Limitations of Traffic Analysis at Large Scale

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What We Will Cover

Overarching questions

What will we never know?

Analytical Limitations

Overarching Questions

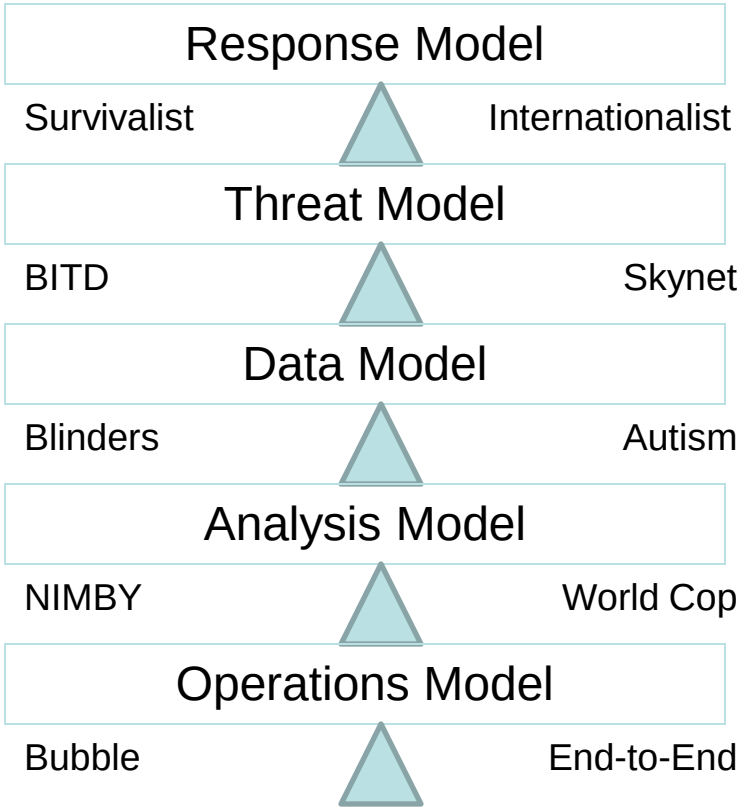
How do I know what I’m looking for?

How do I know why I’m looking?

How do I know where to look?

How do I know when it’s found?

Traffic Balance



What will you never know?

Total ground truth on a network of any size

How often is bad considered good? (false negative)

What is the next attack?

Why did they attack you?

What are your competitors seeing?

Inherently Partial Data

Technology shifts

Attacker actions

Defender actions

Managerial decisions

Network bandwidth

Correlation and Causation

Baseline in dynamic environment

Correlation vs. Causation

Implications

- Need to be cautious in kinds of conclusions
- Consider strategies for dealing with analysis gone wrong

Indication and Proof

Indication: There is reason to believe

Proof: There is no other logically defensible explanation

How much confidence do you need?

Cost of false positive?

Cost of false negative?

Conclusions

Many failure modes

Many challenges

Topic of continuing interest