

# PROJECT: V1.1

## INFRASTRUCTURE AS CODE

Jamal Tadrous

## TOPICS COVERED

### TOPIC 1:

WHAT IS V1\_0 AND WHAT IS  
EXCPECTED OF V1.1?

### TOPIC 2:

WHAT\_HOW\_WHY  
WHAT WAS MY APPROACH?

### TOPIC 3:

WHAT DO I HAVE?

- DIAGRAMS
- CODE

### DEMO TIME

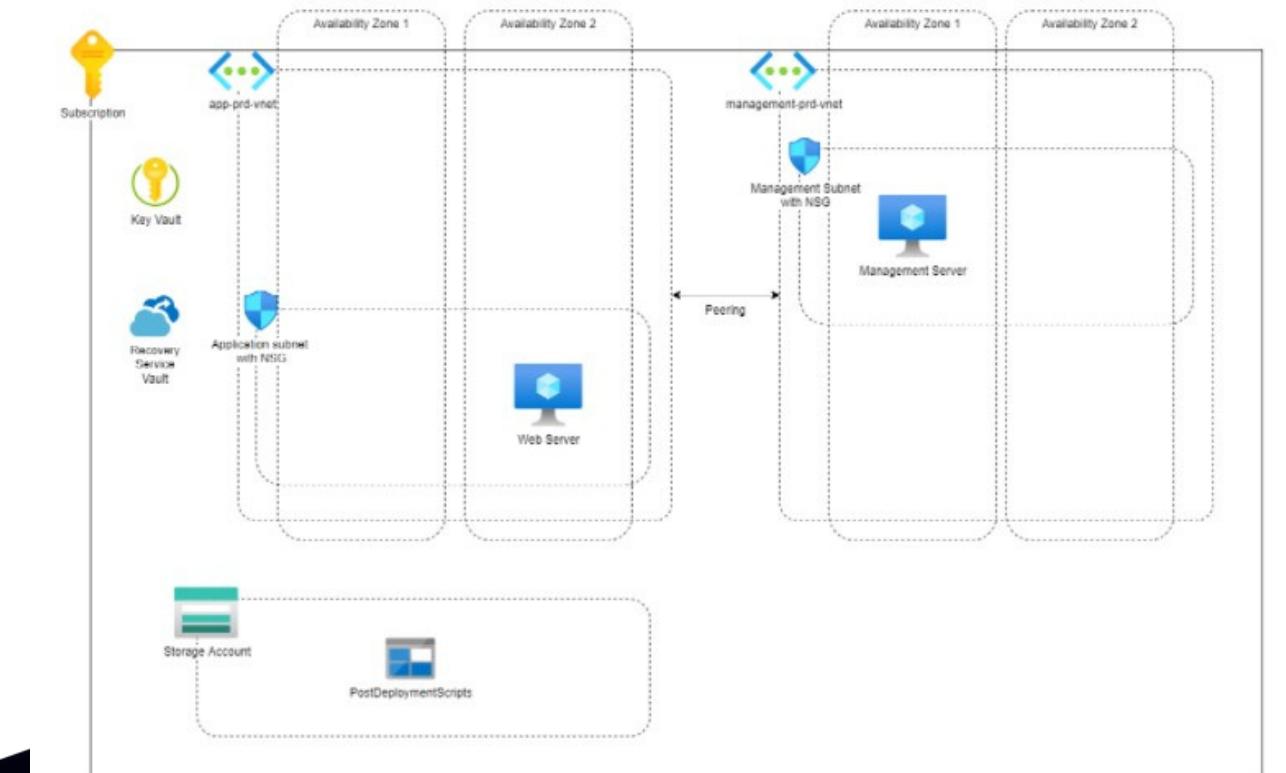
### TOPIC 4:

LEARNINGS & CONCLUSION

## AGENDA

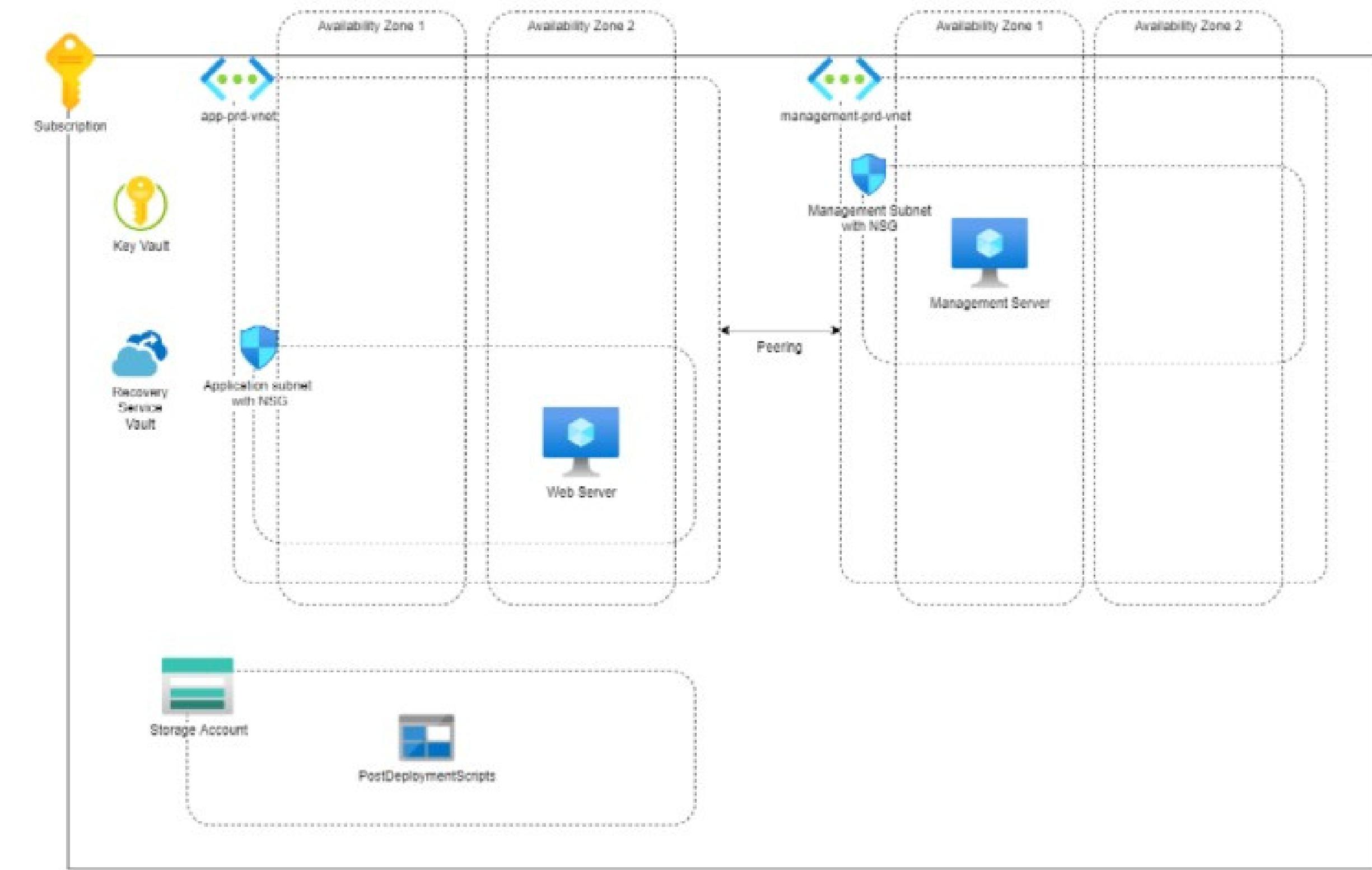
# WHAT IS V1.0?

- Creation of infrastructure
- Automation
- Templates



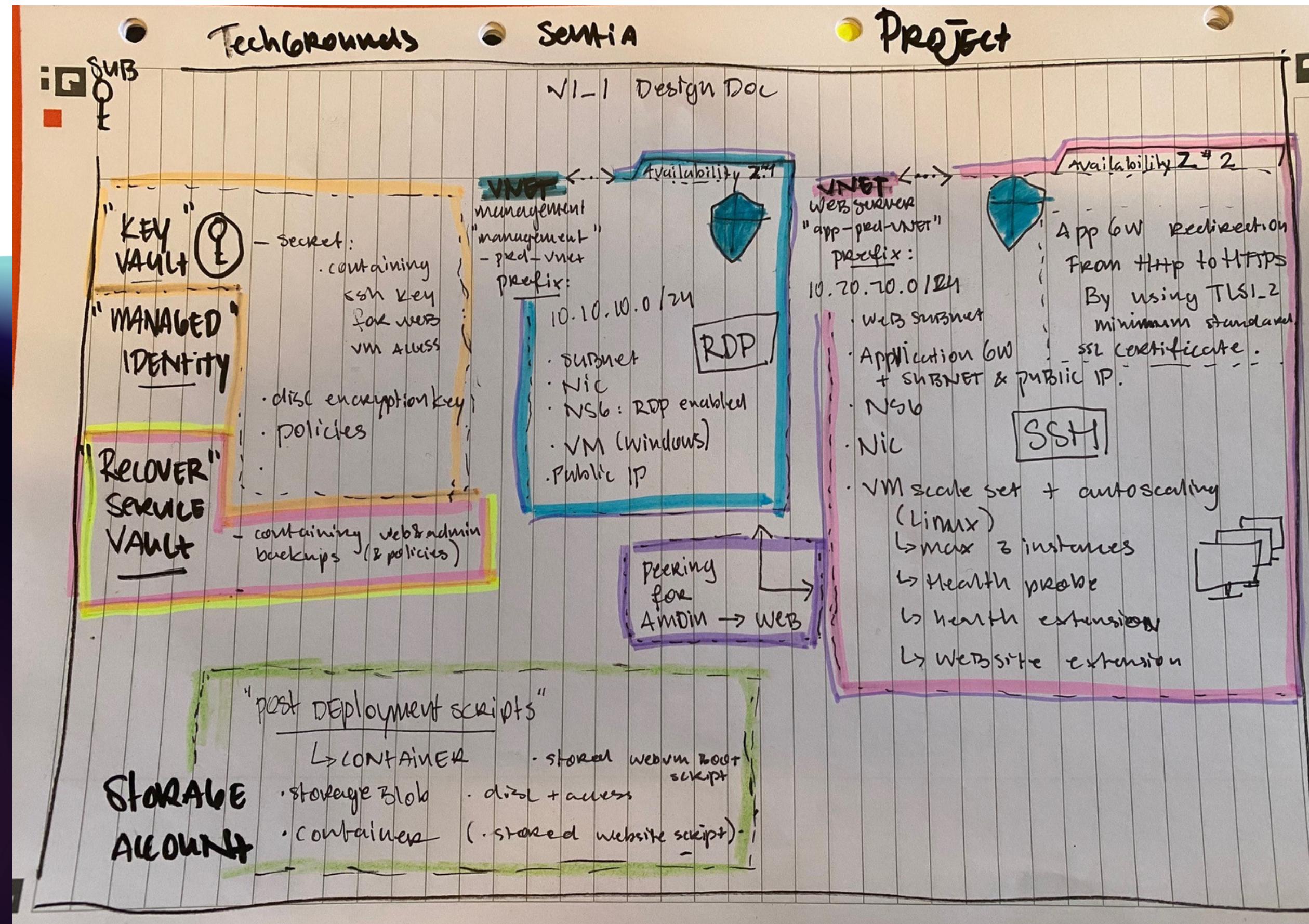
TOPIC 1:

# V1.0 SCOPE



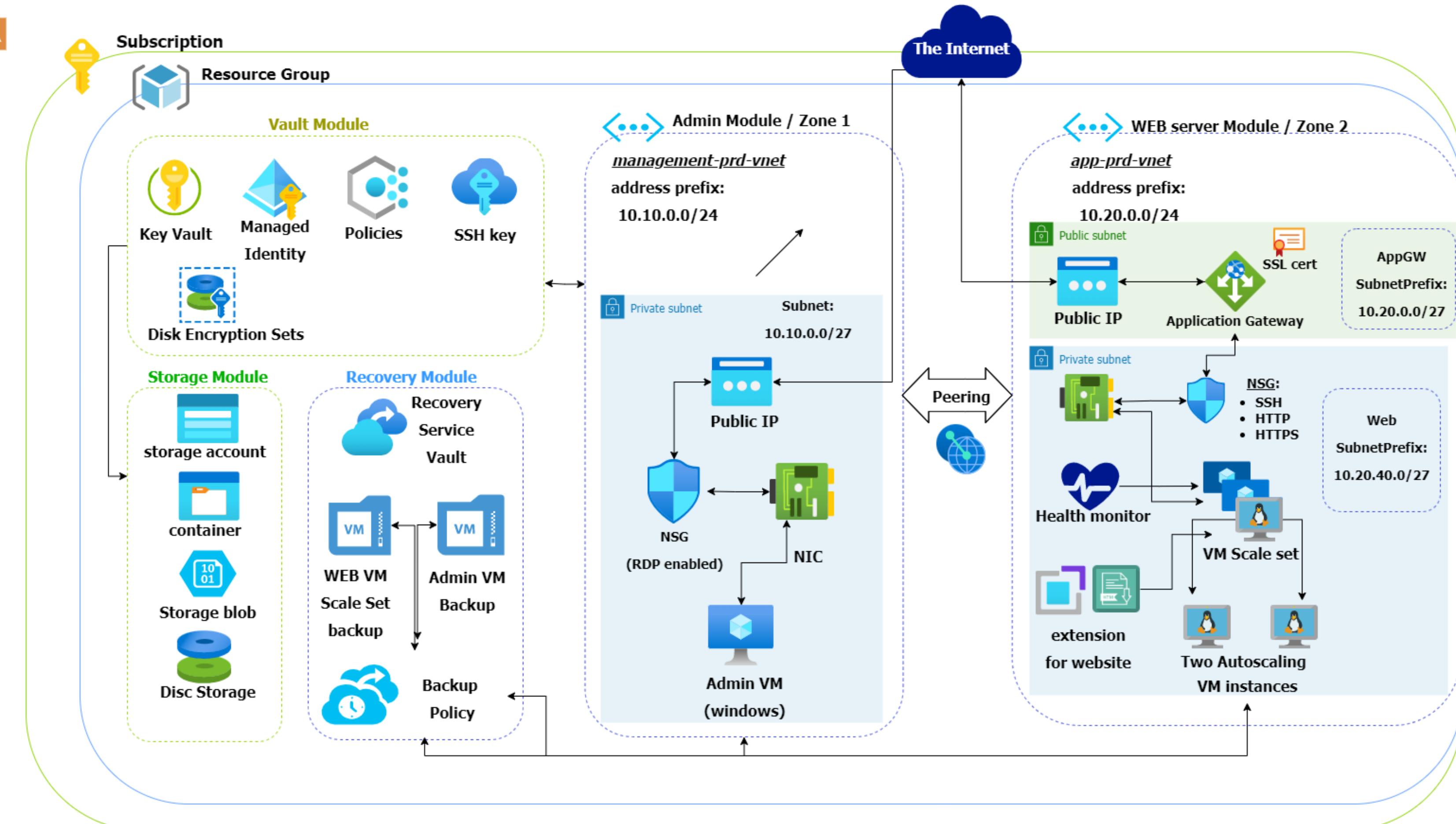
# V1.1 SCOPE // DESIGN DIAGRAM

1:

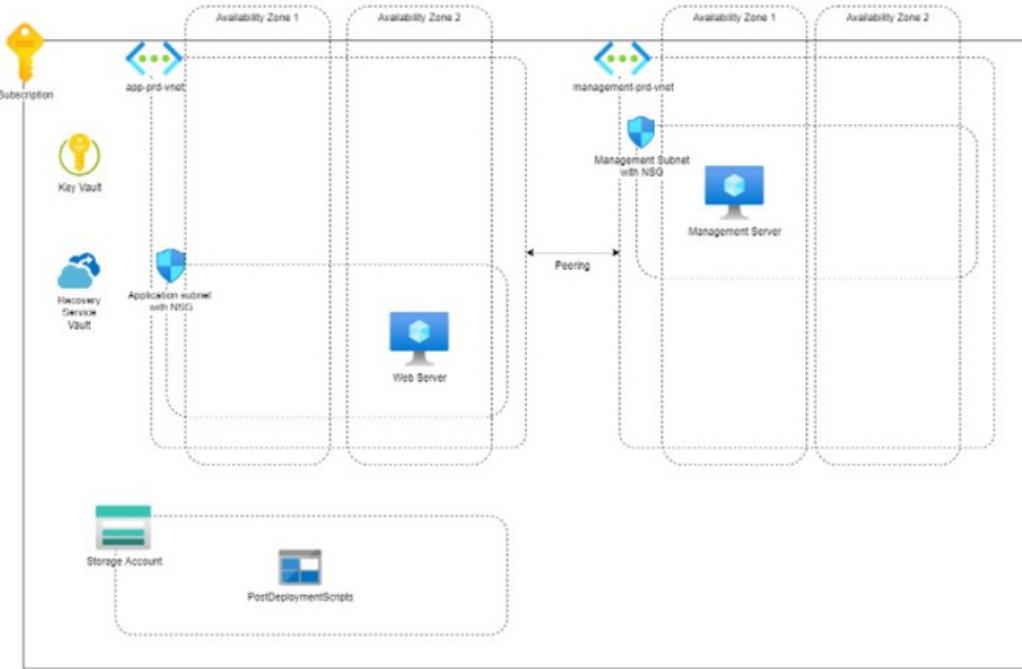


# V1.1 SCOPE // DESIGN DIAGRAM

2:



# WHAT\_HOW\_WHY



```

PROJECT > BicepTemplates > main.bicep
PROJECt > BicepTemplates > main.bicep > accessPolicies
165     <resource> vnet1Config: 'Microsoft.Network/virtualNetworks@2020-05-01' = {
166         addressSpacePrefix: '10.20.20.0/24'
167         subnetName: 'subnet2'
168         subnetPrefix: '10.20.20.0/24'
169     }
170
171     <resource> vnet1: 'Microsoft.Network/virtualNetworks@2020-05-01' = {
172         dependsOn: [
173             ProjectStorage
174         ]
175         name: vnet1Name
176         location: location
177         properties:
178             addressSpace: [
179                 <resource> vnet1Config.addressSpacePrefix
180             ]
181             subnets: [
182                 <resource> vnet1Config.subnetName
183                 properties: {
184                     addressPrefix: vnet1Config.addressPrefix
185                 }
186             ]
187         }
188     }
189
190     <resource> vnet2Config: 'Microsoft.Network/virtualNetworks@2020-05-01' = {
191         dependsOn: [
192             ProjectStorage
193         ]
194         name: vnet2Name
195         properties: {
196             allowVirtualNetworkAccess: true
197             allowForwardedTraffic: false
198             allowGatewayTransit: false
199             useRemoteGateways: false
200             remoteVirtualNetwork: {
201                 id: vnet2.id
202             }
203         }
204     }
205
206     <resource> vnet2: 'Microsoft.Network/virtualNetworks@2020-05-01' = {
207         dependsOn: [
208             vnet1Config
209         ]
210         name: vnet2Name
211         properties: {
212             allowVirtualNetworkAccess: true
213             allowForwardedTraffic: false
214             allowGatewayTransit: false
215             useRemoteGateways: false
216             remoteVirtualNetwork: {
217                 id: vnet1.id
218             }
219         }
220     }
221
222     <resource> VnetPeering1: 'Microsoft.Network/virtualNetworks/virtualNetworkPeering@2020-05-01' = {
223         parent: vnet1
224         name: '${vnet1Name}-${vnet2Name}'
225         properties: {
226             allowVirtualNetworkAccess: true
227             allowForwardedTraffic: false
228             allowGatewayTransit: false
229             useRemoteGateways: false
230             remoteVirtualNetwork: {
231                 id: vnet2.id
232             }
233         }
234     }
235
236     <resource> VnetPeering2: 'Microsoft.Network/virtualNetworks/virtualNetworkPeering@2020-05-01' = {
237         parent: vnet2
238         name: '${vnet2Name}-${vnet1Name}'
239         properties: {
240             allowVirtualNetworkAccess: true
241             allowForwardedTraffic: false
242             allowGatewayTransit: false
243             useRemoteGateways: false
244             remoteVirtualNetwork: {
245                 id: vnet1.id
246             }
247         }
248     }
249
250     <resource> NSG1: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
251         name: 'app-prod-vnet-nsg'
252         location: location
253         properties: {
254             securityRules: [
255                 <resource> NSGRule1: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
256                     name: 'Allow-HTTP'
257                     priority: 100
258                     direction: 'Inbound'
259                     protocol: 'TCP'
260                     portRange: '80'
261                     sourceAddressPrefix: '*'
262                     destinationAddressPrefix: '*'
263                     access: 'Allow'
264                     direction: 'Inbound'
265                 }
266             ]
267         }
268     }
269
270     <resource> NSG2: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
271         name: 'management-prod-vnet-nsg'
272         location: location
273         properties: {
274             securityRules: [
275                 <resource> NSGRule2: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
276                     name: 'Allow-HTTP'
277                     priority: 100
278                     direction: 'Inbound'
279                     protocol: 'TCP'
280                     portRange: '80'
281                     sourceAddressPrefix: '*'
282                     destinationAddressPrefix: '*'
283                     access: 'Allow'
284                     direction: 'Inbound'
285                 }
286             ]
287         }
288     }
289
290     <resource> NSG3: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
291         name: 'Management Subnet with NSG'
292         location: location
293         properties: {
294             securityRules: [
295                 <resource> NSGRule3: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
296                     name: 'Allow-HTTP'
297                     priority: 100
298                     direction: 'Inbound'
299                     protocol: 'TCP'
300                     portRange: '80'
301                     sourceAddressPrefix: '*'
302                     destinationAddressPrefix: '*'
303                     access: 'Allow'
304                     direction: 'Inbound'
305                 }
306             ]
307         }
308     }
309
310     <resource> NSG4: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
311         name: 'Application gateway with NSG'
312         location: location
313         properties: {
314             securityRules: [
315                 <resource> NSGRule4: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
316                     name: 'Allow-HTTP'
317                     priority: 100
318                     direction: 'Inbound'
319                     protocol: 'TCP'
320                     portRange: '80'
321                     sourceAddressPrefix: '*'
322                     destinationAddressPrefix: '*'
323                     access: 'Allow'
324                     direction: 'Inbound'
325                 }
326             ]
327         }
328     }
329
330     <resource> NSG5: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
331         name: 'Web Server'
332         location: location
333         properties: {
334             securityRules: [
335                 <resource> NSGRule5: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
336                     name: 'Allow-HTTP'
337                     priority: 100
338                     direction: 'Inbound'
339                     protocol: 'TCP'
340                     portRange: '80'
341                     sourceAddressPrefix: '*'
342                     destinationAddressPrefix: '*'
343                     access: 'Allow'
344                     direction: 'Inbound'
345                 }
346             ]
347         }
348     }
349
350     <resource> NSG6: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
351         name: 'Management Server'
352         location: location
353         properties: {
354             securityRules: [
355                 <resource> NSGRule6: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
356                     name: 'Allow-HTTP'
357                     priority: 100
358                     direction: 'Inbound'
359                     protocol: 'TCP'
360                     portRange: '80'
361                     sourceAddressPrefix: '*'
362                     destinationAddressPrefix: '*'
363                     access: 'Allow'
364                     direction: 'Inbound'
365                 }
366             ]
367         }
368     }
369
370     <resource> NSG7: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
371         name: 'PostDeploymentScripts'
372         location: location
373         properties: {
374             securityRules: [
375                 <resource> NSGRule7: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
376                     name: 'Allow-HTTP'
377                     priority: 100
378                     direction: 'Inbound'
379                     protocol: 'TCP'
380                     portRange: '80'
381                     sourceAddressPrefix: '*'
382                     destinationAddressPrefix: '*'
383                     access: 'Allow'
384                     direction: 'Inbound'
385                 }
386             ]
387         }
388     }
389
390     <resource> NSG8: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
391         name: 'App-prod-vnet'
392         location: location
393         properties: {
394             securityRules: [
395                 <resource> NSGRule8: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
396                     name: 'Allow-HTTP'
397                     priority: 100
398                     direction: 'Inbound'
399                     protocol: 'TCP'
400                     portRange: '80'
401                     sourceAddressPrefix: '*'
402                     destinationAddressPrefix: '*'
403                     access: 'Allow'
404                     direction: 'Inbound'
405                 }
406             ]
407         }
408     }
409
410     <resource> NSG9: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
411         name: 'management-prod-vnet'
412         location: location
413         properties: {
414             securityRules: [
415                 <resource> NSGRule9: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
416                     name: 'Allow-HTTP'
417                     priority: 100
418                     direction: 'Inbound'
419                     protocol: 'TCP'
420                     portRange: '80'
421                     sourceAddressPrefix: '*'
422                     destinationAddressPrefix: '*'
423                     access: 'Allow'
424                     direction: 'Inbound'
425                 }
426             ]
427         }
428     }
429
430     <resource> NSG10: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
431         name: 'Management Subnet with NSG'
432         location: location
433         properties: {
434             securityRules: [
435                 <resource> NSGRule10: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
436                     name: 'Allow-HTTP'
437                     priority: 100
438                     direction: 'Inbound'
439                     protocol: 'TCP'
440                     portRange: '80'
441                     sourceAddressPrefix: '*'
442                     destinationAddressPrefix: '*'
443                     access: 'Allow'
444                     direction: 'Inbound'
445                 }
446             ]
447         }
448     }
449
450     <resource> NSG11: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
451         name: 'Application gateway with NSG'
452         location: location
453         properties: {
454             securityRules: [
455                 <resource> NSGRule11: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
456                     name: 'Allow-HTTP'
457                     priority: 100
458                     direction: 'Inbound'
459                     protocol: 'TCP'
460                     portRange: '80'
461                     sourceAddressPrefix: '*'
462                     destinationAddressPrefix: '*'
463                     access: 'Allow'
464                     direction: 'Inbound'
465                 }
466             ]
467         }
468     }
469
470     <resource> NSG12: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
471         name: 'Web Server'
472         location: location
473         properties: {
474             securityRules: [
475                 <resource> NSGRule12: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
476                     name: 'Allow-HTTP'
477                     priority: 100
478                     direction: 'Inbound'
479                     protocol: 'TCP'
480                     portRange: '80'
481                     sourceAddressPrefix: '*'
482                     destinationAddressPrefix: '*'
483                     access: 'Allow'
484                     direction: 'Inbound'
485                 }
486             ]
487         }
488     }
489
490     <resource> NSG13: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
491         name: 'Management Server'
492         location: location
493         properties: {
494             securityRules: [
495                 <resource> NSGRule13: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
496                     name: 'Allow-HTTP'
497                     priority: 100
498                     direction: 'Inbound'
499                     protocol: 'TCP'
500                     portRange: '80'
501                     sourceAddressPrefix: '*'
502                     destinationAddressPrefix: '*'
503                     access: 'Allow'
504                     direction: 'Inbound'
505                 }
506             ]
507         }
508     }
509
510     <resource> NSG14: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
511         name: 'PostDeploymentScripts'
512         location: location
513         properties: {
514             securityRules: [
515                 <resource> NSGRule14: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
516                     name: 'Allow-HTTP'
517                     priority: 100
518                     direction: 'Inbound'
519                     protocol: 'TCP'
520                     portRange: '80'
521                     sourceAddressPrefix: '*'
522                     destinationAddressPrefix: '*'
523                     access: 'Allow'
524                     direction: 'Inbound'
525                 }
526             ]
527         }
528     }
529
530     <resource> NSG15: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
531         name: 'app-prod-vnet'
532         location: location
533         properties: {
534             securityRules: [
535                 <resource> NSGRule15: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
536                     name: 'Allow-HTTP'
537                     priority: 100
538                     direction: 'Inbound'
539                     protocol: 'TCP'
540                     portRange: '80'
541                     sourceAddressPrefix: '*'
542                     destinationAddressPrefix: '*'
543                     access: 'Allow'
544                     direction: 'Inbound'
545                 }
546             ]
547         }
548     }
549
550     <resource> NSG16: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
551         name: 'management-prod-vnet'
552         location: location
553         properties: {
554             securityRules: [
555                 <resource> NSGRule16: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
556                     name: 'Allow-HTTP'
557                     priority: 100
558                     direction: 'Inbound'
559                     protocol: 'TCP'
560                     portRange: '80'
561                     sourceAddressPrefix: '*'
562                     destinationAddressPrefix: '*'
563                     access: 'Allow'
564                     direction: 'Inbound'
565                 }
566             ]
567         }
568     }
569
570     <resource> NSG17: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
571         name: 'Management Subnet with NSG'
572         location: location
573         properties: {
574             securityRules: [
575                 <resource> NSGRule17: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
576                     name: 'Allow-HTTP'
577                     priority: 100
578                     direction: 'Inbound'
579                     protocol: 'TCP'
580                     portRange: '80'
581                     sourceAddressPrefix: '*'
582                     destinationAddressPrefix: '*'
583                     access: 'Allow'
584                     direction: 'Inbound'
585                 }
586             ]
587         }
588     }
589
590     <resource> NSG18: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
591         name: 'Application gateway with NSG'
592         location: location
593         properties: {
594             securityRules: [
595                 <resource> NSGRule18: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
596                     name: 'Allow-HTTP'
597                     priority: 100
598                     direction: 'Inbound'
599                     protocol: 'TCP'
600                     portRange: '80'
601                     sourceAddressPrefix: '*'
602                     destinationAddressPrefix: '*'
603                     access: 'Allow'
604                     direction: 'Inbound'
605                 }
606             ]
607         }
608     }
609
610     <resource> NSG19: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
611         name: 'Web Server'
612         location: location
613         properties: {
614             securityRules: [
615                 <resource> NSGRule19: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
616                     name: 'Allow-HTTP'
617                     priority: 100
618                     direction: 'Inbound'
619                     protocol: 'TCP'
620                     portRange: '80'
621                     sourceAddressPrefix: '*'
622                     destinationAddressPrefix: '*'
623                     access: 'Allow'
624                     direction: 'Inbound'
625                 }
626             ]
627         }
628     }
629
630     <resource> NSG20: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
631         name: 'Management Server'
632         location: location
633         properties: {
634             securityRules: [
635                 <resource> NSGRule20: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
636                     name: 'Allow-HTTP'
637                     priority: 100
638                     direction: 'Inbound'
639                     protocol: 'TCP'
640                     portRange: '80'
641                     sourceAddressPrefix: '*'
642                     destinationAddressPrefix: '*'
643                     access: 'Allow'
644                     direction: 'Inbound'
645                 }
646             ]
647         }
648     }
649
650     <resource> NSG21: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
651         name: 'PostDeploymentScripts'
652         location: location
653         properties: {
654             securityRules: [
655                 <resource> NSGRule21: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
656                     name: 'Allow-HTTP'
657                     priority: 100
658                     direction: 'Inbound'
659                     protocol: 'TCP'
660                     portRange: '80'
661                     sourceAddressPrefix: '*'
662                     destinationAddressPrefix: '*'
663                     access: 'Allow'
664                     direction: 'Inbound'
665                 }
666             ]
667         }
668     }
669
670     <resource> NSG22: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
671         name: 'app-prod-vnet'
672         location: location
673         properties: {
674             securityRules: [
675                 <resource> NSGRule22: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
676                     name: 'Allow-HTTP'
677                     priority: 100
678                     direction: 'Inbound'
679                     protocol: 'TCP'
680                     portRange: '80'
681                     sourceAddressPrefix: '*'
682                     destinationAddressPrefix: '*'
683                     access: 'Allow'
684                     direction: 'Inbound'
685                 }
686             ]
687         }
688     }
689
690     <resource> NSG23: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
691         name: 'management-prod-vnet'
692         location: location
693         properties: {
694             securityRules: [
695                 <resource> NSGRule23: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
696                     name: 'Allow-HTTP'
697                     priority: 100
698                     direction: 'Inbound'
699                     protocol: 'TCP'
700                     portRange: '80'
701                     sourceAddressPrefix: '*'
702                     destinationAddressPrefix: '*'
703                     access: 'Allow'
704                     direction: 'Inbound'
705                 }
706             ]
707         }
708     }
709
710     <resource> NSG24: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
711         name: 'Management Subnet with NSG'
712         location: location
713         properties: {
714             securityRules: [
715                 <resource> NSGRule24: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
716                     name: 'Allow-HTTP'
717                     priority: 100
718                     direction: 'Inbound'
719                     protocol: 'TCP'
720                     portRange: '80'
721                     sourceAddressPrefix: '*'
722                     destinationAddressPrefix: '*'
723                     access: 'Allow'
724                     direction: 'Inbound'
725                 }
726             ]
727         }
728     }
729
730     <resource> NSG25: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
731         name: 'Application gateway with NSG'
732         location: location
733         properties: {
734             securityRules: [
735                 <resource> NSGRule25: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
736                     name: 'Allow-HTTP'
737                     priority: 100
738                     direction: 'Inbound'
739                     protocol: 'TCP'
740                     portRange: '80'
741                     sourceAddressPrefix: '*'
742                     destinationAddressPrefix: '*'
743                     access: 'Allow'
744                     direction: 'Inbound'
745                 }
746             ]
747         }
748     }
749
750     <resource> NSG26: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
751         name: 'Web Server'
752         location: location
753         properties: {
754             securityRules: [
755                 <resource> NSGRule26: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
756                     name: 'Allow-HTTP'
757                     priority: 100
758                     direction: 'Inbound'
759                     protocol: 'TCP'
760                     portRange: '80'
761                     sourceAddressPrefix: '*'
762                     destinationAddressPrefix: '*'
763                     access: 'Allow'
764                     direction: 'Inbound'
765                 }
766             ]
767         }
768     }
769
770     <resource> NSG27: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
771         name: 'Management Server'
772         location: location
773         properties: {
774             securityRules: [
775                 <resource> NSGRule27: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
776                     name: 'Allow-HTTP'
777                     priority: 100
778                     direction: 'Inbound'
779                     protocol: 'TCP'
780                     portRange: '80'
781                     sourceAddressPrefix: '*'
782                     destinationAddressPrefix: '*'
783                     access: 'Allow'
784                     direction: 'Inbound'
785                 }
786             ]
787         }
788     }
789
790     <resource> NSG28: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
791         name: 'PostDeploymentScripts'
792         location: location
793         properties: {
794             securityRules: [
795                 <resource> NSGRule28: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
796                     name: 'Allow-HTTP'
797                     priority: 100
798                     direction: 'Inbound'
799                     protocol: 'TCP'
800                     portRange: '80'
801                     sourceAddressPrefix: '*'
802                     destinationAddressPrefix: '*'
803                     access: 'Allow'
804                     direction: 'Inbound'
805                 }
806             ]
807         }
808     }
809
810     <resource> NSG29: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
811         name: 'app-prod-vnet'
812         location: location
813         properties: {
814             securityRules: [
815                 <resource> NSGRule29: 'Microsoft.Network/networkSecurityRules@2020-05-01' = {
816                     name: 'Allow-HTTP'
817                     priority: 100
818                     direction: 'Inbound'
819                     protocol: 'TCP'
820                     portRange: '80'
821                     sourceAddressPrefix: '*'
822                     destinationAddressPrefix: '*'
823                     access: 'Allow'
824                     direction: 'Inbound'
825                 }
826             ]
827         }
828     }
829
830     <resource> NSG30: 'Microsoft.Network/networkSecurityGroups@2020-05-01' = {
831         name: 'management-prod-vnet'
832         location: location
833         properties: {
834             securityRules: [
835                 <resource> NSGRule30: 'Microsoft.Network/networkSecurityRules@20
```

# WHAT WAS MY APPROACH?



What is  
Bicep?  
declarative coding

How do i  
write the  
code?

How do i  
make the  
template?

How do i  
deploy the  
template?

# WHAT DO I HAVE?

- LAYOUT MAIN.BICEP FILE
- DIAGRAM V1\_O
- DIAGRAM V1\_1
- INSIGHTS OF THE MODULES

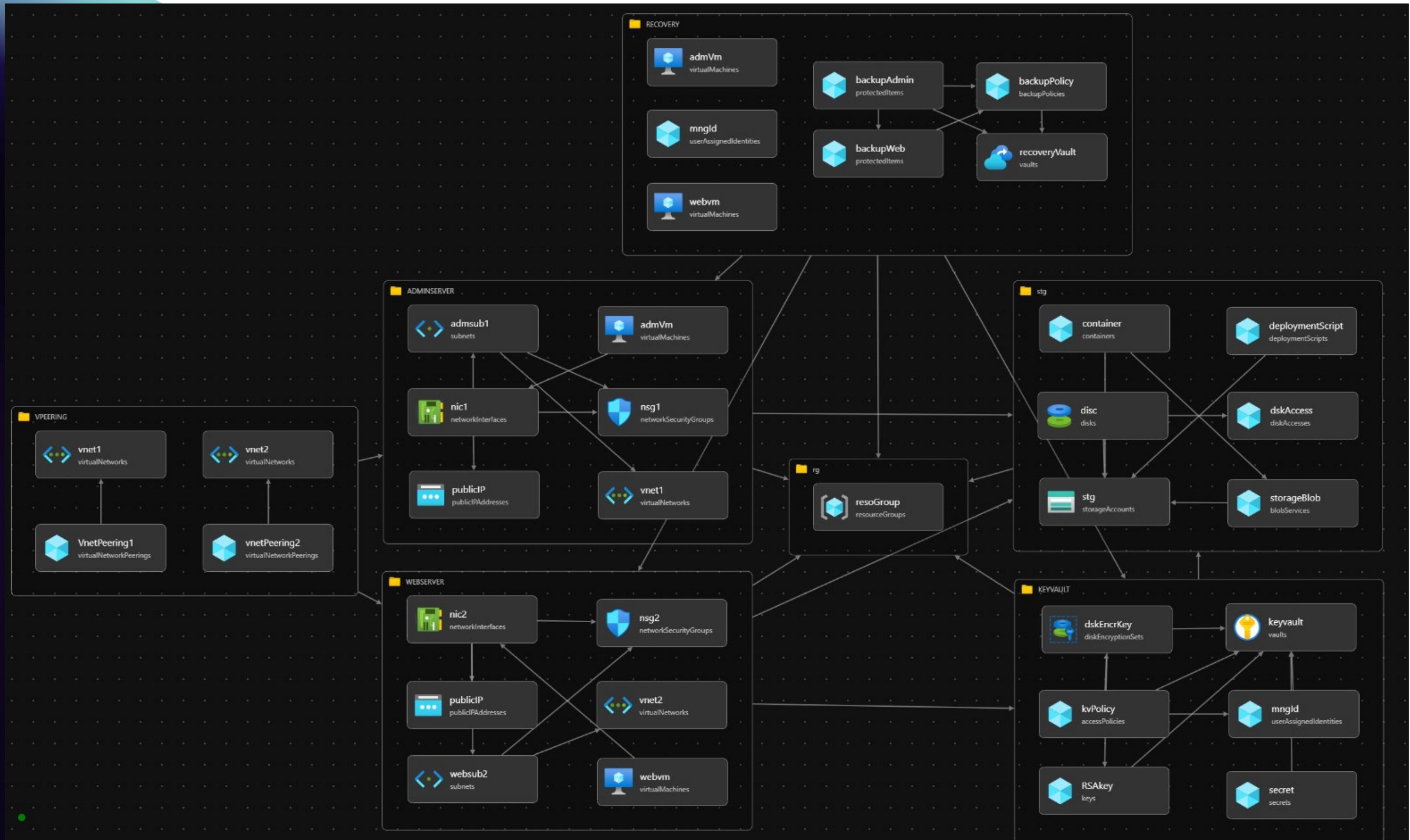
# /Main.bicep

containing:

- RESOURCEGROUP
- STORAGE ACCOUNT
- ADMINSERVER
- WEBSERVER
- PEERING
- KEYVAULT
- RECOVERY SERVICE VAULT

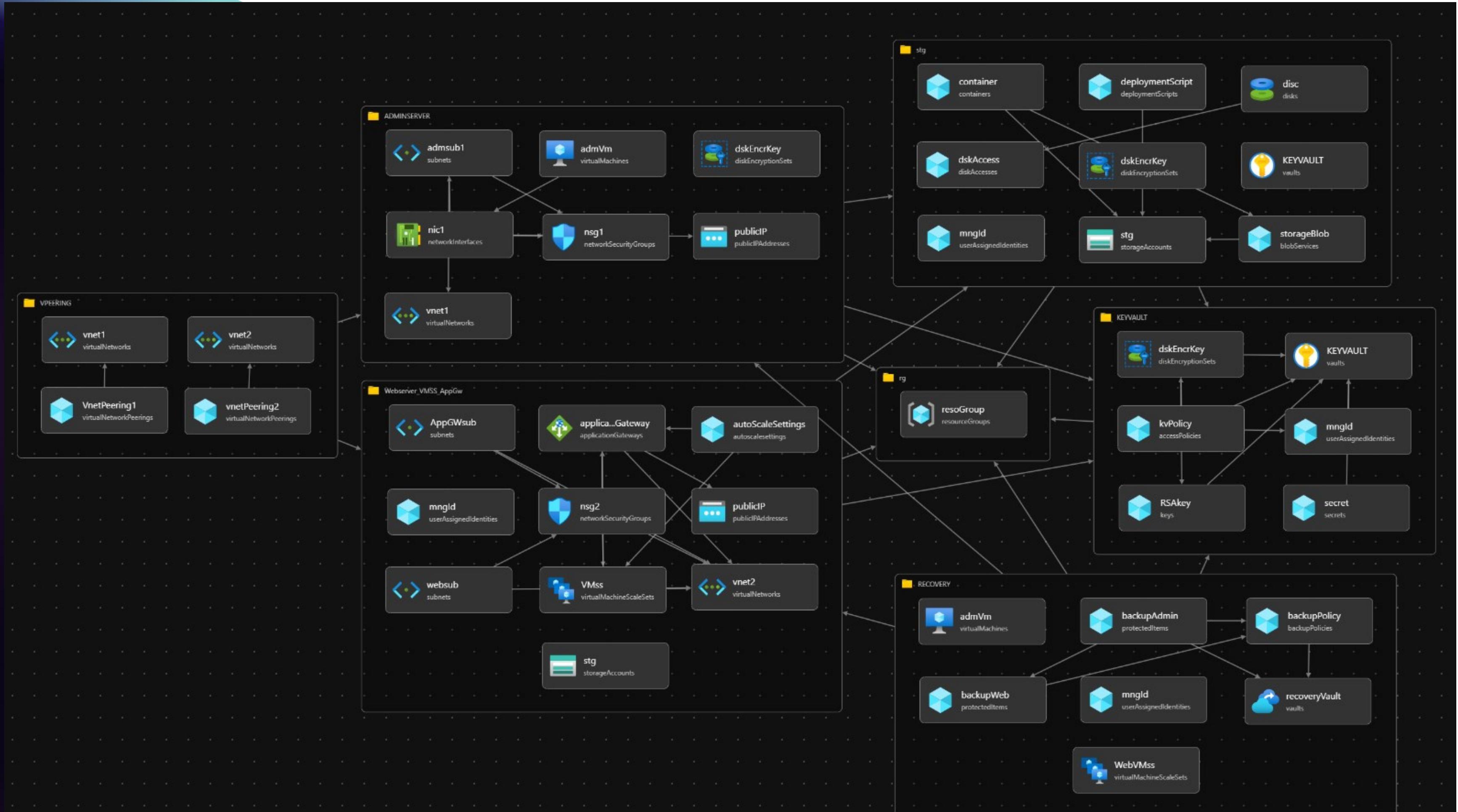
## MODULES

# DIAGRAM V1\_O



TOPIC 3:

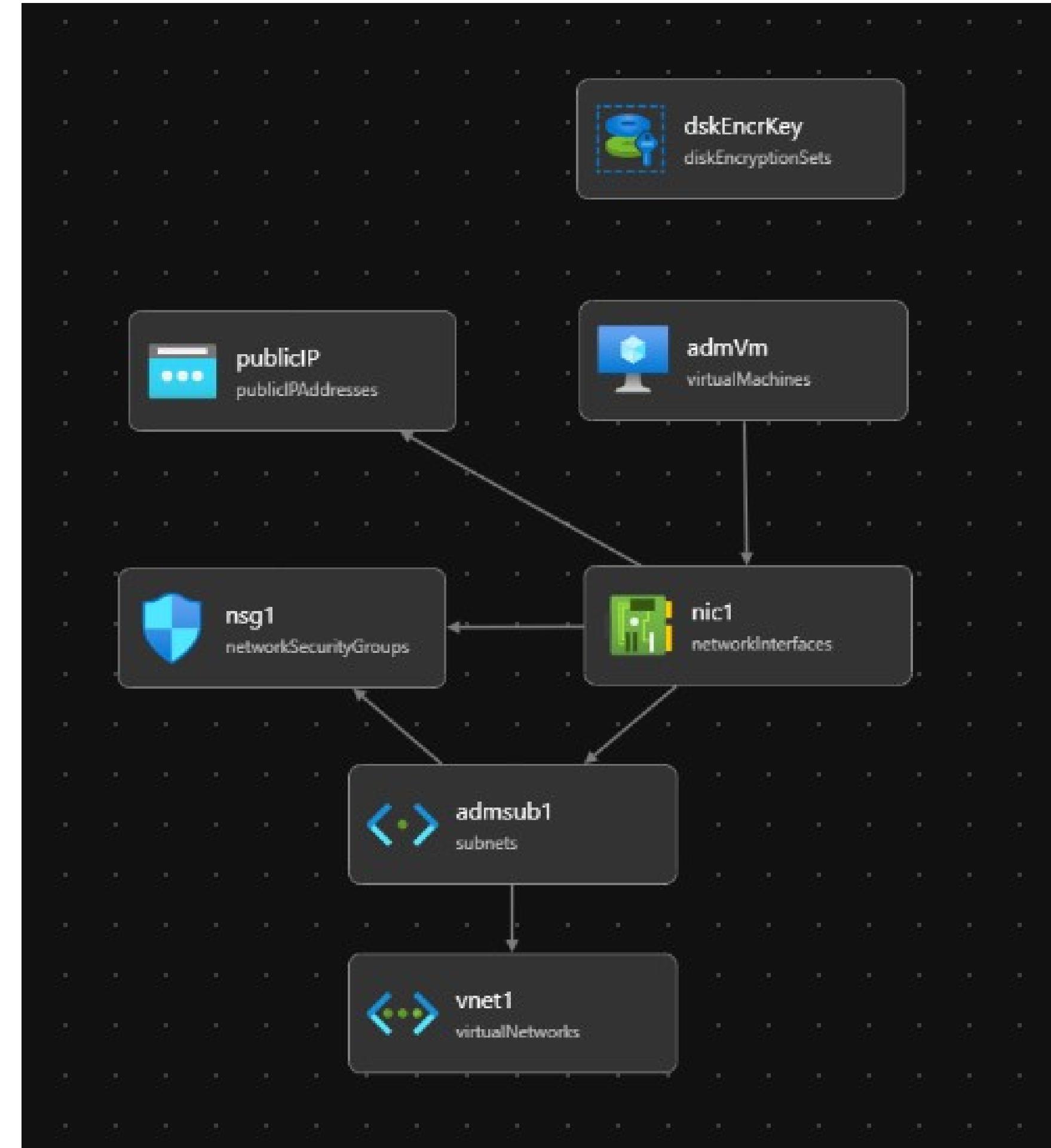
# DIAGRAM V1\_1



# ADMIN SERVER

MODULE

TOPIC 3:



# ADMIN SERVER

MODULE

TOPIC 3:

management-prd-vnet | Virtual network

Search (Ctrl+ /) → Move Delete Refresh Give feedback JSON View

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Address space Connected devices Subnets Bastion DDoS protection Firewall Security Network manager DNS servers Peerings Service endpoints Private endpoints Properties

Resource group (move) : ZenTia Address space : 10.10.0.0/16 Location (move) : West Europe DNS servers : Azure provided DNS service Subscription (move) : Jamal Tadrous Flow timeout : Configure Subscription ID : 214bb771-fd30-4f8e-9dfc-7195f7b165ff BGP community string : Configure Virtual network ID : cb2d4dcf-86b4-41f8-b33e-7227fe39369b

Tags (edit) : Click here to add tags

Topology Capabilities (5) Recommendations Tutorials

management-prd-vnet | Address space

The address space for a virtual network is composed of one or more non-overlapping address ranges that are specified in CIDR notation. The address range you define can be public or private (RFC 1918). Learn more

Address space	Address range	Address count
10.10.0.0/16	10.10.0.0 - 10.10.255.255	65536

Add additional address range

Peered virtual network address space

Peering name	Peered to	Address space	Address range
management-prd-vnet-app-prod-vnet	app-prod-vnet	10.20.0.0/16	10.20.0.0 - 10.20.255.255

# ADMIN SERVER

MODULE

TOPIC 3:

adminserv | Networking

Virtual machine

Search (Ctrl+ /)

Attach network interface Detach network interface Feedback

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Settings

Networking Connect Windows Admin Center (preview) Disks Size Security Advisor recommendations Extensions + applications Continuous delivery

adminnic

IP configuration ipconfig1 (Primary)

Network Interface: adminnic Effective security rules Troubleshoot VM connection issues Topology

Virtual network/subnet: management-prd-vnet/admsubnet NIC Public IP: 13.80.97.55 NIC Private IP: 10.10.0.4 Accelerated networking: Disabled

Inbound port rules Outbound port rules Application security groups Load balancing

Network security group adminNSG (attached to subnet: admsubnet)  
Impacts 1 subnets, 1 network interfaces

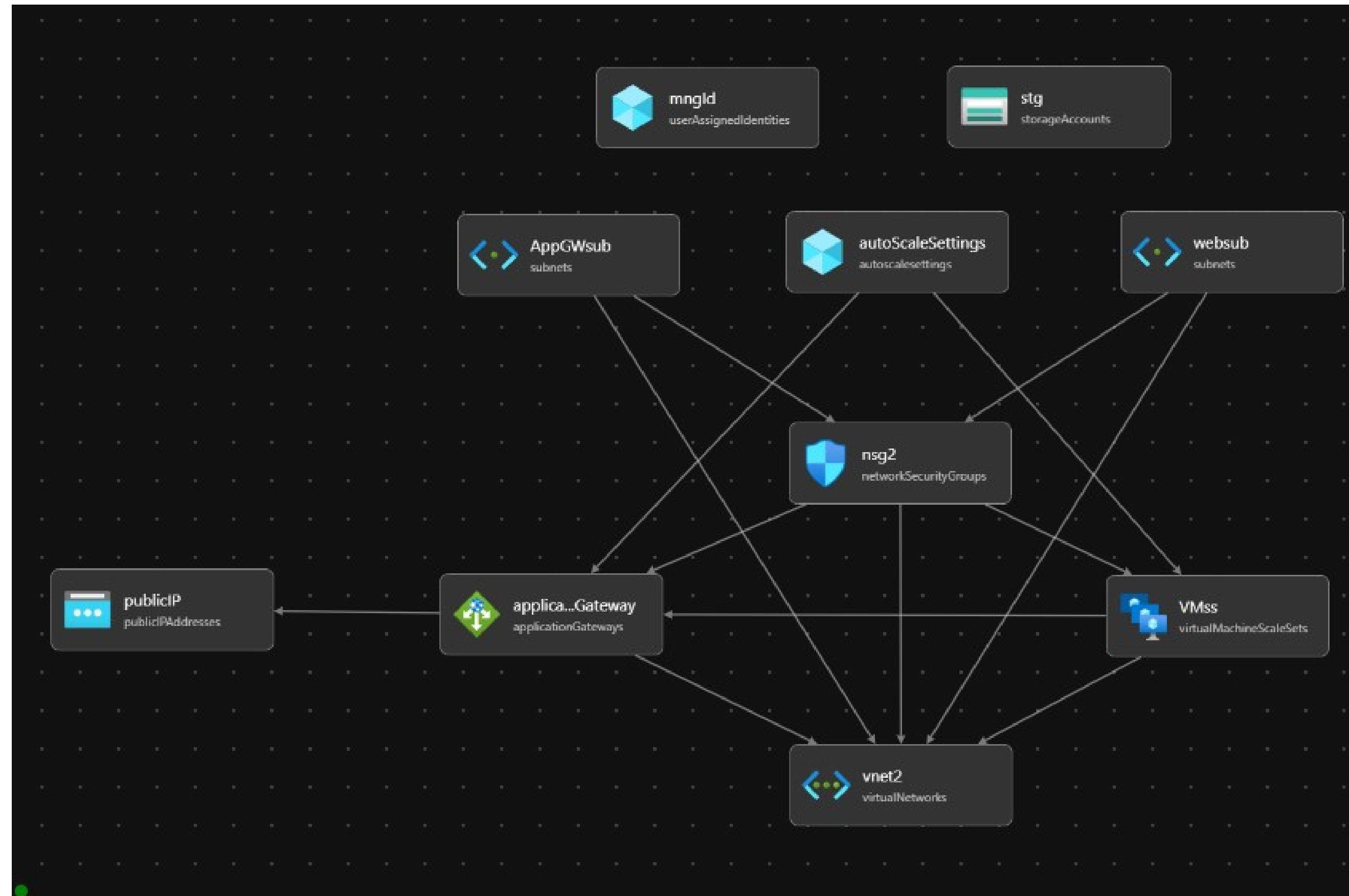
Add inbound port rule

Priority	Name	Port	Protocol	Source	Destination	A
300	RDP	3389	TCP	84.83.9.144	Any	✓
1000	SSH	22	TCP	84.83.9.144	Any	✓
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	✓
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any	✓
65500	DenyAllInBound	Any	Any	Any	Any	✗

# WEB SERVER

MODULE

TOPIC 3:



# WEB SERVER

MODULE

TOPIC 3:

WebVMss Virtual machine scale set

Search (Ctrl+ /) Move Start Restart Stop Delete Refresh Feedback JSON View

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource group (move) : ZenTia Status 1 out of 1 succeeded Location West Europe Subscription (move) : Jamal Tadrous Subscription ID 214bb771-fd30-4f8e-9dfc-7195f7b165ff Tags (edit) Click here to add tags

Operating system : Linux Size : Standard\_B1s (1 instance) Public IP address : - Public IP address (IPv6) : - Virtual network/subnet : app-prod-vnet/WebSubnet Orchestration mode : Uniform

Properties Monitoring Capabilities (6) Recommendations Tutorials

**Virtual machine profile**

Operating system	Linux
Publisher	Canonical
Offer	UbuntuServer
Plan	18.04-LTS
Capacity reservation group	-

**Networking**

Public IP address	-
Public IP address (IPv6)	-
Virtual network/subnet	app-prod-vnet/WebSubnet

**Availability + scaling**

Availability zone	-
Proximity placement group	-
Colocation status	-
Host group	-

**Size**

Size	Standard_B1s
vCPUs	1
RAM	1 GiB

**Disk**

OS disk	Standard SSD LRS
Encryption at host	Disabled
Ultra disk compatibility	Disabled

app-prod-vnet | Subnets

Virtual network

Search (Ctrl+ /) Subnet Gateway subnet Refresh Manage users Delete

Search subnets

Name ↑↓	IPv4 ↑↓	IPv6 ↑↓	Available IPs ↑↓	Delegated to ↑↓	Security group ↑↓
WebSubnet	10.20.40.0/27	-	25	-	webNSG
AppGWSubnet	10.20.0.0/27	-	availability dependent on dynamic use	-	webNSG

# WEB SERVER

MODULE

TOPIC 3:

webAppGW Application gateway

Search (Ctrl+ /) Delete Refresh

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Settings Configuration

webNSG Network security group

Search (Ctrl+ /) Move Delete Refresh Give feedback

Resource group (move) ZenTia Virtual network/subnet app-prod-vnet/AppGWSubnet

Location West Europe Frontend public IP address 20.224.107.19 (webAppGW-pip)

Subscription (move) Jamal Tadrous Frontend private IP address -

Subscription ID 214bb771-fd30-4f8e-9dfc-7195f7b165ff Tier Standard V2

Tags (edit) Click here to add tags

Custom security rules 4 inbound, 2 outbound Associated with 2 subnets, 0 network interfaces

Location : West Europe Subscription (move) : Jamal Tadrous Subscription ID : 214bb771-fd30-4f8e-9dfc-7195f7b165ff Tags (edit) : Click here to add tags

Filter by name Port == all Protocol == all Source == all Destination == all Action == all

Priority ↑	Name ↑	Port ↑	Protocol ↑	Source ↑	Destination ↑	Action ↑
100	HTTPIn	80	Tcp	Internet	Any	Allow
120	HTTPSSin	443	Tcp	Internet	Any	Allow
160	sshin	22	Tcp	84.83.9.144	Any	Allow
180	GatewayManager	65200-65535	Tcp	Any	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalanc...	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny
Outbound Security Rules						
200	sshowt	22	Tcp	84.83.9.144	Any	Allow
220	HTTPSSout	443	Tcp	Internet	Any	Allow
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow

# WEB SERVER

MODULE

TOPIC 3:

Home > All resources > WebVMss >

### WebVMss\_0

Scale set instance

Search (Ctrl+ /) <>

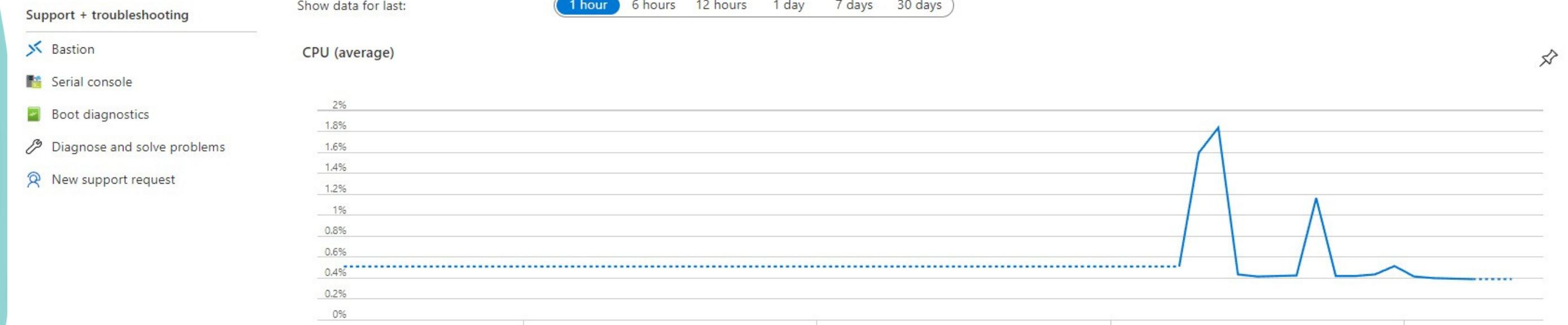
Connect Start Restart Stop Reimage Delete Refresh Protection Policy

Overview

^ Essentials

Settings	Instance ID : 0	Public IP address : -
Networking	Status : Running_1 more	Private IP address : 10.20.40.4
Connect	Location : West Europe (Zone 2)	Public IP address (IPv6) : -
Disks	Provisioning state : Succeeded	Private IP address (IPv6) : -
Properties	Latest model applied : Yes	Virtual network/subnet : app-prod-vnet/WebSubnet
Monitoring	Computer name : WebVM000000	Disk : WebVMss_WebVMss_0_OsDisk_1_1ba77f7421f94ec8962f40f865f28833
Insights	Fault domain : 1	Protection Policy : -
Metrics	SKU : Standard_B1s	Health state : Healthy
Tags (edit)	Click here to add tags	

Show data for last: 1 hour 6 hours 12 hours 1 day 7 days 30 days



All resources

Standaardmap

+ Create Manage view <>

Filter for any field...

Name	...
adminserv	...
adminvmstorage	...
app-prod-vnet	...
deployscript20220411T211423Z	...
diskAccess	...

WebVMss | Instances

Virtual machine scale set

Search (Ctrl+ /) <>

Start Restart Stop Reimage Delete Refresh Protection Policy

Overview

Search virtual machine instances

Name	Computer name	Status	Health state	Provisioning state
WebVMss_0	WebVM000000	Running	Healthy	Succeeded

When an instance returns 200 (OK) on the port configured for health probes, then the "Health state" in table above shows Healthy.

Activity log  
Access control (IAM)  
Tags  
Diagnose and solve problems  
Settings  
Instances  
Networking

# ADMIN peering WEB

## TOPIC 3:

The screenshot shows a Windows desktop environment with the following elements:

- PowerShell Window:** An Administrator: Windows PowerShell window titled "Administrator: Windows PowerShell" is open. It displays the following command history and output:

```
PS C:\Users\jamaltadrous> ^C
PS C:\Users\jamaltadrous> ping 10.20.40.4

Pinging 10.20.40.4 with 32 bytes of data:
Reply from 10.20.40.4: bytes=32 time=2ms TTL=64
Reply from 10.20.40.4: bytes=32 time<1ms TTL=64
Reply from 10.20.40.4: bytes=32 time=1ms TTL=64
Reply from 10.20.40.4: bytes=32 time=1ms TTL=64

Ping statistics for 10.20.40.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 1ms
PS C:\Users\jamaltadrous> Test-NetConnection -ComputerName 10.20.40.4 -Port 22
>>

ComputerName      : 10.20.40.4
RemoteAddress     : 10.20.40.4
RemotePort        : 22
InterfaceAlias   : Ethernet
SourceAddress     : 10.10.0.4
TcpTestSucceeded  : True

PS C:\Users\jamaltadrous> ssh jamaltadrous@10.20.40.4
The authenticity of host '10.20.40.4 (10.20.40.4)' can't be established.
ECDSA key fingerprint is SHA256:I8AQ/uxfaL+WUBtI0n7wG/kQPxPk+FibwQJiqJx6QIs.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.20.40.4' (ECDSA) to the list of known hosts.
jamaltadrous@10.20.40.4: Permission denied (publickey).
PS C:\Users\jamaltadrous>
```
- Browser Tab:** A Microsoft Edge browser window is visible in the background, showing a network configuration page with tabs like "What", "Web", "Apache", "Down", "ATES", "Whizlabs", "draw.io", "CODING", and "Try". The main content area shows network interface details and a protection policy section.
- Status Bar:** At the bottom of the screen, there is a status bar with icons for "New support request" and a progress bar indicating 1% completion.

TOPIC 3:

LET ME SEE YOUR CODE !

DEMO  
TIME

LETS SWITCH OVER TO VS CODE!

# TOPIC 3:

## CODE SNIPPITS

### /MAIN.BICEP "MODULES"

RESOURCEGROUP

STORAGE ACCOUNT

ADMIN SERVER

WEBSERVER

PEERING

KEYVAULT

RECOVERY SERVICE VAULT

```
5
6
7 /////////////////__PARAMETERS__///////////
8 //LOCATION
9 //RESOURCE GROUP
10 param location string = 'westeurope'
11 param resourceGroupName string = 'ZenTIA'
12
13
14 ////////////////RESOURCES/////////
15
16 ////////////////RESOURCE GROUP/////////
17
18
19 ////////////////RESOURCE GROUP/////////
20 //RESOURCE GROUP
21
22 module rg './Modules/RESOURCEGROUP.bicep' -{
23   .name: resourceGroupName
24   .params: {
25     .location: location
26     .resourceGroupName: resourceGroupName
27   }
28 }
29
30
31
32 ////////////////STORAGE ACCOUNT/////////
33 //STORAGE ACCOUNT
34 //DEPLOYMENT SCRIPT
35
36 > module stg './Modules/STORAGEACCOUNT.bicep' -{ ...
37   }
38
39
40
41
42 ////////////////ADMIN SERVER/////////
43 //VNET1
44 //SUBNET1
45 //NIC1
46 //NSG1
47 //PublicIP
48 //ADMIN VM(WINDOWS)
49
50
51 //PARAMS
52 param adminUsername1 string = 'jamaltadrous'
53 // @secure()
54 param adminPassword1 string = 'T3chgr0und$'
55
56 //
57 //ADMIN SERVER
58 > module ADMINSERVER './Modules/ADMINSERVER.bicep' -{ ...
59   }
60
61
62
63
64
65
66
67 //ADMIN SERVER
68 > module ADMINSERVER './Modules/ADMINSERVER.bicep' -{ ...
69   }
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84 ////////////////WEBSERVER/////////
85 //VNET2
86 //PublicIP
87 //APPGW
88 //SUBNET
89 //NIC2
90 //NSG2
91
92 //VM SCALESET
93 //Autoscalesettings
94 //FRONTEND POOL/CONFIG
95 //BACKEND POOL/CONFIG
96 //LISTENER
97
98 //PARAMS
99 param adminUsername2 string = 'jamaltadrous'
100 @description('Password for the Virtual Machine.')
101 param adminPassword2 string = 'T3chgr0und$'
102
103 > module Webserver_VMSS_AppGw './Modules/Webserver_VMSS_AppGw.bicep' -{ ...
104   }
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121 ////////////////VNET PEERING/////////
122 //VNET PEERING 1 & 2
123
124 > module VPEERING './Modules/VNETpeering.bicep' -{ ...
125   }
126
127
128
129
130
131
132
133
134
135
136
137 ////////////////KeyVault/////////
138 //VAULT
139 //ManagedIdentity
140 //SECRET(ssh)
141 //RSAkey
142 //DiscEncryptionKey
143 //KV_Policy
144
145 param keyVaultName string = 'ZenTIA${toLowerCase(utcNow())}'
146
147 > module KEYVAULT './Modules/KeyVault.bicep' -{ ...
148   }
149
150
151
152
153
154
155
156
157
158
159
160
161 ////////////////RECOVERY SERVICE VAULT/////////
162 //RECOVERYVAULT
163 //BACKUP_POLICY_WITH_SCHEDULE
164
165 > module RECOVERY './Modules/Recoverymod.bicep' -{ ...
166   }
167
168
169
170
171
172
173
174
175
176
177
178
179
```

## TOPIC 3:

### CODE SNIPPIT

PIC.# 1

/ADMINSERVER.BICEP

"MODULE"

```
ADMINSERVER.BICEP X

PROJECT > ProjectV1_1 > Modules > ADMINSERVER.BICEP > ...
79 | ////////////////////////////////////////////////////////////////////  
80 | //////////////////////////////////////////////////////////////////// RESOURCES ///////////////////////////////////////////////////////////////////  
81 | ////////////////////////////////////////////////////////////////////  
82 |  
83 |  
84 |  
85 |  
86 | //VNets  
87 | > resource vnet1 'Microsoft.Network/virtualNetworks@2021-05-01' = {  
88 |   name: vnet1Name  
89 |   location: location  
90 |   properties: {  
91 |     addressSpace: {  
92 |       addressPrefixes: [  
93 |         vnet1Config.addressSpacePrefix  
94 |       ]  
95 |     }  
96 |     subnets: [  
97 |       {  
98 |         name: vnet1Config.subnetName  
99 |         properties: {  
100 |           addressPrefix: vnet1Config.subnetPrefix  
101 |         }  
102 |       }  
103 |     ]  
104 |   }  
105 | }  
106 |  
107 | //SUBNET  
108 | > resource admsub1 'Microsoft.Network/virtualNetworks/subnets@2021-05-01' = { ...  
109 | }  
110 |  
111 | //NETWORK-INTERFACE-CONTROLLER  
112 | > resource nic1 'Microsoft.Network/networkInterfaces@2021-02-01' = { ...  
113 | }  
114 |  
115 | //NETWORK-SECURITY-GROUP  
116 | > resource nsg1 'Microsoft.Network/networkSecurityGroups@2020-06-01' = { ...  
117 | }  
118 |  
119 | //PUBLIC-IP  
120 | > resource publicIP 'Microsoft.Network/publicIPAddresses@2020-06-01' = { ...  
121 | }  
122 |  
123 | //VM-(WINDOWS)  
124 | > resource admVm 'Microsoft.Compute/virtualMachines@2021-03-01' = { ...  
125 | }  
126 |  
127 |  
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```

```
Webserver_VMSS_AppGw.bicep M X

PROJECT > ProjectV1_1 > Modules > Webserver_VMSS_AppGw.bicep > ...
102 | ////////////////////////////////////////////////////////////////////  
103 | //////////////////////////////////////////////////////////////////// RESOURCES ///////////////////////////////////////////////////////////////////  
104 | ////////////////////////////////////////////////////////////////////  
105 |  
106 |  
107 |  
108 |  
109 | //VNets  
110 | > resource vnet2 'Microsoft.Network/virtualNetworks@2021-05-01' = { ...  
111 | }  
112 |  
113 | //WEB-SUBNET  
114 | > resource websub 'Microsoft.Network/virtualNetworks/subnets@2021-05-01' = { ...  
115 | }  
116 |  
117 | //APPLICATION-GATEWAY-SUBNET  
118 | > resource AppGWsub 'Microsoft.Network/virtualNetworks/subnets@2021-05-01' = { ...  
119 | }  
120 |  
121 |  
122 |  
123 |  
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# Learnings & Conclusion

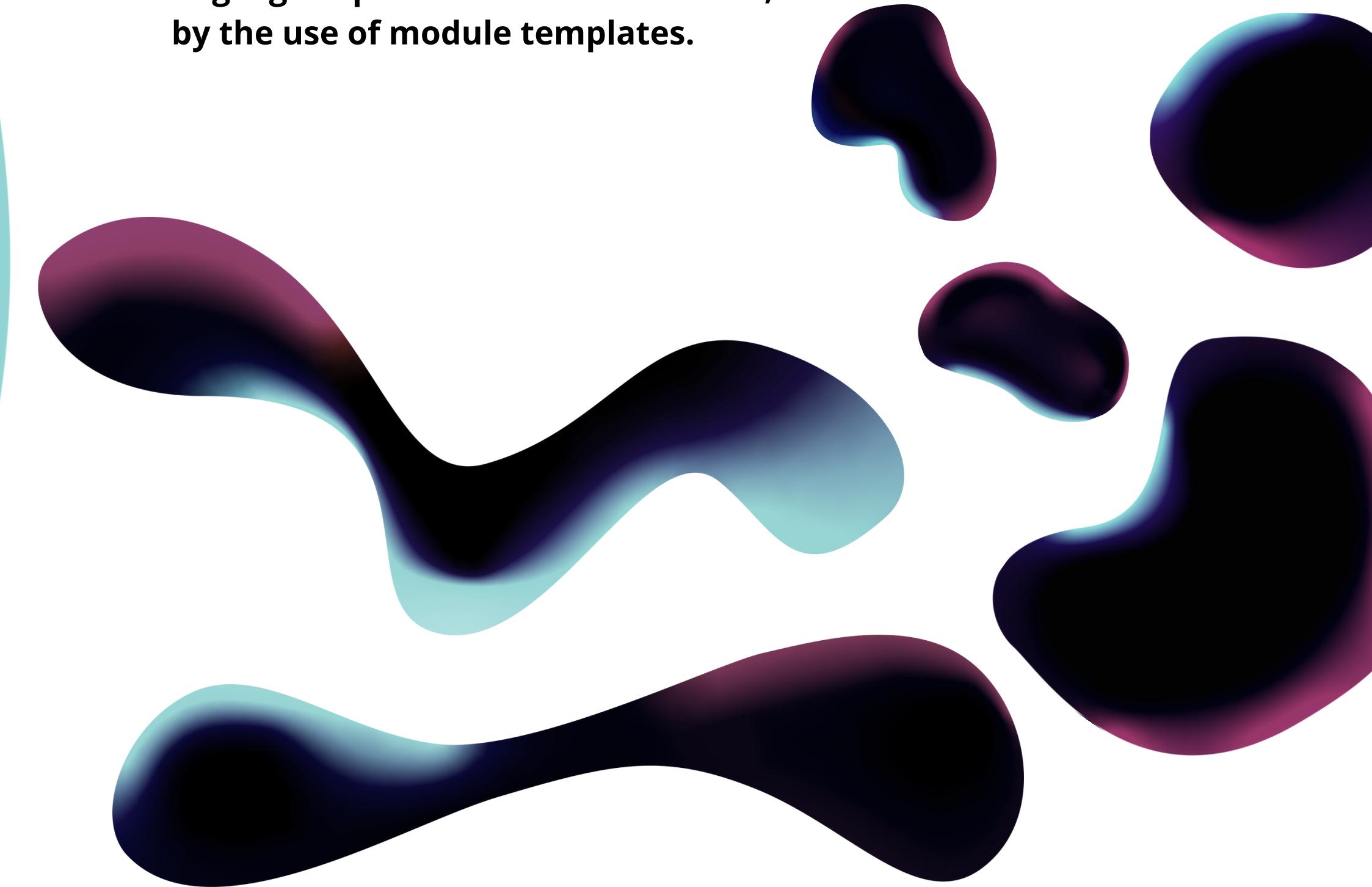
TOPIC 4:

**Coding with Bicep.**

**Using Computational Thinking  
to solve problems and fulfill the assignment.**

**Building Infrastructure.**

**Creating logical placements for resources,  
by the use of module templates.**





THANK  
YOU!

Any Questions?