

IPv4 to IPv6 modernization Journey

Note1: The intent of our journey is not to restructure the existing architecture; it is to enhance the current architecture to support IPv6 enablement.

Note2: The M3 instance type does not support IPv6 connectivity. According to the AWS documentation, only the current generation instance types launched into IPv6-only subnets will have IPv6 addresses assigned. Some older instance types like M1, M2, M3, C1 and t1 do not support IPv6

I would recommend testing with a newer t2.small or t3.micro instance type as those generally have better performance and are confirmed to support IPv6.

Link1: Which EC2 types support IPv6?

Link2: AWS services that support IPv6 - Amazon Virtual Private Cloud

Link3: Instance types - Amazon Elastic Compute Cloud

The screenshot displays the AWS Management Console interface for a VPC named 'v6-engineer'. The top section shows the VPC details, including its ID, state (Available), IPv4 CIDR (10.11.12.0/24), and DHCP option set (dopt-ddbfceb5). Below this, a diagram illustrates the VPC architecture, showing subnets (v6public3, v6public1, v6public2-ELB, v6private1, v6private2-ELB, v6private4-client, v6private3-infra) connected to route tables (v6-rt2-public-ELB, v6-main, v6-rt1-public, v6-rt2-private-ELB, v6-rt1-private-client, v6-rt3-private-infra) and network connections (v6-IGW). The bottom section shows a list of subnets within the VPC, including their IDs, states, VPCs, IPv4 CIDRs, and IPv6 CIDRs.

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
v6private2-ELB	subnet-0b68e1052443ddbef	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.48/28	-
v6private3-infra	subnet-0d89efd466c37ca5f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.64/28	-
v6public3	subnet-068582a3218ab6da3	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.16/28	-
v6private4-client	subnet-0879c23064f3815ad	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.80/28	-
v6public2-ELB	subnet-0b3deb14197f1ed06	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.0/28	-
v6public1	subnet-0056ccac49bc8c7c8	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.96/28	-
v6private1	subnet-0109c45d7e98b3a2f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.32/28	-

Subnets (1/7) Info

Find resources by attribute or tag

v6 Clear filters

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CID
<input checked="" type="checkbox"/> v6private2-ELB	subnet-0b68e1052443ddbef	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.48/28	-
<input type="checkbox"/> v6private3-infra	subnet-0d89efd466c37ca5f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.64/28	-

subnet-0b68e1052443ddbef / v6private2-ELB

Details | Flow logs | **Route table** | Network ACL | CIDR reservations | Sharing | Tags

Route table: rtb-0d4e980e6a168c0eb / v6-rt2-private-ELB

Edit route table association

Routes (1)

Filter routes

Destination	Target
10.11.12.0/24	local

Subnets (1/7) Info

Find resources by attribute or tag

v6 Clear filters

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CID
<input type="checkbox"/> v6public2-ELB	subnet-0b3deb14197f1ed06	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.0/28	-
<input checked="" type="checkbox"/> v6public1	subnet-0056ceac49bc8c7c8	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.96/28	-

subnet-0056ceac49bc8c7c8 / v6public1

Details | Flow logs | **Route table** | Network ACL | CIDR reservations | Sharing | Tags

Route table: rtb-03ba23fa5cd1ff987 / v6-rt1-public

Edit route table association

Routes (2)

Filter routes

Destination	Target
10.11.12.0/24	local
0.0.0.0/0	igw-07e8aff1a52ca85fe

Internet gateways (1) Info

Search

VPC ID: vpc-086f65a64530bd74b Clear filters

Name	Internet gateway ID	State	VPC ID	Owner
<input type="checkbox"/> v6-IGW	igw-07e8aff1a52ca85fe	Attached	vpc-086f65a64530bd74b v6-engineer	701441436243

- The Internet Gateway (IGW) is not a focal point in this scenario. When your subnet consists solely of IPv6 addresses, the Egress-Only Internet Gateway must be used.

You have successfully updated subnet associations for acl-098d779793f5e3627 / v6-private-client.

Details

Network ACLs (1/2) Info

Find resources by attribute or tag

VPC ID : vpc-086f65a64530bd74b

Clear filters

1

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

303

304

305

306

307

308

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

324

325

326

327

328

329

330

331

332

333

334

335

336

337

338

339

340

341

342

343

344

345

346

347

348

349

350

351

352

353

354

355

356

357

358

359

360

361

362

363

364

365

366

367

368

369

370

371

372

373

374

375

376

377

378

379

380

381

382

383

384

385

386

387

388

389

390

391

392

393

394

395

396

397

398

399

400

401

402

403

404

405

406

407

408

409

410

411

412

413

414

415

416

417

418

419

420

421

422

423

424

425

426

427

428

429

430

431

432

433

434

435

436

437

438

439

440

441

442

443

444

445

446

447

448

449

450

451

452

453

454

455

456

457

458

459

460

461

462

463

464

465

466

467

468

469

470

471

472

473

474

475

476

477

478

479

480

481

482

483

484

485

486

487

488

489

490

491

492

493

494

495

496

497

498

499

500

501

502

503

504

505

506

507

508

509

510

511

512

513

514

515

516

517

518

519

520

521

522

523

524

525

526

527

528

529

530

531

532

533

534

535

536

537

538

539

540

541

542

543

544

545

546

547

548

549

550

551

552

553

554

555

556

557

558

559

560

561

562

563

564

565

566

567

568

569

570

571

572

573

574

575

576

577

578

579

580

581

582

583

584

585

586

587

588

589

590

591

592

593

594

595

596

597

598

599

600

601

602

603

604

605

606

607

608

609

610

611

612

613

614

615

616

617

618

619

620

621

622

623

624

625

626

627

628

629

630

631

632

633

634

635

636

637

638

639

640

641

642

643

644

645

646

647

648

649

650

651

652

653

654

655

656

657

658

659

660

661

662

663

664

665

666

667

668

669

670

671

672

673

674

675

676

677

678

679

680

681

682

683

684

685

686

687

688

689

690

691

692

693

694

695

696

697

698

699

700

701

702

703

704

705

706

707

708

709

710

711

712

713

714

715

716

717

718

719

720

721

722

723

724

725

726

727

728

729

730

731

732

733

734

735

736

737

738

739

740

741

742

743

744

745

746

747

748

749

750

751

752

753

754

755

756

757

758

759

760

761

762

763

764

765

766

767

768

769

770

771

772

773

774

775

776

777

778

779

780

781

782

783

784

785

786

787

788

789

790

791

792

793

794

795

796

797

798

799

800

801

802

803

804

805

806

807

808

809

810

811

812

813

814

815

816

817

818

819

820

821

822

823

824

825

826

827

828

829

830

831

832

833

834

835

836

837

838

839

840

841

842

843

844

845

846

847

848

849

850

851

852

853

854

855

856

857

858

859

860

861

862

863

864

865

866

867

868

869

870

871

872

873

874

875

876

877

878

879

880

881

882

883

884

885

886

887

888

889

890

891

892

893

894

895

896

897

898

899

900

901

902

903

904

905

906

907

908

909

910

911

912

913

914

915

916

917

918

919

920

921

922

923

924

925

926

927

928

929

930

931

932

933

934

935

936

937

938

939

940

941

942

943

944

945

946

947

948

949

950

951

952

953

954

955

956

957

958

959

960

961

962

963

964

965

966

967

968

969

970

971

972

973

974

975

976

977

978

979

980

981

982

983

984

985

986

987

988

989

990

991

992

993

994

995

996

997

998

999

1000

1001

1002

1003

1004

1005

1006

1007

1008

1009

1010

1011

1012

1013

1014

1015

1016

1017

1018

1019

1020

1021

1022

1023

1024

1025

1026

1027

1028

1029

1030

1031

1032

1033

1034

1035

1036

1037

1038

1039

1040

1041

1042

1043

1044

1045

1046

1047

1048

1049

1050

1051

1052

1053

1054

1055

1056

1057

1058

1059

1060

1061

1062

1063

1064

1065

1066

1067

1068

1069

1070

1071

1072

1073

1074

1075

1076

1077

1078

1079

1080

1081

1082

1083

1084

1085

1086

1087

1088

1089

1090

1091

1092

1093

1094

1095

1096

1097

1098

1099

1100

1101

1102

1103

1104

1105

1106

1107

1108

1109

1110

1111

1112

1113

1114

1115

1116

1117

1118

1119

1120

1121

1122

1123

1124

1125

1126

1127

1128

1129

1130

1131

1132

1133

1134

1135

1136

1137

1138

1139

1140

1141

1142

1143

1144

1145

1146

1147

1148

1149

1150

1151

1152

1153

1154

1155

1156

1157

1158

1159

1160

1161

1162

1163

1164

1165

1166

1167

1168

1169

1170

1171

1172

1173

1174

1175

1176

1177

1178

1179

1180

1181

1182

1183

1184

1185

1186

1187

1188

1189

1190

1191

1192

1193

1194

1195

1196

1197

1198

1199

1200

1201

1202

1203

1204

1205

1206

1207

1208

1209

1210

1211

1212

1213

1214

1215

1216

1217

1218

1219

1220

1221

1222

1223

1224

1225

1226

1227

1228

1229

1230

1231

1232

1233

1234

1235

1236

1237

1238

1239

1240

1241

1242

1243

1244

1245

1246

1247

1248

1249

1250

1251

1252

1253

1254

1255

1256

1257

1258

1259

1260

1261

1262

1263

1264

1265

1266

1267

1268

1269

1270

1271

1272

1273

1274

1275

1276

1277

1278

1279

1280

1281

1282

1283

1284

1285

1286

1287

1288

1289

1290

1291

1292

1293

1294

1295

1296

1297

1298

1299

1300

1301

1302

1303

1304

1305

1306

1307

1308

1309

1310

1311

1312

1313

1314

1315

1316

1317

1318

1319

1320

1321

1322

1323

1324

1325

1326

1327

1328

1329

1330

1331

1332

1333

1334

1335

1336

1337

1338

1339

1340

1341

1342

1343

1344

1345

1346

1347

1348

1349

1350

1351

1352

1353

1354

1355

1356

1357

1358

1359

1360

1361

1362

1363

1364

1365

1366

1367

1368

1369

1370

1371

1372

1373

1374

1375

1376

1377

1378

1379

1380

1381

1382

1383

1384

1385

1386

1387

1388

1389

1390

1391

1392

1393

1394

1395

1396

1397

1398

1399

1400

1401

1402

1403

1404

1405

1406

1407

1408

1409

1410

1411

1412

1413

1414

1415

1416

1417

1418

1419

1420

1421

1422

1423

1424

1425

1426

1427

1428

1429

1430

1431

1432

1433

1434

1435

1436

1437

1438

1439

1440

1441

1442

1443

1444

1445

1446

1447

1448

1449

1450

1451

1452

1453

1454

1455

1456

1457

1458

1459

1460

1461

1462

1463

1464

1465

1466

1467

1468

1469

1470

1471

1472

1473

1474

1475

1476

1477

1478

1479

1480

1481

1482

1483

1484</

Security Groups (1/13) Info

Find resources by attribute or tag

vpc-086f65a64530bd74b

Clear filters

< 1 >

	Name	Security group ID	Security group name	VPC ID	Description
<input checked="" type="checkbox"/>	v6-default	sg-0e7f89ac0e208a415	default	vpc-086f65a64530bd74b	default VPC security group
<input type="checkbox"/>	v6sg9	sg-059bb88a6db874bc3	v6sg9	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...

sg-0e7f89ac0e208a415 - default

Details

Inbound rules

Outbound rules

Tags

Outbound rules (1)

Manage tags

Edit outbound rules

Search

< 1 >

	Name	Security group rule...	IP version	Type	Protocol	Port range	Destination	Description
<input type="checkbox"/>	-	sg-05100dd176c614...	IPv4	All traffic	All	All	0.0.0.0/0	-

Security Groups (13) Info

Find resources by attribute or tag

vpc-086f65a64530bd74b

Clear filters

< 1 >

	Name	Security group ID	Security group name	VPC ID	Description
<input type="checkbox"/>	v6-default	sg-0e7f89ac0e208a415	default	vpc-086f65a64530bd74b	default VPC security group
<input type="checkbox"/>	v6sg9	sg-059bb88a6db874bc3	v6sg9	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...
<input type="checkbox"/>	v6sg12-linux	sg-0263f312bfaae7de	v6sg12-linux	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...
<input type="checkbox"/>	v6sg2	sg-05bfeda01e00dbdd5	v6sg2	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...

sg-0538e0693c5093fbe - v6sg11-linux

Details

Inbound rules

Outbound rules

Tags

Inbound rules

Manage tags

Edit inbound rules

Search

< 1 >

	Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
No security group rules found								

Security Groups (13) Info

Find resources by attribute or tag

vpc-086f65a64530bd74b

Clear filters

< 1 >

	Name	Security group ID	Security group name	VPC ID	Description
<input type="checkbox"/>	v6-default	sg-0e7f89ac0e208a415	default	vpc-086f65a64530bd74b	default VPC security group
<input type="checkbox"/>	v6sg9	sg-059bb88a6db874bc3	v6sg9	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...

sg-0538e0693c5093fbe - v6sg11-linux

Details

Inbound rules

Outbound rules

Tags

Outbound rules (1)

Manage tags

Edit outbound rules

Search

< 1 >

	Name	Security group rule...	IP version	Type	Protocol	Port range	Destination	Description
<input type="checkbox"/>	-	sg-0d0ec3a40296d14...	IPv4	All traffic	All	All	0.0.0.0/0	-

Note: Observe carefully: the default Security Group (created during VPC creation) has both inbound and outbound rules. In contrast, Security Groups created during instance creation will have rules only for outbound traffic, not for inbound traffic.

Above all, before IPv6 is enabled. Now, the changes below represent what will be observed after IPv6 is enabled on top of the VPC first.

VPC > Your VPCs > vpc-086f65a64530bd74b

vpc-086f65a64530bd74b / v6-engineer

Details [Info](#)

VPC ID vpc-086f65a64530bd74b	State Available	DNS hostnames Disabled	DNS resolution Enabled
Tenancy Default	DHCP option set dopt-ddbfceb5	Main route table rtb-02f453e25d93fe20 / v6-main	Main network ACL acl-07a0b3eca63e0a14
Default VPC No	IPv4 CIDR 10.11.12.0/24	IPv6 pool -	IPv6 CIDR (Network border group) -
Network Address Usage metrics Disabled	Route 53 Resolver DNS Firewall rule groups -	Owner ID 701441436243	

[Resource map](#) [CIDRs](#) [Flow logs](#) [Tags](#) [Integrations](#)

Resource map [Info](#)

VPC [Show details](#)
Your AWS virtual network

Subnets (7)
Subnets within this VPC

Route tables (6)
Route network traffic to resources

Network connections (1)
Connections to other networks

VPC > Your VPCs > vpc-086f65a64530bd74b / v6-engineer > **Edit CIDRs**

Edit CIDRs [Info](#)

Add or remove CIDR blocks for your VPC.

IPv4 CIDRs [Info](#)

CIDR	Status	
10.11.12.0/24	Associated	Remove

[Add new IPv4 CIDR](#)

IPv6 CIDRs [Info](#)

CIDR (Network border group)	Pool	Status	
You have no IPv6 CIDR blocks associated with your VPC.			

[Add new IPv6 CIDR](#)

[Close](#)

Remove

Add IPv6 CIDR

IPv6 CIDR block

☐ IPAM-allocated IPv6 CIDR block

☒ Amazon-provided IPv6 CIDR block

☐ IPv6 CIDR owned by me

Network border group

A network border group is a unique group of Zones from where IPv4 and IPv6 IP addresses are advertised. All Availability Zones in this VPC will use this network border group.

us-east-1

us-east-1

us-east-1a us-east-1b us-east-1c us-east-1d us-east-1e us-east-1f

Cancel

Select CIDR

✔ Succeeded associating IPv6 CIDR

VPC > Your VPCs > vpc-086f65a64530bd74b / v6-engineer > Edit CIDRs

Edit CIDRs [Info](#)

Add or remove CIDR blocks for your VPC.

IPv4 CIDRs [Info](#)

CIDR	Status	
10.11.12.0/24	✔ Associated	Remove

Add new IPv4 CIDR

IPv6 CIDRs [Info](#)

CIDR (Network border group)	Pool	Status	
2600:1f18:4848:2a00::/56 (us-east-1)	Amazon	✔ Associated	Remove

Add new IPv6 CIDR

Close

Your VPCs (1/1) [Info](#)

🔄

Actions

Create VPC

🔍 Search

VPC ID: vpc-086f65a64530bd74b

✕

Clear filters

< 1 > ⚙

<input checked="" type="checkbox"/>	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP option set	Main route table
<input checked="" type="checkbox"/>	v6-engineer	vpc-086f65a64530bd74b	✔ Available	10.11.12.0/24	2600:1f18:4848:2a00::/56	dopt-ddbfceb5	rtb-02f453e252d93fe20

vpc-086f65a64530bd74b / v6-engineer

Details

Resource map

CIDRs

Flow logs

Tags

Integrations

CIDRs [Info](#)

Address type	CIDR	Network Border Group	Pool	Status
IPv4	10.11.12.0/24	-	-	✔ Associated
IPv6	2600:1f18:4848:2a00::/56	us-east-1	Amazon	✔ Associated

The above screenshots represents the IPv6 enabled on VPC .. now lets enable at each subnet level.. lets try to do so math calculations for the IPv4 address ranges that we have assigned to VPC and subnet as per our test scenario.

IPv4 CIDR for VPC is /24 no of equal subnets that we can divide or no of IP address that are available for this range would be $32-24 = 8$. Now, $2^{*8} = 256$ (256 IP address are available for /24 CIDR)..

Similarly, each subnet we specified /28 as our CIDR. $32-28=4$. Now, $2^{*4}=16$

With respect to AWS cloud provider if you are spinning up any resource within any of the created subnet the first 4 and the last one IP will be always reserved for AWS for its computational services. Let say, 10.11.12.48/28 is IP CIDR..

The CIDR notation "10.11.12.48/28" represents a subnet with a prefix length of 28 bits. In IPv4, a /28 subnet means that the first 28 bits are the network part, and the remaining 4 bits are used for host addresses.

The formula to calculate the number of available IP addresses in a subnet is $2^{(32 - \text{prefix length})}$.

For "/28", the calculation is $2^{(32 - 28)} = 2^4 = 16$.

So, there are 16 IP addresses available in the subnet "10.11.12.48/28". The range of IP addresses can be determined by considering the increment of 1 for each host address within the subnet. The usable IP addresses typically range from the first address (network address) to the last address (broadcast address) in the subnet.

Here are the IP addresses in the subnet "10.11.12.48/28":

Network Address: 10.11.12.48

Usable IP addresses: 10.11.12.49 to 10.11.12.62

Broadcast Address: 10.11.12.63

So, there are 16 IP addresses in total, ranging from 10.11.12.48 to 10.11.12.63. but, (.48,.49,.50,.51 and .63) not available to get assigned to our resource and in between any one IP will get associated to our resource.

Let's revisit IPv6. The reason I mentioned IPv4 earlier is due to our IP address management practices, where we don't necessarily use contiguous ranges. Even though our VPC can accommodate 16 equal /28 subnets, we have currently created only 7 subnets with /28, reserving the possibility to create more in the future if needed. Similarly, we aim to calculate for IPv6. As we are aware, the IPv6 CIDR for our VPC is /56, providing approximately 4,722,366,482,869,645,213,696 IPs, nearly five quintillion, which is an immensely vast address space.

This is AWS given IPv6 (2600:1f18:4848:2a00::/56)

In simply let me try to explain you how IPv6 works before we enable it on subnet level.

Note: As per IPv6 architectural design, In IPv6, the minimum and maximum CIDR prefix lengths are determined by the available address space. Unlike IPv4, where subnets are often allocated in powers of 2, IPv6 subnets are typically allocated with a fixed prefix length of /64 due to the vast address space available.

The /64 prefix length is considered the standard and recommended for IPv6 subnets. This is because IPv6 was designed with a huge address space, and a /64 subnet provides an ample 2^{64} addresses, which is more than enough for most purposes.

The /64 recommendation comes from considerations related to IPv6's Stateless Address Autoconfiguration (SLAAC) and Neighbor Discovery Protocol. Using a /64 allows for efficient address autoconfiguration and simplifies network operations.

While technically possible, using shorter or longer prefixes (e.g., /60, /56, /48) for subnets in IPv6 is not recommended and can lead to operational challenges. Allocating anything smaller than /64 subnets breaks some fundamental features of IPv6.

So, in IPv6, the standard practice is to use /64 as the minimum and maximum CIDR prefix length for subnets.

Question: Then considering minimum and maximum /64 for subnet, how many equal sized /64 subnets can we divide from /56 VPC?

Answer: In IPv6, a /56 is a 56-bit address block. To determine the number of /64 subnets you can have within a /56 VPC, you can use the formula:

Number of /64 subnets= $2^{(64-56)}$

Here's the calculation:

Number of /64 subnets= $2^8=256$

So, within a /56 VPC, you can have 256 equal-sized /64 subnets. Each /64 subnet within the /56 will have its own range of 2^{64} IPv6 addresses, providing a vast number of addresses for each subnet.

This is important to notice, once the IPv6 is enabled on VPC, will see the first changes on default and Custom Route Table. Both default and custom route tables will inherit the IPv6 address as local route into the tables. Let's try to understand looking into below images:

1: main/default route table provisioned with VPC

The screenshot displays the AWS Management Console interface for Route Tables. At the top, there's a header for 'Route tables (1/6)' with a search bar and a 'Create route table' button. Below this, a table lists the available route tables:

Name	Route table ID	Explicit subnet associati...	Edge associations	Main	VPC	Owner ID
<input type="checkbox"/> v6-rt2-public-ELB	rtb-064ec3d026f1dea66	2 subnets	-	No	vpc-086f65a64530bd74b v6-e...	701441436243
<input checked="" type="checkbox"/> v6-main	rtb-02f453e252d93fe20	-	-	Yes	vpc-086f65a64530bd74b v6-e...	701441436243
<input type="checkbox"/> v6-rt1-public	rtb-03ba23fa5cd1ff987	subnet-0056ceac49bc8c7...	-	No	vpc-086f65a64530bd74b v6-e...	701441436243

Below the table, the details for the selected 'v6-main' route table (rtb-02f453e252d93fe20) are shown. The 'Routes' tab is active, displaying a list of routes:

Destination	Target	Status	Propagated
2600:1f18:4848:2a00::/56	local	Active	No
10.11.12.0/24	local	Active	No

2: Custom public and private route tables

<input checked="" type="checkbox"/>	v6-rt1-public	rtb-03ba23fa5cd1ff987	subnet-0056ceac49bc87...	-	No	vpc-086f65a64530bd74b v6-e...	701441436243
<input type="checkbox"/>	v6-rt2-public-ELB	rtb-064ec3c026f1dea66	2 subnets	-	No	vpc-086f65a64530bd74b v6-e...	701441436243
<input type="checkbox"/>	v6-rt2-private-ELB	rtb-0d4e980e6a168c0eb	2 subnets	-	No	vpc-086f65a64530bd74b v6-e...	701441436243

rtb-03ba23fa5cd1ff987 / v6-rt1-public

Details

Routes

Subnet associations

Edge associations

Route propagation

Tags

Routes (4)

Both

Edit routes

Q Filter routes

Destination	Target	Status	Propagated
::/0	eigw-0c69cfdd6f5792037	Active	No
2600:1f18:4848:2a00::/56	local	Active	No
0.0.0.0/0	igw-07e8aff1a52ca85fe	Active	No
10.11.12.0/24	local	Active	No

<input checked="" type="checkbox"/>	v6-rt2-private-ELB	rtb-0d4e980e6a168c0eb	2 subnets	-	No	ypc-086f65a64530bd74b v6-e...	701441436243
-------------------------------------	--------------------	---------------------------------------	-----------	---	----	---	--------------

rtb-0d4e980e6a168c0eb / v6-rt2-private-ELB

Details

Routes

Subnet associations

Edge associations

Route propagation

Tags

Routes (2)

Both ▾

Edit routes

<

1

>

⌂

Destination ▾	Target ▾	Status ▾	Propagated ▾
2600:1f18:4848:2a00::/56	local	✔ Active	No
10.11.12.0/24	local	✔ Active	No

Public and Private Subnets with route tables association and this is how they look:

Subnets (1/7) Info

	Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR	Availability
<input type="checkbox"/>	vprivate2-ELB	subnet-0b68e1052443ddbef	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.48/28	-	10
<input type="checkbox"/>	vprivate3-infra	subnet-0d89efd466c37ca5f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.64/28	-	9
<input checked="" type="checkbox"/>	v6public3	subnet-068582a3218ab6da3	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.16/28	-	11
<input type="checkbox"/>	vprivate4-client	subnet-0879c23064f3815ad	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.80/28	-	10
<input type="checkbox"/>	v6public2-ELB	subnet-0b3deb14197f1ed06	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.0/28	-	9
<input type="checkbox"/>	v6public1	subnet-0056ceac49bc8c7c8	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.96/28	-	7
<input type="checkbox"/>	vprivate1	subnet-0109c45d7e98b3a7f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.32/28	-	9

Details

Flow logs

Route table

Network ACL

CIDR reservations

Sharing

Tags

Route table: [rtb-064ec3d026f1dea66](#) / v6-rt2-public-ELB

Edit route table association

Routes (4)

Destination	Target
10.11.12.0/24	local
0.0.0.0/0	igw-07e8aff1a52ca85fe
2600:1f18:4848:2a00::/56	local
::/0	eigw-0c69cfd65f792037

Subnets (1/7) [Info](#)

Find resources by attribute or tag

VPC: vpc-086f65a64530bd74b ✕ Clear filters

	Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR	Availability
<input type="checkbox"/>	v6private2-ELB	subnet-0b68e1052443ddbef	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.48/28	-	10
<input type="checkbox"/>	v6private3-infra	subnet-0d89efd466c37ca5f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.64/28	-	9
<input type="checkbox"/>	v6public3	subnet-068582a3218ab6da3	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.16/28	-	11
<input checked="" type="checkbox"/>	v6private4-client	subnet-0879c23064f3815ad	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.80/28	-	10
<input type="checkbox"/>	v6public2-ELB	subnet-0b3deb14197f1ed06	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.0/28	-	9
<input type="checkbox"/>	v6public1	subnet-0056ceac49bc8c7c8	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.96/28	-	7
<input type="checkbox"/>	v6private1	subnet-0109c45d7e98b3a2f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.32/28	-	9

subnet-0879c23064f3815ad / v6private4-client

Details | Flow logs | **Route table** | Network ACL | CIDR reservations | Sharing | Tags

Route table: rtb-0406e45d7031d3aca / v6-rt1-private-client

[Edit route table association](#)

Routes (2)

Filter routes

Destination	Target
10.11.12.0/24	local
2600:1f18:4848:2a00::/56	local

Changes on NACL after IPv6 enabled on VPC:

Main NACL:

Inbound:

Network ACLs (1/2) [Info](#)

Find resources by attribute or tag

v6 ✕ Clear filters

	Name	Network ACL ID	Associated with	Default	VPC ID	Inbound rules count	Outbound rules count
<input type="checkbox"/>	v6-private-client	acl-098d779793f5e3627	subnet-0879c23064f3815ad / v6private4-client	No	vpc-086f65a64530bd74b / v6-engineer	2 Inbound rules	2 Outbound rules
<input checked="" type="checkbox"/>	v6-main	acl-07a0b3eca63e0a143	6 Subnets	Yes	vpc-086f65a64530bd74b / v6-engineer	4 Inbound rules	4 Outbound rules

acl-07a0b3eca63e0a143 / v6-main

Details | **Inbound rules** | Outbound rules | Subnet associations | Tags

Inbound rules (4)

Filter inbound rules

Rule number	Type	Protocol	Port range	Source	Allow/Deny
100	All traffic	All	All	0.0.0.0/0	Allow
101	All traffic	All	All	::/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny
*	All traffic	All	All	::/0	Deny

Outbound:

<input checked="" type="checkbox"/>	v6-main	acl-07a0b3eca63e0a143	6 Subnets	Yes	vpc-086f65a64530bd74b / v6-engineer	4 Inbound rules	4 Outbound rules
-------------------------------------	---------	-----------------------	-----------	-----	-------------------------------------	-----------------	------------------

acl-07a0b3eca63e0a143 / v6-main

Details | Inbound rules | **Outbound rules** | Subnet associations | Tags

Outbound rules (4)

Filter outbound rules

Rule number	Type	Protocol	Port range	Destination	Allow/Deny
100	All traffic	All	All	0.0.0.0/0	Allow
101	All traffic	All	All	::/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny
*	All traffic	All	All	::/0	Deny

Subnet Associations on NACL before IPv6 enabled on subnet level:

<input checked="" type="checkbox"/>	v6-main	acl-07a0b3eca63e0a143	6 Subnets	Yes	vpc-086f65a64530bd74b / v6-engineer	4 Inbound rules	4 Outbound rules
-------------------------------------	---------	-----------------------	-----------	-----	-------------------------------------	-----------------	------------------

acl-07a0b3eca63e0a143 / v6-main							
Details Inbound rules Outbound rules Subnet associations Tags							
Subnet associations (6)							
<input type="text" value="Filter subnet associations"/>							
<div>< 1 ></div>							
Name	Subnet ID	Associated with	Availability Zone	IPv4 CIDR	IPv6 CIDR		
v6public3	subnet-068582a3218ab6da3	acl-07a0b3eca63e0a143 / v6-main	us-east-1e	10.11.12.16/28	-		
v6private1	subnet-0109c45d7e98b3a2f	acl-07a0b3eca63e0a143 / v6-main	us-east-1e	10.11.12.32/28	-		
v6public2-ELB	subnet-0b3deb14197f1ed06	acl-07a0b3eca63e0a143 / v6-main	us-east-1e	10.11.12.0/28	-		
v6private3-infra	subnet-0d89efd466c37ca5f	acl-07a0b3eca63e0a143 / v6-main	us-east-1e	10.11.12.64/28	-		
v6public1	subnet-0056ceac49bc8c7c8	acl-07a0b3eca63e0a143 / v6-main	us-east-1e	10.11.12.96/28	-		
v6private2-ELB	subnet-0b68e1052443ddbef	acl-07a0b3eca63e0a143 / v6-main	us-east-1e	10.11.12.48/28	-		

Custom NACL:

Inbound:

Network ACLs (1/2) Info

Find resources by attribute or tag

v6

Clear filters

Name

Network ACL ID

Associated with

Default

VPC ID

Inbound rules count

Outbound rules count

v6-private-client

acl-098d779793f5e3627

subnet-0879c23064f3815ad / v6private4-client

No

vpc-086f65a64530bd74b / v6-engineer

2 Inbound rules

2 Outbound rules

v6-main

acl-07a0b3eca63e0a143

6 Subnets

Yes

vpc-086f65a64530bd74b / v6-engineer

4 Inbound rules

4 Outbound rules

acl-098d779793f5e3627 / v6-private-client

Details

Inbound rules

Outbound rules

Subnet associations

Tags

Inbound rules (2)

Filter inbound rules

Rule number

Type

Protocol

Port range

Source

Allow/Deny

*

All traffic

All

All

0.0.0.0/0

Deny

*

All traffic

All

All

::/0

Deny

Outbound:

Network ACLs (1/2) Info

Find resources by attribute or tag

v6

X

Clear filters

Refresh

Actions

Create network ACL

<input type="checkbox"/>	Name	Network ACL ID	Associated with	Default	VPC ID	Inbound rules count	Outbound rules count
<input checked="" type="checkbox"/>	v6-private-client	acl-098d779793f5e3627	subnet-0879c23064f3815ad / v6private4-client	No	vpc-086f65a64530bd74b / v6-engineer	2 Inbound rules	2 Outbound rules
<input type="checkbox"/>	v6-main	acl-07a0b3eca63e0a143	6 Subnets	Yes	vpc-086f65a64530bd74b / v6-engineer	4 Inbound rules	4 Outbound rules

acl-098d779793f5e3627 / v6-private-client

Details

Inbound rules

Outbound rules

Subnet associations

Tags

Outbound rules (2)

Filter outbound rules

< 1 >

Rule number	Type	Protocol	Port range	Destination	Allow/Deny
*	All traffic	All	All	0.0.0.0/0	Deny
*	All traffic	All	All	::/0	Deny

Subnet associations will see only IPv4 not IPv6 address.

Network ACLs (1/2) Info

Find resources by attribute or tag

v6

X

Clear filters

1

>

⚙

<input checked="" type="checkbox"/>	Name	Network ACL ID	Associated with	Default	VPC ID	Inbound rules count	Outbound rules count
<input checked="" type="checkbox"/>	v6-private-client	acl-098d779793f5e3627	subnet-0879c23064f3815ad / v6private4-client	No	vpc-086f65a64530bd74b / v6-engineer	2 Inbound rules	2 Outbound rules
<input type="checkbox"/>	v6-main	acl-07a0b3eca63e0a143	6 Subnets	Yes	vpc-086f65a64530bd74b / v6-engineer	4 Inbound rules	4 Outbound rules

acl-098d779793f5e3627 / v6-private-client

Details

Inbound rules

Outbound rules

Subnet associations

Tags

Subnet associations (1)

Edit subnet associations

Filter subnet associations

Name	Subnet ID	Associated with	Availability Zone	IPv4 CIDR	IPv6 CIDR
v6private4-client	subnet-0879c23064f3815ad	acl-098d779793f5e3627 / v6-private-c...	us-east-1e	10.11.12.80/28	-

Changes on default security group of VPC and default security group of instance:

Inbound security group of VPC:

Security Groups (1/13) Info

Find resources by attribute or tag

v6

X

VPC ID = vpc-086f65a64530bd74b

X

Clear filters

1

>

⚙

<input type="checkbox"/>	Name	Security group ID	Security group name	VPC ID	Description
<input type="checkbox"/>	v6sg12-linux	sg-0263f312bfaaee7de	v6sg12-linux	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...
<input checked="" type="checkbox"/>	v6-default	sg-0e7f89ac0e208a415	default	vpc-086f65a64530bd74b	default VPC security group

sg-0e7f89ac0e208a415 - default

Details

Inbound rules

Outbound rules

Tags

Inbound rules (1)

Manage tags

Edit inbound rules

Search

<input type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
<input type="checkbox"/>	-	sgr-05caceacbb6626682	-	All traffic	All	All	sg-0e7f89ac0e208a41...	-

Outbound security group of VPC:

<input checked="" type="checkbox"/>	Name	Security group ID	Security group name	VPC ID	Description
<input type="checkbox"/>	v6sg12-linux	sg-0263f312bfaaee7de	v6sg12-linux	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...
<input checked="" type="checkbox"/>	v6-default	sg-0e7f89ac0e208a415	default	vpc-086f65a64530bd74b	default VPC security group

sg-0e7f89ac0e208a415 - default

Details

Inbound rules

Outbound rules

Tags

Outbound rules (2)

Manage tags

Edit outbound rules

Search

<input type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol	Port range	Destination	Description
<input type="checkbox"/>	-	sgr-05100dd176c614...	IPv4	All traffic	All	All	0.0.0.0/0	-
<input type="checkbox"/>	-	sgr-0fc49060a5347293a	IPv6	All traffic	All	All	:::0	-

Inbound security group of instances: (No inbound rule)

Security Groups (1/16) Info

Find resources by attribute or tag

v6

VPC ID = vpc-086f65a64530bd74b

Clear filters

Actions

Export security groups to CSV

Create security group

Name	Security group ID	Security group name	VPC ID	Description
v6sg1	sg-0fdf7bf95108ae234	v6sg1	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...

sg-0fdf7bf95108ae234 - v6sg1

Details

Inbound rules

Outbound rules

Tags

Inbound rules

Search

Name

Security group rule...

IP version

Type

Protocol

Port range

Source

Description

No security group rules found

Outbound security group of instances:

Security Groups (1/16) Info

Find resources by attribute or tag

v6

VPC ID = vpc-086f65a64530bd74b

Clear filters

Actions

Export security groups to CSV

Create security group

Name	Security group ID	Security group name	VPC ID	Description
v6sg1	sg-0fdf7bf95108ae234	v6sg1	vpc-086f65a64530bd74b	launch-wizard-16 created 2024-01-28...

sg-0fdf7bf95108ae234 - v6sg1

Details

Inbound rules

Outbound rules

Tags

Outbound rules (2)

Search

Name

Security group rule...

IP version

Type

Protocol

Port range

Destination

Description

-	sgr-08652678a81605...	IPv4	All traffic	All	All	0.0.0.0/0	-
-	sgr-0613b7d58338a0...	IPv6	All traffic	All	All	:::/0	-

Instance:

Instances (1/12) Info

Find Instance by attribute or tag (case-sensitive)

Any state

Instance state = running

VPC ID = vpc-086f65a64530bd74b

Clear filters

Connect

Instance state

Actions

Launch instances

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public I
v6instance9	i-09b00e43184c4e3bb	Running	m3.medium	2/2 checks passed	View alarms +	us-east-1e	-	-
v6instance4	i-097b54dcfe3daa990	Running	m3.large	2/2 checks passed	View alarms +	us-east-1e	-	-

Instance: i-09b00e43184c4e3bb (v6instance9)

Details

Status and alarms New

Monitoring

Security

Networking

Storage

Tags

Instance summary Info

Instance ID

i-09b00e43184c4e3bb (v6instance9)

Public IPv4 address

-

Private IPv4 addresses

10.11.12.73

Instance state

Running

Public IPv4 DNS

-

Section 2:

Now, let's enable IPv6 at each subnet level and observe the changes in the associated Security Groups and Instances within those specific subnets.

Subnets (1/7) info

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	v6private2-ELB	subnet-0b68e1052443ddbef	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.48/28
<input type="checkbox"/>	v6private3-infra	subnet-0d89efd466c37ca5f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.64/28
<input type="checkbox"/>	v6public3	subnet-068582a3218ab6da3	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.16/28
<input type="checkbox"/>	v6private4-client	subnet-0879c23064f3815ad	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.80/28
<input type="checkbox"/>	v6public2-ELB	subnet-0b3deb14197f1ed06	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.0/28
<input checked="" type="checkbox"/>	v6public1	subnet-0056ceac49bc8c7c8	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.96/28
<input type="checkbox"/>	v6private1	subnet-0109c45d07e98b3a2f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.32/28

Actions

Create subnet

View details
Create flow log
Edit subnet settings
Edit IPv6 CIDRs
Edit network ACL association
Edit route table association
Edit CIDR reservations
Share subnet
Manage tags
Delete subnet

subnet-0056ceac49bc8c7c8 / v6public1

Details

Flow logs

Route table

Network ACL

CIDR reservations

Sharing

Tags

Subnet ID

subnet-0056ceac49bc8c7c8

Available IPv4 addresses

7

Network border group

-

Subnet ARN

arn:aws:ec2:us-east-1:701441436243:subnet/subnet-0056ceac49bc8c7c8

IPv6 CIDR

-

VPC

vpc-086f65a64530bd74b | v6-ennioneer

State

Available

Availability Zone

us-east-1e

Route table

rtb-03ba23fa5cd1ff987 | v6-r11-public

IPv4 CIDR

10.11.12.96/28

Availability Zone ID

us-east-1az2





Network ACL

acl-07a0b3eca63e0a143 | v6-main

[VPC](#) > [Subnets](#) > [subnet-0056ceac49bc8c7c8](#) > Edit IPv6 CIDRs

Edit IPv6 CIDRs [Info](#)

VPC details

VPC ID  vpc-086f65a64530bd74b	VPC CIDR block  2600:1f18:4848:2a00::/56
Subnet ID  subnet-0056ceac49bc8c7c8	Network border group  us-east-1

Subnet CIDR block

You have no IPv6 CIDR blocks associated with your subnet

Add IPv6 CIDR

1 remaining

Cancel

Save

⊗ There was an error editing IPv6 CIDR.
The CIDR '2600:1f18:4848:2a00::/68' must be one of /44, /48, /52, /56, /60, /64

VPC > Subnets > subnet-0056ceac49bc8c7c8 > Edit IPv6 CIDRs

⊗ There was an error editing IPv6 CIDR.
The CIDR '2600:1f18:4848:2a00::300/120' must be one of /44, /48, /52, /56, /60, /64

[VPC](#) > [Subnets](#) > [subnet-0056ceac49bc8c7c8](#) > Edit IPv6 CIDRs

Edit IPv6 CIDRs [Info](#)

VPC details

VPC ID

vpc-086f65a64530bd74b

Subnet ID

subnet-0056ceac49bc8c7c8

VPC CIDR block

2600:1f18:4848:2a00::/56

Network border group

us-east-1

Subnet CIDR block

VPC CIDR block

2600:1f18:4848:2a00::/56

Subnet CIDR block

2600:1f18:4848:2a00::300/120

256 IPs

Remove

Add IPv6 CIDR

0 remaining

Cancel

Save

Subnet with IPv6 having /64 CIDR

⊙ Successfully edited IPv6 CIDR for subnet (subnet-0056ceac49bc8c7c8 / v6public1).

Subnets (1/7) [Info](#)

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR	Availa...
<input type="checkbox"/>	v6private2-ELB	subnet-0b68e1052443ddbef	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.48/28	-	10
<input type="checkbox"/>	v6private3-infra	subnet-0d89efd466c37ca5f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.64/28	-	9
<input type="checkbox"/>	v6public3	subnet-068582a3218ab6da3	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.16/28	-	11
<input type="checkbox"/>	v6private4-client	subnet-0879c23064f3815ad	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.80/28	-	10
<input type="checkbox"/>	v6public2-ELB	subnet-0b3deb14197f1ed06	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.0/28	-	9
<input checked="" type="checkbox"/>	v6public1	subnet-0056ceac49bc8c7c8	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.96/28	2600:1f18:4848:2a00::/64	7
<input type="checkbox"/>	v6private1	subnet-010b4e47a0b8e3c7f	Available	vpc-086f65a64530bd74b v6-e...	10.11.12.27/28	-	9

subnet-0056ceac49bc8c7c8 / v6public1

[Details](#) | [Flow logs](#) | [Route table](#) | [Network ACL](#) | [CIDR reservations](#) | [Sharing](#) | [Tags](#)

Details

Subnet ID

subnet-0056ceac49bc8c7c8

Available IPv4 addresses

7

Network border group

-

Subnet ARN

arn:aws:ec2:us-east-1:701441436243:subnet/subnet-0056ceac49bc8c7c8

IPv6 CIDR

2600:1f18:4848:2a00::/64

VPC

State

Available

Availability Zone

us-east-1e

Route table

rtb-03ba23fa5cd1f987 | v6-rt1-public

IPv4 CIDR

10.11.12.96/28

Availability Zone ID

use1-az2

Network ACL

acl-07a0b3eca63e0a143 | v6-main

Enabling IPv6 on a subnet will not automatically assign IPv6 addresses to resources inside the subnet. If you want your EC2 instance in that specific subnet to have an IPv6 address, follow the steps below:

The screenshot shows the AWS Management Console 'Instances' page. A table lists instances, with 'v6instance11-linux' (ID: i-08c0bc58de925f5d4) in a 'Running' state. The 'Networking' menu is open, showing options like 'Attach network interface', 'Detach network interface', and 'Manage IP addresses', which is highlighted. The instance details pane shows the instance is running and has a public IPv4 address.

The 'IP addresses' page for instance **i-0ef92da2d1ab59e80 (v6.t2)** displays the following information:

- Instance ID:** i-0ef92da2d1ab59e80 (v6.t2)
- Network Interface:** eth0: eni-06d4d6fd52c92455d - 10.11.12.96/28
- IPv4 addresses:** A table showing a private IP address of 10.11.12.102 and a public IP address of 34.230.74.148, with an 'Unassign' button. Below the table is an 'Assign new IP address' button.
- IPv6 addresses:** A section with an 'IPv6 address' field set to 'Auto-assign', an 'Undo' button, and an 'Assign new IP address' button.
- Assign primary IPv6 IP:** A section with an 'Info' link and a description: 'Makes the first IPv6 address that is assigned to the network interface the primary IPv6. If this is a primary network interface, once a primary IPv6 address is assigned, it cannot be unassigned.' Below this is an 'Enable' checkbox.

If you choose ☐ **Enable**

Assign primary IPv6 IP | [Info](#)
Makes the first IPv6 address that is assigned to the network interface the primary IPv6. If this is a primary network interface, once a primary IPv6 address is assigned, it cannot be unassigned.

If you have multiple IPv6 addresses associated with an ENI and you enable a primary IPv6 address, the first IPv6 GUA address associated with the ENI becomes the primary IPv6 address.

Add IPv6 CIDR reservation

A CIDR reservation prevents AWS from automatically assigning addresses in the specified CIDR range.

Reservation type

Specify how the IP addresses in the reservation will be used.

☒ prefix
☐ explicit

CIDR

2600:1f18:4848:2a00:::/

CancelAdd

Instances (1/5) Info

Find Instance by attribute or tag (case-sensitive)

Any state ▼

Subnet IDs = subnet-0056ceac49bc8c7c8 X Clear filters

Name ↗	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Put
v6.t2	i-0ef92da2d1ab59e80	Running 🔍	t2.micro	2/2 checks passed View alarms +		us-east-1e	-	34.

Instance: i-0ef92da2d1ab59e80 (v6.t2)

Details Status and alarms New Monitoring Security Networking Storage Tags

▼ Instance summary Info

Instance ID i-0ef92da2d1ab59e80 (v6.t2) IPv6 address 2600:f1f8:4848:2a00:60ac:9df8:6167:b34b Hostname type IP name: Answer private resource DNS name - Auto-assigned IP address 34.230.74.148 [Public IP] IAM Role - IMDSv2 Disabled	Public IPv4 address 34.230.74.148 [open address] 🔗 Instance state Running Private IP DNS name (IPv4 only) ip-10-11-12-102.ec2.internal Instance type t2.micro VPC ID vpc-086f65a64530bd74b (v6-engineer) 🔗 Subnet ID subnet-0056ceac49bc8c7c8 (v6public1) 🔗	Private IPv4 addresses 10.11.12.102 Public IPv4 DNS - Private resource DNS name - Elastic IP addresses - AWS Compute Optimizer finding No recommendations available for this instance. Auto Scaling Group name -
--	--	---

Just for the Information:

If, in the event that we are creating the load balancer within an existing IPv6 subnet, we will also observe the assigned IPv6 addresses for the load balancer.

VS

Services

Search

[Alt+S]

Dualstack

Includes IPv4 and IPv6 addresses.

Network mapping

Info

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

VPC

Info

Select the virtual private cloud (VPC) for your targets or you can [create a new VPC](#). Only VPCs with an internet gateway are enabled for selection. The selected VPC can't be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

v6-engineer

vpc-086f65a64530bd74b

IPv4: 10.11.12.0/24 IPv6: 2600:1f18:4848:2a00::/56

Mappings

Info

Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

☒ us-east-1e (use1-az2)

Subnet

subnet-0056ceac49bc8c7c8 v6public1

IPv4 address

Assigned by AWS

IPv6 address

Assigned from CIDR 2600:1f18:4848:2a00::/64

At least two subnets must be specified.

- If, in case, we attempt to remove IPv6 from the VPC level while IPv6 is still enabled on the subnet, an error will occur.

Failed to disassociate IPv6 CIDR

The vpc vpc-086f65a64530bd74b currently has a subnet within CIDR block 2600:1f18:4848:2a00::/56

VPC

>

Your VPCs

>

vpc-086f65a64530bd74b / v6-engineer

>

Edit CIDRs

Edit CIDRs

Info

Add or remove CIDR blocks for your VPC.

IPv4 CIDRs

Info

CIDR	Status	
10.11.12.0/24	✔ Associated	Remove

Add new IPv4 CIDR

IPv6 CIDRs

Info

CIDR (Network border group)	Pool	Status	
2600:1f18:4848:2a00::/56 (us-east-1)	Amazon	✔ Associated	Remove

Add new IPv6 CIDR

Close

⊗ **There was an error editing IPv6 CIDR.**
The subnet subnet-0056ceac49bc8c7c8 currently has an interface within CIDR block 2600:1f18:4848:2a00::/64

After detaching the ENI and removing IPv6 from subnet and VPC:

Main route table:

Main route table:

Route tables (1/6) Info

Find resources by attribute or tag

vpc-086f65a64530bd74b

Clear filters

Actions

Create route table

	Name	Route table ID	Explicit subnet associati...	Edge associations	Main	VPC	Owner ID
<input checked="" type="checkbox"/>	v6-main	rtb-02f453e252d93fe20	-	-	Yes	vpc-086f65a64530bd74b v6-e...	701441436243
<input type="checkbox"/>	v6-rt3-private-infra	rtb-0286470dce5597f3b	subnet-0d89ef466c37ca...	-	No	vpc-086f65a64530bd74b v6-e...	701441436243
<input type="checkbox"/>	v6-rt1-private-client	rtb-0406ca4547031d3a3	subnet-0879c73064f381	-	No	vpc-086f65a64530bd74b v6-e...	701441436243

rtb-02f453e252d93fe20 / v6-main

Details Routes Subnet associations Edge associations Route propagation Tags

Routes (1)

Filter routes

Both Edit routes

Destination	Target	Status	Propagated
10.11.12.0/24	local	Active	No

Custom route table:

Route tables (1/6) Info

Find resources by attribute or tag

vpc-086f65a64530bd74b

Clear filters

Actions

Create route table

	Name	Route table ID	Explicit subnet associati...	Edge associations	Main	VPC	Owner ID
<input type="checkbox"/>	v6-rt3-public	rtb-02d9c23a2c011f38 /	subnet-0a20ceca490c0c / ...	-	No	vpc-086f65a64530bd74b v6-e...	701441436243
<input checked="" type="checkbox"/>	v6-rt2-public-ELB	rtb-064ec3d026f1dea66	2 subnets	-	No	vpc-086f65a64530bd74b v6-e...	701441436243
<input type="checkbox"/>	v6-rt2-private-ELB	rtb-0d4e980e6a168c0eb	2 subnets	-	No	vpc-086f65a64530bd74b v6-e...	701441436243

rtb-064ec3d026f1dea66 / v6-rt2-public-ELB

Details Routes Subnet associations Edge associations Route propagation Tags

Routes (3)

Filter routes

Both Edit routes

Destination	Target	Status	Propagated
::/0	igw-0c69cfd6f5792037	Active	No
0.0.0.0/0	igw-07e8aff1a52ca85fe	Active	No
10.11.12.0/24	local	Active	No

Main NACL:

Network ACLs (1/2) Info

Find resources by attribute or tag

VPC ID: vpc-086f65a64530bd74b

Clear filters

Actions

Create network ACL

	Name	Network ACL ID	Associated with	Default	VPC ID	Inbound rules count	Outbound rules count
<input type="checkbox"/>	v6-private-client	acl-098d779793f5e3627	subnet-0879c23064f3815ad / v6private4-client	No	vpc-086f65a64530bd74b / v6-engineer	2 Inbound rules	2 Outbound rules
<input checked="" type="checkbox"/>	v6-main	acl-07a0b3eca63e0a143	6 Subnets	Yes	vpc-086f65a64530bd74b / v6-engineer	4 Inbound rules	4 Outbound rules

acl-07a0b3eca63e0a143 / v6-main

Details Inbound rules Outbound rules Subnet associations Tags

Inbound rules (4)

Filter inbound rules

Edit inbound rules

Rule number	Type	Protocol	Port range	Source	Allow/Deny
100	All traffic	All	All	0.0.0.0/0	Allow
101	All traffic	All	All	::/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny
*	All traffic	All	All	::/0	Deny

Outbound:

Outbound rules (4)

Q Filter outbound rules

Edit outbound rules

< 1 > ⚙

Rule number	Type	Protocol	Port range	Destination	Allow/Deny
100	All traffic	All	All	0.0.0.0/0	Allow
101	All traffic	All	All	::/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny
*	All traffic	All	All	::/0	Deny

Custom NACL inbound:

Network ACLs (1/2) Info

Q Find resources by attribute or tag

VPC ID : vpc-086f65a64530bd74b X Clear filters

< 1 > ⚙

Name	Network ACL ID	Associated with	Default	VPC ID	Inbound rules count	Outbound rules count
<input checked="" type="checkbox"/> v6-private-client	acl-098d779793f5e3627	subnet-0879c23064f3815ad / v6private4-client	No	vpc-086f65a64530bd74b / v6-engineer	2 Inbound rules	2 Outbound rules
<input type="checkbox"/> v6-main	acl-07a0b3eca63e0a143	6 Subnets	Yes	vpc-086f65a64530bd74b / v6-engineer	4 Inbound rules	4 Outbound rules

Inbound rules (2)

Q Filter inbound rules

Edit inbound rules

< 1 > ⚙

Rule number	Type	Protocol	Port range	Source	Allow/Deny
*	All traffic	All	All	0.0.0.0/0	Deny
*	All traffic	All	All	::/0	Deny

Custom NACL outbound:

acl-098d779793f5e3627 / v6-private-client

Details | Inbound rules | Outbound rules | Subnet associations | Tags

Outbound rules (2)

Q Filter outbound rules

Edit outbound rules

< 1 > ⚙

Rule number	Type	Protocol	Port range	Destination	Allow/Deny
*	All traffic	All	All	0.0.0.0/0	Deny
*	All traffic	All	All	::/0	Deny

Default security group inbound:

Instance default security group outbound:

sg-074541009ab35d56a - v6sg5

Details

Inbound rules

Outbound rules

Tags

Outbound rules (2)

Q Search

< 1 > ⚙

<input type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol	Port range	Destination	Description
<input type="checkbox"/>	-	sgr-064a765fbb26a0808	IPv6	All traffic	All	All	::/0	-
<input type="checkbox"/>	-	sgr-037530c44daaae004	IPv4	All traffic	All	All	0.0.0.0/0	-