Evolving Internet Transport

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NEAT is funded by the European Union’s Horizon 2020 research and innovation programme under grant agreement no. 644334.
API Built for the 1980s

FTP
Telnet
SMTP
Gopher

Socket API

TCP
UDP
SCTP

IP

App
App

hints.ai_family = AF_UNSPEC;
hints.ai_socktype = SOCK_STREAM;
getaddrinfo("vh.net", "80", &hints, &servinfo)

//Loop through results, connect to the first we can
for(p = servinfo; p != NULL; p = p->ai_next) {
    sockfd = socket(p->ai_family, p->ai_socktype,
                    p->ai_protocol);
    if(sockfd == -1)
        continue;
    if (connect(sockfd, p->ai_addr, p->ai_addrlen) == -1) {
        close(sockfd);
        continue;
    }
    break;
}
while(true) {
    send(sockfd, buf, SIZE, 0);
    recv(sockfd, buf, SIZE, 0);
}
The Naive View of the Network
The Reality of the Network

Middleboxes drop non http traffic
Firewalls Block protocols
Security devices inject ‘bad’ data
Proxies break TLS
Networks vary a ton

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2.5G is slow
3G has unpredictable latency
WiFi maintains really high bandwidth
4G has high, but variability in bandwidth
Application Requirements have changed
The Network Should ‘Just Work’

NEAT

DNS  STUN  HE  QoS

NAT  ...  ...  ...

Socket API

TCP  UDP  SCTP

IP
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