



# IPv6



## IPv6 Security & Privacy

# A Global Issue

# ”Taming the World ”





# Some Internet Security Protocols

You are  
here

## Application

- e-mail  
+ PGP, S/MIME

## Transport

- Primarily Web  
+ SSL/TLS  
+ Secure Shell (SSH)

## Network

+ IPsec –MIPv6  
Routing Security

## Infrastructure

+ DNSsec - PKI  
+ SNMPv3 security

Political

Economic

Application

Presentation

Session

Transport

Network

Link

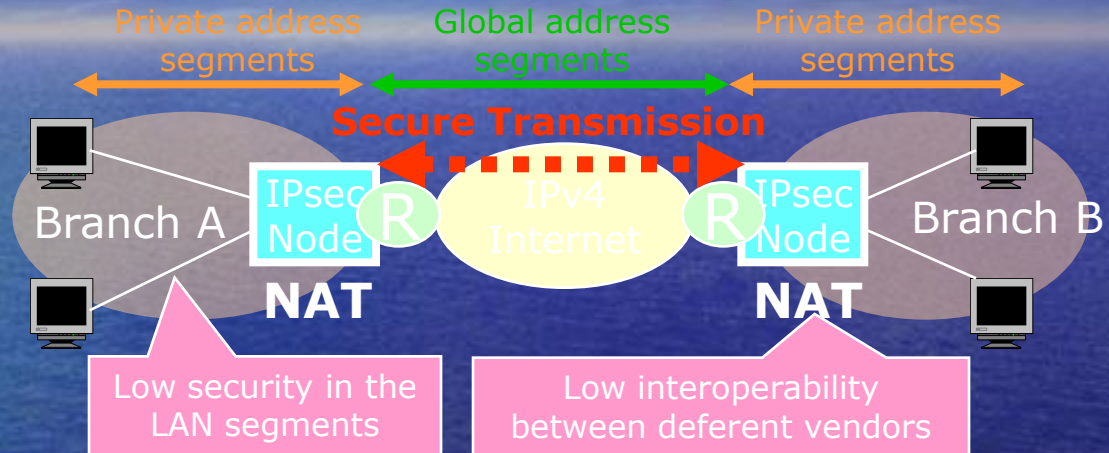
Physical

# End-to-End Secure Communications

**Easy to setup IP-VPN between End-to-End nodes with IPv6**

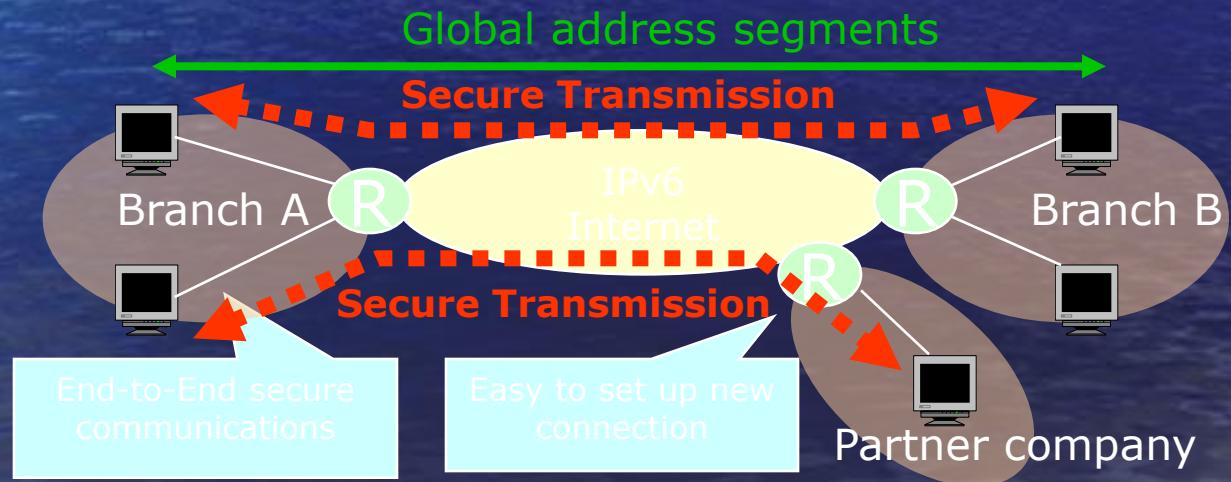
## IPv4

Site-to-Site  
secure  
communications



## IPv6

End-to-End  
secure  
communications





# **New Benefits of IPv6 for Security & Privacy**

## **Anti-HACK :**

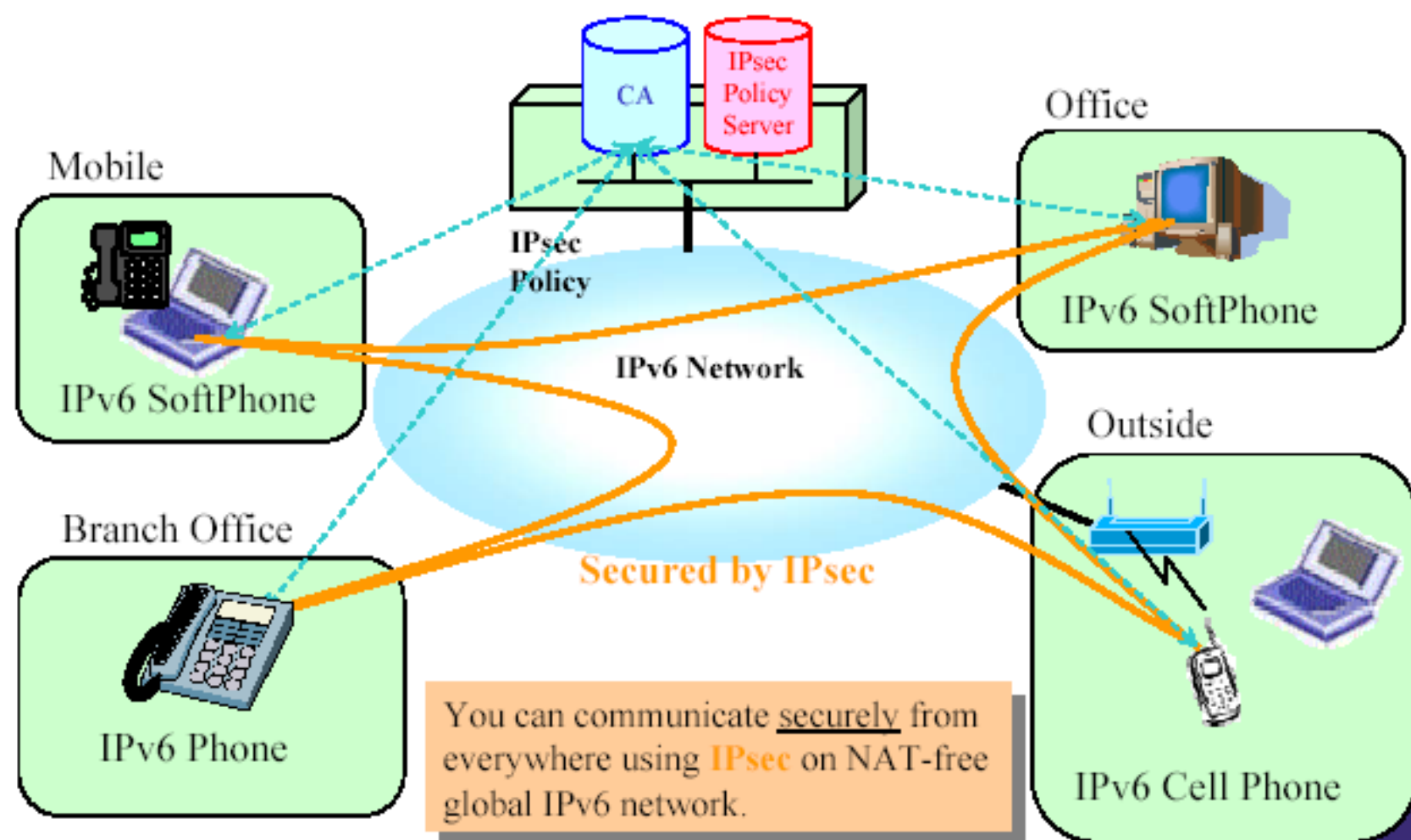
- **No Fragmentation (Routers are MiMs)**
- **No Broadcast in IPv6**
- **No IP ID Field**
- **No IP Record Route Option**
  - **No traceroute alternative anymore**
- **Multicast addresses cannot be destined from remote**
- **No Port Scanning**

## **New security features**

- **IPsec Mandated (My peer supports IPsec & interoperates)**
- **Privacy addresses (randomised MAC addresses)**
- **Cryptographic Generated Addresses (CGA)**
- **No need for NAT (kills IPsec & Skerberos ..)**
- **Mobile IPv6**
- **Potential spam control**

# Case Study: End to End Secure VoIPv6

## Secure voice communication over IPv6/IPsec





# IPv6 End-to-End Management

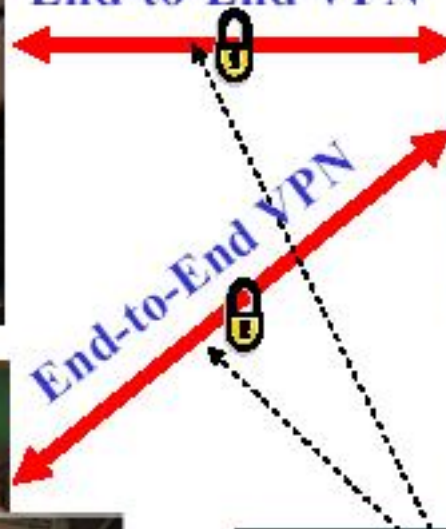
at Net.Liferium 2002 Exhibition



SANYO  
(Camera)

SHARP  
(PDA)

End-to-End VPN



Toshiba  
(Fridge)

NTT Com  
(Platform)

IPsec  
Policy  
Management



# New Challenges

- **Hackers use IPv6 as backdoor (even before the sex industry) -- 6to4 in unprotected networks**
- **Lack of IPv6 Firewalls (Where are the famous Security experts?)**
- **The biggest myth: PKI ( needs world peace and all crooks and hackers behind bars)**
- **Education ... Education ... Education**
  - **Obsolete security knowledge & experts – (many in denial)**
  - **Hackers are smarter than security experts**
- **Not a single IPv6 Security & privacy funded by the EC (most probably advised by same experts)**