A simplified anatomy of a layer 3 router...

Routing table

<table>
<thead>
<tr>
<th>Dest</th>
<th>Next hop</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>192.168.0.0/16</td>
<td>192.168.1.1</td>
<td>3</td>
</tr>
<tr>
<td>10.0.0.0/8</td>
<td>10.1.0.0</td>
<td>2</td>
</tr>
<tr>
<td>192.168.2.0/28</td>
<td>0.0.0.0</td>
<td>0</td>
</tr>
</tbody>
</table>

Forwarding table

<table>
<thead>
<tr>
<th>Dest</th>
<th>Out iface</th>
</tr>
</thead>
<tbody>
<tr>
<td>192.168.0.0/16</td>
<td>eth1</td>
</tr>
<tr>
<td>10.0.0.0/8</td>
<td>eth2</td>
</tr>
<tr>
<td>192.168.2.0/28</td>
<td>eth3</td>
</tr>
</tbody>
</table>
A Network operating system. Separate the control plane from the data plane
- If one of the red links is congested, apply rate-limiting to the authentication service
- If all red links are congested, migrate the authentication service to edge server 3
- Notification service -> ANY : BLOCK;
- Ticket Booking service <-> Authentication service : ALLOW;

Network security policy

Master orchestrator

Network controller  Container scheduler  Web API  Node Monitor
Security controller  VNF manager  Database  Service monitor

Infrastructure layer

Firewall  Authentication service  Rate limiter
Edge server 1

Migrate

Edge server 3

Firewall  Notification service
Edge server 2

Ticket booking service
Containers and edge services

Virtual Machines

Containers

Figure: Containers vs VMs[2]
Utility models for edge clouds

Figure: Containers as a unit of composition[6]
f = f₁ + f₂
**EDGE**

**GATEWAY API**

Middle tier client library doesn’t support batching

Single request asking for 1,000 objects not in cache

**Middle**

Middle Tier Service
Middle Tier Service
Middle Tier Service

Results in 2 RPC calls per object, or 2,000 RPC calls

**Backend**

Backend Tier Service
Backend Tier Service
Backend Tier Service

Middle tier has to call 3 backend services, or 6,000 calls.