

# Back to My Mac

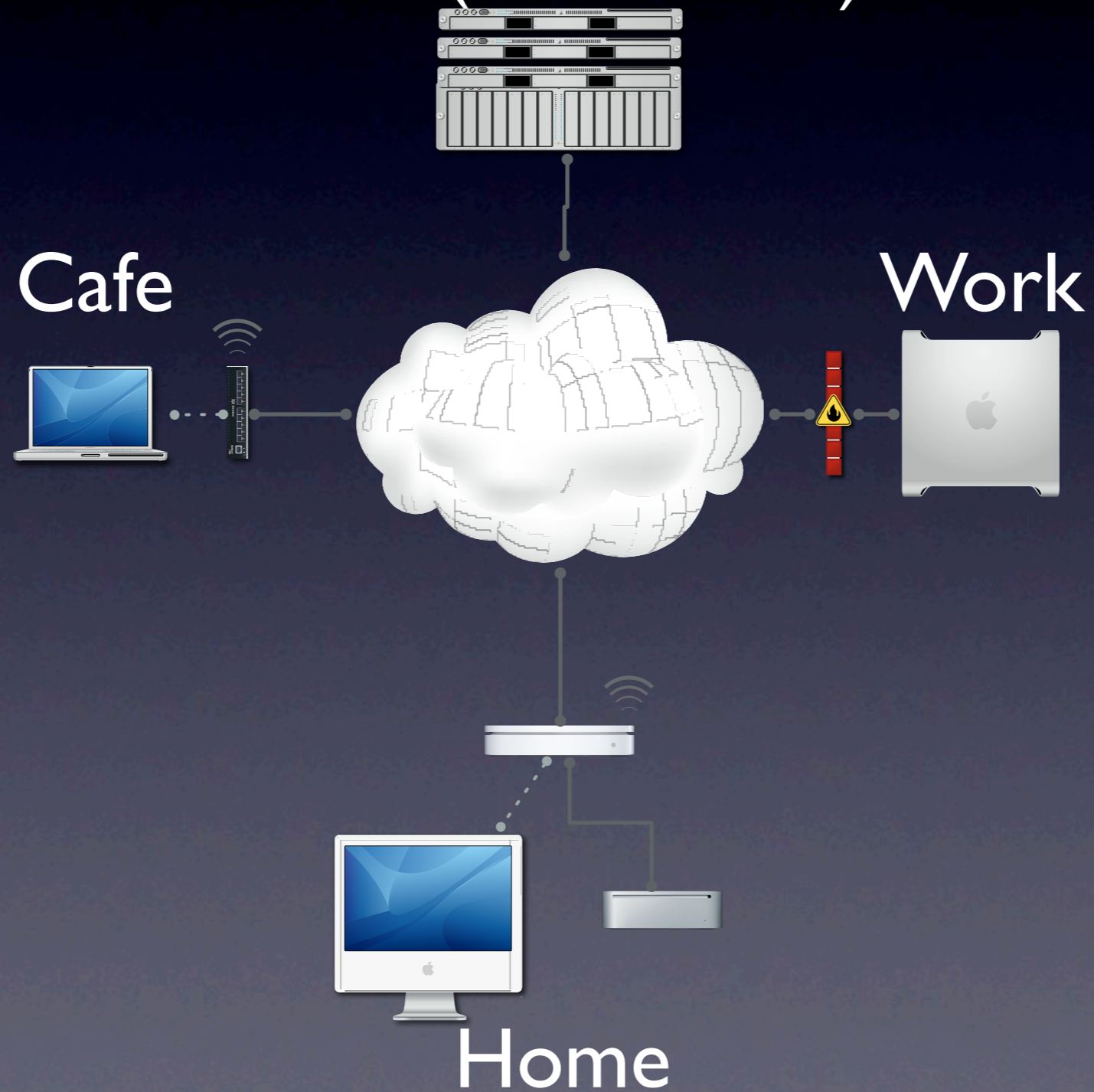
## 77<sup>th</sup> IETF, Anaheim

24<sup>th</sup> March 2010

Rory McGuire  
Stuart Cheshire

# Overview

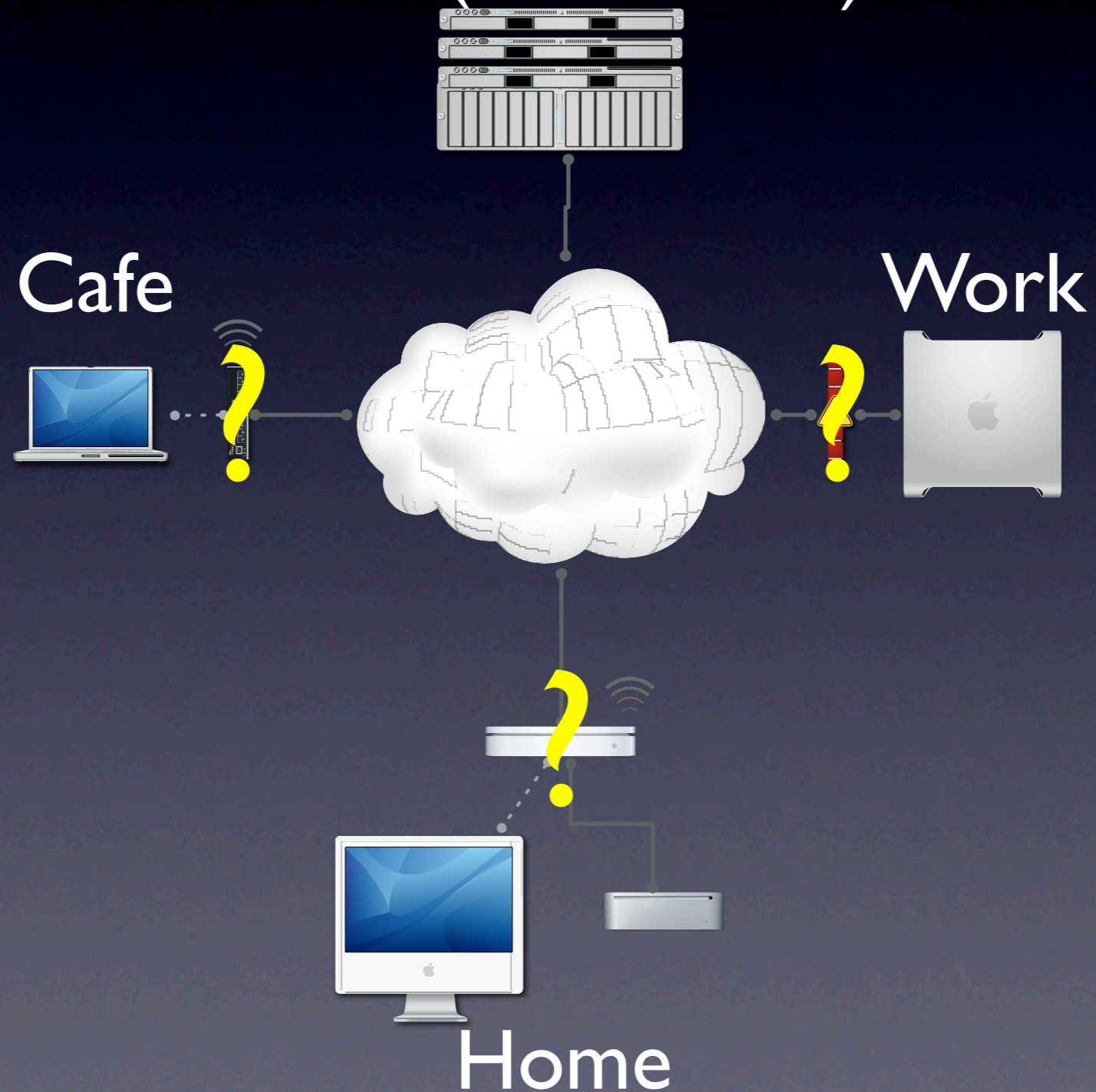
.Mac (Mobile Me)





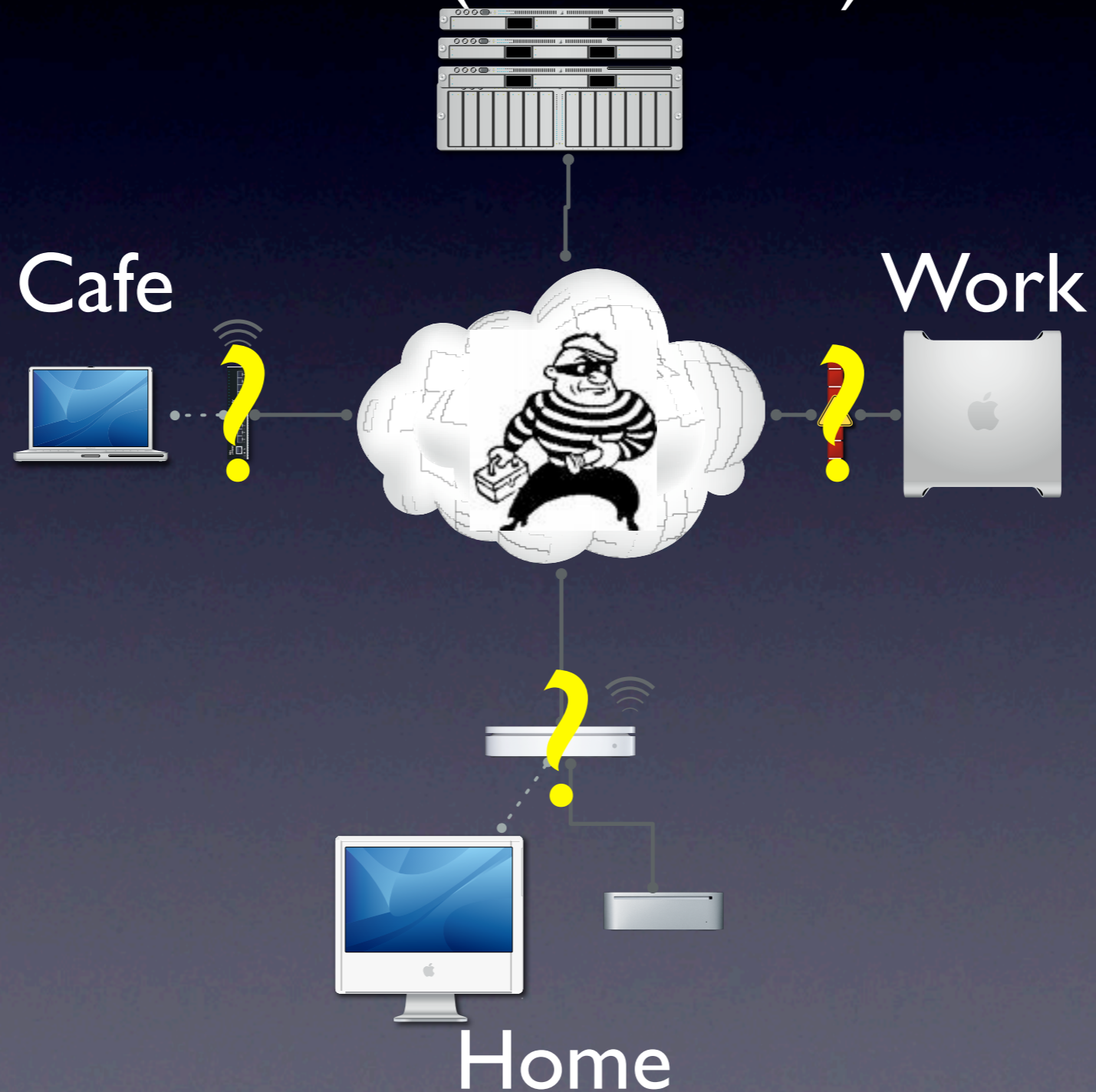
# Overview

## .Mac (Mobile Me)



# Overview

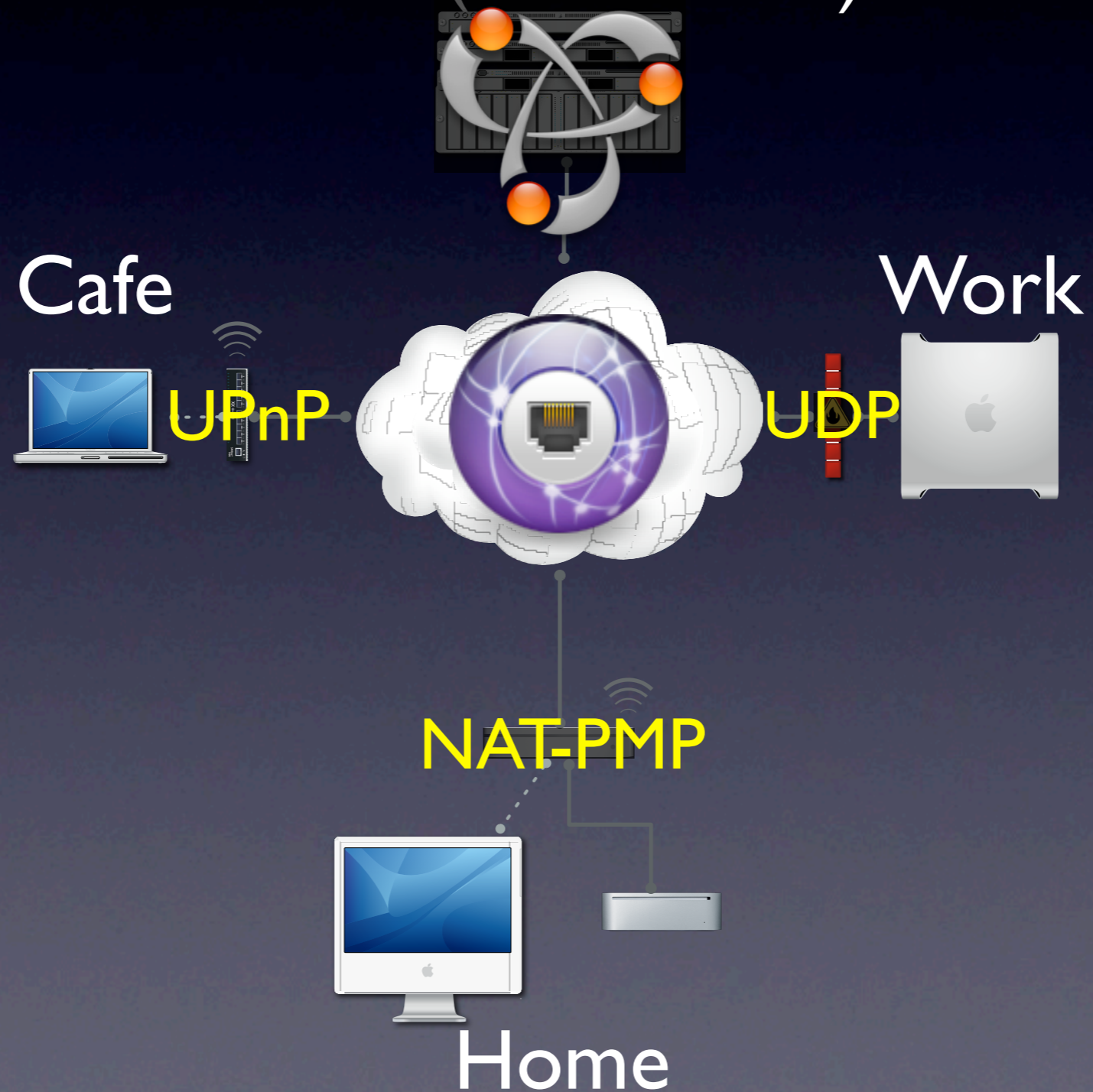
.Mac (Mobile Me)



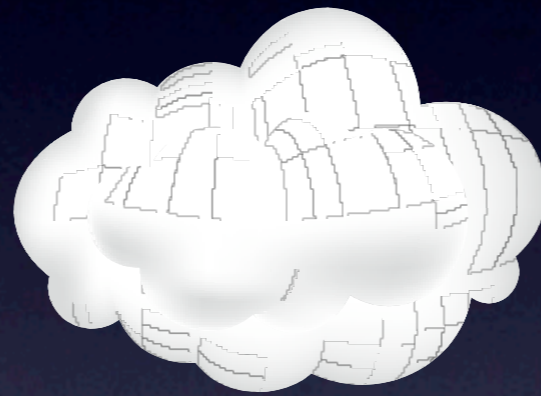


# Overview

.Mac (Mobile Me)



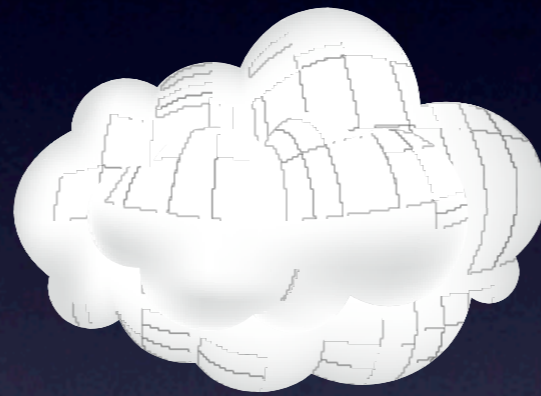
# Server Setup



[bob.members.mac.com](http://bob.members.mac.com)

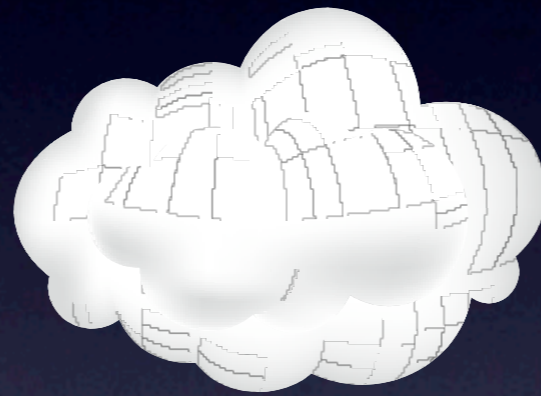


# Server Setup



[bob.members.mac.com](http://bob.members.mac.com)

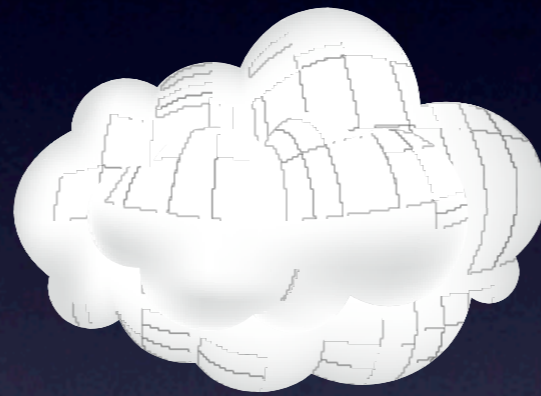
# Server Setup



[bob.members.mac.com](http://bob.members.mac.com)

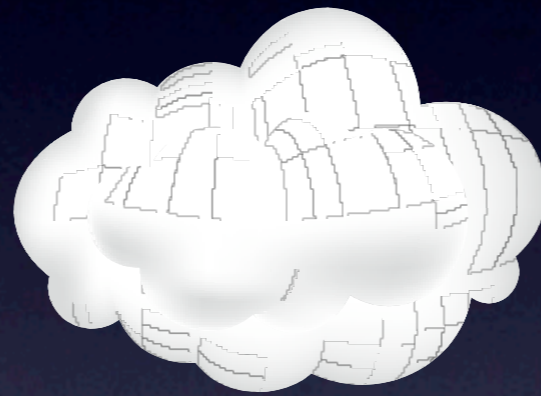


# Server Setup



[bob.members.mac.com](http://bob.members.mac.com)

# Server Setup



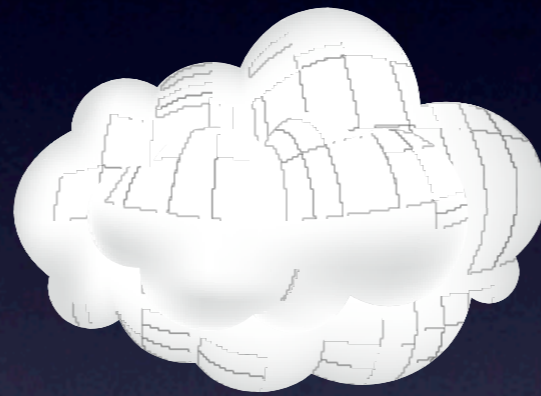
UDP 4500



bob.members.mac.com



# Server Setup



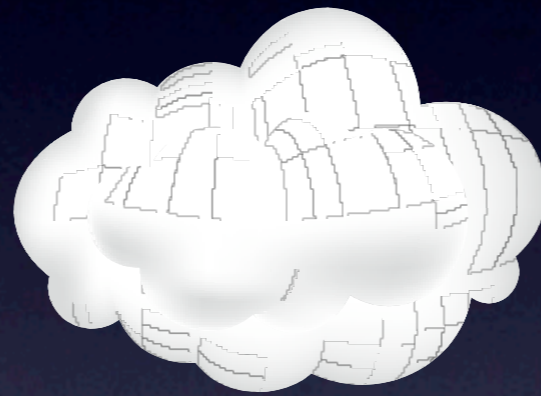
UDP 4500

IPv6 ULA



bob.members.mac.com

# Server Setup



UDP 4500

IPv6 ULA



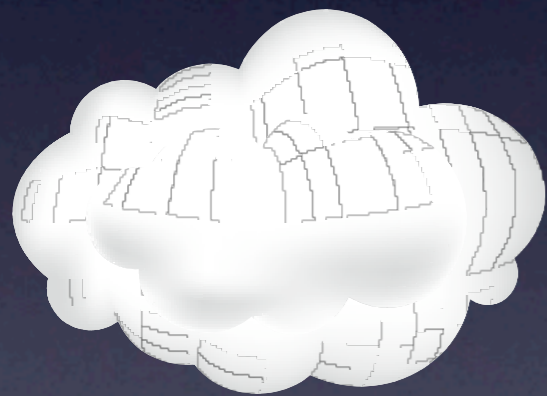
IPSec Policies  
racoon config



bob.members.mac.com



# Server Setup



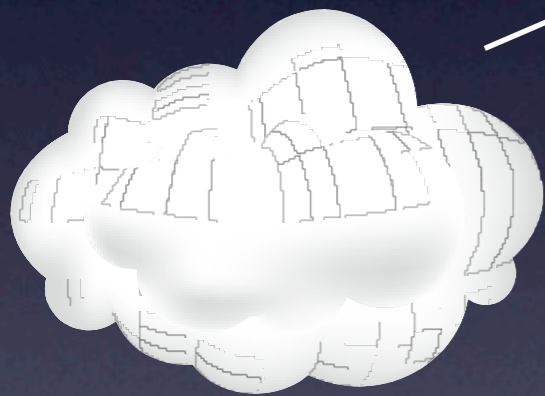
# Server Setup

.Mac (Mobile Me)



TLS

```
PTR _afpovertcp._tcp.bob.members.mac.com >  
Bob's iMac.bob.members.mac.com
```



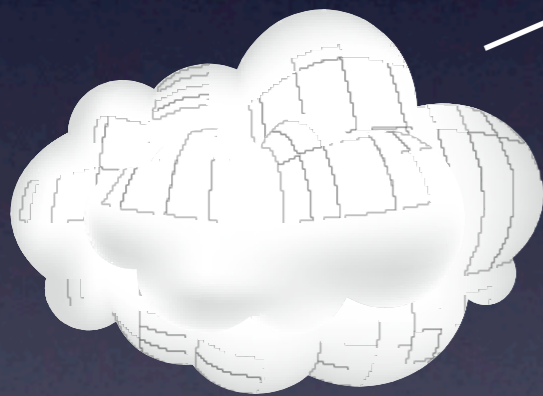


# Server Setup

.Mac (Mobile Me)



TLS



```
PTR _afpovertcp._tcp.bob.members.mac.com >  
Bob's iMac.bob.members.mac.com
```

```
SRV Bob's iMac._afpovertcp._tcp.bob.members.mac.com >  
548 bobs-imac.bob.members.mac.com
```

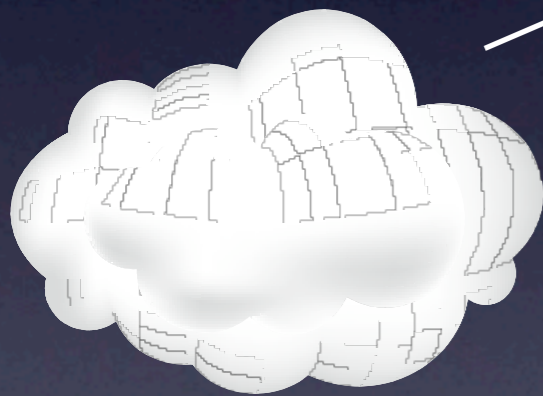


# Server Setup

.Mac (Mobile Me)



TLS



```
PTR _afpovertcp._tcp.bob.members.mac.com >  
Bob's iMac.bob.members.mac.com
```

```
SRV Bob's iMac._afpovertcp._tcp.bob.members.mac.com >  
548 bobs-imac.bob.members.mac.com
```

```
TXT Bob's iMac._afpovertcp._tcp.bob.members.mac.com >
```

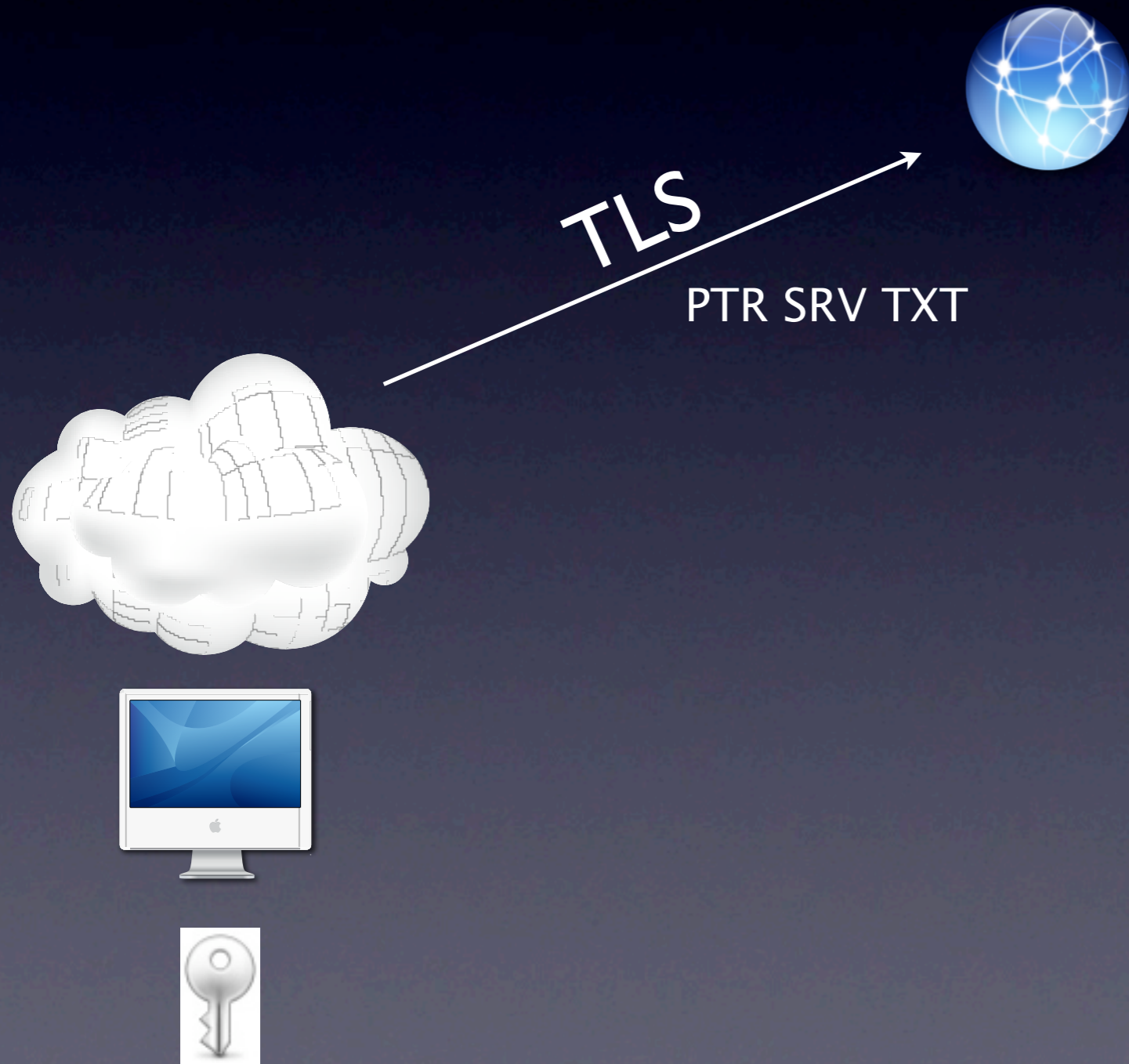
...





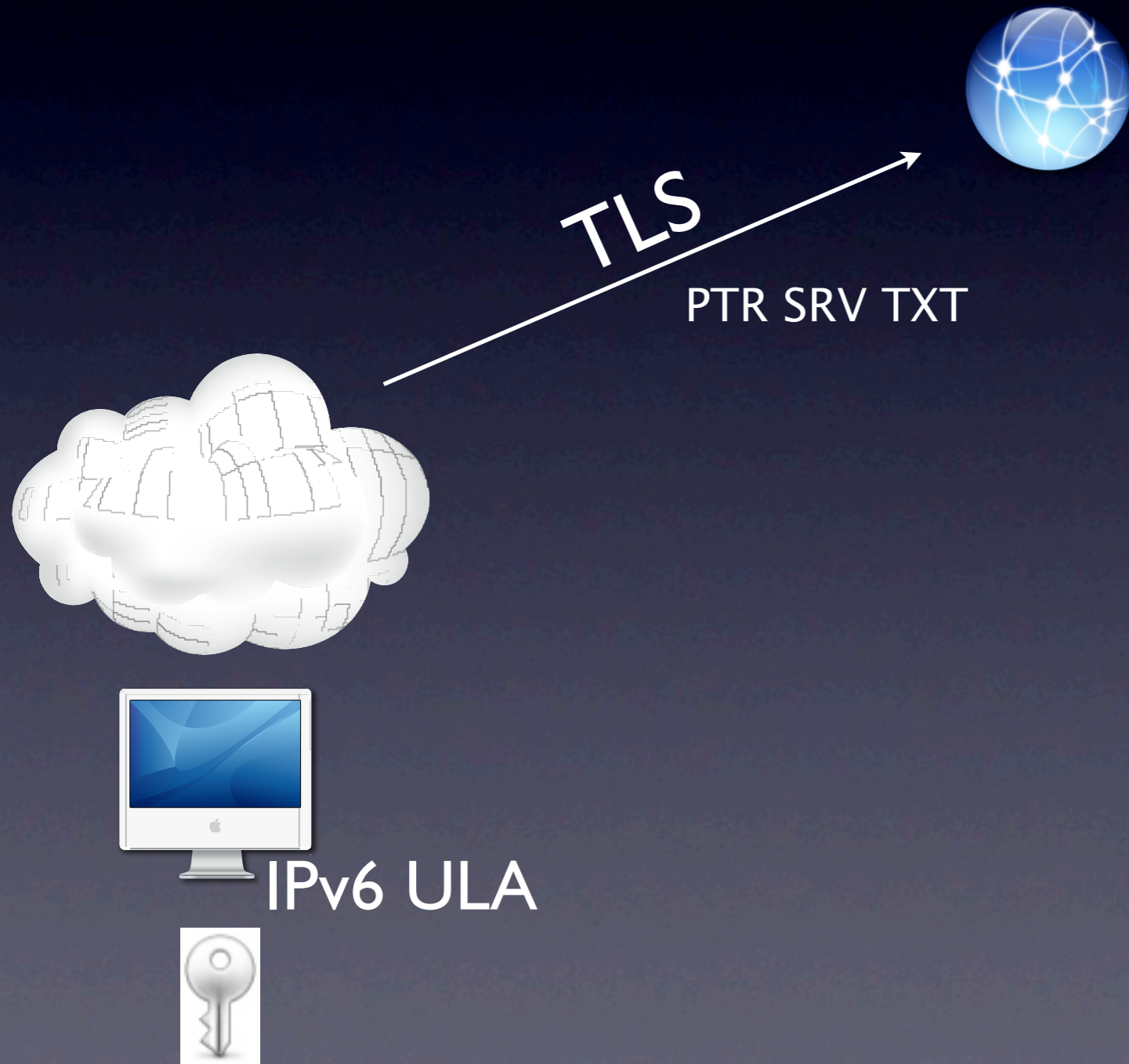
# Server Setup

.Mac (Mobile Me)



# Server Setup

.Mac (Mobile Me)





# Server Setup

.Mac (Mobile Me)



TLS

PTR SRV TXT

AAAA bobs-imac.bob.members.mac.com >  
ULA



IPv6 ULA



# Server Setup

.Mac (Mobile Me)



TLS

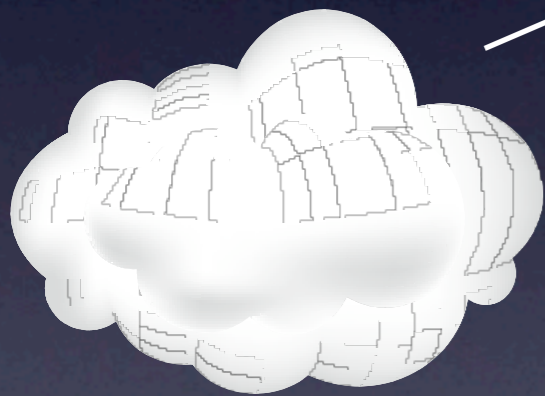
PTR SRV TXT

AAAA bobs-imac.bob.members.mac.com >

ULA

SRV \_autotunnel.\_udp.bobs-imac.bob.members.mac.com >

port AutoTunnel-MAC.bob.members.mac.com.



IPv6 ULA





# Server Setup

.Mac (Mobile Me)



TLS



PTR SRV TXT

```
AAAA bobs-imac.bob.members.mac.com >
```

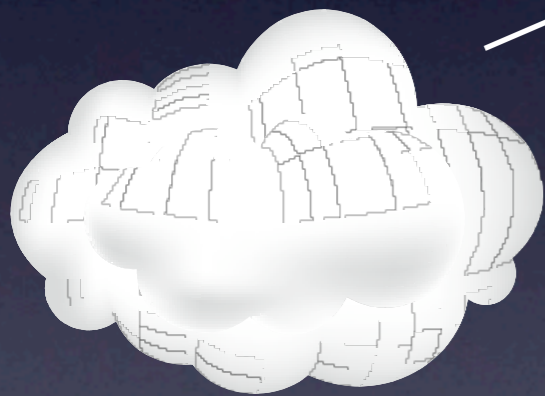
ULA

```
SRV _autotunnel._udp.bobs-imac.bob.members.mac.com >
```

port AutoTunnel-MAC.bob.members.mac.com.

```
A AutoTunnel-MAC.bob.members.mac.com. >
```

V4



IPv6 ULA

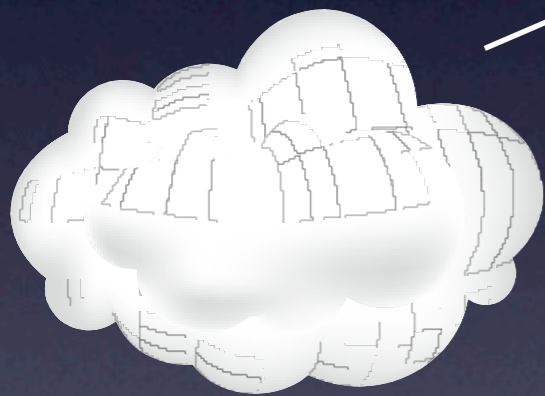


# Server Setup

.Mac (Mobile Me)



TLS



PTR SRV TXT

```
AAAA bobs-imac.bob.members.mac.com >
```

ULA

```
SRV _autotunnel._udp.bobs-imac.bob.members.mac.com >
```

port AutoTunnel-MAC.bob.members.mac.com.

```
A AutoTunnel-MAC.bob.members.mac.com. >
```

V4

```
TXT Bob's iMac._device-info._tcp.bob.members.mac.com >
```

model=iMac4,1



IPv6 ULA



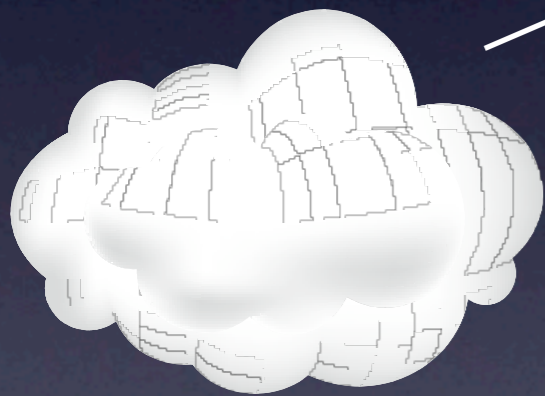


# Server Setup

.Mac (Mobile Me)



TLS



IPv6 ULA



PTR SRV TXT

```
AAAA bobs-imac.bob.members.mac.com >
```

ULA

```
SRV _autotunnel._udp.bobs-imac.bob.members.mac.com >
```

port AutoTunnel-MAC.bob.members.mac.com.

```
A AutoTunnel-MAC.bob.members.mac.com. >
```

V4

```
TXT Bob's iMac._device-info._tcp.bob.members.mac.com >
```

model=iMac4,1

```
TXT _kerberos.bobs-imac.bob.members.mac.com >
```

LKDC:SHA1.HASH

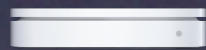
# Client Connection

.Mac (Mobile Me)

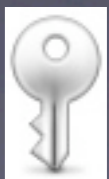


bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT



IPv6 ULA





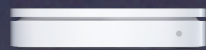
# Client Connection

.Mac (Mobile Me)

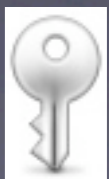


bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT



IPv6 ULA



# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



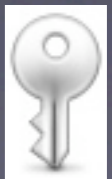
bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT

TLS



IPv6 ULA





# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

**PTR** SRV TXT AAAA SRV A TXT TXT

TLS



IPv6 ULA



# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



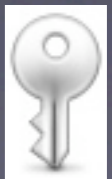
bob.members.mac.com  
PTR SRV TXT AAAA SRV A **TXT** TXT

Icon?

TLS



IPv6 ULA





# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR **SRV** **TXT** AAAA SRV A TXT TXT

SRV/TXT?

TLS



IPv6 ULA



# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

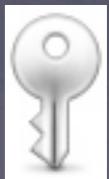
PTR SRV TXT AAAA SRV A TXT TXT

Hostname?

TLS



IPv6 ULA





# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT

Hostname?

TLS



IPv6 ULA



# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT

Hostname?

TLS

Magic!



IPv6 ULA





# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA **SRV** **A** TXT TXT

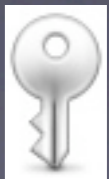
Autotunnel (SRV,A)?

TLS

Magic!



IPv6 ULA



# Client Connection

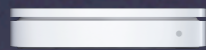
.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT



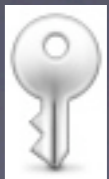
IPv6 ULA



Magic!



IPv6 ULA





# Client Connection

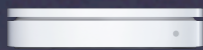
.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT



IPv6 ULA



IPSec Policies  
racoon config  
host route

Magic!



IPv6 ULA



# Client Connection

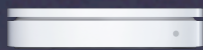
## .Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT



AAAA



IPv6 ULA



IPSec Policies  
racoon config  
host route



IPv6 ULA





# Client Connection

## .Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT



???

IPv6 ULA



IPSec Policies  
racoon config  
host route

IPv6 ULA



# Client Connection

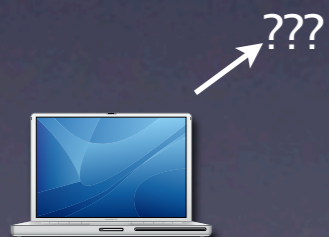
## .Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT



IPv6 ULA



IPSec Policies  
racoon config  
host route

## More Magic!



IPv6 ULA





# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT

ISAKMP (IPSec)



IPv6 ULA



IPSec Policies  
racoon config  
host route

More Magic!

IPv6 ULA



# Client Connection

.Mac (Mobile Me)

Query: AFP, ScreenSharing



bob.members.mac.com

PTR SRV TXT AAAA SRV A TXT TXT

Tunnel

IPv6 in IPSEC in UDP in IPv4

IPv4 | UDP | ESP header | { IPv6 | protocol | data } | ESP footer



IPv6 ULA

IPv6 ULA



IPSec Policies  
racoon config  
host route

