

Institute for Cyber Security



Cyber Security Grand Challenges and Prognosis

Prof. Ravi Sandhu
Executive Director and
Endowed Chair

ravi.sandhu@utsa.edu www.profsandhu.com www.ics.utsa.edu



Cyber Security Status



- Cyber technologies and systems have evolved
- Cyber security goals have evolved
 - Computer security
 - Information security = Computer security + Communications security
 - Information assurance
 - Mission assurance
- Cyber security research and practice are loosing ground



Cyber Security Characteristics



Cyber Security is all about tradeoffs

Productivity

Let's build it
Cash out the benefits
Next generation can secure it

Security

Let's not build it Let's bake in super-security to make it unusable/unaffordable Let's sell unproven solutions

There is a sweet spot We don't know how to predictably find it



Cyber Security Characteristics

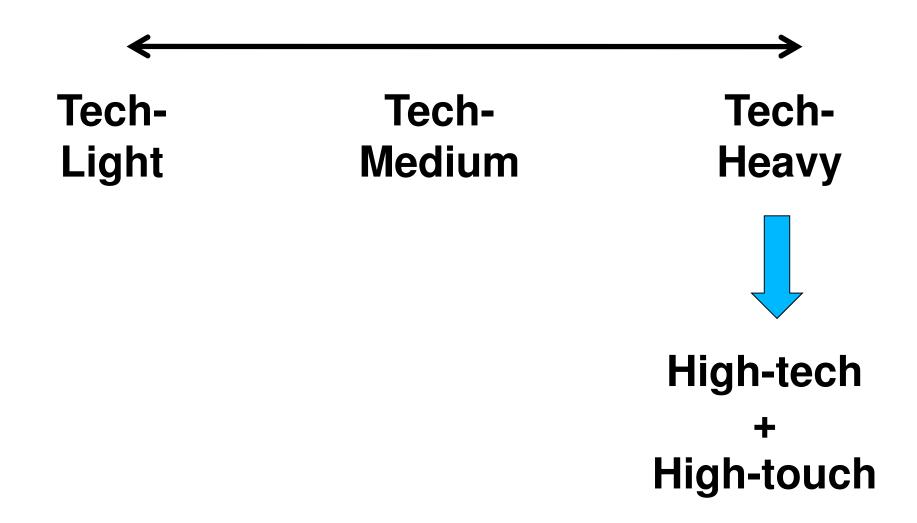


- > Microsec versus Macrosec
 - Most cyber security thinking is microsec
 - Most big cyber security threats are macrosec
- Rational microsec behavior can result in highly vulnerable macrosec



Cyber Security Characteristics





5



Grand Challenges



> Develop a scientific discipline

- to predictably find the sweet spots for different application and mission contexts
- to predictably find, incentivize and deploy microsec that leads to desirable macrosec outcomes
- that can be meaningfully taught in Universities at all levels: BS, MS, PhD

> Prognosis

- we shall succeed (we have no choice)
- UTSA aims to be a world-leader in this endeavor