



# Limitations of Traffic Analysis at Large Scale

**Timothy J. Shimeall**  
**CERT/NetSA**  
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# What We Will Cover

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Overarching questions

What will we never know?

Analytical Limitations

# Overarching Questions

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How do I know what I'm looking for?

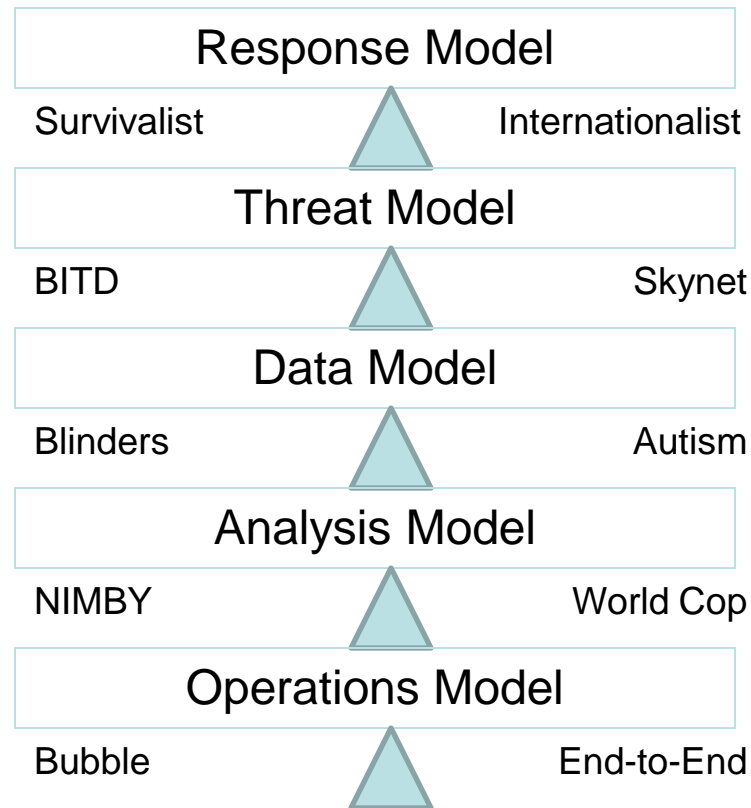
How do I know why I'm looking?

How do I know where to look?

How do I know when it's found?

# Traffic Balance

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# What will you never know?

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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

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Technology shifts

Attacker actions

Defender actions

Managerial decisions

Network bandwidth

# Correlation and Causation

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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

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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

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Many failure modes

Many challenges

Topic of continuing interest