Scalable Security in an Unimaginably Large Network

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Unimaginable Size

- not just workstations and servers

- sensors and controllers

- appliances

- 128-bit network address (IPv6)

Unimaginable Diversity

- walls, chairs, clothing, light switches
- body network [Bell & Gray]
- home appliances

Unimaginable Risk

- processes defy awareness
- information warfare [Druffel]
- life and property at stake

Firewalls

- administrator studies traffic patterns then generates rules

- firewalls protect *the inside* from *the outside* (*inside* and *outside* will be indistinguishable)

- firewalls require global a priori knowledge of traffic
  (traffic patterns will be too complex)

Public Key Infrastructure

- authentication much easier
- deciding degree of trust is a big problem
- who will be the Certificate Authorities?
- what will their policies be?
- how will people trust them?

Host Security

- must be built-in, "nearly free"
- access control
- data/operation validation
- formal analysis and verification
- safer languages

Conclusion

- firewalls will not scale to size or diversity

- each device responsible for its own security
  (need help of software vendors)

- public key based protocols facilitate trust between devices
  (need help of laws to protect commerce)

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http://playground.sun.com/pub/soley/FTDCS/