name: '\$TAG_VERSION-DEV+\$CI_PIPELINE_IID'   description: './changelog.md'  environment:   name: development   url: \$STAGING_PROJECT_URL  only: - main </pre>

Tatacara	Paparan
5. Paparan pada <i>Pipeline</i> GitLab sekiranya pelepasan sistem aplikasi ke pembangunan berjaya [Rajah F-210].	 <p>Rajah F-210: GitLab – Editor <i>Pipeline</i> GitLab</p>

### Lampiran F-3: Pelepasan ke Persekutaran *Staging*

Berikut merupakan tatacara pelepasan ke persekitaran *staging* menggunakan *Pipeline GitLab*

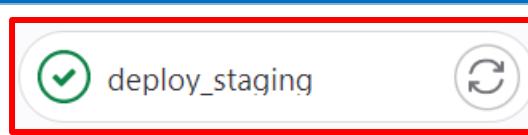
Tatacara	Paparan
<p><b>Konfigurasi skrip pelepasan sistem aplikasi ke persekitaran <i>staging</i> dalam <i>pipeline GitLab</i>.</b></p> <ol style="list-style-type: none"> <li>6. Pilih <b>Menu &gt; Project &gt;</b> Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>7. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah F-211].</li> <li>8. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan diperolehi [ Rajah F-212].</li> </ol>	 <p>Rajah F-211: Gitlab – Paparan Menu Utama</p>



Rajah F-212: Gitlab – Paparan Editor Fail .gitlab-ci.yml

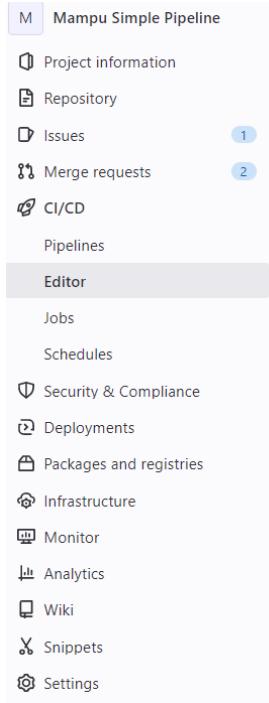
Tatacara	Paparan
<p>9. Masukkan syntax berikut ke dalam fail .gitlab-ci.yml untuk pelepasan sistem aplikasi ke persekitaran <i>staging</i>.</p> <p>Contoh skrip pelepasan sistem aplikasi ke persekitaran <i>staging</i>.</p>	<pre>variables:   a11y_urls: Your URL   NODE_APP: node-app   SERVICE_PORT: 3000   SERVICE_VERSION: "node-1.7"   REPLICAS: 2   SERVICE_NODEPORT: 30123   IMAGE_REPOSITORY: fathich3k/devops-mampu   PROJECT_URL: Your URL   STAGING_PROJECT_URL: Your URL   TAG_VERSION: "1.0.0"  deploy_staging:   stage: deploy   tags:     - cloud     - remote     - staging   needs:     - deploy_development</pre>

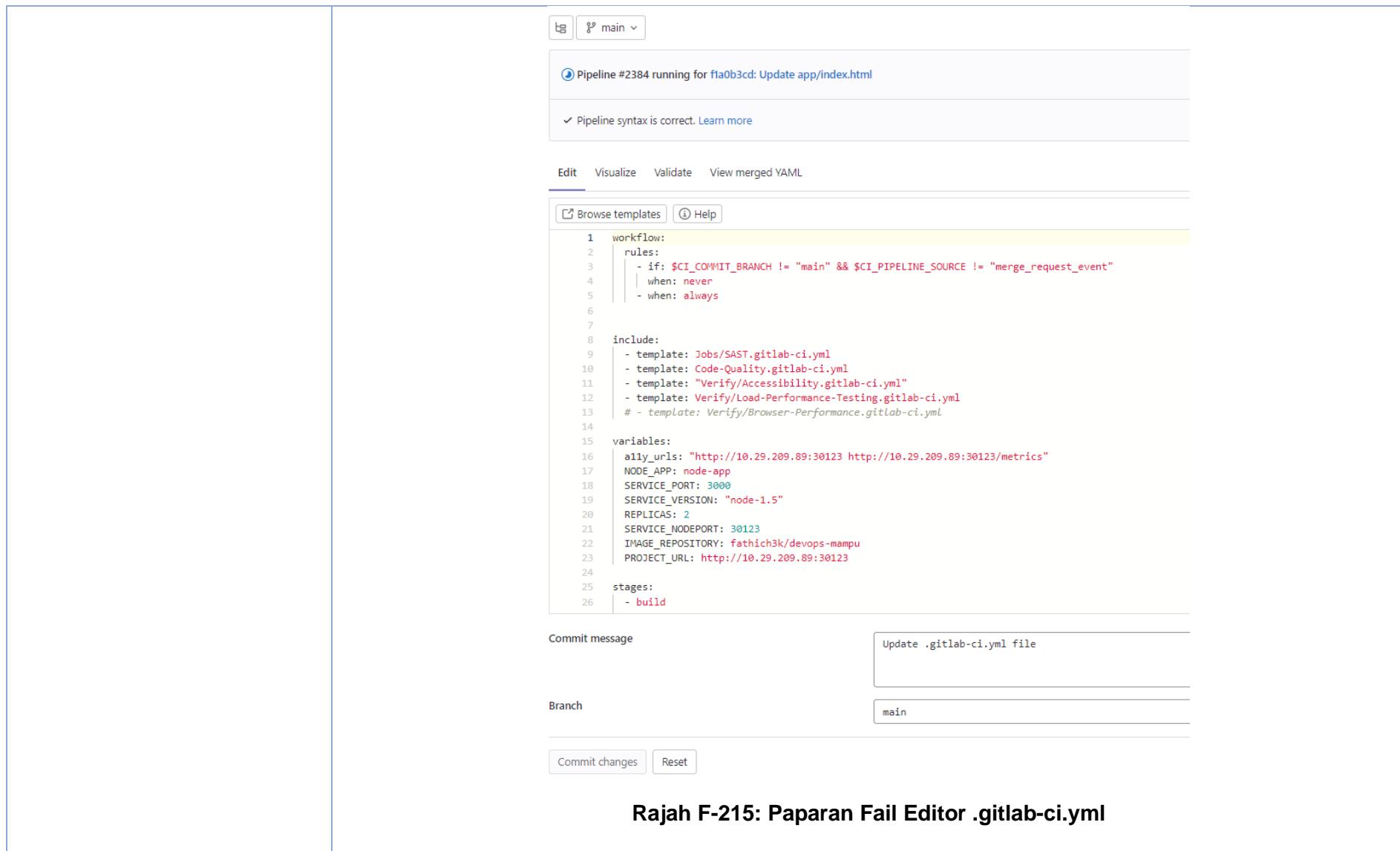
Tatacara	Paparan
	<pre>variables:   APP_PORT: 2345  script:   - docker login -u \$REGISTRY_USER -p \$REGISTRY_PASS docker.io   - export DC_IMAGE_NAME=\$IMAGE_REPOSITORY   - export DC_IMAGE_TAG=\$SERVICE_VERSION   - export DC_APP_PORT=\$APP_PORT   - docker-compose down   - docker-compose up -d  release:   name: '\$TAG_VERSION-STG+\$CI_PIPELINE_IID'   tag_name: '\$TAG_VERSION-STG+\$CI_PIPELINE_IID'   description: './changelog.md'  environment:   name: staging   url: \$STAGING_PROJECT_URL  only:   - main</pre>

Tatacara	Paparan
10. Paparan pada <i>Pipeline</i> GitLab sekiranya pelepasan sistem aplikasi ke <i>staging</i> berjaya [Rajah F-213].	 <p>Rajah F-213: GitLab – Editor Pipeline GitLab</p> The screenshot shows a pipeline step named "deploy_staging" with a green checkmark icon indicating success. A red rectangular box highlights this step. To the right of the step name is a circular icon with a double arrow symbol.

## Lampiran F-4: Pelepasan ke Persekutaran Produksi

Berikut merupakan tatacara pelepasan ke persekitaran produksi menggunakan *Pipeline GitLab*.

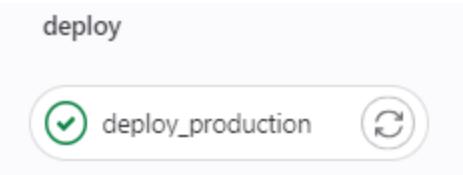
Tatacara	Paparan
<p><b>Konfigurasi skrip pelepasan sistem aplikasi ke persekitaran produksi dalam pipeline GitLab.</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah F-214].</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <code>.gitlab-ci.yml</code> akan diperolehi [Rajah F-215].</li> </ol>	 <p>Rajah F-214: Gitlab – Paparan Menu Utama</p>



Rajah F-215: Paparan Fail Editor .gitlab-ci.yml

Tatacara	Paparan
<p>4. Masukkan syntax berikut ke dalam fail .gitlab-ci.yml untuk pelepasan sistem aplikasi ke persekitaran produksi.</p> <p>Contoh skrip pelepasan sistem aplikasi ke persekitaran produksi.</p>	<pre> variables:   a11y_urls: Your URL   NODE_APP: node-app   SERVICE_PORT: 3000   SERVICE_VERSION: "node-1.7"   REPLICAS: 2   SERVICE_NODEPORT: 30123   IMAGE_REPOSITORY: fathich3k/devops-mampu   PROJECT_URL: Your URL   STAGING_PROJECT_URL: Your URL   TAG_VERSION: "1.0.0"  deploy-production:   stage: deploy   when: manual   tags:     - gitlab-server     - shared     - shell   before_script: </pre>

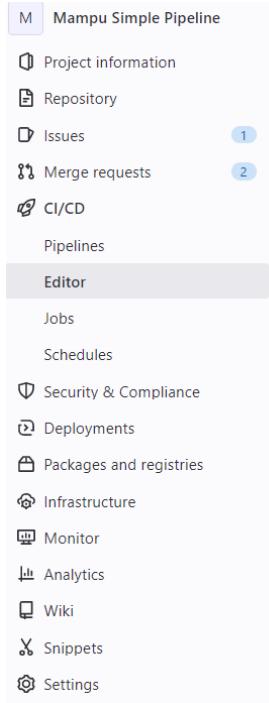
Tatacara	Paparan
	<ul style="list-style-type: none"> <li>- export IMAGE_NAME=\$IMAGE_REPOSITORY</li> <li>- export IMAGE_TAG=\$SERVICE_VERSION</li> <li>- export NODE_APP=\$NODE_APP</li> <li>- export SERVICE_PORT=\$SERVICE_PORT</li> <li>- export REPLICAS=\$REPLICAS</li> <li>- export SERVICE_NODEPORT=\$SERVICE_NODEPORT</li> </ul> <p>script:</p> <ul style="list-style-type: none"> <li>- kubectl --kubeconfig /etc/kube/config create secret docker-registry my-private-docker-registry-key --docker-server=docker.io --docker-username=\$REGISTRY_USER --docker-password=\$REGISTRY_PASS -n uat --dry-run=client -o yaml   kubectl --kubeconfig /etc/kube/config apply -f -</li> <li>- envsubst &lt; kubernetes/deployment.yaml   kubectl --kubeconfig /etc/kube/config apply -f -</li> <li>- envsubst &lt; kubernetes/service.yaml   kubectl --kubeconfig /etc/kube/config apply -f -</li> </ul> <p>release:</p> <pre>name: 'Production Release' tag_name: '\$TAG_VERSION-\$CI_PIPELINE_IID' description: 'Production Release \$TAG_VERSION-\$CI_PIPELINE_IID'</pre> <p>environment:</p> <pre>name: production</pre>

Tatacara	Paparan
	<pre>url: \$PROJECT_URL only: - main</pre>
5. Paparan pada <i>Pipeline</i> GitLab sekiranya pelepasan berjaya [Rajah F-216].	<p>deploy</p>  <p>Rajah F-216: GitLab – Editor <i>Pipeline</i> GitLab</p>

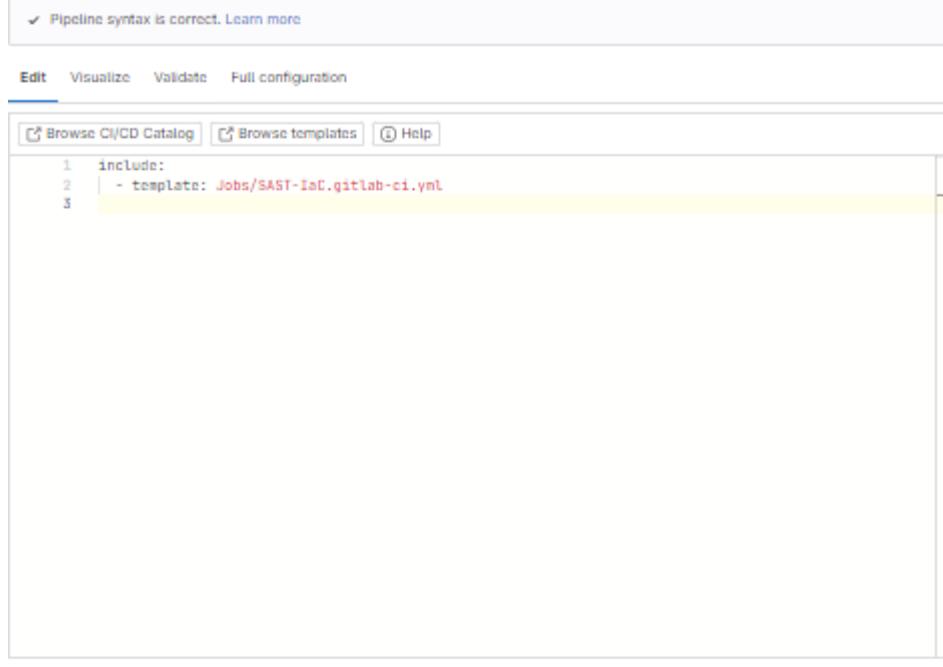
## **LAMPIRAN G: PERINGKAT PENEMPATAN**

### **Lampiran G-1: Pengimbasan Infrastruktur sebagai Kod (IaC)**

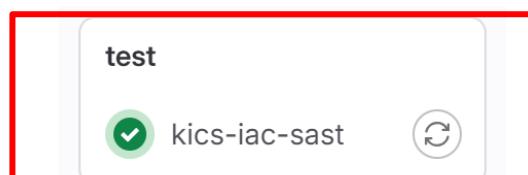
Berikut merupakan tatacara pengimbasan Infrastruktur sebagai Kod menggunakan *Pipeline GitLab*

Tatacara	Paparan
<p><b>Konfigurasi skrip pengimbasan Infrastruktur sebagai Kod dalam <i>pipeline</i> GitLab.</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah F-211].</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan diperolehi [ Rajah F-212].</li> </ol>	 <p>The screenshot shows the GitLab main menu on the left side of the interface. The 'Editor' option under the 'Pipelines' section is highlighted with a light gray background. Other menu items include M (Mampu Simple Pipeline), Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), CI/CD, Pipelines, Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p>

Rajah F-217: Gitlab – Paparan Menu Utama

Tatacara	Paparan
	 <p>The screenshot shows the GitLab CI/CD Editor interface. At the top, a message says "Pipeline syntax is correct. Learn more". Below it are navigation tabs: Edit (which is selected), Visualize, Validate, and Full configuration. There are also buttons for Browse CI/CD Catalog, Browse templates, and Help. The main area contains the following code:</p> <pre>1 include: 2   - template: Jobs/SAST-IAE.gitlab-ci.yml 3</pre> <p>Below the editor, there are fields for "Commit message" containing "Update .gitlab-ci.yml file" and "Branch" set to "main". At the bottom are "Commit changes" and "Reset" buttons.</p>

Rajah F-218: Gitlab – Paparan Editor Fail .gitlab-ci.yml

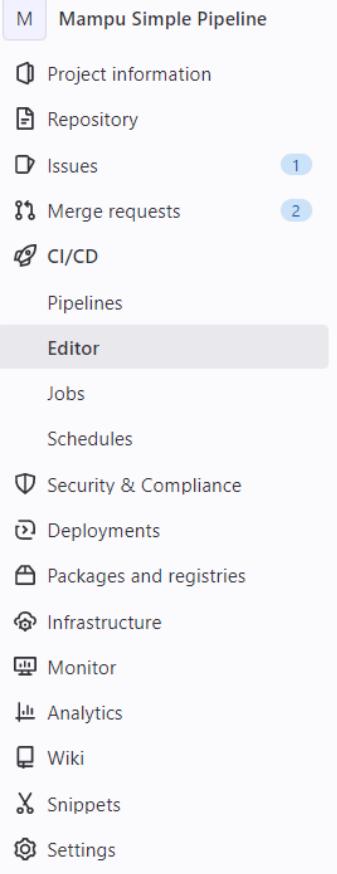
Tatacara	Paparan
4. Masukkan <i>syntax</i> berikut ke dalam fail <i>.gitlab-ci.yml</i> untuk pengimbasan Infrastruktur sebagai Kod.  Contoh skrip pengimbasan Infrastruktur sebagai Kod.	include:  - template: <i>Jobs/SAST-IaC.gitlab-ci.yml</i>
5. Paparan pada <i>Pipeline</i> GitLab sekiranya pengimbasan Infrastruktur sebagai Kod berjaya [Rajah F-213].	 <p>Rajah F-219: GitLab – Editor <i>Pipeline</i> GitLab</p>

## Lampiran G-2: Penempatan ke VM

Pasukan perlu memastikan ketersediaan persekitaran VM mengikut bahasa pengaturcaraan sistem aplikasi yang digunakan. VM untuk panduan ini telah dikonfigurasi seperti berikut.

- a. Sistem Pengoperasian: Linux Ubuntu
- b. Pelayan Web: Nginx
- c. Pangkalan Data: Postgress
- d. Javascript Framework: NodeJS
- e. Pengurusan Proses: PM2

Langkah seterusnya adalah mengkonfigurasi *pipeline* GitLab untuk mengautomasikan proses penempatan sistem aplikasi ke VM.

Tatacara	Paparan
<p><b>Konfigurasi skrip penempatan fail sistem aplikasi ke VM dalam pipeline GitLab.</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah G-220].</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan diperolehi [Rajah G-221].</li> </ol>	 <p>The screenshot shows the GitLab main menu with the following items:</p> <ul style="list-style-type: none"> <li>M Mampu Simple Pipeline</li> <li>Project information</li> <li>Repository</li> <li>Issues (1)</li> <li>Merge requests (2)</li> <li>CI/CD</li> <li>Pipelines</li> <li><b>Editor</b> (highlighted with a gray box)</li> <li>Jobs</li> <li>Schedules</li> <li>Security &amp; Compliance</li> <li>Deployments</li> <li>Packages and registries</li> <li>Infrastructure</li> <li>Monitor</li> <li>Analytics</li> <li>Wiki</li> <li>Snippets</li> <li>Settings</li> </ul>

Rajah G-220: Gitlab – Paparan Menu Utama

The screenshot shows the GitLab CI Editor interface. At the top, it displays "Pipeline #2384 running for f1a0b3cd: Update app/index.html" and a message indicating "Pipeline syntax is correct. Learn more". Below this, there are navigation links: "Edit", "Visualize", "Validate", and "View merged YAML". The main area contains the CI configuration file:

```
1 workflow:
2   rules:
3     - if: $CI_COMMIT_BRANCH != "main" && $CI_PIPELINE_SOURCE != "merge_request_event"
4       | when: never
5     - when: always
6
7
8   include:
9     - template: Jobs/SAST.gitlab-ci.yml
10    - template: Code-Quality.gitlab-ci.yml
11    - template: Verify/Accessibility.gitlab-ci.yml
12    - template: Verify/Load-Performance-Testing.gitlab-ci.yml
13    # - template: Verify/Browser-Performance.gitlab-ci.yml
14
15  variables:
16    a11y_urls: "http://10.29.209.89:30123 http://10.29.209.89:30123/metrics"
17    NODE_APP: node-app
18    SERVICE_PORT: 3000
19    SERVICE_VERSION: "node-1.5"
20    REPLICAS: 2
21    SERVICE_NODEPORT: 30123
22    IMAGE_REPOSITORY: fathich3k/devops-mampu
23    PROJECT_URL: http://10.29.209.89:30123
24
25  stages:
26    - build
```

Below the code editor, there are fields for "Commit message" containing "Update .gitlab-ci.yml file" and "Branch" set to "main". At the bottom, there are "Commit changes" and "Reset" buttons.

**Rajah G-221: Gitlab – Paparan Fail Editor .gitlab-ci.yml**

Tatacara	Paparan
<p>4. Masukkan syntax berikut ke dalam fail .gitlab-ci.yml untuk penempatan fail sistem aplikasi ke Virtual Machine.</p> <p>Contoh skrip penempatan fail sistem aplikasi ke Virtual Machine.</p>	<pre> deploy_development:   stage: deploy   tags:     - cloud     - remote     - staging   needs: []   before_script:     - sudo cp -r -u * /opt/project/mampu-simple-pipeline     - cd /opt/project/mampu-simple-pipeline/app   script:     - sudo npm install     - pm2 stop /opt/project/mampu-simple-pipeline/app/server.js     - pm2 start /opt/project/mampu-simple-pipeline/app/server.js   # after_script:   #   - systemctl restart nginx   release:     name: '\$TAG_VERSION-Alpha-\$CI_COMMIT_SHORT_SHA'     tag_name: '\$TAG_VERSION-Alpha-\$CI_COMMIT_SHORT_SHA'     description: 'Alpha Release \$TAG_VERSION-\$CI_COMMIT_SHORT_SHA' </pre>

Tatacara	Paparan
	<pre>environment:   name: development   url: \$STAGING_PROJECT_URL only:   - main</pre>
5. Paparan pada <i>Pipeline</i> GitLab sekiranya penempatan fail sistem aplikasi <i>Virtual Machine</i> berjaya [Rajah G-222].	 <p>Rajah G-222: GitLab – Editor <i>Pipeline</i> GitLab</p>

### Lampiran G-3: Penempatan menggunakan imej dari Docker Container

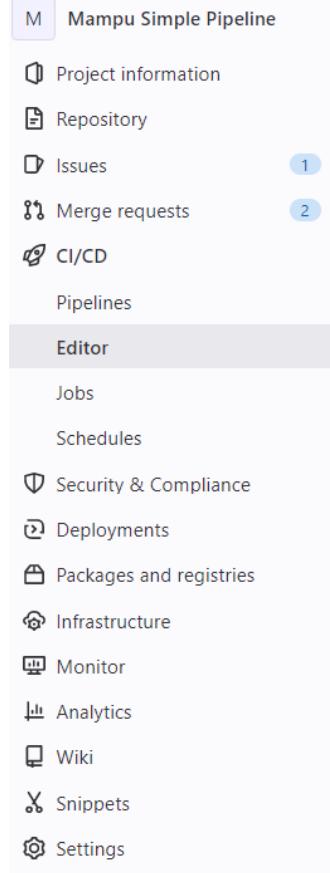
Pasukan perlu memastikan ketersediaan imej Docker Container mengikut bahasa pengaturcaraan sistem aplikasi yang digunakan.

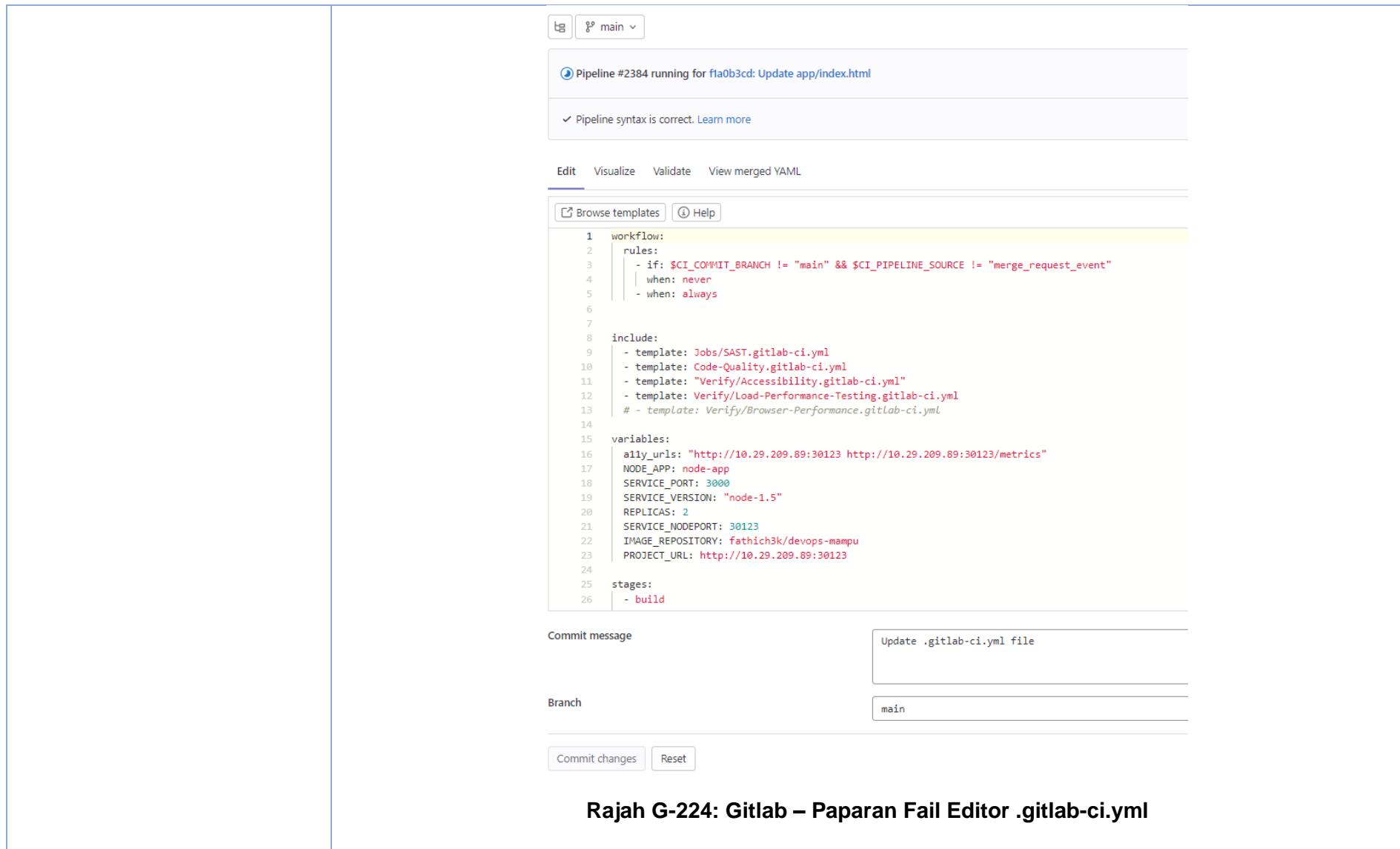
Bagi tujuan kes, imej Docker Container untuk panduan ini telah dikonfigurasi seperti berikut.

- a. Sistem Pengoperasian: Linux VM
- b. Apache Server
- c. MySQL
- d. PHP

Langkah seterusnya adalah mengkonfigurasi *pipeline* GitLab untuk mengautomasikan proses penempatan sistem aplikasi ke Docker Container.

- a. Sistem Pengoperasian: Linux Ubuntu
- b. Pelayan Web: Nginx
- c. Pangkalan Data: Postgress
- d. Javascript Framework: NodeJS
- e. Pengurusan Proses: PM2

Tatacara	Paparan
<p>Konfigurasi skrip penempatan imej Docker ke Docker Container dalam <b>pipeline GitLab</b>.</p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah G-223].</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <i>.gitlab-ci.yml</i> akan muncul [Rajah G-224].</li> </ol>	 <p>Mampu Simple Pipeline</p> <ul style="list-style-type: none"> <li>Project information</li> <li>Repository</li> <li>Issues 1</li> <li>Merge requests 2</li> <li>CI/CD</li> <li>Pipelines</li> <li><b>Editor</b></li> <li>Jobs</li> <li>Schedules</li> <li>Security &amp; Compliance</li> <li>Deployments</li> <li>Packages and registries</li> <li>Infrastructure</li> <li>Monitor</li> <li>Analytics</li> <li>Wiki</li> <li>Snippets</li> <li>Settings</li> </ul> <p><b>Rajah G-223: Gitlab – Paparan Menu Utama</b></p>

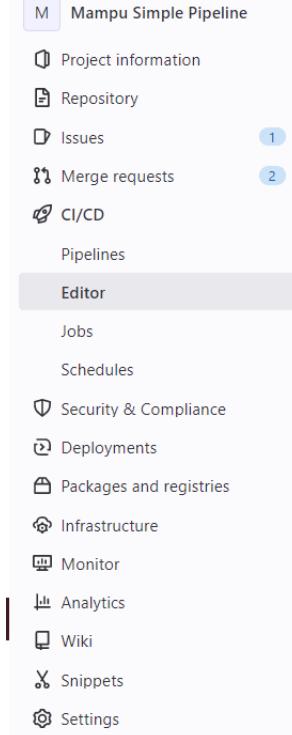


Rajah G-224: Gitlab – Paparan Fail Editor .gitlab-ci.yml

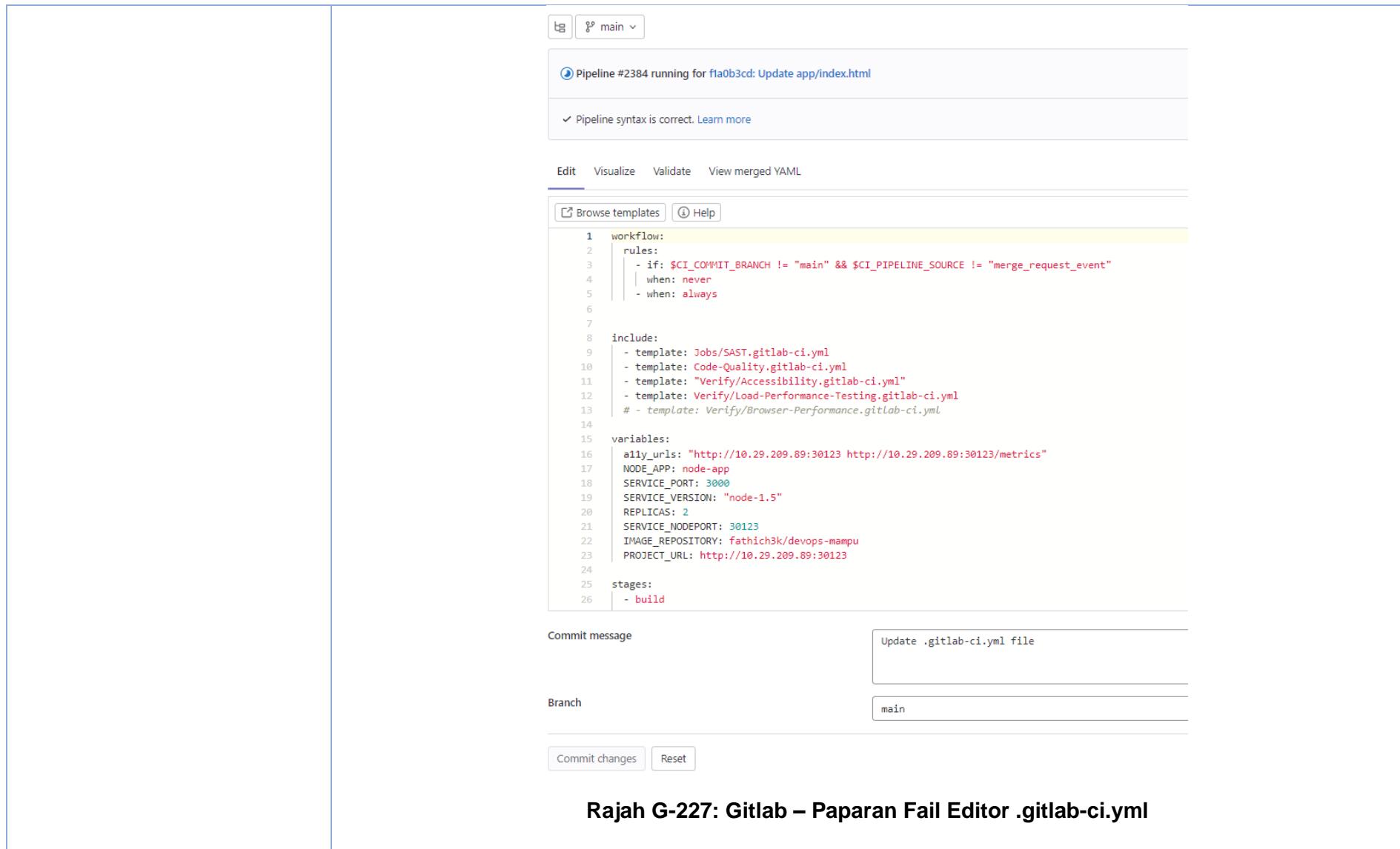
Tatacara	Paparan
<p>4. Masukkan syntax berikut ke dalam fail <code>.gitlab-ci.yml</code> untuk penempatan imej ke Docker Container.</p> <p>Contoh skrip penempatan imej ke Docker Container.</p>	<pre> deploy_staging:   stage: deploy   tags:     - cloud     - remote     - staging   variables:     APP_PORT: 2345   script:     - docker login -u \$REGISTRY_USER -p \$REGISTRY_PASS docker.io     - export DC_IMAGE_NAME=\$IMAGE_REPOSITORY     - export DC_IMAGE_TAG=\$SERVICE_VERSION     - export DC_APP_PORT=\$APP_PORT     - docker-compose down     - docker-compose up -d   only:     - main </pre>

Tatacara	Paparan
5. Paparan pada <i>Pipeline</i> GitLab sekiranya penempatan <i>image</i> pada Docker <i>Container</i> berjaya [Rajah G-225].	<p>deploy</p> <div style="border: 2px solid red; padding: 10px; text-align: center;"><p>deploy_staging</p></div> <p>Rajah G-225: GitLab – Editor <i>Pipeline</i> GitLab</p>

## Lampiran G-4: Penempatan ke Kubernetes

Tatacara	Paparan
<p><b>Konfigurasi skrip penempatan imej Docker ke Kubernetes dalam <i>pipeline</i> GitLab</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b> [Rajah G-226].</li> <li>3. Paparan <i>Pipeline</i> Editor yang memaparkan <i>.gitlab-ci.yml</i> akan muncul [Rajah G-227].</li> </ol>	 <p>The screenshot shows the GitLab project interface. At the top left, there's a placeholder icon labeled 'Mampu Simple Pipeline'. Below it, the main navigation menu is visible, with 'Editor' highlighted in grey. Other menu items include 'Project information', 'Repository', 'Issues' (with a count of 1), 'Merge requests' (with a count of 2), 'CI/CD', 'Pipelines', 'Jobs', 'Schedules', 'Security &amp; Compliance', 'Deployments', 'Packages and registries', 'Infrastructure', 'Monitor', 'Analytics', 'Wiki', 'Snippets', and 'Settings'. The 'Editor' option is the focal point of the image.</p>

Rajah G-226: Gitlab – Paparan Menu Utama

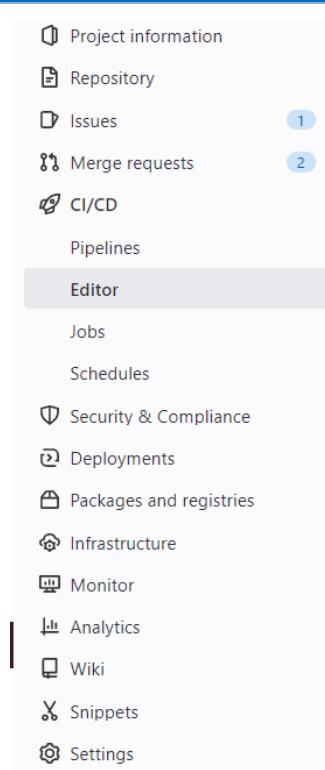


Tatacara	Paparan
<p>4. Masukkan syntax berikut ke dalam fail .gitlab-ci.yml untuk penempatan imej ke Kubernetes.</p> <p>Contoh skrip penempatan imej ke Kubernetes.</p>	<pre> deploy-production:   stage: deploy   tags:     - gitlab-server     - shared     - shell   before_script:     - export IMAGE_NAME=\$IMAGE_REPOSITORY     - export IMAGE_TAG=\$SERVICE_VERSION     - export NODE_APP=\$NODE_APP     - export SERVICE_PORT=\$SERVICE_PORT     - export REPLICAS=\$REPLICAS     - export SERVICE_NODEPORT=\$SERVICE_NODEPORT   script:     - kubectl --kubeconfig /etc/kube/config create secret docker-registry my-private-docker-registry-key --docker-server=docker.io --docker-username=\$REGISTRY_USER --docker-password=\$REGISTRY_PASS -n uat --dry-run=client -o yaml   kubectl --kubeconfig /etc/kube/config apply -f -     - envsubst &lt; kubernetes/deployment.yaml   kubectl --kubeconfig /etc/kube/config apply -f - </pre>

Tatacara	Paparan
	<pre> - envsubst &lt; kubernetes/service.yaml   kubectl --kubeconfig /etc/kube/config apply -f - environment:   name: development   url: \$PROJECT_URL only:   - production </pre>
<p>5. Paparan pada <i>Pipeline</i> GitLab sekiranya penempatan <i>image</i> pada Kubernetes berjaya [Rajah G-228].</p>	<p style="text-align: center;">deploy</p>  <p>Rajah G-228: GitLab – Editor <i>Pipeline</i> GitLab</p>

## LAMPIRAN H: PERINGKAT PENGOPERASIAN

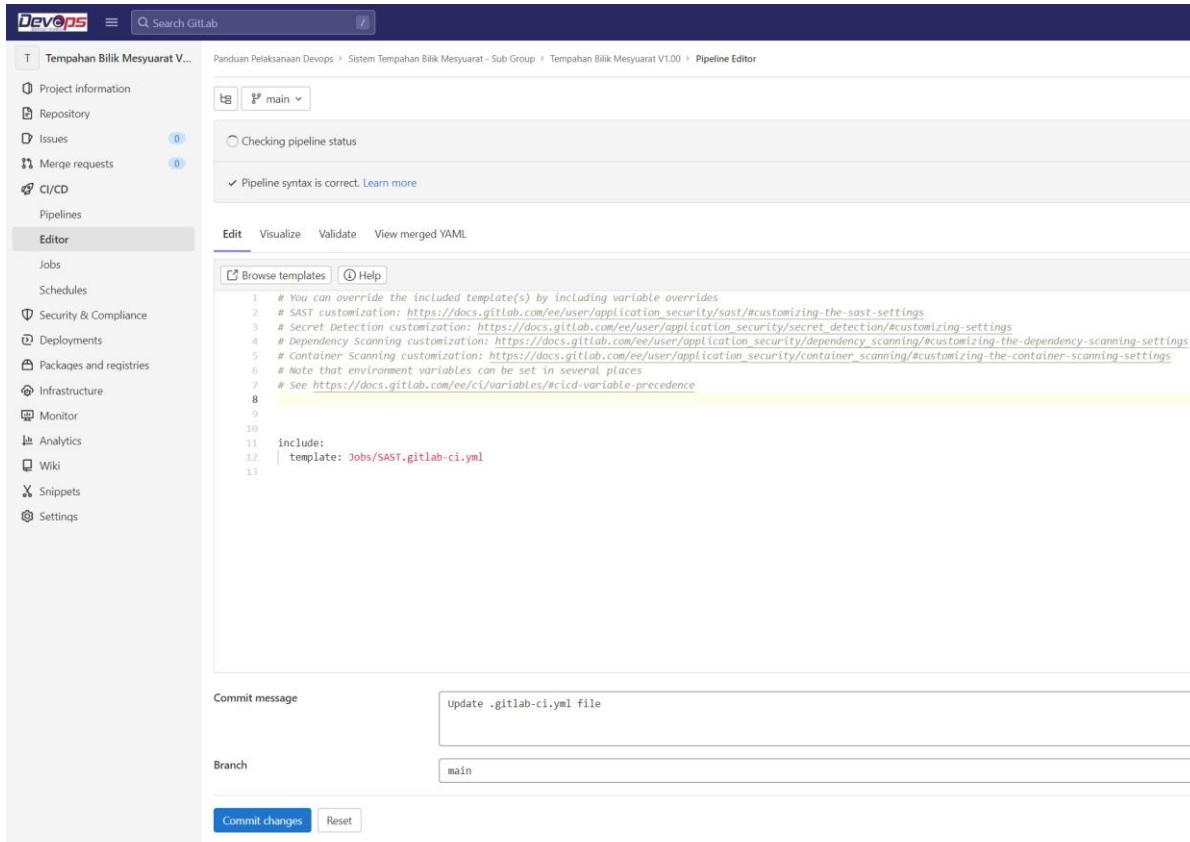
### Lampiran H-1: Penyandaran Pangkalan Data

Tatacara	Paparan
<p>Konfigurasi skrip penyandaran pangkalan data ke dalam <i>pipeline</i> GitLab.</p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li><li>2. Sub-menu akan muncul [Rajah H-229]. Klik menu <b>Editor</b>.</li><li>3. Paparan Pipeline Editor yang memaparkan <code>.gitlab-ci.yml</code> akan muncul.</li></ol>	 <p>The screenshot shows the main navigation menu of a GitLab project. The menu items include: Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), CI/CD, Pipelines, Editor (which is highlighted with a grey box), Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p>

Rajah H-229: Gitlab – Paparan Menu Utama

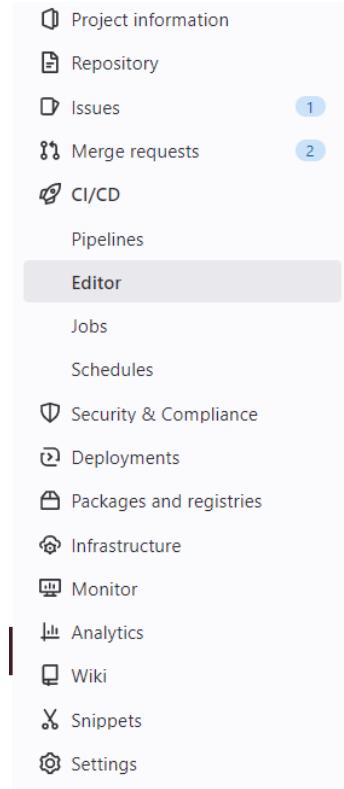
Tatacara	Paparan
4. Masukkan syntax berikut ke dalam fail .gitlab-ci.yml	<pre>postgresql-backup:   image: openjdk:8-jre-alpine   services:     - postgres   script:     - INIT_PATH='pwd'     - apk upgrade     - apk add bash     - apk add postgresql     - cd migrations     - mkdir /liquibase     - mkdir /Downloads     - cd /Downloads     - wget "https://github.com/liquibase/liquibase/releases/download/liquibase-parent-3.7.0-bin.zip"     - wget "https://repo1.maven.org/maven2/org/postgresql/postgresql/42.2.8/postgresql-42.2.8.jar"     - unzip liquibase-3.7.0-bin.zip -d /liquibase -q     - cd ../../liquibase</pre>

Tatacara	Paparan
	<pre>- export PATH=\$PATH:/liquibase - psql -h "postgres" -U "\$POSTGRES_USER" -d "\$POSTGRES_DB" -l - liquibase --changeLogFile=\$INIT_PATH/migrations/baseline_postgres.xml --url="jdbc:postgresql://postgres:5432/custom_baseline" --username \$POSTGRES_USER" -d "\$POSTGRES_DB" -l - cd ../../.. - pg_dump -h "postgres" -U "\$POSTGRES_USER" -d "POSTGRES_DB" &gt; baseline_schema.sql</pre>

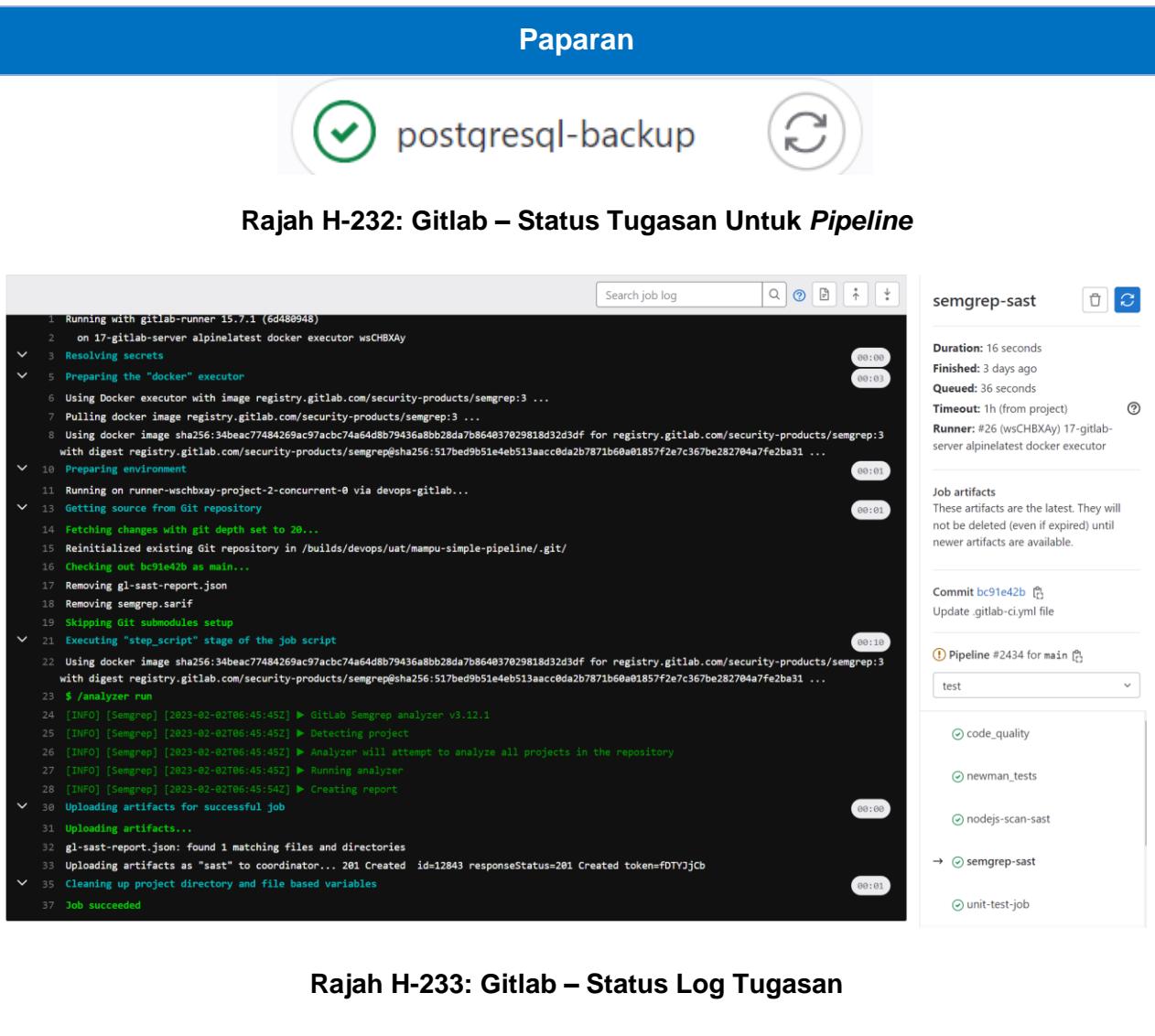
Tatacara	Paparan
<p>5. Masukkan mesej pada ruangan <i>commit message</i> seperti <b>Kemaskini skrip penyandaran pangkalan data pada pipeline</b></p> <p>6. Klick <b>Commit changes</b> untuk menyimpan dan mengemaskini file <i>.gitlab-ci.yml</i>.</p> <p>7. <i>Pipeline</i> GitLab telah dikemaskini dengan job penyandaran pangkalan data.</p> <p>Paparan editor [Rajah H-230].</p>	 <pre> Tempahan Bilik Mesyuarat V... Project information Repository Issues 0 Merge requests 0 CI/CD Pipelines Editor Jobs Schedules Security &amp; Compliance Deployments Packages and registries Infrastructure Monitor Analytics Wiki Snippets Settings  Checking pipeline status ✓ Pipeline syntax is correct. Learn more  Edit Visualize Validate View merged YAML Browse templates Help  1 # You can override the included template(s) by including variable overrides 2 # SAST customization: https://docs.gitlab.com/ee/user/application_security/sast/#customizing-the-sast-settings 3 # Secret Detection customization: https://docs.gitlab.com/ee/user/application_security/secret_detection/#customizing-settings 4 # Dependency Scanning customization: https://docs.gitlab.com/ee/user/application_security/dependency_scanning/#customizing-the-dependency-scanning-settings 5 # Container Scanning customization: https://docs.gitlab.com/ee/user/application_security/container_scanning/#customizing-the-container-scanning-settings 6 # Note that environment variables can be set in several places 7 # See https://docs.gitlab.com/ee/ci/variables/#ci-variable-precedence 8 9 10 11 include: 12   template: Jobs/SAST.gitlab-ci.yml 13 </pre> <p>Commit message: Update .gitlab-ci.yml file</p> <p>Branch: main</p> <p>Commit changes Reset</p>

Rajah H-230: Gitlab – Paparan Skrip Editor

Tatacara	Paparan
<p><b>Menjalankan <i>pipeline</i> GitLab untuk penyandaran pangkalan data.</b></p> <ol style="list-style-type: none"><li>1. <i>Pipeline</i> GiLab akan dijalankan secara automasi semasa penyandaran pangkalan data dilaksanakan.</li></ol>	

Tatacara	Paparan
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk penyandaran pangkalan data.</b></p> <ol style="list-style-type: none"><li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li><li>2. Klik <b>Pipeline</b>. Klik butang pada ruangan <b>Status</b>. Status tugas <i>pipeline</i> akan dipaparkan.</li><li>3. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugas [Rajah H-232].</li><li>4. Status log tugas akan dipaparkan [Rajah H-233].</li></ol>	 <p>The screenshot shows the GitLab main menu on the right side of the interface. The 'Editor' tab is highlighted with a grey background and white text. Other menu items include Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), CI/CD, Pipelines, Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p>

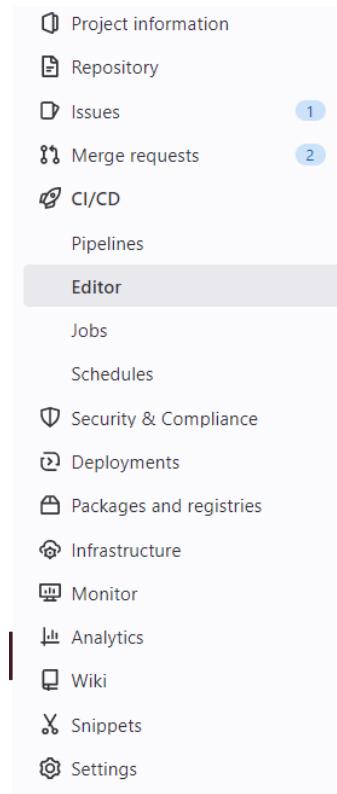
Rajah H-231: Gitlab – Paparan Menu Utama

Tatacara	Paparan
	 <p><b>Rajah H-232: Gitlab – Status Tugasan Untuk Pipeline</b></p> <p>semgrep-sast</p> <p>Duration: 16 seconds Finished: 3 days ago Queued: 36 seconds Timeout: 1h (from project) Runner: #26 (wsCHBXAy) 17-gitlab-server alpinelatest docker executor</p> <p>Job artifacts These artifacts are the latest. They will not be deleted (even if expired) until newer artifacts are available.</p> <p>Commit bc91e42b Update .gitlab-ci.yml file</p> <p>Pipeline #2434 for main</p> <p>test</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> code_quality</li> <li><input checked="" type="checkbox"/> newman_tests</li> <li><input checked="" type="checkbox"/> nodejs-scan-sast</li> <li><input checked="" type="checkbox"/> semgrep-sast</li> <li><input checked="" type="checkbox"/> unit-test-job</li> </ul> <pre> 1 Running with gitlab-runner 15.7.1 (6d488948) 2 on 17-gitlab-server alpinelatest docker executor wsCHBXAy 3 Resolving secrets 4 Preparing the "docker" executor 5 Using Docker executor with image registry.gitlab.com/security-products/semgrep:3 ... 6 Pulling docker image registry.gitlab.com/security-products/semgrep:3 ... 7 Using docker image sha256:34beac77484269ac97acbc74a64d8b79436a8bb28da7b864037029818d32d3df for registry.gitlab.com/security-products/semgrep:3 8 with digest registry.gitlab.com/security-products/semgrep@sha256:517bed9b51e4eb513aacc0da2b7871b60a01857f2e7c367be282704a7fe2ba31 ... 9 Preparing environment 10 Running on runner-wschbxay-project-2-concurrent-0 via devops-gitlab... 11 Getting source from Git repository 12 Fetching changes with git depth set to 20... 13 Reinitialized existing Git repository in /builds/devops/uat/mampu-simple-pipeline/.git/ 14 Checking out bc91e42b as main... 15 Removing gl-sast-report.json 16 Removing semgrep.sarif 17 Skipping Git submodules setup 18 Executing "step_script" stage of the job script 19 Using docker image sha256:34beac77484269ac97acbc74a64d8b79436a8bb28da7b864037029818d32d3df for registry.gitlab.com/security-products/semgrep:3 20 with digest registry.gitlab.com/security-products/semgrep@sha256:517bed9b51e4eb513aacc0da2b7871b60a01857f2e7c367be282704a7fe2ba31 ... 21 \$ analyzer run 22 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► GitLab Semgrep analyzer v3.12.1 23 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Detecting project 24 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Analyzer will attempt to analyze all projects in the repository 25 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Running analyzer 26 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Creating report 27 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Uploading artifacts for successful job 28 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Uploading artifacts... 29 gl-sast-report.json: found 1 matching files and directories 30 Uploading artifacts as "sast" to coordinator... 201 Created id=12843 responseStatus=201 Created token=fDTVjC 31 Cleaning up project directory and file based variables 32 Job succeeded </pre>

Rajah H-233: Gitlab – Status Log Tugasan

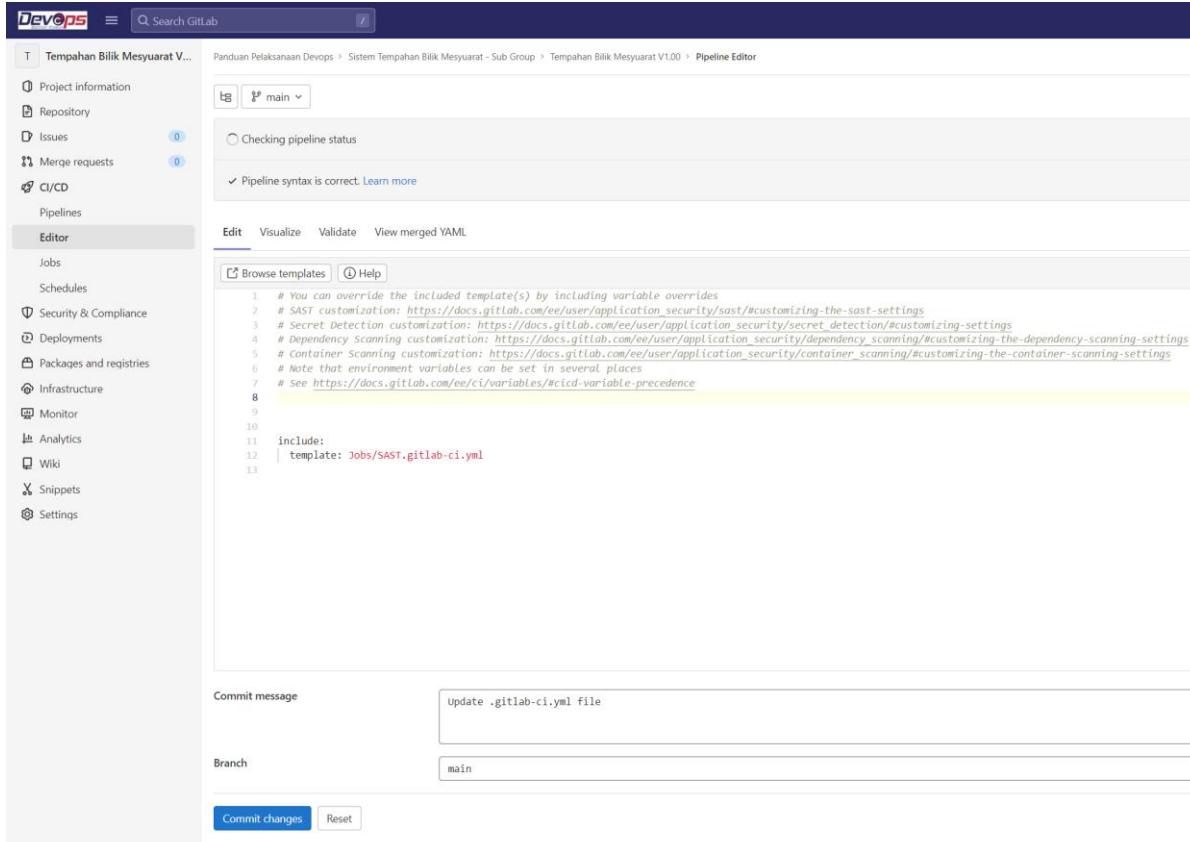
## Lampiran H-2: Pengemasan *Container Registry*

### a. Pemadaman secara automasi

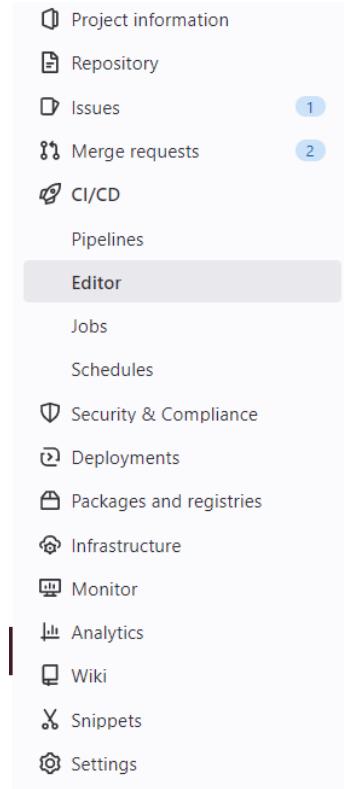
Tatacara	Paparan
<p>Konfigurasi skrip pemadaman <i>imej container</i> dari <i>Container Registry</i> ke dalam <i>pipeline GitLab</i>.</p> <p>Paparan menu utama [Rajah H-234].</p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b>.</li> <li>3. Paparan <i>Pipeline Editor</i> yang memaparkan <code>.gitlab-ci.yml</code> akan muncul.</li> </ol>	 <p>The screenshot shows the GitLab main menu on the left side. The 'Editor' option under the CI/CD section is highlighted with a grey box. Other options visible include Project information, Repository, Issues (with 1 notification), Merge requests (with 2 notifications), CI/CD, Pipelines, Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p>

Rajah H-234: Gitlab – Paparan Menu Utama

Tatacara	Paparan
<p>4. Masukkan <i>syntax</i> berikut ke dalam fail <code>.gitlab-ci.yml</code>.</p>	<pre> stages:   - clean  delete_image:   before_script:     - curl --fail --show-error --location       "https://github.com/genuinetools/reg/releases/download/v\$REG_VERSION/reg-       linux-amd64" --output ./reg     - echo "\$REG_SHA256 ./reg"   sha256sum -c -     - chmod a+x ./reg    image: curlimages/curl:7.86.0    script:     - ./reg rm -d --auth-url \$CI_REGISTRY -u \$CI_REGISTRY_USER -p       \$CI_REGISTRY_PASSWORD \$IMAGE_TAG    stage: clean  variables:   IMAGE_TAG: \$CI_PROJECT_PATH:\$CI_COMMIT_REF_SLUG   REG_SHA256:   ade837fc5224acd8c34732bf54a94f579b47851cc6a7fd5899a98386b782e228   REG_VERSION: 0.16.1   only:     - branches </pre>

Tatacara	Paparan
<p>5. Masukkan mesej pada ruangan <i>commit message</i> seperti <b>Kemaskini skrip pemadaman imej pada pipeline</b></p> <p style="text-align: center;"><b>Commit changes</b></p> <p>6. Klik <b>Commit changes</b> untuk menyimpan dan mengemaskini file <i>.gitlab-ci.yml</i>. [Rajah H-235].</p> <p>7. <i>Pipeline</i> GitLab telah dikemaskini dengan job pemadaman imej <i>container</i>.</p>	<p>except:</p> <ul style="list-style-type: none"> <li>- main</li> </ul>  <pre> except:   - main  # You can override the included template(s) by including variable overrides # SAST customization: https://docs.gitlab.com/ee/user/application_security/sast/#customizing-the-sast-settings # Secret Detection customization: https://docs.gitlab.com/ee/user/application_security/secret_detection/#customizing-settings # Dependency Scanning customization: https://docs.gitlab.com/ee/user/application_security/dependency_scanning/#customizing-the-dependency-scanning-settings # Container Scanning customization: https://docs.gitlab.com/ee/user/application_security/container_scanning/#customizing-the-container-scanning-settings # Note that environment variables can be set in several places # See https://docs.gitlab.com/ee/ci/variables/#ci-variable-precedence  include:     template: Jobs/SAST.gitlab-ci.yml   </pre> <p>Commit message: update .gitlab-ci.yml file</p> <p>Branch: main</p> <p><b>Commit changes</b> Reset</p> <p><b>Rajah H-235: Gitlab – Paparan Editor</b></p>

Tatacara	Paparan
<p><b>Menjalankan <i>pipeline</i> GitLab untuk pemadaman imej <i>container</i>.</b></p> <ol style="list-style-type: none"><li>1. <i>Pipeline</i> GiLab akan dijalankan secara automasi semasa penempatan imej <i>container</i> versi baharu pada persekitaran pembangunan.</li></ol>	

Tatacara	Paparan
<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk pemadaman imej <i>container</i>.</b></p> <ol style="list-style-type: none"><li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b> [Rajah H-236].</li><li>2. Klik butang pada ruangan Status. Status tugas <i>pipeline</i> akan dipaparkan. Klik pada ikon  pada tugasan untuk melihat log terperinci bagi setiap tugasan [Rajah H-237].</li><li>3. Status log tugasan akan dipaparkan [Rajah H-238].</li></ol>	 <p>Rajah H-236: Gitlab – Paparan Menu Utama</p>



Rajah H-237: Gitlab – Status Tugasan Untuk Pipeline

```

1 Running with gitlab-runner 15.7.1 (6d488948)
2 on 17-gitlab-server alpineatest docker executor wsCHBxAy
3 Resolving secrets
4 Preparing the "docker" executor
5 Using Docker executor with image registry.gitlab.com/security-products/semgrep:3 ...
6 Pulling docker image registry.gitlab.com/security-products/semgrep:3 ...
7 Using docker image sha256:34beac77484269ac97acbc74a64d8b79436a8bb28da7b864037029818d32d3df for registry.gitlab.com/security-products/semgrep:3 ...
8 with digest registry.gitlab.com/security-products/semgrep@sha256:517bed9b51e4eb513aacc0da2b7871b60a01857f2e7c367be282704a7fe2ba31 ...
9 Preparing environment
10 Running on runner-wschbxay-project-2-concurrent-0 via devops-gitlab...
11 Getting source from Git repository
12 Fetching changes with git depth set to 20...
13 Reinitialized existing Git repository in /builds/devops/uat/mampu-simple-pipeline/.git/
14 Checking out bc91e42b as main...
15 Removing gl-sast-report.json
16 Removing semgrep.sarif
17 Skipping Git submodules setup
18 Executing "step_script" stage of the job script
19 Using docker image sha256:34beac77484269ac97acbc74a64d8b79436a8bb28da7b864037029818d32d3df for registry.gitlab.com/security-products/semgrep:3 ...
20 with digest registry.gitlab.com/security-products/semgrep@sha256:517bed9b51e4eb513aacc0da2b7871b60a01857f2e7c367be282704a7fe2ba31 ...
21 $ analyzer run
22 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Gitlab Semgrep analyzer v3.12.1
23 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Detecting project
24 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Analyzer will attempt to analyze all projects in the repository
25 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Running analyzer
26 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Creating report
27 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ► Uploading artifacts for successful job
28 [INFO] [Semgrep] [2023-02-02T06:45:54Z] ► Uploading artifacts...
29 gl-sast-report.json: found 1 matching files and directories
30 Uploading artifacts as "sast" to coordinator... 201 Created id=12843 responseStatus=201 Created token=fDTYjJCb
31 Cleaning up project directory and file based variables
32 Job succeeded

```

**semgrep-sast**

**Duration:** 16 seconds  
**Finished:** 3 days ago  
**Queued:** 36 seconds  
**Timeout:** 1h (from project)  
**Runner:** #26 (wsCHBxAy) 17-gitlab-server alpineatest docker executor

**Job artifacts**  
These artifacts are the latest. They will not be deleted (even if expired) until newer artifacts are available.

**Commit** bc91e42b   
Update\_gitlab-ci.yml file

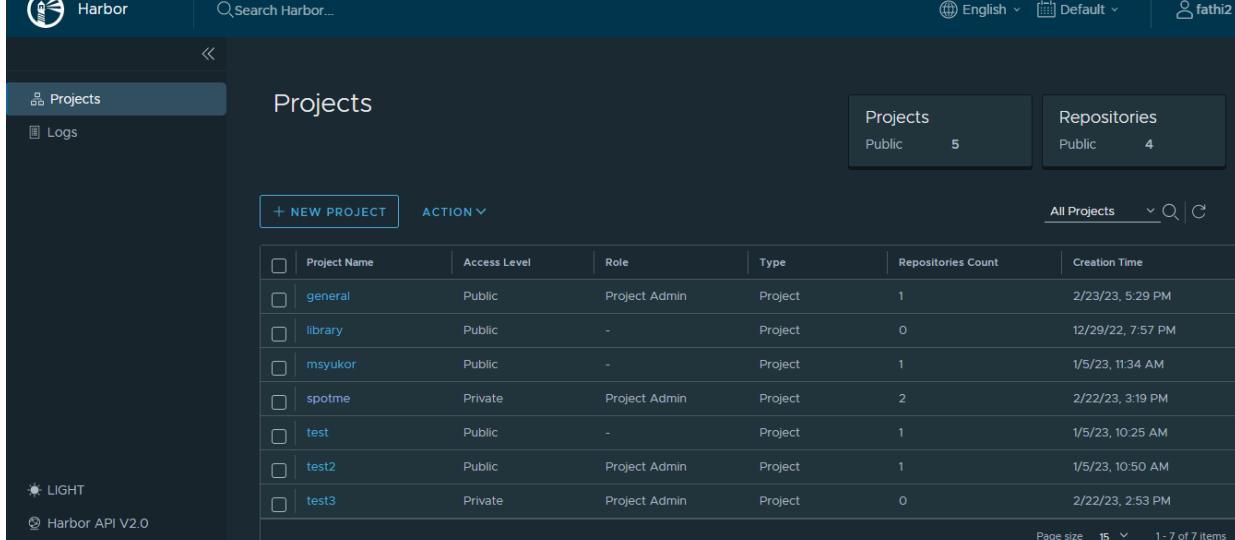
**Pipeline** #2434 for main

test

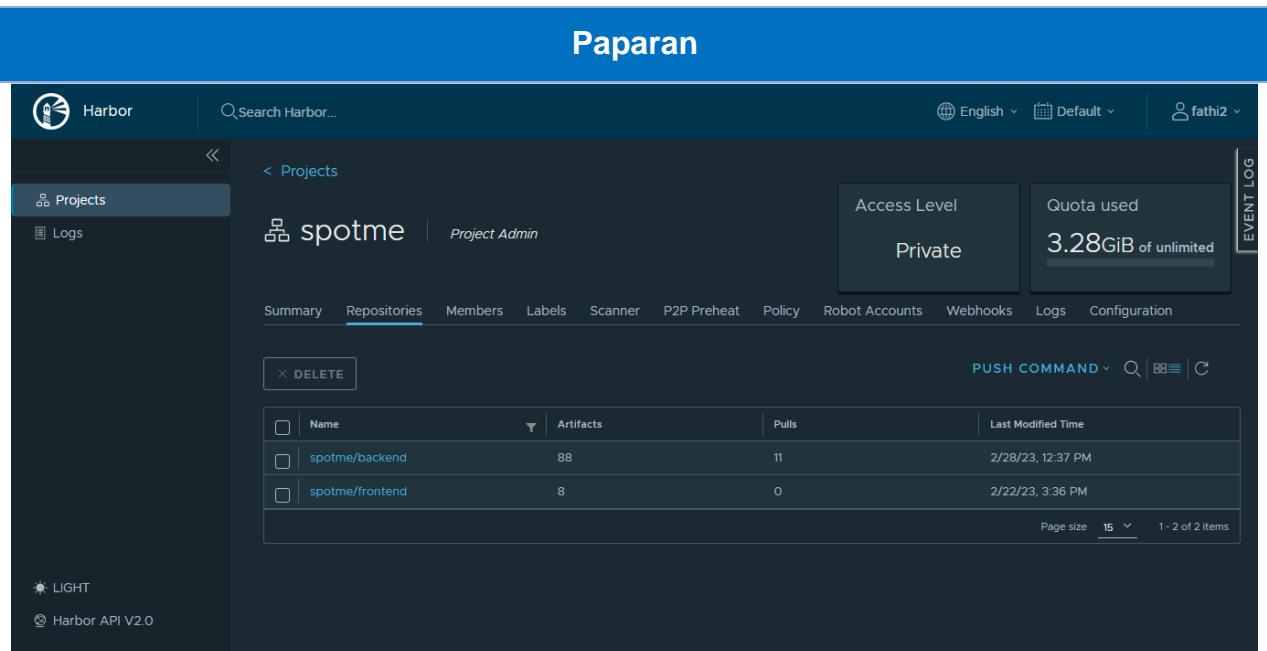
code\_quality  
 newman\_tests  
 nodejs-scan-sast  
→  semgrep-sast  
 unit-test-job

Rajah H-238: Gitlab – Status Log Tugasan

## b. Pemadaman secara manual

Tatacara	Paparan																																																
<p><b>Navigasi ke senarai artifak imej container pada Harbor</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri, Pilih <b>Project</b> &gt; Pilih projek yang telah diwujudkan dari senarai.</li> <li>2. Pilih projek dari senarai projek yang dipaparkan [Rajah H-239].</li> <li>3. Sub-menu akan muncul. Senarai repositori akan dipaparkan. Pilih repositori dari senarai yang dipaparkan [Rajah H-240]. Senarai artifak imej container akan dipaparkan.</li> </ol>	 <p>The screenshot shows the Harbor web interface. On the left sidebar, 'Projects' is selected under the 'Harbor' icon. The main area is titled 'Projects' and displays a table with the following data:</p> <table border="1"> <thead> <tr> <th>Project Name</th> <th>Access Level</th> <th>Role</th> <th>Type</th> <th>Repositories Count</th> <th>Creation Time</th> </tr> </thead> <tbody> <tr> <td>general</td> <td>Public</td> <td>Project Admin</td> <td>Project</td> <td>1</td> <td>2/23/23, 5:29 PM</td> </tr> <tr> <td>library</td> <td>Public</td> <td>-</td> <td>Project</td> <td>0</td> <td>12/29/22, 7:57 PM</td> </tr> <tr> <td>msyukor</td> <td>Public</td> <td>-</td> <td>Project</td> <td>1</td> <td>1/5/23, 11:34 AM</td> </tr> <tr> <td>spotme</td> <td>Private</td> <td>Project Admin</td> <td>Project</td> <td>2</td> <td>2/22/23, 3:19 PM</td> </tr> <tr> <td>test</td> <td>Public</td> <td>-</td> <td>Project</td> <td>1</td> <td>1/5/23, 10:25 AM</td> </tr> <tr> <td>test2</td> <td>Public</td> <td>Project Admin</td> <td>Project</td> <td>1</td> <td>1/5/23, 10:50 AM</td> </tr> <tr> <td>test3</td> <td>Private</td> <td>Project Admin</td> <td>Project</td> <td>0</td> <td>2/22/23, 2:53 PM</td> </tr> </tbody> </table> <p>At the bottom of the interface, there are buttons for 'Page size' (set to 15), 'All Projects', and a search bar.</p> <p><b>Rajah H-239: Harbor – Paparan Senarai Projek</b></p>	Project Name	Access Level	Role	Type	Repositories Count	Creation Time	general	Public	Project Admin	Project	1	2/23/23, 5:29 PM	library	Public	-	Project	0	12/29/22, 7:57 PM	msyukor	Public	-	Project	1	1/5/23, 11:34 AM	spotme	Private	Project Admin	Project	2	2/22/23, 3:19 PM	test	Public	-	Project	1	1/5/23, 10:25 AM	test2	Public	Project Admin	Project	1	1/5/23, 10:50 AM	test3	Private	Project Admin	Project	0	2/22/23, 2:53 PM
Project Name	Access Level	Role	Type	Repositories Count	Creation Time																																												
general	Public	Project Admin	Project	1	2/23/23, 5:29 PM																																												
library	Public	-	Project	0	12/29/22, 7:57 PM																																												
msyukor	Public	-	Project	1	1/5/23, 11:34 AM																																												
spotme	Private	Project Admin	Project	2	2/22/23, 3:19 PM																																												
test	Public	-	Project	1	1/5/23, 10:25 AM																																												
test2	Public	Project Admin	Project	1	1/5/23, 10:50 AM																																												
test3	Private	Project Admin	Project	0	2/22/23, 2:53 PM																																												

**Tatacara**

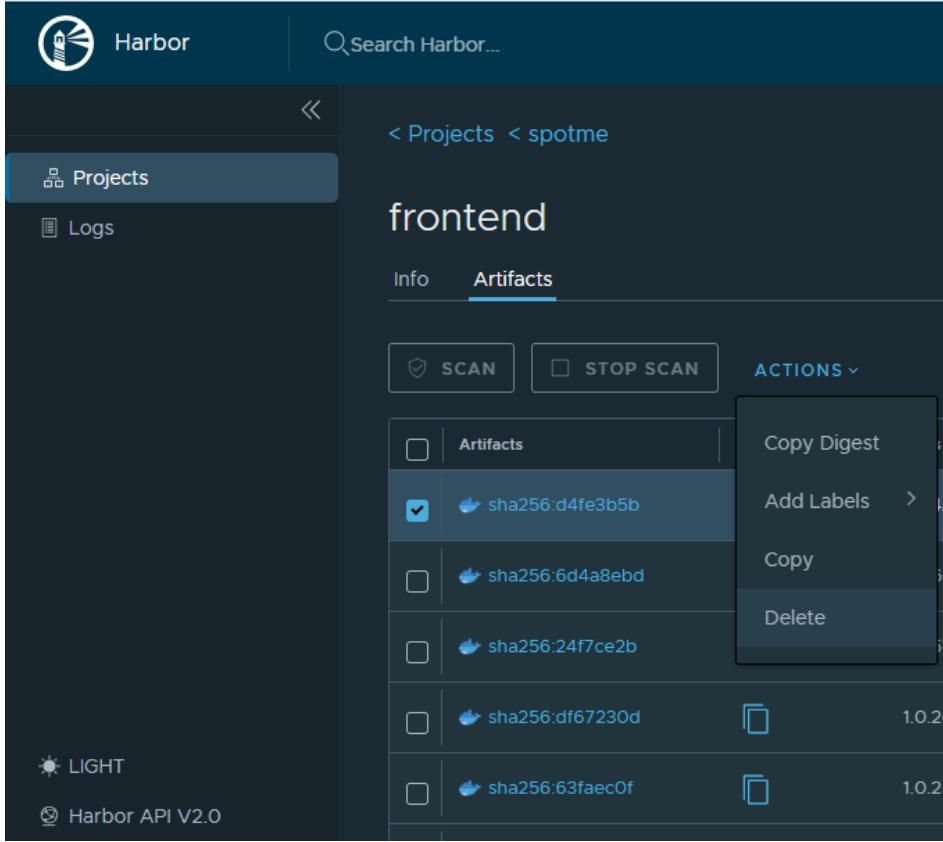


The screenshot shows the Harbor interface. At the top, there's a search bar labeled "Search Harbor...". Below it, a sidebar has "Projects" selected. The main area displays a project named "spotme" with "Project Admin" privileges. The "Repositories" tab is active, showing two repositories: "spotme/backend" and "spotme/frontend". Both have 88 and 8 artifacts respectively, with 11 and 0 pulls, and were last modified on 2/28/23 at 12:37 PM and 3:36 PM. There are buttons for "DELETE" and "PUSH COMMAND". The bottom of the screen shows "LIGHT" mode and "Harbor API V2.0".

**Paparan**

**Rajah H-240: *Harbor – Paparan Repotori***

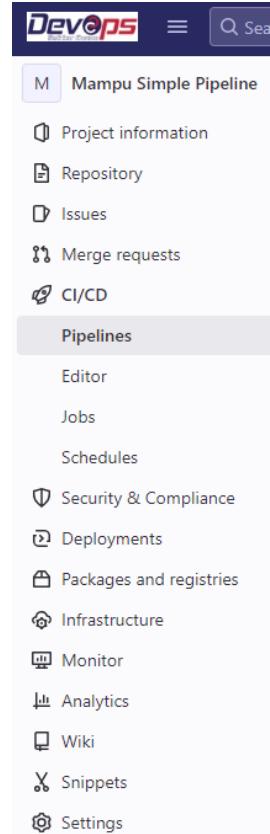
Muka Surat 324

Tatacara	Paparan
<p><b>Memadam <i>imej container</i>.</b></p> <ol style="list-style-type: none"><li>1. Klik dan pilih artifak dari senarai rajah [Rajah H-241].</li><li>2. Klick <b>[ACTIONS]</b> dan pilih <b>[Delete]</b>.</li><li>3. Paparan kotak akan dipaparkan untuk pengesahan. Pilih <b>[Delete]</b> untuk meneruskan proses pemadaman <i>imej container</i> [Rajah H-242].</li></ol>	 <p>Rajah H-241: <i>Harbor – Paparan Senarai Artifak</i></p>

Tatacara	Paparan
	<p>Confirm Artifact Deletion</p> <p>Do you want to delete artifact sha256:d4fe3b5b? If you delete this artifact, all tags referenced by the digest will also be deleted.</p> <p><span style="border: 1px solid #ccc; padding: 2px;">CANCEL</span> <span style="background-color: red; color: white; border: 1px solid red; padding: 2px;">DELETE</span></p>

Rajah H-242: *Harbor – Paparan Pengesahan*

### Lampiran H-3: Pemulihan Sistem Aplikasi

Tatacara	Paparan
<p><b>Konfigurasi skrip penempatan semula imej <i>container</i> dari <i>Container Registry</i> ke dalam <i>pipeline</i> GitLab.</b></p> <ol style="list-style-type: none"> <li>1. <b>Menu &gt; Project</b> &gt; Pilih projek yang telah diwujudkan. Pada menu sebelah kiri projek, pilih pada <b>CI/CD</b>.</li> <li>2. Sub-menu akan muncul. Klik menu <b>Editor</b>. Paparan <i>Pipeline</i> Editor yang memaparkan <i>.gitlab-ci.yml</i> akan muncul.</li> </ol>	 <p>The screenshot shows the GitLab interface with the sidebar menu open. The 'Pipelines' option under the CI/CD section is highlighted with a grey background. Other options visible in the sidebar include M, Project information, Repository, Issues, Merge requests, CI/CD, Editor, Jobs, Schedules, Security &amp; Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings.</p> <p><b>Rajah H-243: Gitlab – Paparan Menu Utama</b></p>

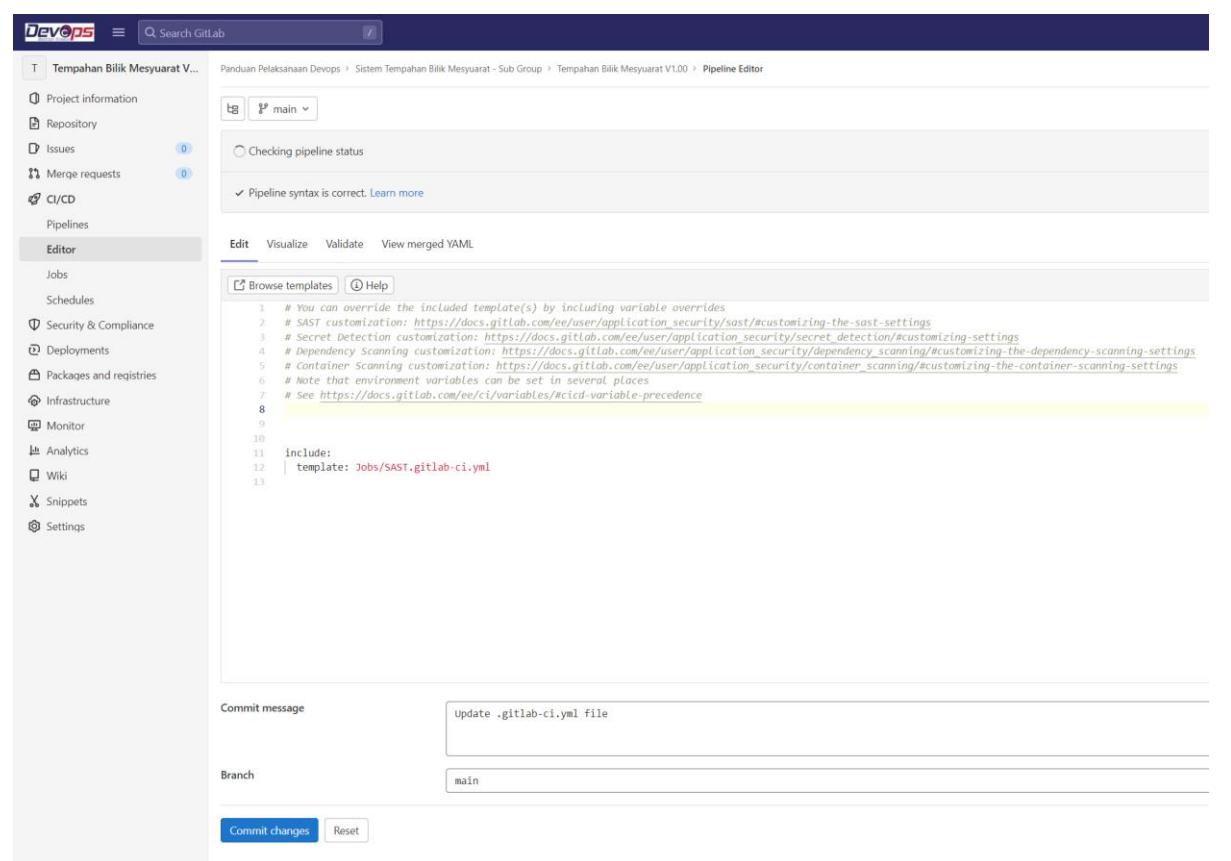
3. Masukkan *syntax* berikut ke dalam fail .gitlab-ci.yml

```
redeploy_staging:  
  tags:  
    - docker01  
    - shell  
    - spotme-fe  
  rules: # whether to include the job in the pipeline  
    - if: '$CI_PIPELINE_SOURCE == "trigger" && $SERVER_ENV == "staging"'  
      # when: always  
      when: delayed  
      start_in: '3 hours'  
    - when: never  
  script:  
    - echo 'test'
```

4. Masukkan mesej pada ruangan *commit message* seperti

**Kemaskini skrip penempatan semula imej pada pipeline**

5. Klik **Commit changes** untuk menyimpan dan mengemaskini fail *.gitlab-ci.yml* [Rajah H-244].
6. *Pipeline* GitLab telah dikemaskini dengan job penempatan semula imej container.



The screenshot shows the GitLab CI/CD Editor interface. On the left, a sidebar lists various project sections: Project information, Repository, Issues, Merge requests, CI/CD (which is selected), Pipelines, Editor (selected), Jobs, Schedules, Security & Compliance, Deployments, Packages and registries, Infrastructure, Monitor, Analytics, Wiki, Snippets, and Settings. The main area displays a pipeline configuration in YAML:

```

1 # You can override the included template(s) by including variable overrides
2 # SAST customization: https://docs.gitlab.com/ee/user/application_security/sast/#customizing-the-sast-settings
3 # Secret Detection customization: https://docs.gitlab.com/ee/user/application_security/secret_detection/#customizing-settings
4 # Dependency Scanning customization: https://docs.gitlab.com/ee/user/application_security/dependency_scanning/#customizing-the-dependency-scanning-settings
5 # Container Scanning customization: https://docs.gitlab.com/ee/user/application_security/container_scanning/#customizing-the-container-scanning-settings
6 # Note that environment variables can be set in several places
7 # See https://docs.gitlab.com/ee/ci/variables/#cicd-variable-precedence
8
9
10
11 include:
12 | template: jobs/SAST.gitlab-ci.yml
13

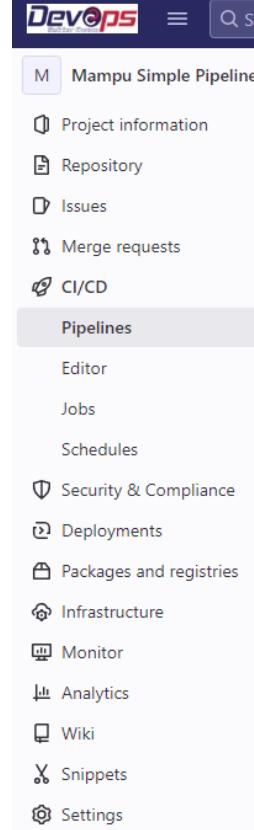
```

Below the code editor, there are fields for "Commit message" containing "Update .gitlab-ci.yml file" and "Branch" set to "main". At the bottom are "Commit changes" and "Reset" buttons.

**Rajah H-244: Gitlab – Paparan CI/CD Editor**

**Menjalankan *pipeline* GitLab untuk pemadaman imej container.**

1. *Pipeline* GitLab akan dijalankan secara automasi semasa penempatan semula imej container pada persekitaran *staging*.

<p><b>Melihat status tugas <i>pipeline</i> GitLab untuk penempatan semula imej <i>container</i>.</b></p> <ol style="list-style-type: none"><li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b> [Rajah H-245].</li><li>2. Klik butang pada ruangan Status. Status tugas <i>pipeline</i> akan dipaparkan. Klik pada ikon  pada tugas untuk melihat log terperinci bagi setiap tugasan [Rajah H-246].</li><li>3. Status log tugas akan dipaparkan [Rajah H-247].</li></ol>	 <p>Rajah H-245: Gitlab – Paparan Menu Utama</p>
--	--



Rajah H-246: Gitlab - Status Tugasan Untuk *Pipeline*

```

1 Running with gitlab-runner 15.7.1 (6d488948)
2 on 17-gitlab-server alpinelatest docker executor wsCHBXAY
3 Resolving secrets
4
5 Preparing the "docker" executor
6 Using Docker executor with image registry.gitlab.com/security-products/semgrep:3 ...
7 Pulling docker image registry.gitlab.com/security-products/semgrep:3 ...
8 Using docker image sha256:34beac77484269ac97acbc74a64d8bb79436a8bb28da7b864037829818d32d3df for registry.gitlab.com/security-products/semgrep:3
9 with digest registry.gitlab.com/security-products/semgrep@sha256:517bed9b51e4eb513aacc0da2b7871b60a01857f2e7c367be282704a7fe2ba31 ...
10 Preparing environment
11 Running on runner-wschbxay-project-2-concurrent-0 via devops-gitlab...
12 Getting source from Git repository
13 Fetching changes with git depth set to 20...
14 Reinitialized existing Git repository in /builds/devops/uat/mampu-simple-pipeline/.git/
15 Checking out bc91e42b as main...
16 Removing gl-sast-report.json
17 Removing semgrep.sarif
18 Skipping Git submodules setup
19 Executing "step_script" stage of the job script
20 Using docker image sha256:34beac77484269ac97acbc74a64d8bb79436a8bb28da7b864037829818d32d3df for registry.gitlab.com/security-products/semgrep:3
21 with digest registry.gitlab.com/security-products/semgrep@sha256:517bed9b51e4eb513aacc0da2b7871b60a01857f2e7c367be282704a7fe2ba31 ...
22 $ ./analyze run
23 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Gitlab Semgrep analyzer v3.12.1
24 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Detecting project
25 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Analyzer will attempt to analyze all projects in the repository
26 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Running analyzer
27 [INFO] [Semgrep] [2023-02-02T06:45:45Z] ▶ Creating report
28 [INFO] [Semgrep] [2023-02-02T06:45:54Z] ▶ Uploading artifacts for successful job
29 Uploading artifacts...
30 gl-sast-report.json: found 1 matching files and directories
31 Uploading artifacts...
32 Uploading artifacts as "sast" to coordinator... 201 Created id=12843 responseStatus=201 Created token=fDTYJjCb
33 Cleaning up project directory and file based variables
34 Job succeeded

```

**semgrep-sast**

**Duration:** 16 seconds  
**Finished:** 3 days ago  
**Queued:** 36 seconds  
**Timeout:** 1h (from project)  
**Runner:** #26 (wsCHBXAY) 17-gitlab-server alpinelatest docker executor

**Job artifacts**  
These artifacts are the latest. They will not be deleted (even if expired) until newer artifacts are available.

**Commit** bc91e42b  
Update .gitlab-ci.yml file

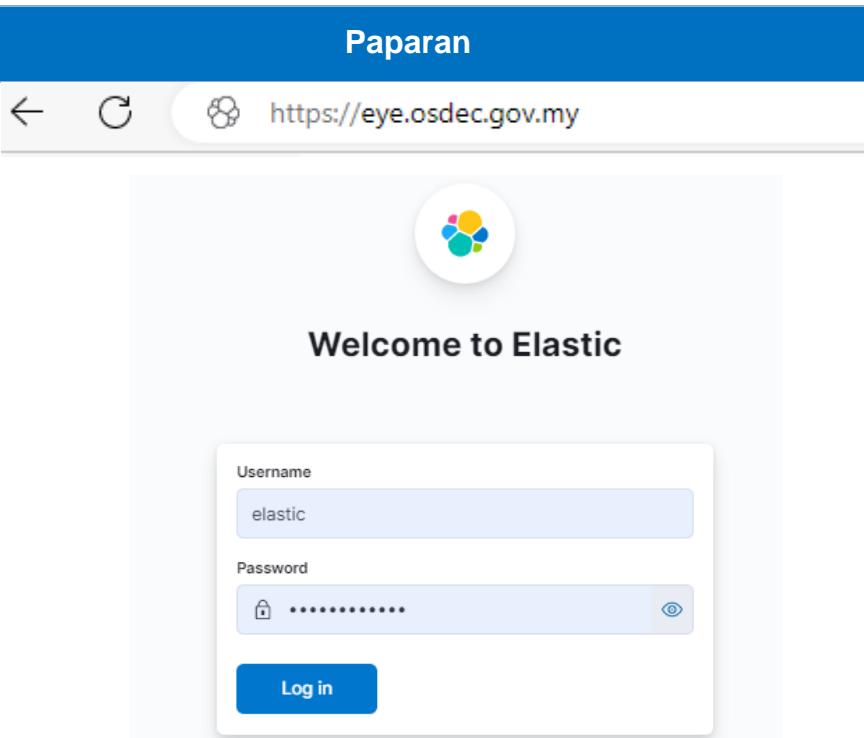
**Pipeline** #2434 for main

test

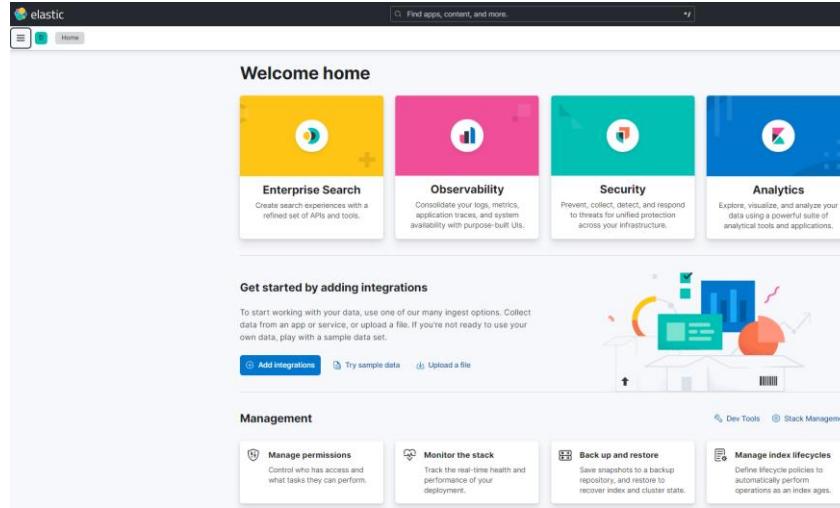
code\_quality  
newman\_tests  
nodejs-scan-sast  
→ semgrep-sast  
unit-test-job

Rajah H-247: Gitlab – Status Log Tugasan

**LAMPIRAN I: PERINGKAT PEMANTAUAN****Lampiran I-1: Pemantauan Log**

Tatacara	Paparan
<p><b>Log masuk ke dalam aplikasi Elastic [Rajah I-248].</b></p> <ol style="list-style-type: none"><li>1. Log masuk ke laman sesawang dan masukkan alamat berikut: <a href="https://eye.osdec.gov.my">https://eye.osdec.gov.my</a></li><li>2. Masukkan</li></ol> <p>Username :</p> <p>Password :</p> <ol style="list-style-type: none"><li>3. Tekan <b>Log in</b>.</li><li>4. Paparan <b>Welcome home</b> muncul.</li></ol>	

**Rajah I-248: Elastic – Paparan Halaman Log Masuk**

Tatacara	Paparan
<p><b>Menetapkan Konfigurasi dari Log Web Server (Apache Tomcat).</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Add Integration</b>.</li> <li>2. Paparan <b>Integration</b> muncul.</li> </ol> <p>Paparan halaman utama Elastic [Rajah I-249].</p>	 <p>The screenshot shows the main interface of the Elastic Stack. At the top, there's a navigation bar with a search bar labeled "Find apps, content, and more." Below the header, a "Welcome home" section features four colored cards: yellow for "Enterprise Search", pink for "Observability", teal for "Security", and blue for "Analytics". Underneath these cards, a section titled "Get started by adding integrations" includes a call-to-action button "Add integration", a link to "Try sample data", and a "Upload a file" button. At the bottom of the page, there's a "Management" section with four more cards: "Manage permissions", "Monitor the stack", "Back up and restore", and "Manage index lifecycles".</p> <p><b>Rajah I-249: Elastic – Paparan Halaman Utama</b></p>

Tatacara	Paparan
<p>3. Pilih <b>Installed Integrations</b>.</p> <p>4. Paparan <b>Integration</b> muncul.</p> <p>5. Pada <b>Browse integration</b>, memaparkan senarai aplikasi yang tersedia boleh dihubungkan kepada sistem.</p> <p>6. Pada <b>Installed integrations</b> menunjukkan senarai aplikasi yang telah dihubungkan kepada sistem.</p> <p>Paparan halaman Integrations [Rajah I-250][Rajah I-251].</p>	<p><b>Integrations</b></p> <p>Choose an integration to start collecting and analyzing your data.</p> <p><a href="#">Browse integrations</a> <a href="#">Installed integrations</a></p> <p>All categories <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">284</span></p> <p>AWS <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">30</span></p> <p>Azure <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">25</span></p> <p>Cloud <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">59</span></p> <p>Communications <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">3</span></p> <p>Config management <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">2</span></p> <p>Containers <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">3</span></p> <p>Custom <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">25</span></p> <p>Database <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">29</span></p> <p>Elastic Stack <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">16</span></p> <p>Enterprise search <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">6</span></p> <p>File storage <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">7</span></p> <p>Geo <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">4</span></p> <p>Google Cloud <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">16</span></p> <p>Infrastructure <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">16</span></p> <p>Kubernetes <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">5</span></p> <p>Language client <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">9</span></p> <p>Message Broker <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">9</span></p> <p>Microsoft 365 <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">2</span></p> <p>Monitoring <span style="background-color: #e0f2ff; border: 1px solid #e0f2ff; padding: 2px 5px;">8</span></p> <p><input type="text"/> Search for integrations</p> <div style="display: grid; grid-template-columns: 1fr 1fr 1fr;"> <div style="padding: 10px;"> <p><b>APM</b> Collect performance metrics from your applications with Elastic APM.</p> </div> <div style="padding: 10px;"> <p><b>Elastic Defend</b> Protect your hosts and cloud workloads with threat prevention, detection, and deep security data visibility.</p> </div> <div style="padding: 10px;"> <p><b>Web crawler</b> Add search to your website with the Enterprise Search web crawler.</p> </div> <div style="padding: 10px;"> <p><b>1Password</b> Collect logs from 1Password with Elastic Agent.</p> </div> <div style="padding: 10px;"> <p><b>AbuseCH</b> Ingest threat intelligence indicators from URL Haus, Malware Bazaar, and Threat Fox feeds with Elastic Agent.</p> </div> <div style="padding: 10px;"> <p><b>ActiveMQ Logs</b> Collect and parse logs from ActiveMQ instances with Filebeat.</p> </div> <div style="padding: 10px;"> <p><b>ActiveMQ Metrics</b> Collect metrics from ActiveMQ instances with Metricbeat.</p> </div> <div style="padding: 10px;"> <p><b>Aerospike Metrics</b> Collect metrics from Aerospike servers with Metricbeat.</p> </div> <div style="padding: 10px;"> <p><b>Akamai</b> Collect logs from Akamai with Elastic Agent.</p> </div> <div style="padding: 10px;"> <p><b>AlienVault OTX</b> Ingest threat intelligence indicators from AlienVault Open Threat Exchange (OTX) with Elastic Agent.</p> </div> <div style="padding: 10px;"> <p><b>Amazon CloudFront</b> Collect Amazon CloudFront logs with Elastic Agent.</p> </div> <div style="padding: 10px;"> <p><b>Amazon DynamoDB</b> Collect Amazon DynamoDB metrics with Elastic Agent.</p> </div> <div style="padding: 10px;"> <p><b>Amazon EBS</b></p> </div> <div style="padding: 10px;"> <p><b>Amazon EC2</b></p> </div> <div style="padding: 10px;"> <p><b>Amazon ECS</b></p> </div> </div> <p><b>Rajah I-250: Elastic – Paparan Halaman <i>Integrations</i></b></p>

Tatacara	Paparan
	<p><b>Integrations</b></p> <p>Choose an integration to start collecting and analyzing your data.</p> <p><a href="#">Browse integrations</a> <a href="#">Installed integrations</a></p> <p>All installed 9 Updates available 3</p> <p>Search for integrations</p> <p>Only installed Elastic Agent Integrations are displayed. To learn more about integrations and the Elastic Agent, read our <a href="#">announcement blog post</a></p> <div><p><b>Elastic APM</b> Monitor, detect, and diagnose complex application performance issues.</p><p><b>Elastic Defend</b> Protect your hosts and cloud workloads with threat prevention, detection, and deep security data visibility.</p><p><b>Elastic Agent</b> Collect logs and metrics from Elastic Agents.</p><p><b>Fleet Server</b> Centrally manage Elastic Agents with the Fleet Server integration.</p><p><b>Custom API</b> Collect custom events from an API endpoint with Elastic agent</p><p><b>Prebuilt Security Detection Rules</b> Prebuilt detection rules for Elastic Security</p><p><b>Elastic Synthetics</b> Monitor the availability of your services with Elastic Synthetics. <small>Technical preview</small></p><p><b>System</b> Collect system logs and metrics from your servers with Elastic Agent.</p><p><b>Apache Tomcat</b> Collect and parse logs from Apache Tomcat servers with Elastic Agent.</p></div> <p><b>Rajah I-251: Elastic – Paparan Halaman <i>Integrations</i></b></p>

Tatacara	Paparan
<p>7. Pada <b>Browse Integration</b>, gunakan fungsi <b>search : nginx</b>. Senarai aplikasi “nginx” muncul.</p> <p>8. Klik pada <b>Nginx</b>.</p> <p>Paparan halaman <i>Integrations</i> [Rajah I-252].</p>	<p><b>Integrations</b></p> <p>Choose an integration to start collecting and analyzing your data.</p> <p><a href="#">Browse integrations</a> <a href="#">Installed integrations</a></p> <p>All categories <span style="border: 1px solid #ccc; padding: 2px 5px;">284</span></p> <p>AWS <span style="border: 1px solid #ccc; padding: 2px 5px;">30</span></p> <p>Azure <span style="border: 1px solid #ccc; padding: 2px 5px;">25</span></p> <p>Cloud <span style="border: 1px solid #ccc; padding: 2px 5px;">59</span></p> <p>Communications <span style="border: 1px solid #ccc; padding: 2px 5px;">3</span></p> <p>Config management <span style="border: 1px solid #ccc; padding: 2px 5px;">2</span></p> <p>Containers <span style="border: 1px solid #ccc; padding: 2px 5px;">3</span></p> <p><input type="text"/> nginx</p> <p><b>Nginx</b> Collect logs and metrics from Nginx HTTP servers with Elastic Agent.</p> <p><b>Nginx Ingress Controller Logs</b> Collect Nginx Ingress Controller logs.</p> <p>Don't see an integration? Collect any logs or metrics using our <a href="#">custom inputs</a>. Request new integrations in our <a href="#">forum</a>.</p> <p><b>Rajah I-252: Elastic – Paparan Integrations</b></p>

Tatacara	Paparan
<p>9. Pada halaman Nginx, Pilih <b>[Rajah I-253]</b>.</p> <p><b>+ Add Nginx</b></p>	<p>The screenshot shows the 'Nginx' integration page in the Elastic interface. At the top, there's a green 'Nginx' logo icon. To its right, the word 'Nginx' is displayed in large bold letters, with 'Elastic Agent' underneath it. Below this, there are tabs for 'Overview', 'Integration policies', 'Assets', 'Settings', and 'API reference'. The 'Overview' tab is selected. On the right side of the header, it says 'Version 1.7.0' and 'Agent policies 1'. There's also a blue button labeled '+ Add Nginx'. The main content area is titled 'Nginx Integration' and contains text explaining its purpose: 'The Nginx integration allows you to monitor Nginx servers.' It also describes how to use the integration to collect metrics and logs from Nginx servers, visualize them in Kibana, and use the Machine Learning app to find unusual activity. It mentions creating alerts and referencing data for troubleshooting. On the right side of the content area, there are sections for 'Screenshots' (with three small preview images) and 'Details' (showing 'Version 1.7.0').</p>

**Rajah I-253: Elastic – Paparan Integrations**

10. Isikan maklumat yang berkenaan dan Klik **[Save and continue]** [Rajah I-254].

[Cancel](#)

## Add Nginx integration

Configure an integration for the selected agent policy.

**1 Configure integration**

**Integration settings**

Choose a name and description to help identify how this integration will be used.

Integration name: nginx-2

Description: Optional

[Advanced options](#)

Collect logs from Nginx instances [Change defaults](#)

Nginx access logs  
Collect Nginx access logs  
Paths: /var/log/nginx/access.log\*

[Add row](#)

Preserve original event  
Preserves a raw copy of the original event, added to the field event.original

[Advanced options](#)

Nginx error logs  
Collect Nginx error logs  
Paths: /var/log/nginx/error.log\*

[Add row](#)

Preserve original event  
Preserves a raw copy of the original event, added to the field event.original

[Advanced options](#)

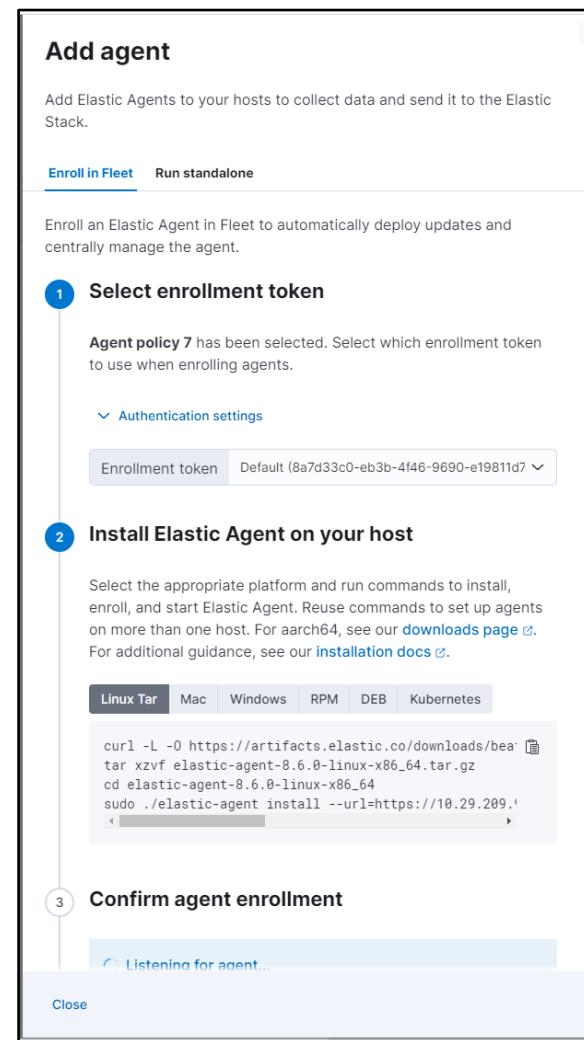
[Cancel](#) [Preview API request](#) **[Save and continue]**

Rajah I-254: Elastic – Paparan *Integrations*

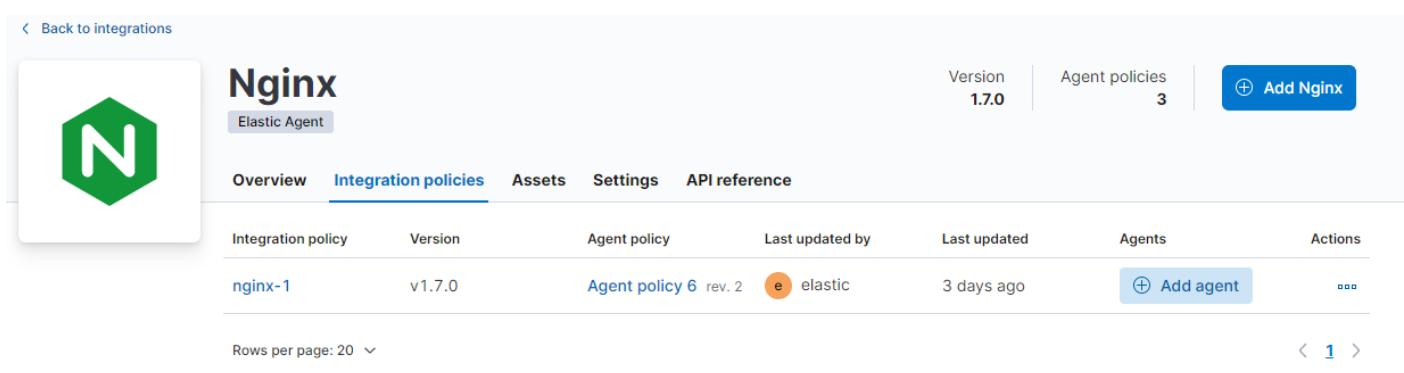
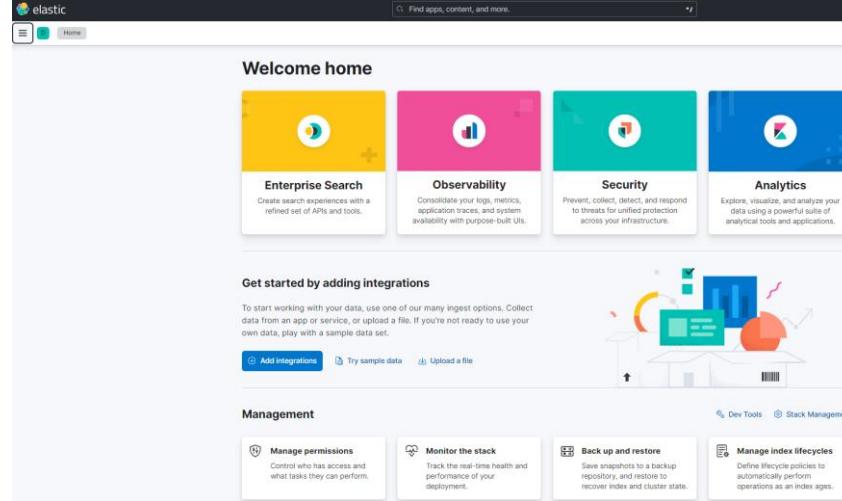
Tatacara	Paparan
<p>11. Pilih <a href="#">Add Elastic Agent to your hosts</a> untuk menetapkan Agents Nginx. [Rajah I-255].</p>	<p><b>Nginx integration added</b></p> <p>To complete this integration, add <b>Elastic Agent</b> to your hosts to collect data and send it to Elastic Stack.</p> <p><a href="#">Add Elastic Agent later</a> <a href="#">Add Elastic Agent to your hosts</a></p>

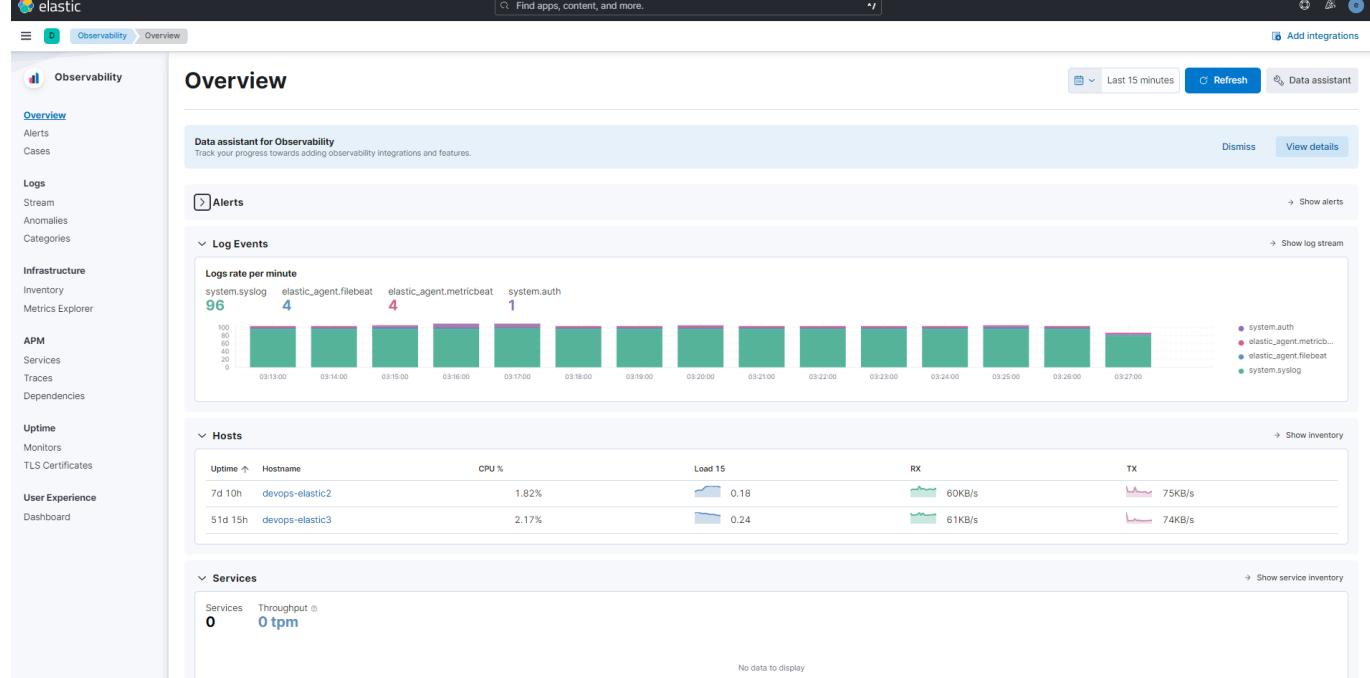
**Rajah I-255: Elasic – Paparan Integrations**

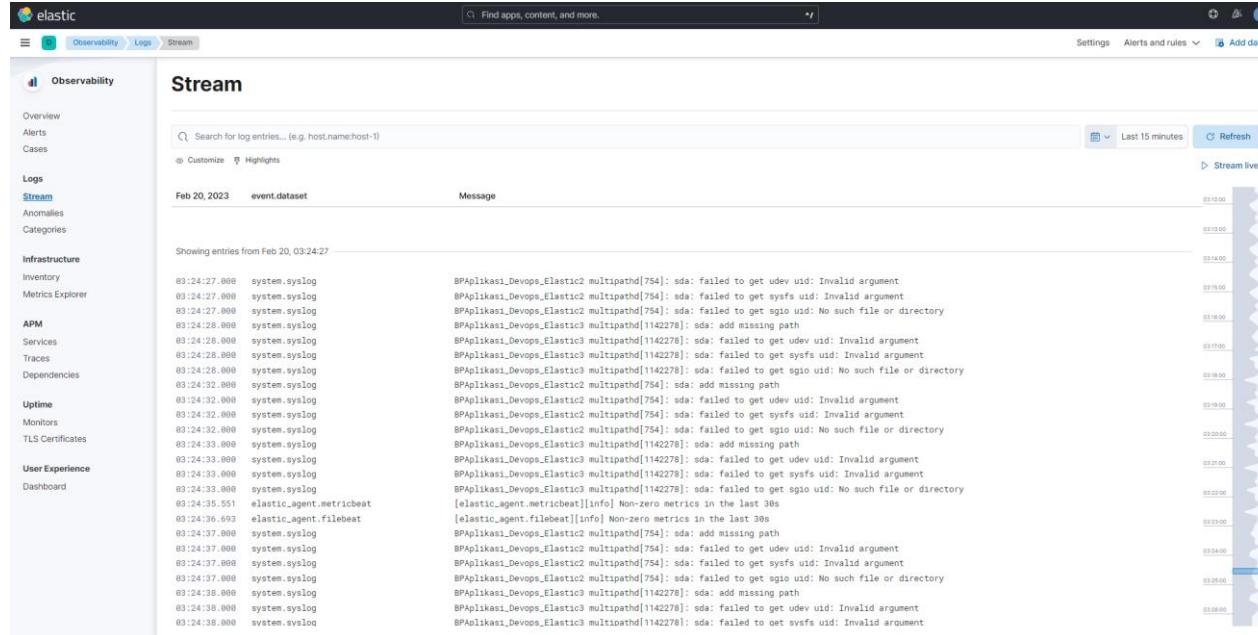
12. Masukkan maklumat berkaitan konfigurasi Agent [Rajah I-256].



Rajah I-256: Elastic – Paparan *Integrations*

Tatacara	Paparan
<p>12. Page ini menunjukkan Nginx telah berjaya di hubungkan pada sistem [Rajah I-257].</p>	 <p>The screenshot shows the 'Integration policies' tab for the Nginx integration. It displays the following details:</p> <ul style="list-style-type: none"> <li><b>Version:</b> 1.7.0</li> <li><b>Agent policies:</b> 3</li> <li><b>Add Nginx</b> button</li> <li><b>Overview</b>, <b>Integration policies</b> (selected), <b>Assets</b>, <b>Settings</b>, <b>API reference</b> tabs</li> <li><b>Integration policy</b>: nginx-1</li> <li><b>Version</b>: v1.7.0</li> <li><b>Agent policy</b>: Agent policy 6 rev. 2 (by elastic)</li> <li><b>Last updated by</b>: elastic</li> <li><b>Last updated</b>: 3 days ago</li> <li><b>Agents</b>: 3</li> <li><b>Actions</b>: Add agent, more options</li> </ul>
<p><b>Memaparkan Log Stream dari Web Server.</b></p> <ol style="list-style-type: none"> <li>Pilih <b>Observability</b>. Paparan <b>Observability view</b> muncul.</li> </ol> <p>Paparan halaman utama Elastic [Rajah I-258].</p>	 <p>The screenshot shows the main Elastic homepage with the following sections:</p> <ul style="list-style-type: none"> <li><b>Welcome home</b>: Four cards for Enterprise Search, Observability, Security, and Analytics.</li> <li><b>Get started by adding integrations</b>: Buttons for Add integrations, Try sample data, and Upload a file.</li> <li><b>Management</b>: Buttons for Manage permissions, Monitor the stack, Back up and restore, and Manage index lifecycles.</li> <li><b>Dev Tools</b> and <b>Stack Management</b> links.</li> </ul>

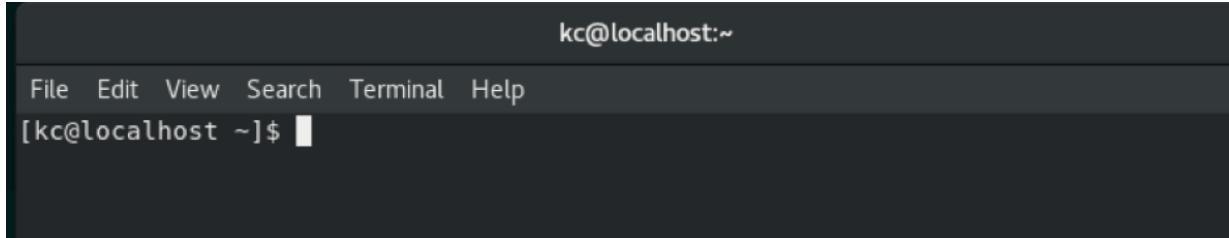
Tatacara	Paparan
<p><b>2. Pilih <i>Logs Stream</i></b></p> <p>Paparan <b>Overview</b> [Rajah I-259].</p>	 <p>The screenshot shows the Elastic Observability platform's Overview page. On the left, there is a sidebar with navigation links for Observability, Logs, Infrastructure, APM, Uptime, and User Experience. The main area displays three sections: 'Logs rate per minute' (a chart showing rates for system.syslog, elastic_agent.filebeat, elastic_agent.metricbeat, and system.auth), 'Hosts' (a table with two entries: devops-elastic2 and devops-elastic3 showing uptime, CPU %, Load 15, RX, and TX metrics), and 'Services' (a section showing 0 services with 0 throughput). The top right of the page includes a search bar, a 'Last 15 minutes' dropdown, a 'Refresh' button, and a 'Data assistant' link.</p> <p><b>Rajah I-259: Elastic – Paparan Overview</b></p>

Tatacara	Paparan
<p>Paparan <b>Logs Stream</b> muncul [Rajah I-260].</p>	 <p><b>Rajah I-260: Elastic – Paparan Logs Stream</b></p>
<p>Interpretasi Data: Melalui paparan ini, Pengguna akan dapat memberi fokus kepada masalah atau ralat yang wujud. Seterusnya mencari punca masalah dan membaik pulih sistem atau aplikasi supaya</p>	 <p><b>Rajah I-261: Elastic – Paparan Data Daripada Logs Stream</b></p>

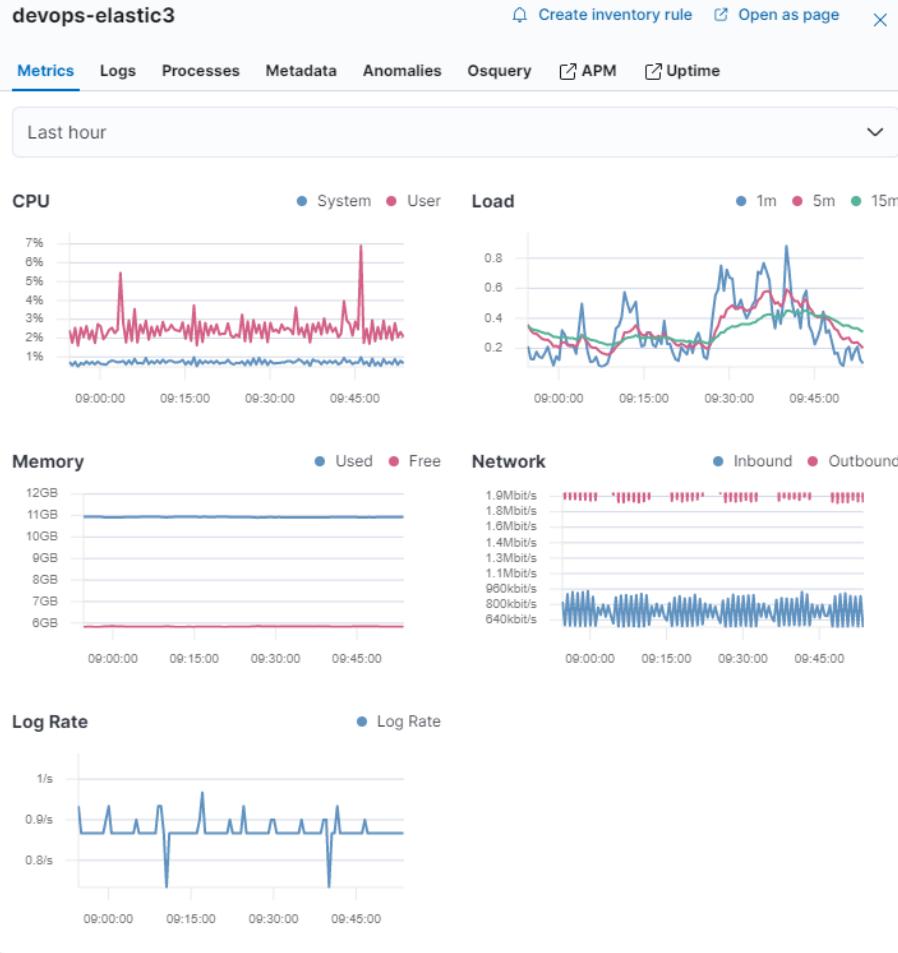
Tatacara	Paparan
berada pada tahap yang optimum [Rajah I-261].	

## Lampiran I-2: Pemantauan Infrastruktur

Tatacara	Paparan																					
<p><b>Penyemakan ketersediaan Agent untuk penerimaan data inventory.</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu &gt; Management &gt; Fleet</b>. Paparan senarai <b>Agents</b> akan muncul.</li> <li>2. Semak dan pastikan <b>Agent</b> untuk penerimaan data inventory telah dikonfigurasi.</li> </ol> <p>Paparan halaman <i>Fleet</i> [Rajah I-262].</p>	<p>The screenshot shows the Elastic Fleet management interface. At the top, there's a search bar with the placeholder "Find apps, content, and more." Below the header, a navigation bar includes a menu icon, a "D" button, a "Fleet" tab (which is active), and an "Agents" link. To the right of the navigation are "Send feedback" and user profile icons. The main title "Fleet" is displayed in large, bold letters. Below it, a subtitle reads "Centralized management for Elastic Agents." A navigation bar below the title has tabs for "Agents" (which is selected and highlighted in blue), "Agent policies", "Enrollment tokens", "Data streams", and "Settings". On the far right of this bar are buttons for "Agent activity", "Add Fleet Server", and "Add agent". Below the navigation, there's a search bar with the placeholder "Filter your data using KQL syntax" and a status filter section with dropdowns for "Status", "Tags", "Agent policy", and "Upgrade available". A message indicates "Showing 2 agents". Below this, a legend shows four categories: Healthy (green dot), Unhealthy (yellow dot), Updating (blue dot), and Offline (grey dot). The table lists two agents:</p> <table border="1"> <thead> <tr> <th>Host</th> <th>Status</th> <th>Tags</th> <th>Agent policy</th> <th>Version</th> <th>Last activity</th> <th>Actions</th> </tr> </thead> <tbody> <tr> <td>devops-elastic3</td> <td>Unhealthy</td> <td></td> <td>Agent policy 2 rev. 8</td> <td>8.3.1 ⚠ Upgrade available</td> <td>44 seconds ago</td> <td>...</td> </tr> <tr> <td>devops-elastic2</td> <td>Healthy</td> <td></td> <td>Fleet Server Policy rev. 5</td> <td>8.3.1 ⚠ Upgrade available</td> <td>21 seconds ago</td> <td>...</td> </tr> </tbody> </table> <p style="text-align: center;"><b>Rajah I-262: Elastic – Paparan Halaman Fleet</b></p>	Host	Status	Tags	Agent policy	Version	Last activity	Actions	devops-elastic3	Unhealthy		Agent policy 2 rev. 8	8.3.1 ⚠ Upgrade available	44 seconds ago	...	devops-elastic2	Healthy		Fleet Server Policy rev. 5	8.3.1 ⚠ Upgrade available	21 seconds ago	...
Host	Status	Tags	Agent policy	Version	Last activity	Actions																
devops-elastic3	Unhealthy		Agent policy 2 rev. 8	8.3.1 ⚠ Upgrade available	44 seconds ago	...																
devops-elastic2	Healthy		Fleet Server Policy rev. 5	8.3.1 ⚠ Upgrade available	21 seconds ago	...																

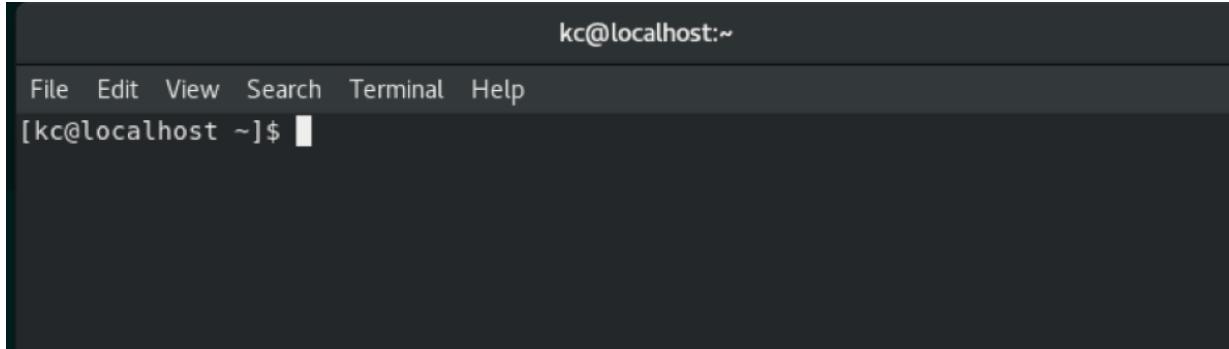
Tatacara	Paparan
<p><b>Pemasangan Metricbeat pada server yang dipantau.</b></p> <ol style="list-style-type: none"> <li>1. Log masuk pada server yang ingin dipantau.</li> <li>2. Tekan <b>Ctrl+Alt+T</b> untuk membuka tetingkap terminal Linux Ubuntu [Rajah I-263].</li> <li>3. Jalankan skrip berikut untuk memuat turun dan memasang Heartbeat [Rajah I-264].</li> </ol>	 <p><b>Rajah I-263: Elastic – Paparan Log Masuk Terminal Linux Ubuntu</b></p> <pre data-bbox="720 647 1949 933"> curl -L -O https://artifacts.elastic.co/downloads/beats/metricbeat/metricbeat- 8.6.2-linux-x86_64.tar.gz tar xzvf metricbeat-8.6.2-linux-x86_64.tar.gz </pre> <p><b>Rajah I-264: Elastic – Paparan Skrip</b></p>
<p><b>Penetapan dan konfigurasi fail metricbeat.yml pada server.</b></p> <ol style="list-style-type: none"> <li>1. Masukkan konfigurasi berikut pada metricbeat.yml pada</li> </ol>	<pre data-bbox="720 1033 1949 1389"> output.elasticsearch:   hosts: ["https://myEHost:9200"]   username: "metricbeat_internal"   password: "YOUR_PASSWORD"   ssl:     enabled: true </pre>

Tatacara	Paparan
fail direktori server [Rajah I-265].	<pre data-bbox="743 298 1911 377">ca_trusted_fingerprint: "b9a10bbe64ee9826abeda6546fc988c8bf798b41957c33d05db736716513dc9c"</pre> <p data-bbox="1080 457 1590 489"><b>Rajah I-265: Elastic – Paparan Skrip</b></p>
<p><b>Paparan data <i>Infrastructure Inventory</i> [Rajah I-266].</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri, pilih <b>Infrastructure &gt; Inventory</b>.</li> <li>2. Paparan <b>Inventory</b> muncul.</li> </ol>	<p>The screenshot shows the Elastic Observability interface with the 'Infrastructure' section selected. On the left, a sidebar lists various monitoring categories like Observability, Logs, Metrics Explorer, and Infrastructure (with 'Inventory' highlighted). The main area is titled 'Inventory' and displays a treemap visualization of infrastructure components. Two large blue rectangles represent hosts: 'devops-elastic3' at 2.1% and 'devops-elastic2' at 2.7%. A vertical color scale bar on the right indicates percentages from 1.6% to 2.2%.</p> <p data-bbox="889 1108 1783 1140"><b>Rajah I-266: Elastic – Paparan Halaman <i>Infrastructure Inventory</i></b></p>

Tatacara	Paparan
<p>3. Melalui paparan ini, Pengguna akan dapat memberi fokus kepada masalah atau ralat yang wujud. Seterusnya mencari punca masalah dan membaik pulih sistem atau aplikasi supaya berada pada tahap yang optimum.</p> <p>Paparan halaman <i>Metrics</i> [Rajah I-267].</p>	 <p><b>Rajah I-267: Elastic – Paparan <i>Metrics</i></b></p>

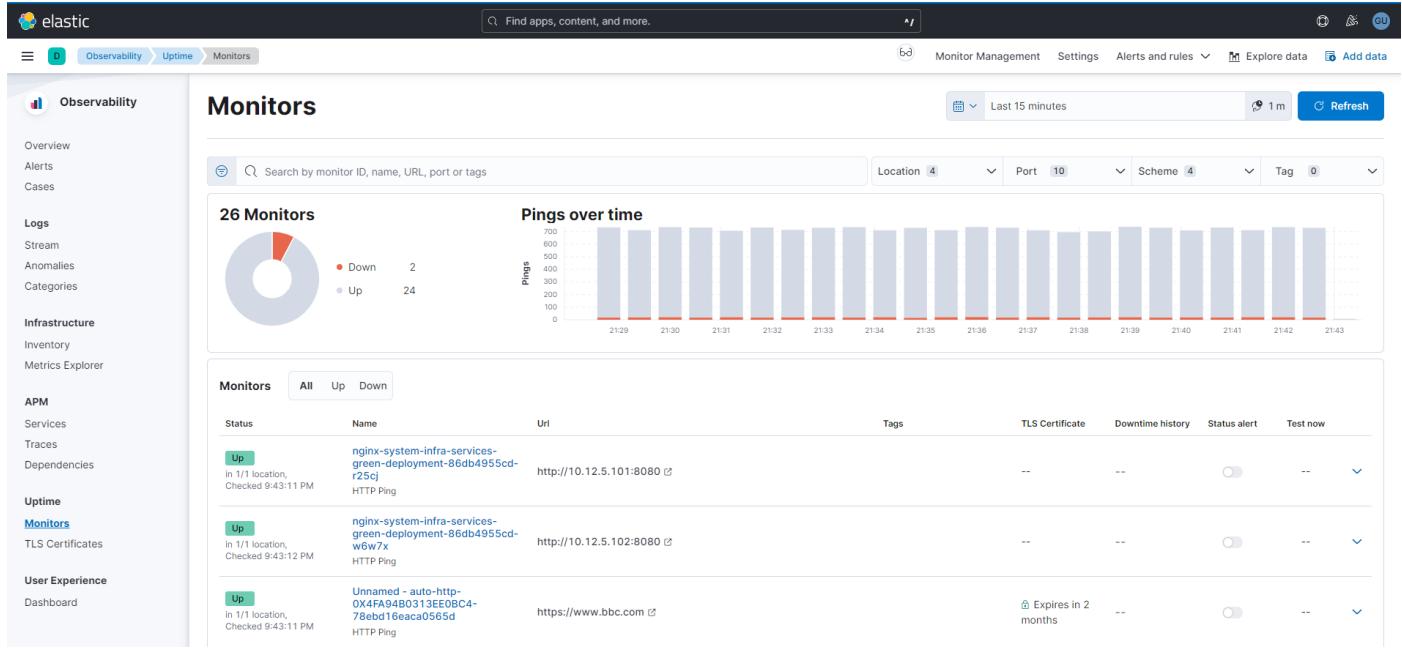
### Lampiran I-3: Pemantauan *Uptime*

Tatacara	Paparan
<p><b>Penyemakan ketersediaan Agent untuk penerimaan data <i>uptime</i>.</b></p> <ol style="list-style-type: none"> <li>1. Pilih <b>Menu &gt; Management &gt; Fleet.</b> Paparan senarai Agents akan muncul.</li> <li>2. Semak dan pastikan Agent untuk penerimaan data <i>uptime</i> telah dikonfigurasi.</li> </ol> <p>Paparan halaman Fleet [Rajah I-268].</p>	<p>The screenshot shows the Elastic Fleet management interface. At the top, there's a navigation bar with the Elastic logo, a search bar, and various icons. Below it, a breadcrumb navigation shows 'Fleet &gt; Agents'. The main title is 'Fleet' with the subtitle 'Centralized management for Elastic Agents.' Below the title, there are tabs for 'Agents' (which is selected), 'Agent policies', 'Enrollment tokens', 'Data streams', and 'Settings'. On the right side of the header, there are buttons for 'Agent activity', 'Add Fleet Server', and 'Add agent'. Below the tabs, there's a search bar labeled 'Filter your data using KQL syntax' and a status filter section with dropdowns for 'Status', 'Tags', 'Agent policy', and 'Upgrade available'. The main table area shows 'Showing 2 agents' with columns for 'Host', 'Status', 'Tags', 'Agent policy', 'Version', 'Last activity', and 'Actions'. The first agent, 'devops-elastic3', is listed as 'Unhealthy' with a yellow background. The second agent, 'devops-elastic2', is listed as 'Healthy' with a green background. Both agents have their respective 'Agent policy' and 'Version' details below them. The last column, 'Actions', contains three dots for each agent.</p> <p><b>Rajah I-268: Elastic – Paparan Halaman Fleet</b></p>

Tatacara	Paparan
<p><b>Pemasangan <i>Heartbeat</i> pada server yang dipantau.</b></p> <ol style="list-style-type: none"> <li>1. Log masuk pada server yang ingin dipantau.</li> <li>2. Tekan <b>Ctrl+Alt+T</b> untuk membuka tetingkap terminal Linux Ubuntu [Rajah I-269].</li> <li>3. Jalankan skrip berikut untuk memuat turun dan memasang <i>Heartbeat</i> [Rajah I-270].</li> </ol>	 <p><b>Rajah I-269: Elastic – Paparan Log masuk Terminal Linux Ubuntu</b></p> <pre data-bbox="720 759 1949 1076"> curl -L -O https://artifacts.elastic.co/downloads/beats/heartbeat/heartbeat-8.6.2- linux-x86_64.tar.gz tar xzvf heartbeat-8.6.2-linux-x86_64.tar.gz </pre> <p><b>Rajah I-270: Elastic – Paparan Skrip</b></p>
<p><b>Penetapan dan konfigurasi protokol pada server yang dipantau [Rajah I-271].</b></p>	<pre data-bbox="720 1187 1949 1330"> heartbeat.monitors: - type: icmp </pre>

Tatacara	Paparan
<p>1. Contoh konfigurasi berikut adalah untuk pemantauan icmp, tcp, dan http.</p> <p>2. Masukkan konfigurasi untuk setiap protokol yang dipantau pada fail heartbeat.yml pada fail direktori server yang dipantau.</p> <p><b>Nota: Contoh penetapan untuk pemantauan protokol icmp dan tcp.</b></p> <p>3. Pemantauan icmp dijadualkan berjalan setiap 5 saat (10:00:00, 10:00:05, dan seterusnya).</p> <p>4. Pemantauan tcp ditetapkan untuk berjalan setiap 5 saat dari masa Heartbeat dimulakan.</p>	<pre> schedule: '*/5 * * * *'  hosts: ["https://10.29.209.92:8220"]  id: my-icmp-service  name: My ICMP Service  - type: tcp    schedule: '@every 5s'    hosts: ["https://10.29.209.92:8220"]    mode: any    id: my-tcp-service  - type: http    schedule: '@every 5s'    urls: ["https://10.29.209.92:8220"]    service.name: apm-service-name    id: my-http-service    name: My HTTP Service </pre>

Rajah I-271: Elastic – Paparan Skrip

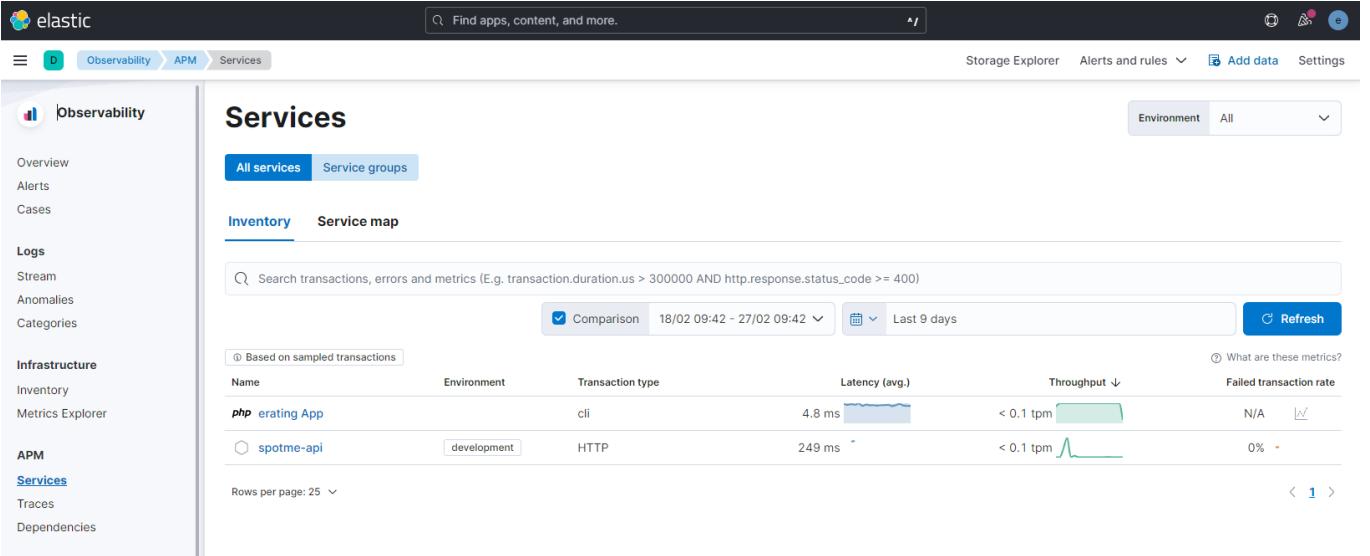
Tatacara	Paparan																													
<p><b>Paparan data <i>Uptime Monitors</i></b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri, Pilih <b><i>Uptime Monitors</i></b>.</li> <li>2. Paparan <b><i>Uptime Monitors</i></b> muncul.</li> </ol> <p>Paparan halaman <i>Monitors</i> [Rajah I-272].</p>	 <p><b>Monitors</b></p> <p><b>26 Monitors</b></p> <p>Pings over time</p> <table border="1"> <thead> <tr> <th>Status</th> <th>Name</th> <th>Url</th> <th>Tags</th> <th>TLS Certificate</th> <th>Downtime history</th> <th>Status alert</th> <th>Test now</th> </tr> </thead> <tbody> <tr> <td>Up</td> <td>nginxx-system-infra-services-green-deployment-86db4955cd-r25qj</td> <td>http://10.12.5.101:8080</td> <td>--</td> <td>--</td> <td><input type="checkbox"/></td> <td>--</td> </tr> <tr> <td>Up</td> <td>nginxx-system-infra-services-green-deployment-86db4955cd-w6w7x</td> <td>http://10.12.5.102:8080</td> <td>--</td> <td>--</td> <td><input type="checkbox"/></td> <td>--</td> </tr> <tr> <td>Up</td> <td>Unnamed - auto-https-0X4FA94B0313EE08C4-78ebd16eaca0563d</td> <td>https://www.bbc.com</td> <td>Expires in 2 months</td> <td>--</td> <td><input type="checkbox"/></td> <td>--</td> </tr> </tbody> </table>	Status	Name	Url	Tags	TLS Certificate	Downtime history	Status alert	Test now	Up	nginxx-system-infra-services-green-deployment-86db4955cd-r25qj	http://10.12.5.101:8080	--	--	<input type="checkbox"/>	--	Up	nginxx-system-infra-services-green-deployment-86db4955cd-w6w7x	http://10.12.5.102:8080	--	--	<input type="checkbox"/>	--	Up	Unnamed - auto-https-0X4FA94B0313EE08C4-78ebd16eaca0563d	https://www.bbc.com	Expires in 2 months	--	<input type="checkbox"/>	--
Status	Name	Url	Tags	TLS Certificate	Downtime history	Status alert	Test now																							
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<p>3. Melalui paparan ini, Pengguna akan dapat memberi fokus kepada masalah atau ralat yang wujud. Seterusnya mencari punca masalah dan membaik pulih sistem atau aplikasi</p>	 <p><b>Monitors</b></p> <p><b>26 Monitors</b></p> <p>Pings over time</p>																													

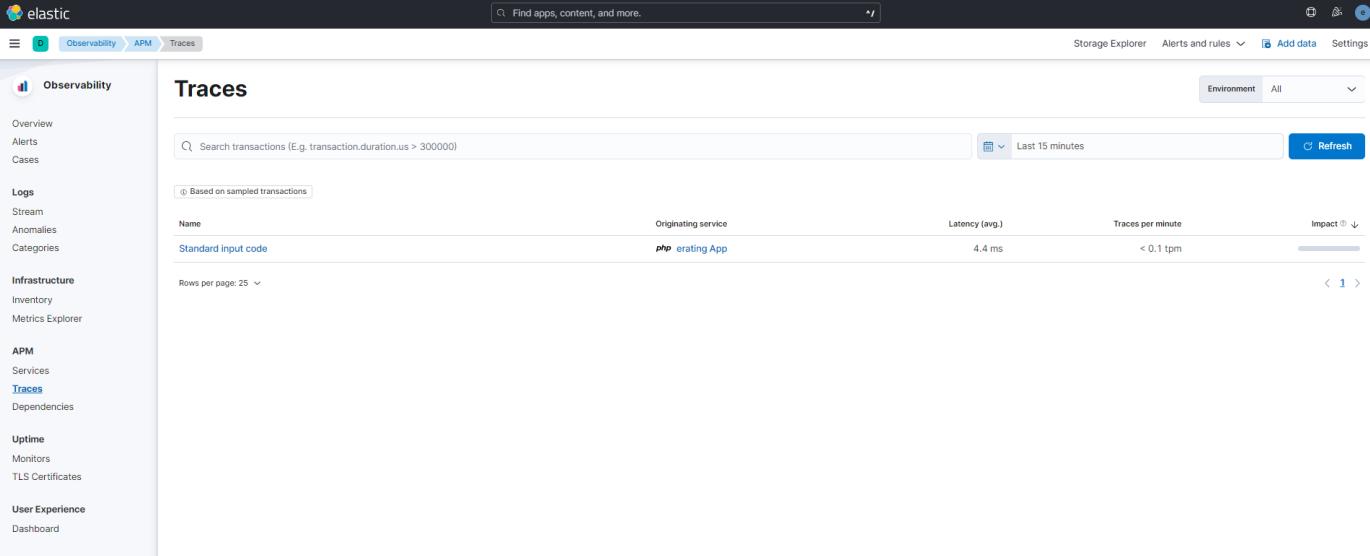
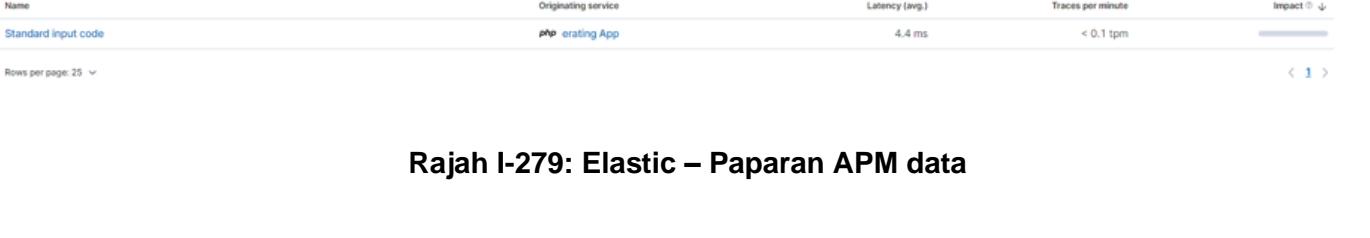
Tatacara	Paparan
<p>supaya berada pada tahap yang optimum.</p> <p>Paparan halaman <i>Monitors</i> [Rajah I-272].</p>	

## Lampiran I-4: Pemantauan Prestasi Aplikasi

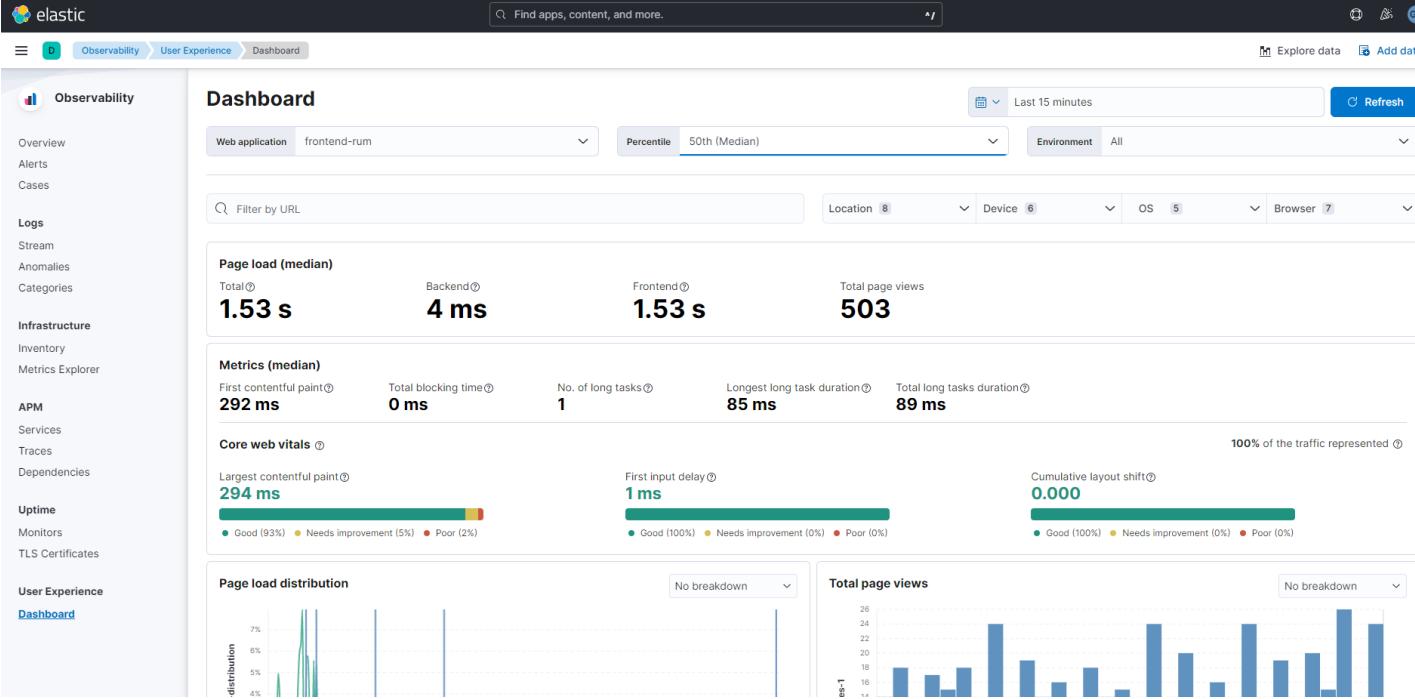
Tatacara	Paparan
<p><b>Penyemakan ketersediaan Agent untuk penerimaan data APM.</b></p> <ol style="list-style-type: none"> <li>Pilih <b>Menu &gt; Management &gt; Fleet</b>. Paparan senarai <i>Agents</i> akan muncul.</li> <li>Semak dan pastikan <i>Agent</i> untuk penerimaan data APM telah dikonfigurasi.</li> </ol> <p>Paparan halaman Fleet [Rajah I-274].</p>	<p>The screenshot shows the Elastic Fleet interface. At the top, there's a search bar with the placeholder 'Find apps, content, and more.' and a navigation bar with tabs for 'D', 'Fleet' (which is selected), and 'Agents'. On the right side of the header are icons for user profile, notifications, and help. Below the header, the title 'Fleet' is displayed in large bold letters, followed by the subtitle 'Centralized management for Elastic Agents.' Underneath, there are five tabs: 'Agents' (selected), 'Agent policies', 'Enrollment tokens', 'Data streams', and 'Settings'. To the right of these tabs are three buttons: 'Agent activity', 'Add Fleet Server', and 'Add agent'. Below the tabs is a search bar with the placeholder 'Filter your data using KQL syntax' and several filter dropdowns for 'Status', 'Tags', 'Agent policy', and 'Upgrade available'. The main table area shows two agents: 'devops-elastic3' is listed as 'Unhealthy' and 'devops-elastic2' is listed as 'Healthy'. Each row in the table includes columns for 'Host', 'Status', 'Tags', 'Agent policy', 'Version', 'Last activity', and 'Actions'. At the bottom of the table, there are summary counts for healthy, unhealthy, updating, and offline agents. The caption 'Rajah I-274: Elastic – Paparan Halaman Fleet' is centered at the bottom of the screenshot.</p> <p><b>Rajah I-274: Elastic – Paparan Halaman Fleet</b></p>

<p><b>Dokumentasi berkaitan pemasangan dan konfigurasi APM Agents.</b></p> <ol style="list-style-type: none"><li>1. Pilih <b>Menu &gt; APM &gt; Services</b>. Klik <b>[Add data]</b></li><li>2. Paparan dokumentasi tatacara konfigurasi Agents akan muncul.</li><li>3. Pilih tab <b>PHP</b>.</li><li>4. Paparan konfigurasi seperti [Rajah I-275] muncul.</li><li>5. Arahan konfigurasi ini akan dipasang pada fail <b>php.ini</b></li></ol>	<p>Find apps, content, and more.</p> <p>Integrations APM</p> <p>Configure the agent</p> <p>Choose policy Manage fleet policies</p> <p>Agent policy 2</p> <p>Adds the selected policy configuration to the snippet below.</p> <table><thead><tr><th>Configuration setting</th><th>Configuration value</th></tr></thead><tbody><tr><td>elastic_apm.service_name</td><td>my-service-name</td></tr><tr><td>elastic_apm.secret_token</td><td></td></tr><tr><td>elastic_apm.server_url</td><td>http://devops-elasticsearch3:8200</td></tr><tr><td>elastic_apm.environment</td><td>my-environment</td></tr></tbody></table> <pre>elastic_apm.service_name="my-service-name" elastic_apm.secret_token="" elastic_apm.server_url="http://devops-elasticsearch3:8200" elastic_apm.environment="my-environment"</pre> <p>See the <a href="#">documentation</a> for configuration options and advanced usage.</p> <p>Agent status</p> <p>Make sure your application is running and the agents are sending data.</p> <p><b>Rajah I-275: Elastic – Paparan Konfigurasi APM Agent</b></p>	Configuration setting	Configuration value	elastic_apm.service_name	my-service-name	elastic_apm.secret_token		elastic_apm.server_url	http://devops-elasticsearch3:8200	elastic_apm.environment	my-environment
Configuration setting	Configuration value										
elastic_apm.service_name	my-service-name										
elastic_apm.secret_token											
elastic_apm.server_url	http://devops-elasticsearch3:8200										
elastic_apm.environment	my-environment										

<p><b>Pemasangan konfigurasi APM Agents pada fail php.ini</b></p> <ol style="list-style-type: none"> <li>1. Masukkan arahan konfigurasi berikut pada fail php.ini pada kod sumber aplikasi [Rajah I-276].</li> <li>2. Setelah sistem aplikasi ditempat dan dijalankan, data APM akan dihantar pada Elastic.</li> </ol>	<pre>elastic_apm.service_name="my-service-name" elastic_apm.secret_token="" elastic_apm.server_url="http://devops-elastic3:8200" elastic_apm.environment="my-environment"</pre>
<p><b>Paparan data APM [Rajah I-277]</b></p> <p>Data pemantauan APM yang dihantar dari services yang telah dikonfigurasi.</p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri. Pilih <b>APM&gt; Services</b>.</li> <li>2. Paparan senarai Services muncul.</li> </ol>	 <p><b>Rajah I-277: Elastic – Paparan halaman APM Services</b></p>

<p><b>APM Traces.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri, Pilih <b>APM Traces</b>.</li> <li>2. Paparan APM Traces muncul.</li> </ol>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Originating service</th> <th>Latency (avg.)</th> <th>Traces per minute</th> <th>Impact</th> </tr> </thead> <tbody> <tr> <td>Standard input code</td> <td>php rating App</td> <td>4.4 ms</td> <td>&lt; 0.1 tpm</td> <td>Low</td> </tr> </tbody> </table>	Name	Originating service	Latency (avg.)	Traces per minute	Impact	Standard input code	php rating App	4.4 ms	< 0.1 tpm	Low
Name	Originating service	Latency (avg.)	Traces per minute	Impact							
Standard input code	php rating App	4.4 ms	< 0.1 tpm	Low							
<p>3. Interpretasi Data: Melalui paparan ini, Pengguna akan dapat memberi fokus kepada masalah atau ralat yang wujud. Seterusnya mencari punca masalah dan membaik pulih sistem atau aplikasi supaya berada pada tahap yang optimum [Rajah I-279].</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Originating service</th> <th>Latency (avg.)</th> <th>Traces per minute</th> <th>Impact</th> </tr> </thead> <tbody> <tr> <td>Standard input code</td> <td>php rating App</td> <td>4.4 ms</td> <td>&lt; 0.1 tpm</td> <td>Low</td> </tr> </tbody> </table>	Name	Originating service	Latency (avg.)	Traces per minute	Impact	Standard input code	php rating App	4.4 ms	< 0.1 tpm	Low
Name	Originating service	Latency (avg.)	Traces per minute	Impact							
Standard input code	php rating App	4.4 ms	< 0.1 tpm	Low							

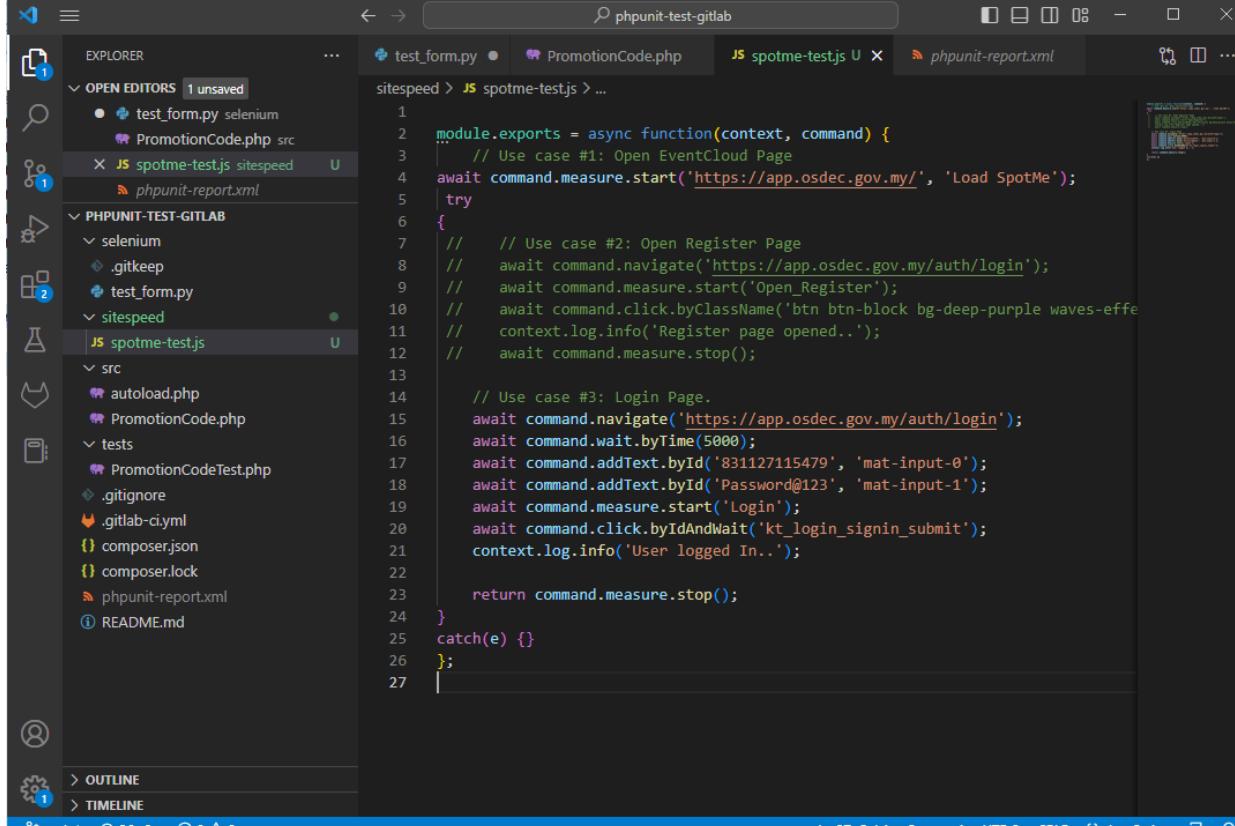
## Lampiran I-5: Pemantauan Pengguna Sebenar

Tatacara	Paparan
<p><b>User Experience Dashboard.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri, Pilih <b>User Experience Dashboard</b>.</li> <li>2. Paparan <b>User Experience Dashboard</b> muncul.</li> </ol> <p>Paparan halaman Dashboard [Rajah I-280].</p>	 <p><b>Rajah I-280: Elastic – Paparan Halaman Dashboard</b></p> <p>Detailed description of Rajah I-280: This screenshot shows the Elastic Observability User Experience Dashboard. The left sidebar lists various monitoring categories under 'Observability'. The main dashboard displays several key performance indicators:      <ul style="list-style-type: none"> <li><b>Page load (median):</b> Total 1.53 s, Backend 4 ms, Frontend 1.53 s, Total page views 503.</li> <li><b>Metrics (median):</b> First contentful paint 292 ms, Total blocking time 0 ms, No. of long tasks 1, Longest long task duration 85 ms, Total long tasks duration 89 ms.</li> <li><b>Core web vitals:</b> Largest contentful paint 294 ms, First input delay 1 ms, Cumulative layout shift 0.000.</li> <li><b>Page load distribution:</b> A histogram showing the distribution of page load times.</li> <li><b>Total page views:</b> A bar chart showing the number of page views over time.</li> </ul>     The dashboard also includes filters for URL, Location, Device, OS, and Browser.</p>

Tatacara	Paparan
<p><b>Interpretasi Data</b></p> <p>Melalui paparan ini, pengguna akan dapat memberi fokus kepada masalah atau ralat yang wujud. Seterusnya mencari punca masalah dan membaik pulih sistem aplikasi supaya berada pada tahap yang optimum [Rajah I-281].</p>	<p>The dashboard displays various performance metrics:</p> <ul style="list-style-type: none"> <li><b>Page load (median):</b> Total 1.53 s, Backend 4 ms, Frontend 1.53 s, Total page views 503.</li> <li><b>Metrics (median):</b> First contentful paint 292 ms, Total blocking time 0 ms, No. of long tasks 1, Longest long task duration 85 ms, Total long tasks duration 89 ms.</li> <li><b>Core web vitals:</b> <ul style="list-style-type: none"> <li>Largest contentful paint: 294 ms (Good 93%, Needs improvement 5%, Poor 2%).</li> <li>First input delay: 1 ms (Good 100%, Needs improvement 0%, Poor 0%).</li> <li>Cumulative layout shift: 0.000 (Good 100%, Needs improvement 0%, Poor 0%).</li> </ul> </li> <li><b>Page load distribution:</b> A histogram showing the distribution of page load times.</li> <li><b>Total page views:</b> A histogram showing the distribution of total page views.</li> </ul> <p><b>Rajah I-281: Elastic – Paparan Halaman Dashboard</b></p>

## Lampiran I-6: Pemantauan Sintetik

Sitespeed yang dipasang pada *pipeline* GitLab akan mengakses sistem aplikasi yang telah dipasang pada Docker Container. sitespeed *Runner* akan melaksanakan pemantauan sintetik secara antara muka pengguna dengan memasukkan input data secara automasi, melaksanakan senario pengguna berdasarkan skrip dan mengeluarkan *output* hasil pemantauan sintetik.

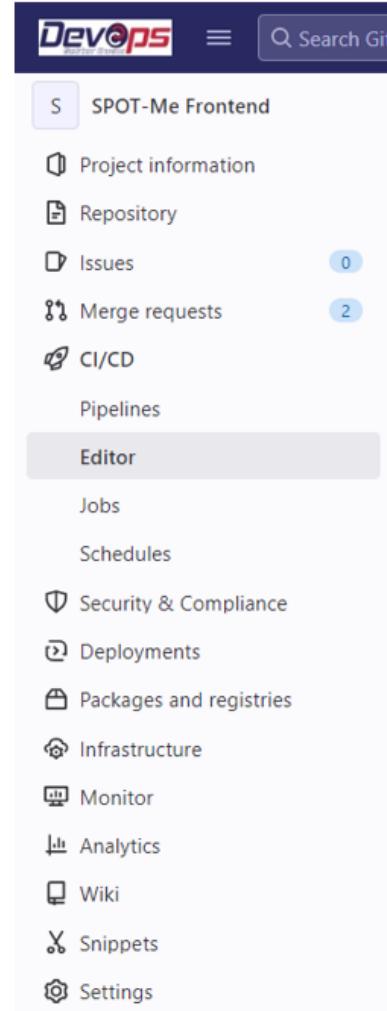
Tatacara	Paparan
<p><b>Membangun dan menjalankan skrip pemantauan sintetik.</b></p> <ol style="list-style-type: none"> <li>Skrip pemantauan sintetik oleh pembangun pada persekitaran pengekodan pembangun menggunakan IDE seperti <i>Visual Studio Code</i>. Bahasa pengaturcaraan yang digunakan ialah Javascript.</li> </ol> <p>Paparan Fail kod sumber [Rajah I-282].</p>	 <pre> 1 module.exports = async function(context, command) { 2     // Use case #1: Open EventCloud Page 3     await command.measure.start('https://app.osdec.gov.my/', 'Load SpotMe'); 4     try { 5         // Use case #2: Open Register Page 6         await command.navigate('https://app.osdec.gov.my/auth/login'); 7         // await command.measure.start('Open_Register'); 8         // await command.click(className('btn btn-block bg-deep-purple waves-effect')); 9         // context.log.info('Register page opened..'); 10        // await command.measure.stop(); 11 12        // Use case #3: Login Page. 13        await command.navigate('https://app.osdec.gov.my/auth/login'); 14        await command.wait.byId('831127115479', 'mat-input-0'); 15        await command.addText.byId('Password@123', 'mat-input-1'); 16        await command.measure.start('Login'); 17        await command.click.byIdAndWait('kt_login_signin_submit'); 18        context.log.info('User logged In..'); 19 20        return command.measure.stop(); 21    } 22    catch(e) {} 23 }; 24 25 26 27 </pre>

Rajah I-282: *Visual Studio Code – Fail Kod Sumber Untuk Pemantauan Sintetik.*

**Konfigurasi skrip pemantauan sintetik ke dalam *pipeline* GitLab.**

1. **Menu > Project** > Pilih projek yang telah diwujudkan.
2. Pada menu sebelah kiri projek, pilih pada **CI/CD**. Sub-menu akan muncul.
3. Klik menu **Editor**. Paparan *Pipeline Editor* yang memaparkan `.gitlab-ci.yml` akan muncul.

Paparan menu [Rajah I-283].

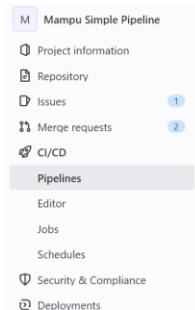
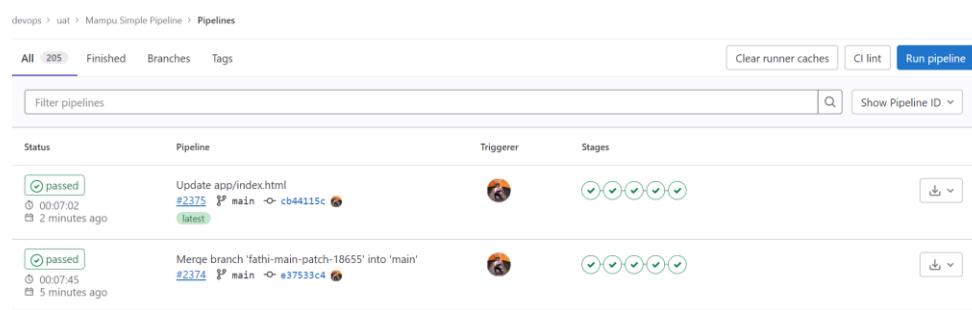
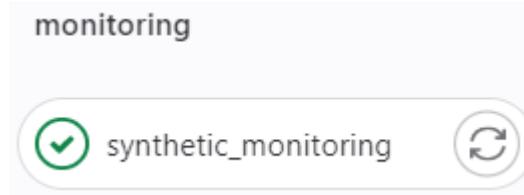


**Rajah I-283: Gitlab – Paparan Menu Utama.**

Tatacara	Paparan
4. Masukkan <i>syntax</i> berikut ke dalam fail .gitlab-ci.yml	<pre>synthetic_monitoring:   stage: monitoring   image: docker:20.10.16   variables:     URL: sitespeed/spotme-test.js     SITESPEED_VERSION: 14.1.0     SITESPEED_OPTIONS: '--multi'     DOCKER_HOST: tcp://docker:2375/     DOCKER_DRIVER: overlay2     DOCKER_TLS_CERTDIR: ""   services:     - docker:20.10.16-dind</pre>

Tatacara	Paparan
<p>5. Masukkan mesej pada ruangan <i>commit message</i> seperti <b>Kemaskini pemantauan sintetik pada pipeline</b></p> <p><b>Commit changes</b></p> <p>6. Klik <b>Commit changes</b> untuk menyimpan dan mengemaskini file <i>.gitlab-ci.yml</i>.</p> <p>7. Pipeline GitLab telah dikemaskini dengan job pemantauan sintetik.</p> <p>Paparan skrip [Rajah I-284].</p>	<pre> 137 synthetic_monitoring: 138   stage: monitoring 139   image: docker:20.10.16 140   variables: 141     URL: sitespeed/spotme-test.js 142     SITE SPEED VERSION: 14.1.0 143     SITE SPEED OPTIONS: '-multi' 144     DOCKER HOST: tcp://docker:2375/ 145     DOCKER DRIVER: overlay 146     DOCKER TLS CERTDIR: '' 147   services: 148     - docker:20.10.16-dind 149       # - name: docker:20.10.16-dind 150       #   alias: docker 151       #   command: ["--tls=false"] 152 153 redeploy_staging: 154   tags: 155     - docker01 156     - shell 157     - spotme-fe 158 159 rules: # whether to include the job in the pipeline 160   - if: '\$CI_PIPELINE_SOURCE == "trigger" &amp;&amp; \$SERVER_ENV == "staging"' 161     # when: always 162     when: delayed </pre> <p>Commit message: Update .gitlab-ci.yml file</p> <p>Branch: master</p> <p style="text-align: right;"><b>Commit changes</b> <b>Reset</b></p>

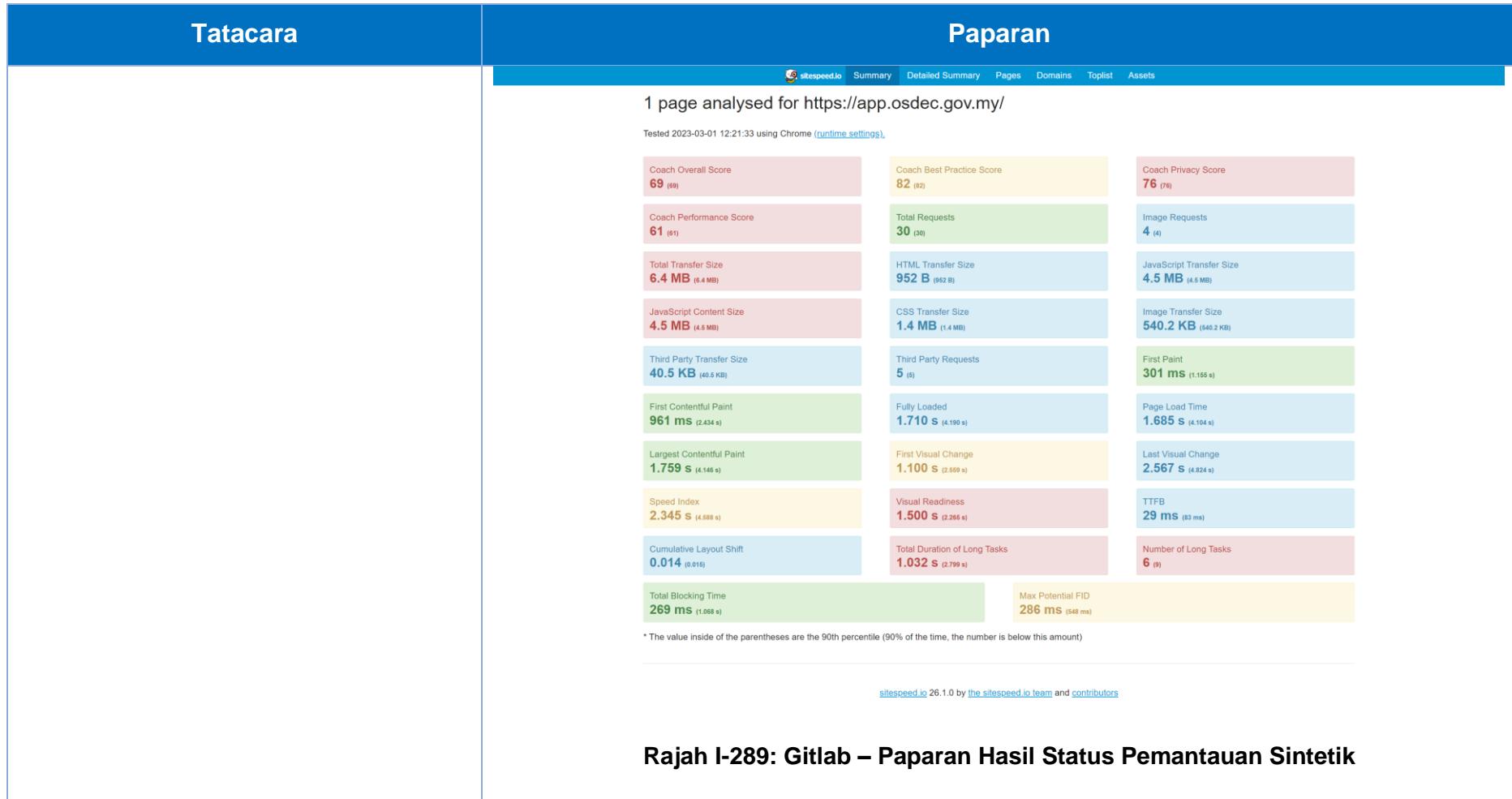
**Rajah I-284: Gitlab – Paparan Skrip**

Tatacara	Paparan
<p><b>Menjalankan <i>pipeline</i> GitLab untuk pemantauan sintetik.</b></p> <ol style="list-style-type: none"> <li>1. <i>Pipeline</i> GitLab dijalankan secara automasi semasa <i>commit</i> dilaksanakan.</li> </ol>	
<p><b>Melihat status log tugas <i>pipeline</i> GitLab untuk pemantauan sintetik.</b></p> <ol style="list-style-type: none"> <li>1. Pada menu sebelah kiri projek, pilih pada <b>CI/CD &gt; Pipeline</b>.</li> <li>2. Klik butang pada ruangan Status. Status tugas senarai <i>pipeline</i> akan dipaparkan [Rajah I-285].</li> <li>3. Klik pada ikon  pada tugasan untuk melihat log terperinci bagi setiap tugasan [Rajah I-286].</li> <li>4. Status log tugas pemantauan sintetik akan dipaparkan [Rajah I-287].</li> </ol>	  <p><b>Rajah I-285: Gitlab – Senarai Status Tugas <i>Pipeline</i> Gitlab</b></p>  <p><b>Rajah I-286: Gitlab – Status Tugasan Untuk <i>Pipeline</i> Gitlab</b></p>

Tatacara	Paparan
	<pre> 208 Google Chrome 106.0.5249.110 209 Mozilla Firefox 106.0 210 Microsoft Edge 106.0.1370.52 211 [2023-03-01 12:21:33] INFO: Versions OS: Linux 5.4.0-126-generic nodejs: v16.16.0 sitespeed.io: 26.1.0 browserTime: 16.17.0 couch: 7.1.2 212 [2023-03-01 12:21:36] INFO: Using default lighthouse configuration for desktop 213 [2023-03-01 12:21:36] INFO: Will run lighthouse tests after browserTime has finished 214 [2023-03-01 12:21:35] INFO: Running tests using Chrome - 3 iteration(s) 215 [2023-03-01 12:21:56] INFO: Use Chrome trace categories: *,disabled-by-default-lighthouse,v8,v8.execute,blink.user_timing,devtools.timeline,disabled-by-default-devtools.timeline,disabled-by-default-devtools.stack 216 [2023-03-01 12:21:56] INFO: Testing url https://app.osdec.gov.my/ iteration 1 217 [2023-03-01 12:22:18] INFO: Take after page complete check screenshot 218 [2023-03-01 12:22:19] INFO: Take cumulative layout shift screenshot 219 [2023-03-01 12:22:20] INFO: Take largest contentful paint screenshot 220 [2023-03-01 12:22:24] INFO: Get visual metrics from the video 221 [2023-03-01 12:22:40] INFO: https://app.osdec.gov.my/ TTFB: 8ms DOMContentLoaded: 2.21s FirstPaint: 1.16s FCP: 2.43s LCP: 4.15s Load: 4.10s TBT: 1.07s CLS:0.0140 222 [2023-03-01 12:22:40] INFO: VisualMetrics: FirstVisualChange: 2.56s SpeedIndex: 4.55s VisualComplete85: 4.79s LastVisualChange: 4.82s 223 [2023-03-01 12:22:42] INFO: Use Chrome trace categories: *,disabled-by-default-lighthouse,v8,v8.execute,blink.user_timing,devtools.timeline,disabled-by-default-devtools.timeline,disabled-by-default-devtools.stack 224 [2023-03-01 12:22:42] INFO: Testing url https://app.osdec.gov.my/ iteration 2 225 [2023-03-01 12:22:54] INFO: Take after page complete check screenshot 226 [2023-03-01 12:22:55] INFO: Take cumulative layout shift screenshot 227 [2023-03-01 12:22:56] INFO: Take largest contentful paint screenshot 228 [2023-03-01 12:23:00] INFO: Get visual metrics from the video 229 [2023-03-01 12:23:07] INFO: https://app.osdec.gov.my/ TTFB: 23ms DOMContentLoaded: 934ms FirstPaint: 292ms FCP: 951ms LCP: 1.76s Load: 1.69s TBT: 209ms CLS:0.0135 230 [2023-03-01 12:23:07] INFO: VisualMetrics: FirstVisualChange: 1.10s SpeedIndex: 2.32s VisualComplete85: 2.50s LastVisualChange: 2.53s 231 [2023-03-01 12:23:08] INFO: Use Chrome trace categories: *,disabled-by-default-lighthouse,v8,v8.execute,blink.user_timing,devtools.timeline,disabled-by-default-devtools.timeline,disabled-by-default-devtools.stack 232 [2023-03-01 12:23:08] INFO: Testing url https://app.osdec.gov.my/ iteration 3 233 [2023-03-01 12:23:22] INFO: Take after page complete check screenshot 234 [2023-03-01 12:23:23] INFO: Take cumulative layout shift screenshot 235 [2023-03-01 12:23:24] INFO: Take largest contentful paint screenshot 236 [2023-03-01 12:23:27] INFO: Get visual metrics from the video 237 [2023-03-01 12:23:34] INFO: https://app.osdec.gov.my/ TTFB: 29ms DOMContentLoaded: 933ms FirstPaint: 301ms FCP: 961ms LCP: 1.72s Load: 1.68s TBT: 252ms CLS:0.0146 238 [2023-03-01 12:23:34] INFO: VisualMetrics: FirstVisualChange: 1.07s SpeedIndex: 2.35s VisualComplete85: 2.53s LastVisualChange: 2.57s 239 [2023-03-01 12:23:34] INFO: https://app.osdec.gov.my/ 30 requests, 29ms (o27.00ms 60.05%), FirstPaint: 301ms (o096.00ms 44.25%), FCP: 961ms (o697.00ms 48.15%), DOMContentLoaded: 934ms (o1.07s 32.45%) (3 runs) 240 [2023-03-01 12:23:35] INFO: Start collecting lighthouse result for https://app.osdec.gov.my/ 241 [2023-03-01 12:24:02] INFO: HTML stored in /sitespeed.io/sitespeed-results 242 &amp; we sitespeed results/sitespeed.json browserPerformance.json 243 Uploading artifacts for successful job 244 Uploading artifacts... 245 Uploading artifacts... 246 sitespeed-results/: found 234 matching files and directories 247 Uploading artifacts as "archive" to coordinator... 201 Created id=14388 responseStatus=201 Created token=2kf5ub1 248 Uploading artifacts... 249 browserPerformance.json: found 1 matching files and directories 250 Uploading artifacts as "browser_performance" to coordinator... 201 Created id=14388 responseStatus=201 Created token=2kf5ub1 251 Cleaning up project directory and file based variables 252 Job succeeded 253 Job succeeded </pre>

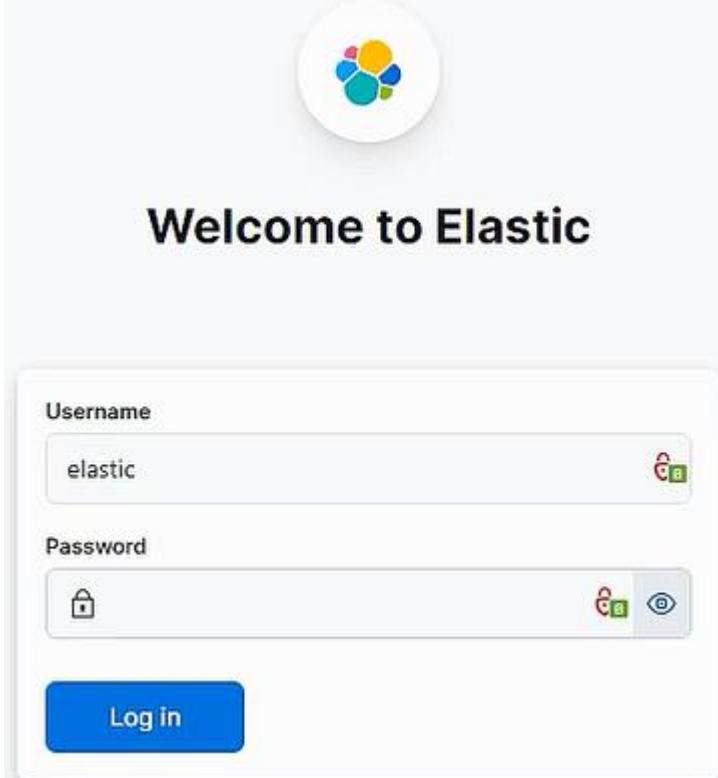
Rajah I-287: Gitlab – Status Log Tugasan

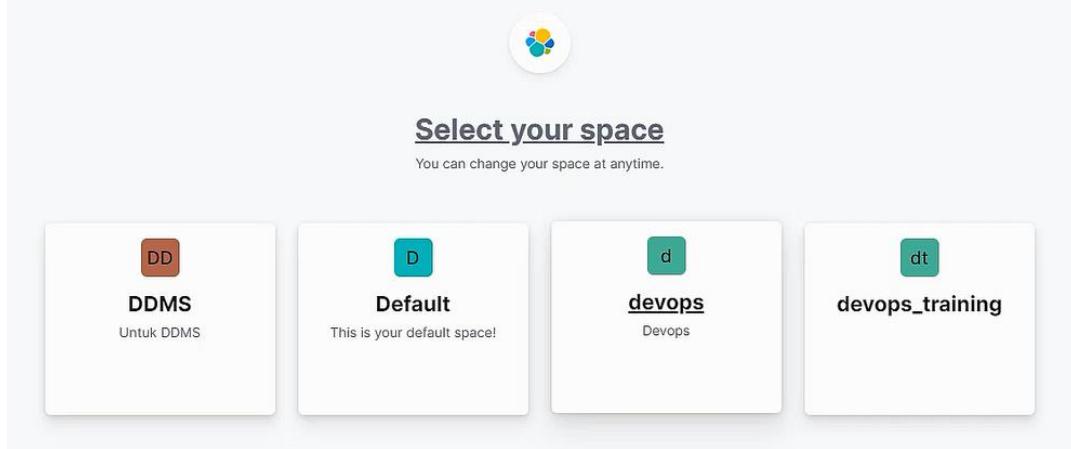
Tatacara	Paparan
<p><b>Melihat status paparan artifak tugas pipeline GitLab untuk pemantauan sintetik .</b></p> <ol style="list-style-type: none"><li>1. Pada sebelah kanan halaman, klik [Download] untuk memuat turun fail artifak GitLab.</li><li>2. Ekstrak fail yang dimuat turun dan klik pada fail indeks.html.</li><li>3. Paparan hasil status pemantauan sintetik dipaparkan [Rajah I-289].</li></ol>	<p><b>Job artifacts</b> These artifacts are the latest. They will not be deleted (even if expired) until newer artifacts are available.</p> <p>Keep    Download    Browse</p> <p><b>Rajah I-288: Gitlab – Paparan Job Artifacts</b></p>



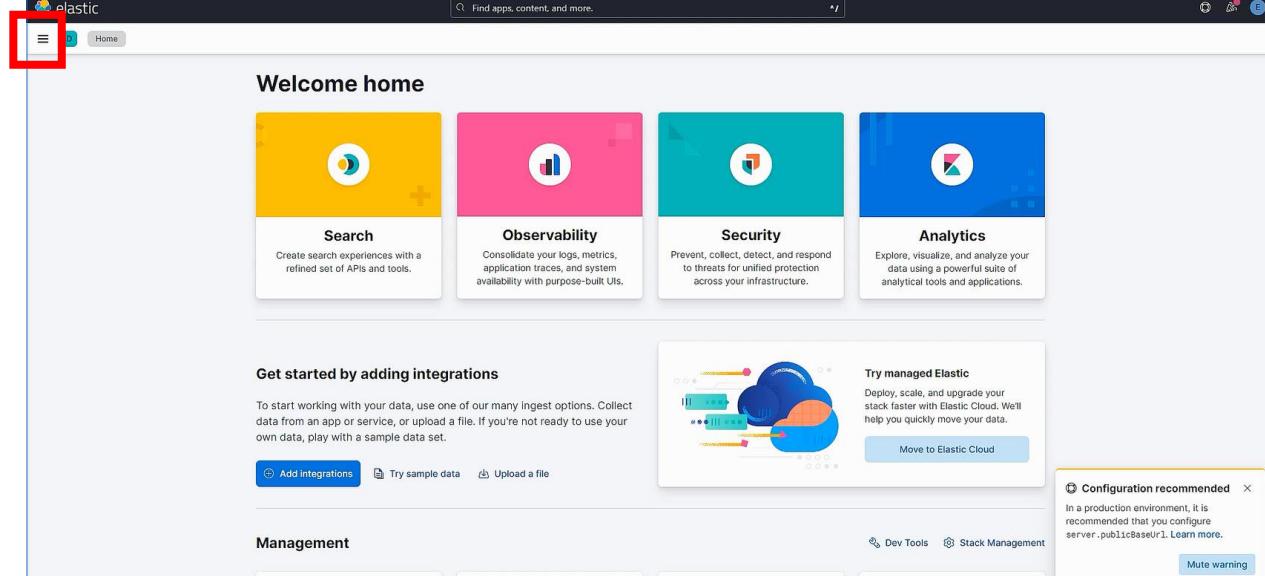
## Lampiran I-7: Konfigurasi Pemantauan Elastic

Berikut merupakan contoh konfigurasi bagi Pemantauan Elastic.

Tatacara	Paparan
<p><b>Log masuk ke dalam aplikasi Elastic [Rajah I-290].</b></p> <ol style="list-style-type: none"><li>1. Log masuk ke laman sesawang dan masukkan alamat berikut: <a href="https://eye.osdec.gov.my">https://eye.osdec.gov.my</a></li><li>2. Masukkan</li></ol> <p>Username :</p> <p>Password :</p> <ol style="list-style-type: none"><li>3. Tekan <b>Log in</b>.</li></ol> <p>Paparan <b>Select your space</b> muncul.</p>	 <p>The screenshot shows the 'Welcome to Elastic' login interface. It features the Elastic logo at the top center. Below it is a large 'Welcome to Elastic' heading. There are two input fields: 'Username' containing 'elastic' and 'Password' containing a masked password. To the right of each input field are small icons: a red 'e' icon with a green 'a' and a lock icon for the password field, and a blue eye icon for both fields. At the bottom is a large blue 'Log in' button.</p> <p><b>Rajah I-290: Elastic – Paparan Halaman Log Masuk</b></p>

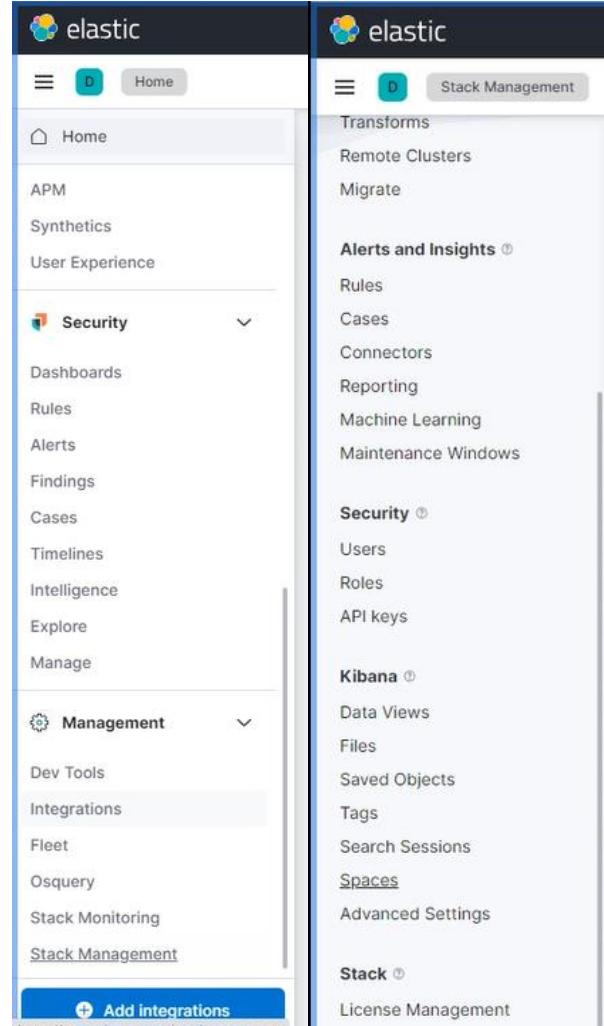
Tatacara	Paparan
<p><b>Paparan halaman pemilihan space [Rajah I-291].</b></p> <p>Pada senarai space yang ada, pilih <b>D Default</b>.</p>	 <p><b>Select your space</b> You can change your space at anytime.</p> <p>DDMS Untuk DDMS</p> <p>D Default This is your default space!</p> <p>d devops Devops</p> <p>dt devops_training</p>

**Rajah I-291: Elastic – Paparan Halaman Pemilihan Space**

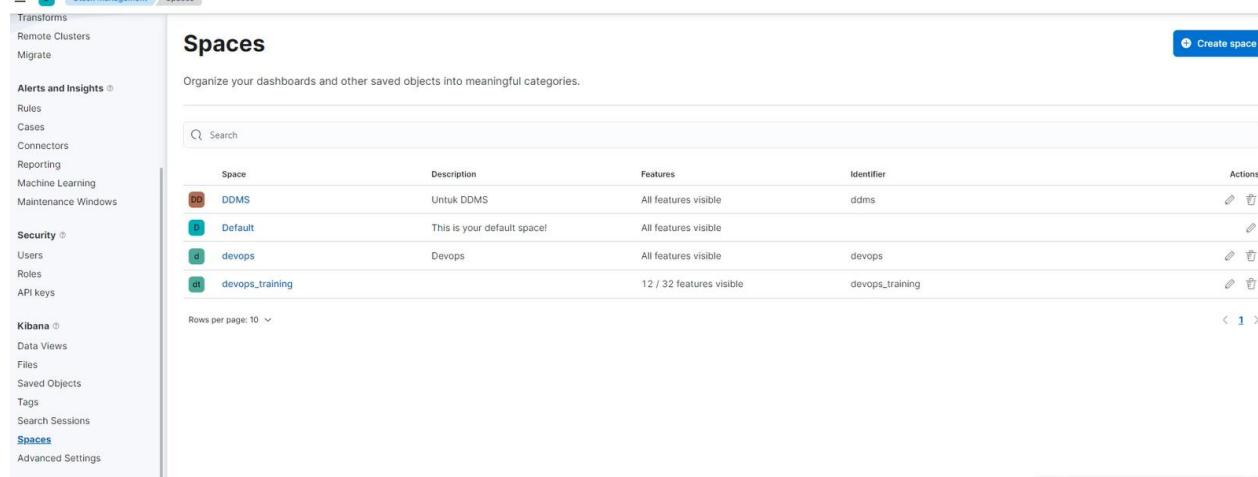
Tatacara	Paparan
<p><b>Paparan halaman <i>Welcome Home</i> [Rajah I-292].</b></p> <ol style="list-style-type: none"><li>1. Klik pada pada senarai menu disebelah kiri atas.</li></ol>	 <p>Rajah I-292: Elastic – Paparan Halaman <i>Welcome Home</i></p>

Paparan senarai menu **Home** dan **Stack Management** [Rajah I-293].

1. Klik pada **Management > Stack Management**.
2. Paparan **Stack Management** muncul.
3. Klik pada **Kibana > Spaces**.



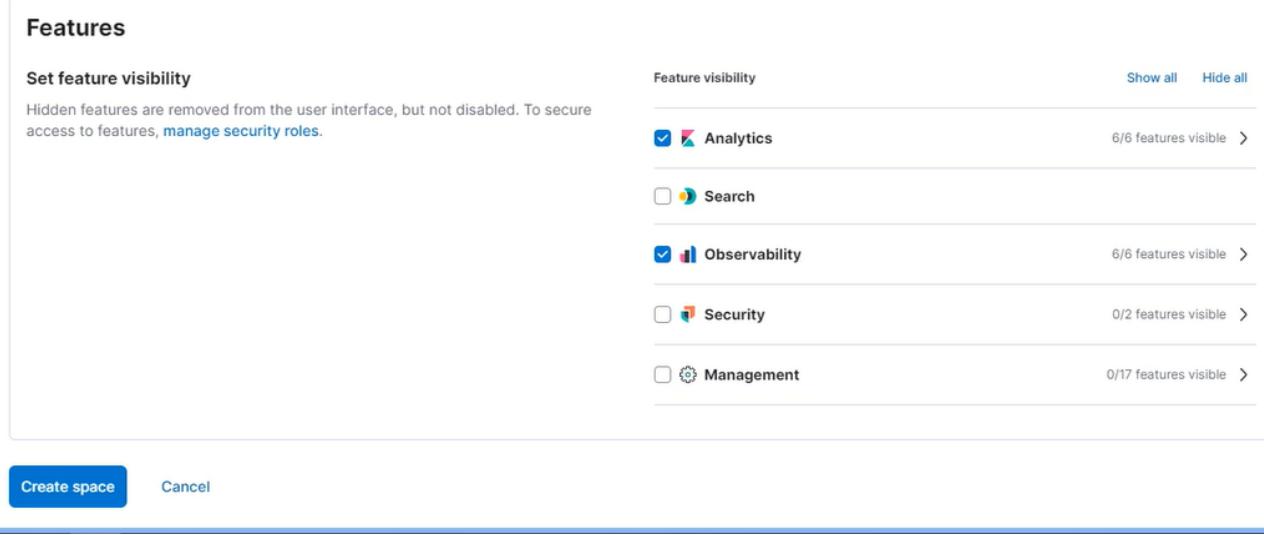
Rajah I-293: Elastic – Paparan **Home Dan Stack Management**

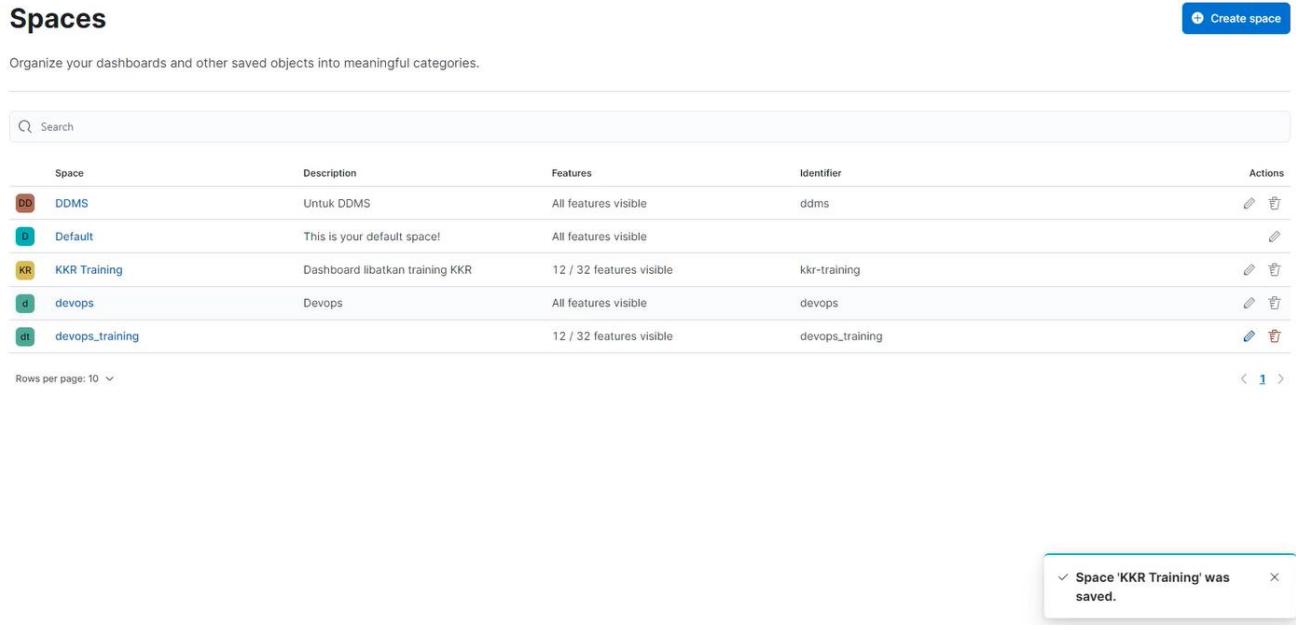
Tatacara	Paparan																									
<p><b>Paparan halaman Spaces</b> [Rajah I-294].</p> <p>Klik pada <b>Create Space</b> untuk <b>menghasilkan Space</b> baru.</p>	 <p>The screenshot shows the 'Spaces' section of the Elastic Stack Management interface. On the left, there's a sidebar with various navigation options like 'Transforms', 'Remote Clusters', 'Migrate', 'Alerts and Insights', 'Rules', 'Cases', 'Connectors', 'Reporting', 'Machine Learning', 'Maintenance Windows', 'Security', 'Users', 'Roles', 'API keys', 'Kibana', 'Data Views', 'Files', 'Saved Objects', 'Tags', 'Search Sessions', 'Spaces', and 'Advanced Settings'. The main area is titled 'Spaces' and contains a table with four rows:</p> <table border="1"><thead><tr><th>Space</th><th>Description</th><th>Features</th><th>Identifier</th><th>Actions</th></tr></thead><tbody><tr><td>DDMS</td><td>Untuk DDMS</td><td>All features visible</td><td>ddms</td><td> </td></tr><tr><td>Default</td><td>This is your default space!</td><td>All features visible</td><td></td><td> </td></tr><tr><td>devops</td><td>Devops</td><td>All features visible</td><td>devops</td><td> </td></tr><tr><td>devops_training</td><td></td><td>12 / 32 features visible</td><td>devops_training</td><td> </td></tr></tbody></table> <p>At the bottom right of the table, there are navigation arrows: '&lt; 1 &gt;'.</p>	Space	Description	Features	Identifier	Actions	DDMS	Untuk DDMS	All features visible	ddms	 	Default	This is your default space!	All features visible		 	devops	Devops	All features visible	devops	 	devops_training		12 / 32 features visible	devops_training	 
Space	Description	Features	Identifier	Actions																						
DDMS	Untuk DDMS	All features visible	ddms	 																						
Default	This is your default space!	All features visible		 																						
devops	Devops	All features visible	devops	 																						
devops_training		12 / 32 features visible	devops_training	 																						

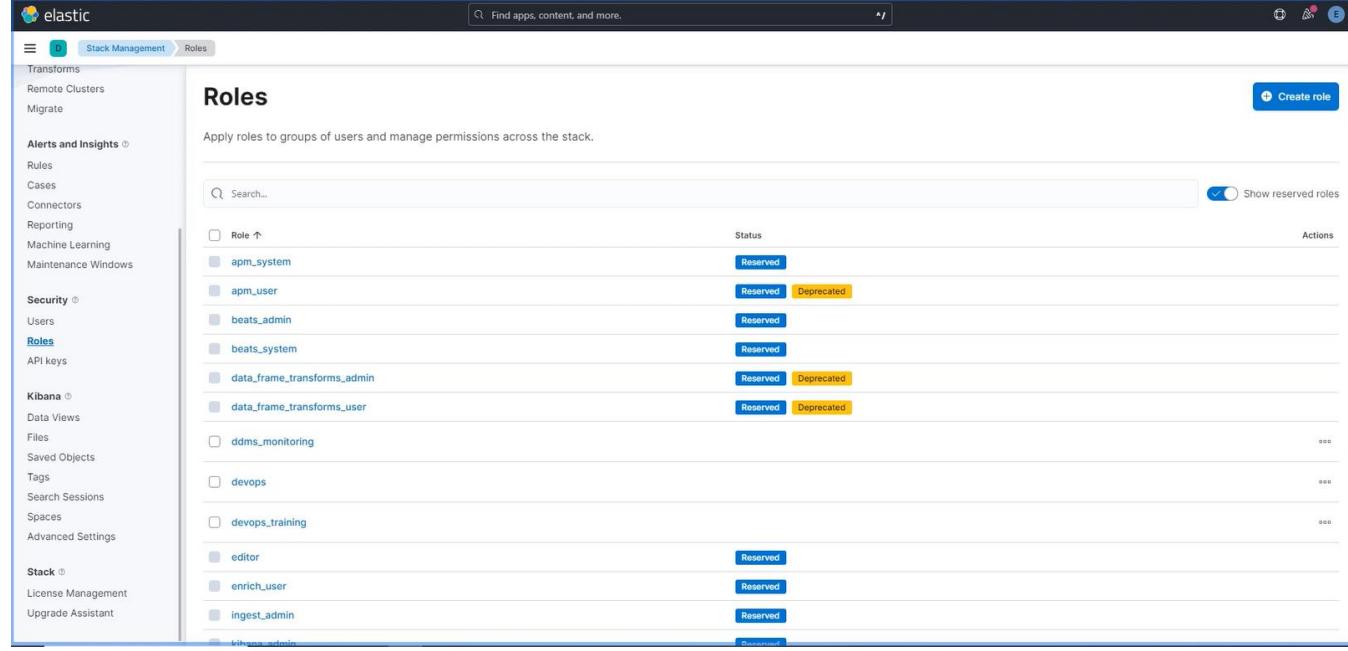
Rajah I-294: Elastic – Paparan Halaman *Create Space*

Tatacara	Paparan
<p>Paparan halaman <b>Create Spaces</b> [Rajah I-295].</p> <ol style="list-style-type: none"> <li>Klik pada <b>Name</b> dan masukkan nama <b>space</b>.</li> <li>Masukkan <b>Description</b> untuk menerangkan secara ringkas keperluan dan tujuan <b>Space</b> dihasilkan.</li> <li><b>URL identifier</b> adalah secara automatik.</li> <li><b>Initials</b> boleh ditukar mengikut keperluan. <b>Image</b> boleh dimasukkan mengikut keperluan.</li> </ol>	<p><b>General</b></p> <p><b>Describe this space</b> Give your space a name that's memorable.</p> <p><b>Name</b> KKR Training</p> <p><b>Description</b> Dashboard libatkan training KKR <small>Optional</small></p> <p>The description appears on the space selection screen.</p> <p><b>URL identifier</b> kkr-training</p> <p>You can't change the URL identifier once created.</p> <p><b>Create an avatar</b> Choose how your space avatar appears across Kibana.</p> <p><b>Avatar type</b> <b>Initials</b> <b>Image</b></p> <p><b>Initials</b> KT Enter up to two characters.</p> <p><b>Background color</b> #D6BF57</p>

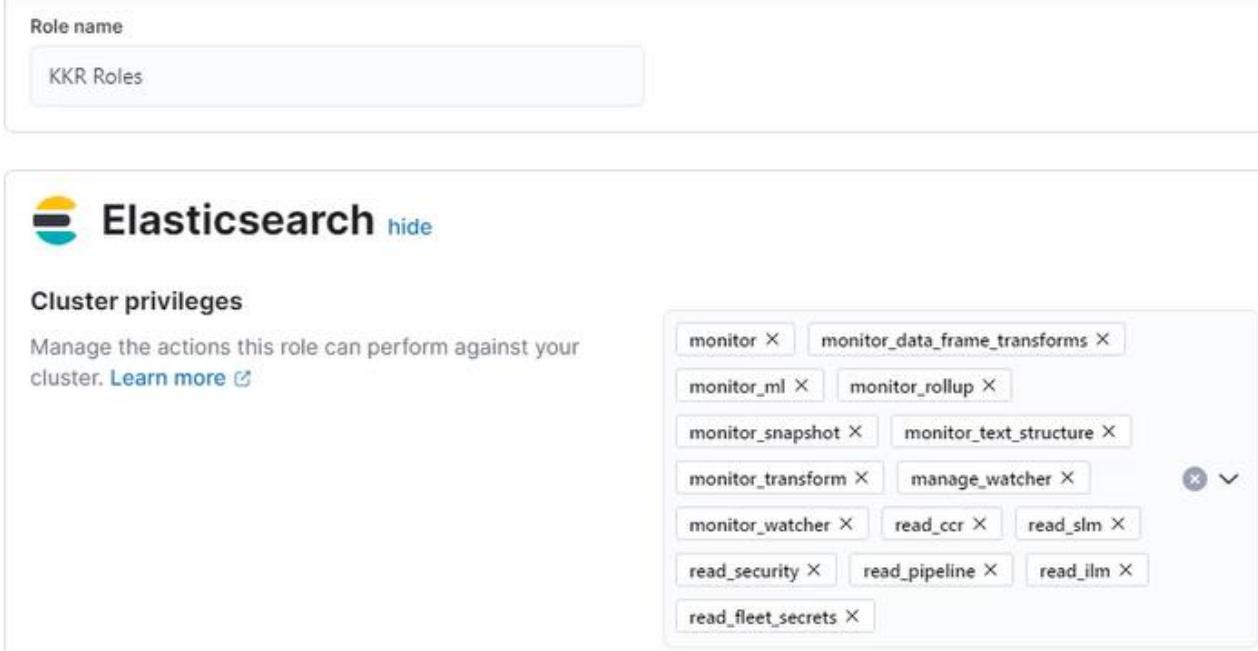
Rajah I-295: Elastic – Paparan Halaman Create Space

Tatacara	Paparan																		
<p>Paparan halaman <b>Create Spaces</b> [Rajah I-296].</p> <ol style="list-style-type: none"> <li>1. Pada bahagian <b>Features</b>, paparan boleh ditentukan dengan memilih features yang tertentu seperti <b>Analytics</b> dan <b>Observability</b>.</li> <li>2. Klik butang <b>Create Space</b> selepas selesai membuat pemilihan space.</li> </ol>	 <p><b>Features</b></p> <p><b>Set feature visibility</b></p> <p>Hidden features are removed from the user interface, but not disabled. To secure access to features, <a href="#">manage security roles</a>.</p> <table border="1"> <thead> <tr> <th>Feature visibility</th> <th>Show all</th> <th>Hide all</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/>  Analytics</td> <td>6/6 features visible &gt;</td> <td></td> </tr> <tr> <td><input type="checkbox"/>  Search</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/>  Observability</td> <td>6/6 features visible &gt;</td> <td></td> </tr> <tr> <td><input type="checkbox"/>  Security</td> <td>0/2 features visible &gt;</td> <td></td> </tr> <tr> <td><input type="checkbox"/>  Management</td> <td>0/17 features visible &gt;</td> <td></td> </tr> </tbody> </table> <p><b>Create space</b>   <a href="#">Cancel</a></p> <p><b>Rajah I-296: Elastic – Paparan Halaman Create Space</b></p>	Feature visibility	Show all	Hide all	<input checked="" type="checkbox"/>  Analytics	6/6 features visible >		<input type="checkbox"/>  Search			<input checked="" type="checkbox"/>  Observability	6/6 features visible >		<input type="checkbox"/>  Security	0/2 features visible >		<input type="checkbox"/>  Management	0/17 features visible >	
Feature visibility	Show all	Hide all																	
<input checked="" type="checkbox"/>  Analytics	6/6 features visible >																		
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<input type="checkbox"/>  Security	0/2 features visible >																		
<input type="checkbox"/>  Management	0/17 features visible >																		

Tatacara	Paparan																														
<p>Paparan halaman <b>Create Spaces</b> [Rajah I-297].</p> <p>Space yang telah berjaya dihasilkan akan dipaparkan bersama space yang sedia ada, dan satu nota makluman "<b>Space was saved.</b>" akan dipaparkan.</p>	 <p><b>Spaces</b></p> <p>Organize your dashboards and other saved objects into meaningful categories.</p> <p><b>Create space</b></p> <table border="1"> <thead> <tr> <th>Space</th> <th>Description</th> <th>Features</th> <th>Identifier</th> <th>Actions</th> </tr> </thead> <tbody> <tr> <td>DDMS</td> <td>Untuk DDMS</td> <td>All features visible</td> <td>ddms</td> <td><span>edit</span> <span>trash</span></td> </tr> <tr> <td>Default</td> <td>This is your default space!</td> <td>All features visible</td> <td></td> <td><span>edit</span> <span>trash</span></td> </tr> <tr> <td>KKR Training</td> <td>Dashboard libatkan training KKR</td> <td>12 / 32 features visible</td> <td>kkr-training</td> <td><span>edit</span> <span>trash</span></td> </tr> <tr> <td>devops</td> <td>Devops</td> <td>All features visible</td> <td>devops</td> <td><span>edit</span> <span>trash</span></td> </tr> <tr> <td>devops_training</td> <td></td> <td>12 / 32 features visible</td> <td>devops_training</td> <td><span>edit</span> <span>trash</span></td> </tr> </tbody> </table> <p>Rows per page: 10 &lt; 1 &gt;</p> <p>✓ Space 'KKR Training' was saved.</p> <p><b>Rajah I-297: Elastic – Paparan Halaman Create Space</b></p>	Space	Description	Features	Identifier	Actions	DDMS	Untuk DDMS	All features visible	ddms	<span>edit</span> <span>trash</span>	Default	This is your default space!	All features visible		<span>edit</span> <span>trash</span>	KKR Training	Dashboard libatkan training KKR	12 / 32 features visible	kkr-training	<span>edit</span> <span>trash</span>	devops	Devops	All features visible	devops	<span>edit</span> <span>trash</span>	devops_training		12 / 32 features visible	devops_training	<span>edit</span> <span>trash</span>
Space	Description	Features	Identifier	Actions																											
DDMS	Untuk DDMS	All features visible	ddms	<span>edit</span> <span>trash</span>																											
Default	This is your default space!	All features visible		<span>edit</span> <span>trash</span>																											
KKR Training	Dashboard libatkan training KKR	12 / 32 features visible	kkr-training	<span>edit</span> <span>trash</span>																											
devops	Devops	All features visible	devops	<span>edit</span> <span>trash</span>																											
devops_training		12 / 32 features visible	devops_training	<span>edit</span> <span>trash</span>																											

Tatacara	Paparan																																										
<p><b>Paparan halaman <i>Create Role</i> [Rajah I-298].</b></p> <ol style="list-style-type: none"> <li>1. Klik pada pada senarai menu disebelah kiri atas.</li> <li>1. Klik pada <b>Management &gt; Stack Management</b>.</li> <li>2. Klik pada <b>Security &gt; Roles</b>.</li> <li>3. Halaman <b>Roles</b> dipaparkan.</li> <li>4. Klik pada butang <b>Create Role</b>.</li> </ol>	 <table border="1"> <thead> <tr> <th>Role</th> <th>Status</th> <th>Actions</th> </tr> </thead> <tbody> <tr> <td>apm_system</td> <td>Reserved</td> <td>...</td> </tr> <tr> <td>apm_user</td> <td>Reserved   Deprecated</td> <td>...</td> </tr> <tr> <td>beats_admin</td> <td>Reserved</td> <td>...</td> </tr> <tr> <td>beats_system</td> <td>Reserved</td> <td>...</td> </tr> <tr> <td>data_frame_transforms_admin</td> <td>Reserved   Deprecated</td> <td>...</td> </tr> <tr> <td>data_frame_transforms_user</td> <td>Reserved   Deprecated</td> <td>...</td> </tr> <tr> <td>ddms_monitoring</td> <td></td> <td>...</td> </tr> <tr> <td>devops</td> <td></td> <td>...</td> </tr> <tr> <td>devops_training</td> <td></td> <td>...</td> </tr> <tr> <td>editor</td> <td>Reserved</td> <td>...</td> </tr> <tr> <td>enrich_user</td> <td>Reserved</td> <td>...</td> </tr> <tr> <td>ingest_admin</td> <td>Reserved</td> <td>...</td> </tr> <tr> <td>logstash_admin</td> <td>Deprecated</td> <td>...</td> </tr> </tbody> </table>	Role	Status	Actions	apm_system	Reserved	...	apm_user	Reserved   Deprecated	...	beats_admin	Reserved	...	beats_system	Reserved	...	data_frame_transforms_admin	Reserved   Deprecated	...	data_frame_transforms_user	Reserved   Deprecated	...	ddms_monitoring		...	devops		...	devops_training		...	editor	Reserved	...	enrich_user	Reserved	...	ingest_admin	Reserved	...	logstash_admin	Deprecated	...
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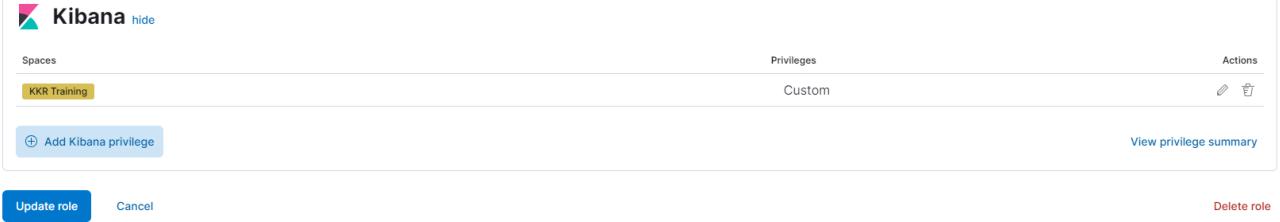
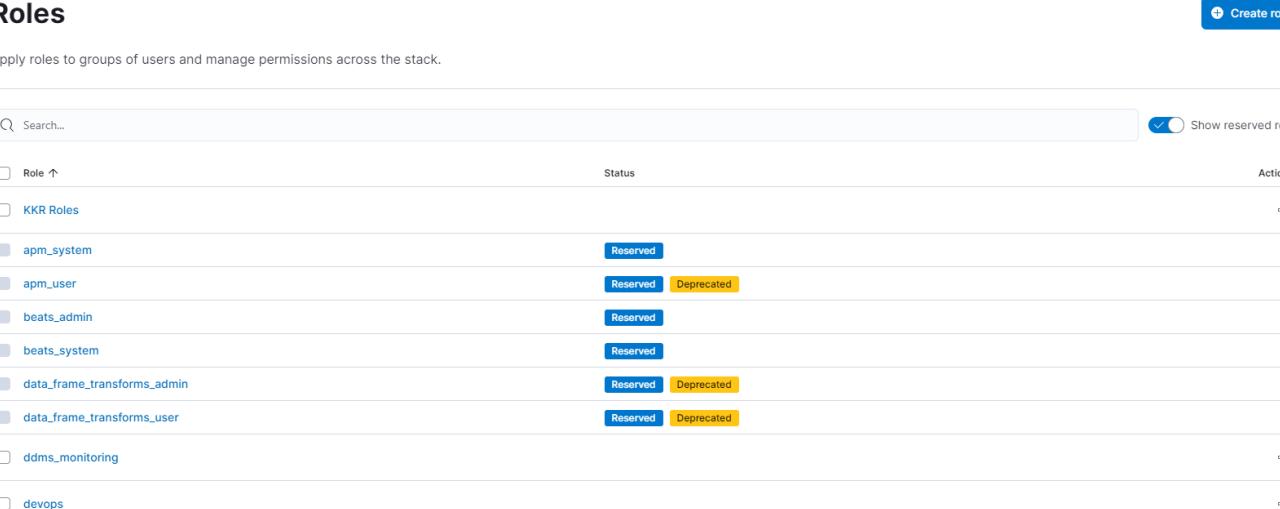
Rajah I-298: Elastic – Paparan Halaman *Create Role*

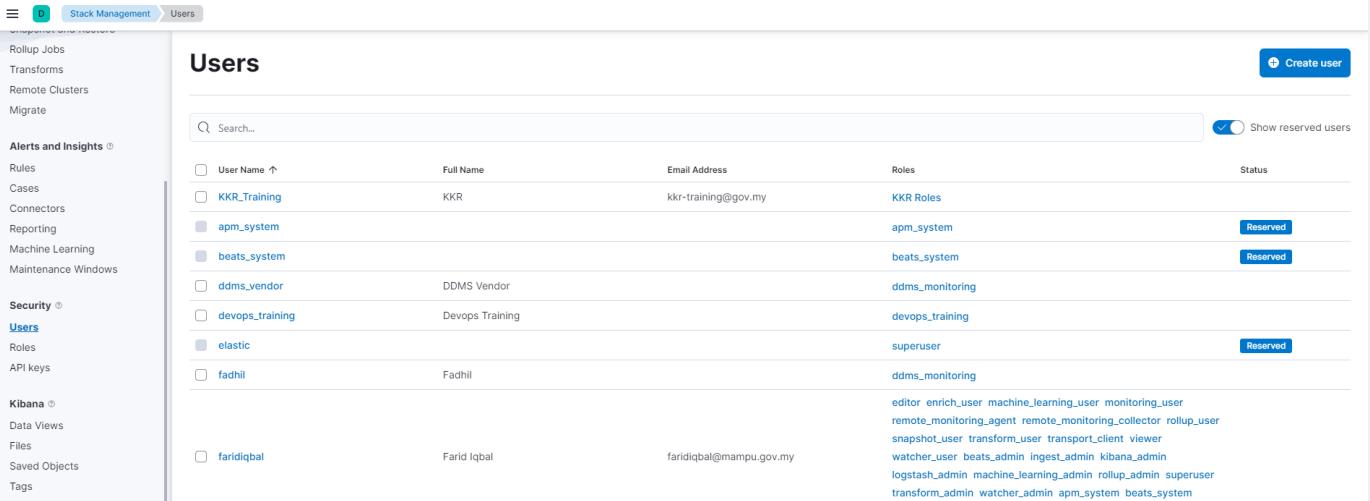
Tatacara	Paparan
<p><b>Paparan halaman <i>Create Role</i> [Rajah I-299].</b></p> <ol style="list-style-type: none"> <li>1. Klik pada <b>Role name</b> dan masukkan nama <b>Role</b>.</li> </ol> <p>Pada bahagian <b>Elasticsearch</b>, fungsi-fungsi <b>Cluster privileges</b> boleh dimasukkan dengan memilih daripada senarai yang disediakan.</p>	 <p>The screenshot shows the 'Create Role' page in the Elasticsearch interface. At the top, there is a 'Role name' input field containing 'KKR Roles'. Below this, under the heading 'Elasticsearch' (with a 'hide' link), is the 'Cluster privileges' section. This section contains a sub-instruction: 'Manage the actions this role can perform against your cluster.' followed by a 'Learn more' link. To the right of this text is a list of privilege names, each enclosed in a separate button-like box with a close ('X') icon. The listed privileges are: monitor, monitor_data_frame_transforms, monitor_ml, monitor_rollup, monitor_snapshot, monitor_text_structure, monitor_transform, manage_watcher, monitor_watcher, read_ccr, read_slm, read_security, read_pipeline, read_ilm, and read_fleet_secrets.</p> <p><b>Rajah I-299: Elastic – Paparan Halaman <i>Create Role</i></b></p>

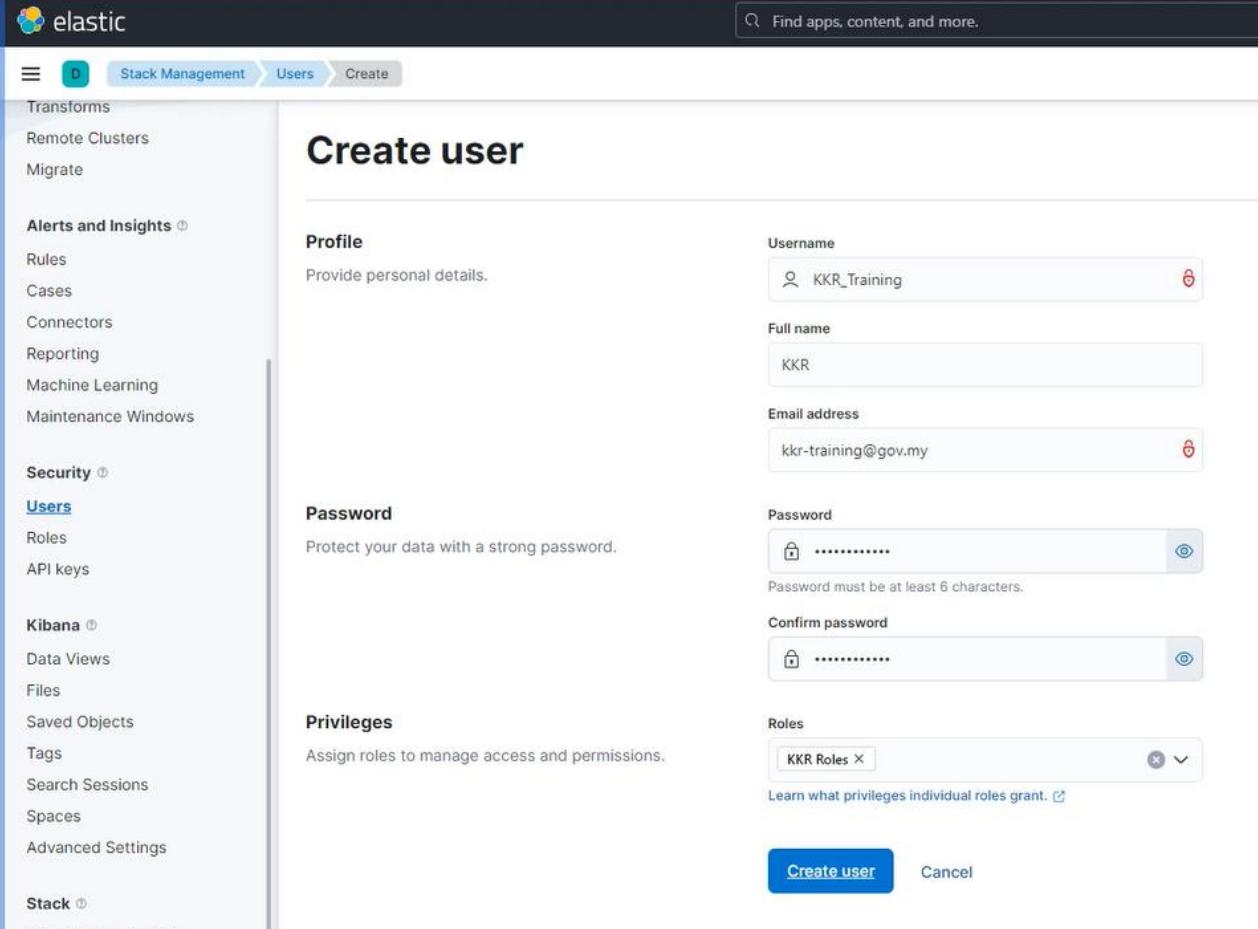
Tatacara	Paparan
<p><b>Paparan halaman <i>Create Role</i> [Rajah I-300].</b></p> <p><b>Index privileges</b> seperti <b>Indices</b> dan <b>privileges</b> boleh dimasukkan mengikut keperluan.</p>	<p><b>Index privileges</b> Control access to the data in your cluster. <a href="#">Learn more</a></p> <p><b>Indices</b> .alerts-security.alerts-ddms,apm-* transaction,auditbeat*,endgame*,filebeat*,logs*,packetbeat*,traces-apm*,winlogbeat*,elastic-cloud-logs X logs-* X metrics-* X kibana-event-log-* X logstash-ossquery_manager.result* X</p> <p><b>Privileges</b> monitor X read X read_cross_cluster X view_index_metadata X index X</p> <p><a href="#">Add index privilege</a></p> <p><b>Remote index privileges</b> Control access to the data in remote clusters. <a href="#">Learn more</a></p> <p><a href="#">Add remote index privilege</a></p> <p><b>Rajah I-300: Elastic – Paparan Halaman <i>Create Role</i></b></p>

Tatacara	Paparan
<p><b>Paparan halaman <i>Create Role</i> [Rajah I-301].</b></p> <p><i>Pada bahagian Kibana privileges, Spaces boleh dipilih berdasarkan space yang telah dihasilkan sebelum ini.</i></p>	<p><b>Kibana privileges</b></p> <p>X</p> <p>Spaces</p> <p>KKR Training X   <span style="float: right;">✖️ ▾</span></p> <ul style="list-style-type: none"><li>• * All Spaces</li><li>• DDMS</li><li>• Default</li><li>• devops</li><li>• devops_training</li></ul> <p>Increase privilege levels on a per feature basis. Some features might be hidden by the space or affected by a global space privilege.</p> <p><b>Rajah I-301: Elastic – Paparan Halaman <i>Create Role</i></b></p>

<p><b>Paparan halaman <i>Create Role</i> [Rajah I-302].</b></p> <p>Pada bahagian <b>Kibana privileges</b>, pemilihan <b>Customize feature privileges</b> ditentukan dengan memilih sama ada <b>All</b>, <b>Read</b> dan <b>None</b>.</p>	<h3>Kibana privileges</h3> <p>Assign the privilege level you wish to grant to all present and future features across this space.</p> <p><b>Customize by feature</b></p> <p>Increase privilege levels on a per feature basis. Some features might be hidden by the space or affected by a global space privilege.</p> <p><b>Customize feature privileges</b> <span style="float: right;">Bulk actions ▾</span></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: left;">Analytics</th> <th style="text-align: right;">6 / 6 features granted</th> </tr> <tr> <th></th> <th>All</th> <th>Read</th> <th>None</th> </tr> </thead> <tbody> <tr> <td>Discover</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> <tr> <td>Dashboard</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> <tr> <td>Canvas</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> <tr> <td>Maps</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> <tr> <td>Machine Learning</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> <tr> <td>Visualize Library</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: left;">Observability</th> <th style="text-align: right;">6 / 6 features granted</th> </tr> <tr> <th></th> <th>All</th> <th>Read</th> <th>None</th> </tr> </thead> <tbody> <tr> <td>Logs</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> <tr> <td>Metrics</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> <tr> <td>APM and User Experience</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> <tr> <td>Synthetics and Uptime</td> <td>All</td> <td style="background-color: #0070C0; color: white;">Read</td> <td>None</td> </tr> </tbody> </table> <p style="text-align: center;"><span style="border: 1px solid #ccc; padding: 2px;">Cancel</span> <span style="border: 1px solid #0070C0; background-color: #0070C0; color: white; padding: 2px;">Update space privilege</span></p> <p style="text-align: center;"><b>Rajah I-302: Elastic – Paparan Halaman <i>Create Role</i></b></p>	Analytics			6 / 6 features granted		All	Read	None	Discover	All	Read	None	Dashboard	All	Read	None	Canvas	All	Read	None	Maps	All	Read	None	Machine Learning	All	Read	None	Visualize Library	All	Read	None	Observability			6 / 6 features granted		All	Read	None	Logs	All	Read	None	Metrics	All	Read	None	APM and User Experience	All	Read	None	Synthetics and Uptime	All	Read	None
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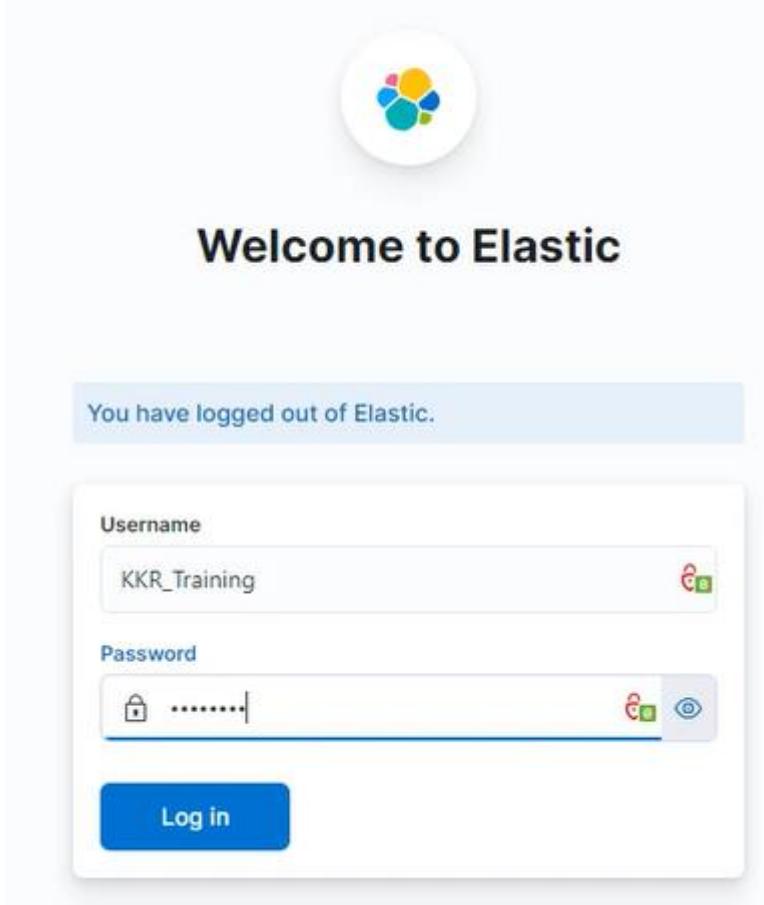
Tatacara	Paparan
<p><b>Paparan halaman <i>Create Role</i> [Rajah I-303].</b></p> <p>Setelah selesai melakukan pemilihan <b>Customize feature privileges Spaces</b>, Klik butang <b>Update role</b>.</p>	 <p style="text-align: center;"><b>Rajah I-303: Elastic – Paparan Halaman <i>Create Role</i></b></p>
<p><b>Paparan halaman <i>Create Role</i> [Rajah I-304].</b></p> <p><b>Role</b> yang berjaya dihasilkan dipaparkan bersama dengan <b>roles</b> yang telah sedia ada.</p>	 <p style="text-align: center;"><b>Rajah I-304: Elastic – Paparan Halaman <i>Create Role</i></b></p>

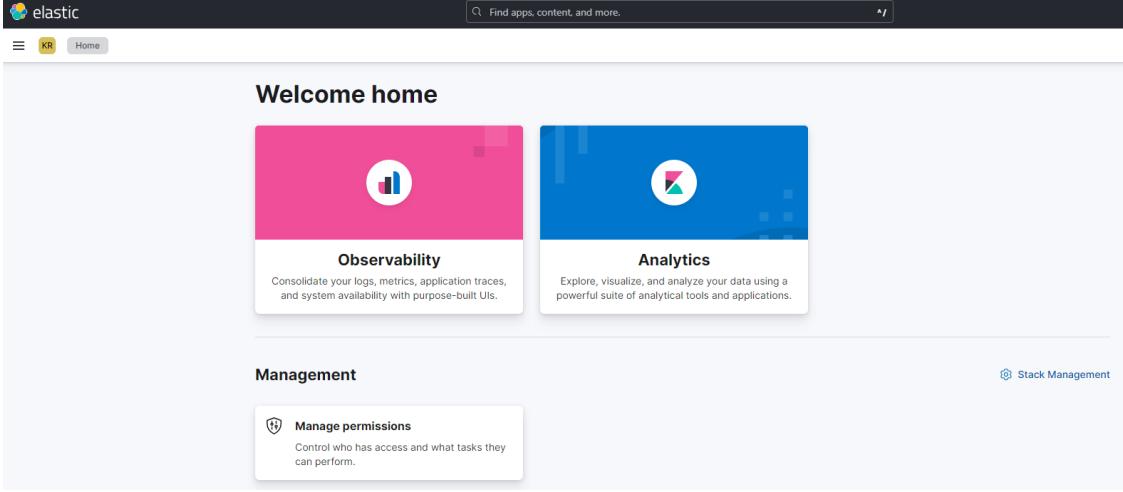
Tatacara	Paparan																																													
<p><b>Paparan halaman <i>Create User</i> [Rajah I-305].</b></p> <ol style="list-style-type: none"> <li>1. Klik pada pada senarai menu disebelah kiri atas.</li> <li>2. Klik pada <b>Management &gt; Stack Management.</b></li> <li>3. Klik pada <b>Security &gt; Users.</b></li> <li>4. Halaman <b>Users</b> dipaparkan</li> <li>5. Klik pada butang <b>Create user.</b></li> </ol>	 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>User Name</th> <th>Full Name</th> <th>Email Address</th> <th>Roles</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>KKR_Training</td> <td>KKR</td> <td>kkr-training@gov.my</td> <td>KKR Roles</td> <td></td> </tr> <tr> <td>apm_system</td> <td></td> <td></td> <td>apm_system</td> <td>Reserved</td> </tr> <tr> <td>beats_system</td> <td></td> <td></td> <td>beats_system</td> <td>Reserved</td> </tr> <tr> <td>ddms_vendor</td> <td>DDMS Vendor</td> <td></td> <td>ddms_monitoring</td> <td></td> </tr> <tr> <td>devops_training</td> <td>Devops Training</td> <td></td> <td>devops_training</td> <td></td> </tr> <tr> <td>elastic</td> <td></td> <td></td> <td>superuser</td> <td></td> </tr> <tr> <td>fadhil</td> <td>Fadhil</td> <td></td> <td>ddms_monitoring</td> <td>Reserved</td> </tr> <tr> <td>faridiqbali</td> <td>Farid Iqbal</td> <td>faridiqbali@mampu.gov.my</td> <td>editor enrich_user machine_learning_user monitoring_user remote_monitoring_agent remote_monitoring_collector rollup_user snapshot_user transform_user transport_client viewer watcher_user beats_admin ingest_admin kibana_admin logstash_admin machine_learning_admin rollup_admin superuser transform_admin watcher_admin apm_system beats_system kibana system logstash system</td> <td></td> </tr> </tbody> </table> <p style="text-align: center;"><b>Rajah I-305: Elastic – Paparan Halaman <i>Create User</i></b></p>	User Name	Full Name	Email Address	Roles	Status	KKR_Training	KKR	kkr-training@gov.my	KKR Roles		apm_system			apm_system	Reserved	beats_system			beats_system	Reserved	ddms_vendor	DDMS Vendor		ddms_monitoring		devops_training	Devops Training		devops_training		elastic			superuser		fadhil	Fadhil		ddms_monitoring	Reserved	faridiqbali	Farid Iqbal	faridiqbali@mampu.gov.my	editor enrich_user machine_learning_user monitoring_user remote_monitoring_agent remote_monitoring_collector rollup_user snapshot_user transform_user transport_client viewer watcher_user beats_admin ingest_admin kibana_admin logstash_admin machine_learning_admin rollup_admin superuser transform_admin watcher_admin apm_system beats_system kibana system logstash system	
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fadhil	Fadhil		ddms_monitoring	Reserved																																										
faridiqbali	Farid Iqbal	faridiqbali@mampu.gov.my	editor enrich_user machine_learning_user monitoring_user remote_monitoring_agent remote_monitoring_collector rollup_user snapshot_user transform_user transport_client viewer watcher_user beats_admin ingest_admin kibana_admin logstash_admin machine_learning_admin rollup_admin superuser transform_admin watcher_admin apm_system beats_system kibana system logstash system																																											

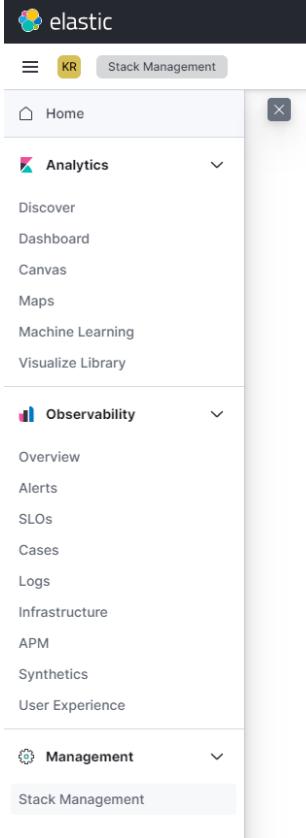
Tatacara	Paparan
<p><b>Paparan halaman <i>Create user</i> [Rajah I-306].</b></p> <ol style="list-style-type: none"> <li>1. Klik pada <b>UserName</b> dan masukkan nama.</li> <li>2. Klik pada <b>Full name</b> dan masukkan nama penuh.</li> <li>3. Klik pada <b>email address</b> dan masukkan alamat email.</li> <li>4. Klik pada <b>Password</b> dan masukkan <b>kata kekunci</b> serta <b>pengesahan kata kekunci</b>.</li> <li>5. Memilih <b>roles</b> yang telah ditetapkan.</li> </ol> <p>Setelah selesai , tekan butang <b>Create user</b>.</p>	 <p><b>Create user</b></p> <p><b>Profile</b> Provide personal details.</p> <p>Username: KKR_Training</p> <p>Full name: KKR</p> <p>Email address: kkr-training@gov.my</p> <p><b>Password</b> Protect your data with a strong password.</p> <p>Password: ..... (must be at least 6 characters)</p> <p>Confirm password: ..... (must be at least 6 characters)</p> <p><b>Privileges</b> Assign roles to manage access and permissions.</p> <p>Roles: KKR Roles</p> <p><b>Create user</b> Cancel</p>

Rajah I-306: Elastic – Paparan Halaman *Create User*

Tatacara	Paparan																																													
<p><b>Paparan halaman <i>Users</i> [Rajah I-307].</b></p> <p>1. <b>User</b> yang telah dihasilkan dipaparkan bersama <b>users</b> sedia ada.</p>	<p><b>Users</b></p> <table border="1"> <thead> <tr> <th>User Name</th> <th>Full Name</th> <th>Email Address</th> <th>Roles</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>KKR_Training</td> <td>KKR</td> <td>kkr-training@gov.my</td> <td>KKR Roles</td> <td>Reserved</td> </tr> <tr> <td>apm_system</td> <td></td> <td></td> <td>apm_system</td> <td>Reserved</td> </tr> <tr> <td>beats_system</td> <td></td> <td></td> <td>beats_system</td> <td>Reserved</td> </tr> <tr> <td>ddms_vendor</td> <td>DDMS Vendor</td> <td></td> <td>ddms_monitoring</td> <td></td> </tr> <tr> <td>devops_training</td> <td>Devops Training</td> <td></td> <td>devops_training</td> <td></td> </tr> <tr> <td>elastic</td> <td></td> <td></td> <td>superuser</td> <td>Reserved</td> </tr> <tr> <td>fadhil</td> <td>Fadhil</td> <td></td> <td>ddms_monitoring</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>editor enrich_user machine_learning_user monitoring_user</td> <td></td> </tr> </tbody> </table> <p><b>Rajah I-307: Elastic – Paparan Halaman <i>Users</i></b></p>	User Name	Full Name	Email Address	Roles	Status	KKR_Training	KKR	kkr-training@gov.my	KKR Roles	Reserved	apm_system			apm_system	Reserved	beats_system			beats_system	Reserved	ddms_vendor	DDMS Vendor		ddms_monitoring		devops_training	Devops Training		devops_training		elastic			superuser	Reserved	fadhil	Fadhil		ddms_monitoring					editor enrich_user machine_learning_user monitoring_user	
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devops_training	Devops Training		devops_training																																											
elastic			superuser	Reserved																																										
fadhil	Fadhil		ddms_monitoring																																											
			editor enrich_user machine_learning_user monitoring_user																																											

Tatacara	Paparan
<p><b>Log masuk ke dalam aplikasi Elastic [Rajah I-308].</b></p> <ol style="list-style-type: none"><li>1. Log masuk ke laman sesawang dan masukkan alamat berikut: <a href="https://eye.osdec.gov.my">https://eye.osdec.gov.my</a></li><li>2. Masukkan Username : Password : 3. Tekan <b>Log in</b>.</li></ol>	 <p>The screenshot shows the 'Welcome to Elastic' landing page. Below it, a message box displays 'You have logged out of Elastic.'. The main area contains a login form with fields for 'Username' (KKR_Training) and 'Password'. The 'Log in' button is at the bottom.</p> <p><b>Rajah I-308: Elastic – Paparan Halaman Log Masuk</b></p>

Tatacara	Paparan
<p><b>Paparan halaman <i>Welcome Home</i> [Rajah I-309].</b></p> <p>Klik pada pada senarai menu disebelah kiri atas.</p>	 <p>The screenshot shows the Elastic Stack's 'Welcome home' interface. At the top, there is a search bar with the placeholder 'Find apps, content, and more.' Below the search bar, there are three main cards:</p> <ul style="list-style-type: none"><li><b>Observability</b>: A pink card with a bar chart icon. Description: 'Consolidate your logs, metrics, application traces, and system availability with purpose-built UIs.'</li><li><b>Analytics</b>: A blue card with a Kibana icon. Description: 'Explore, visualize, and analyze your data using a powerful suite of analytical tools and applications.'</li><li><b>Management</b>: A white card with a shield icon. Description: 'Manage permissions' and 'Control who has access and what tasks they can perform.'</li></ul> <p>At the bottom right of the interface, there is a link labeled 'Stack Management' with a gear icon.</p> <p><b>Rajah I-309: Elastic – Paparan Halaman <i>Welcome Home</i></b></p>

Tatacara	Paparan
<p><b>Paparan halaman <i>Welcome Home</i> [Rajah I-310].</b></p> <p>Hanya paparan yang telah dipilih akan ditunjukkan.</p>	 <p>The screenshot shows the Elastic Stack Management interface. At the top, there is a navigation bar with the Elastic logo, a search bar, and tabs for 'KR' and 'Stack Management'. Below the navigation bar is a sidebar with three main sections: 'Analytics', 'Observability', and 'Management'. Under 'Analytics', the 'Home' option is selected. Under 'Observability', the 'Logs' option is selected. Under 'Management', the 'Stack Management' option is selected. The main content area displays a 'Discover' section with a table of log entries, a 'Dashboard' section, and a 'Canvas' section.</p>

**Rajah I-310: Elastic – Paparan Halaman *Welcome Home***

**LAMPIRAN J: URL****Lampiran J-1: URL TOOLS**

Bil.	Tools	URL
1.	Gitlab	<a href="http://code.osdec.gov.my">code.osdec.gov.my</a>
2.	Rancher / Kuber	<a href="http://cloud.osdec.gov.my">cloud.osdec.gov.my</a>
3.	Public Kubernetes apps	<a href="http://app.osdec.gov.my">app.osdec.gov.my</a>
4.	Elastic Stack	<a href="http://eye.osdec.gov.my">eye.osdec.gov.my</a>
5.	Mattermost	<a href="http://connect.osdec.gov.my">connect.osdec.gov.my</a>
6.	Wiki.js	<a href="http://docs.osdec.gov.my">docs.osdec.gov.my</a>
7.	Harbor	<a href="http://hub.osdec.gov.my">hub.osdec.gov.my</a>

**KEMENTERIAN DIGITAL  
JABATAN DIGITAL NEGARA**

Bangunan MKN Embasy Techzone,  
Blok B, No. 3200 Jalan Teknokrat 2,  
63000 Cyberjaya Sepang, Selangor

Darul Ehsan  
Malaysia



[www.osdec.gov.my](http://www.osdec.gov.my)