Proposing a Multi-touch Interface for Intrusion Detection Environments

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The Problem

- Huge text-based network logs with more being created every second
- Context is difficult to acquire from detail level tools
- And only Jim knows what is really going on

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Analysts need tools which:

- Handle LARGE datasets
- Provide context
- Afford exploration
- Manage cognitive load

Essentially, the Fundamental Problem of Visual Analytics

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Current Visualizations

- Consensus on the need for more interactivity
  - Access to both detail and contextual information

- See Section 2.1 for a more detailed discussion

Getting to Know Analysts

- Need more than a CTA
- Activity Theory
  - provides a theoretical basis
  - need a multi-methods approach

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Applying Activity Theory Example

- Activities – keeping the network
- Actions – reviewing logs
- Operations – changing the configuration of a network sensor

A New Design Approach

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A look at requirements:

- Monitoring
- Analysis
- Response
- Knowledge Management

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Monitoring

- Identify network state at a glance
- Use pre-attentive visual properties to control the amount required attention

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Analysis

- Goal: to develop understanding
- Multiple views at different levels of data abstraction

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Response

- Network management
- Parts of response:
  - Record the happening of an event
  - Affect network changes

Knowledge Management

- Capture Jim's experience
- Provides a library of case studies for future training
- Must be a by product of using the tool, not an extra step

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Our Design

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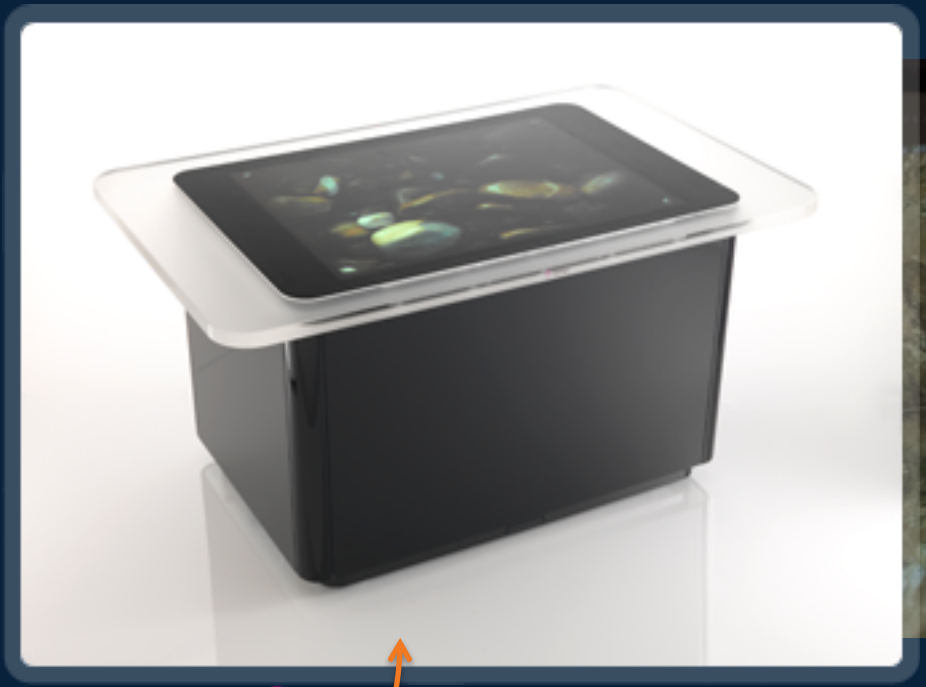
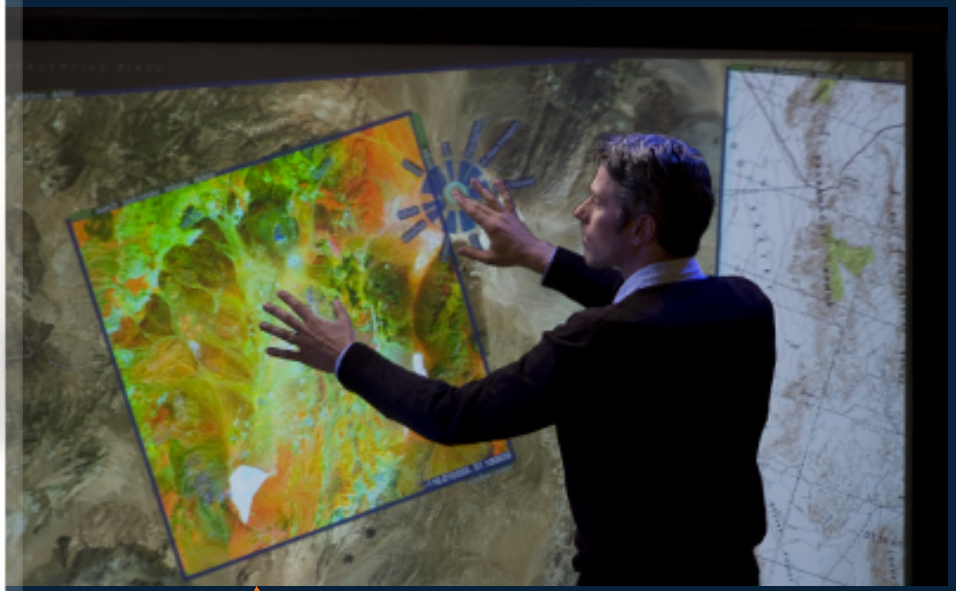
Multi-touch based network analytics tool





Microsoft Surface

PERCEPTIVE PIXEL

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Affordances

- Physical (embodied) interaction with interface
- Gestures
- Faster interaction than with a mouse

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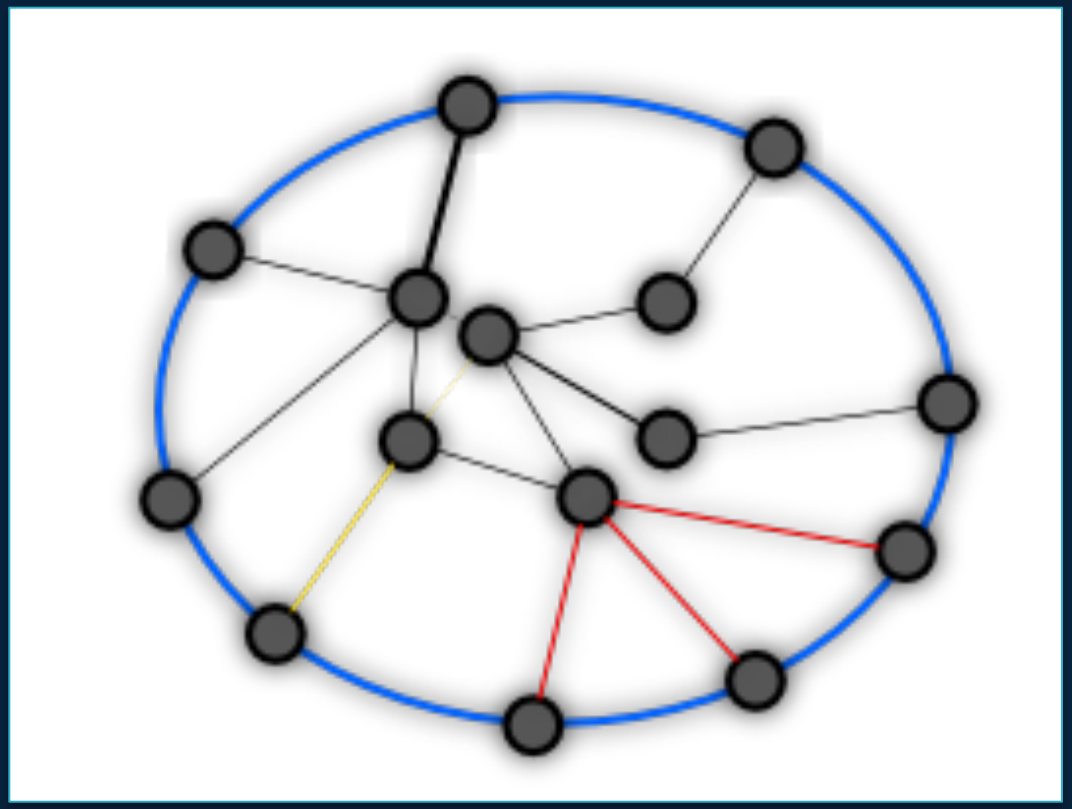
Zoomable, Spatial Exploration



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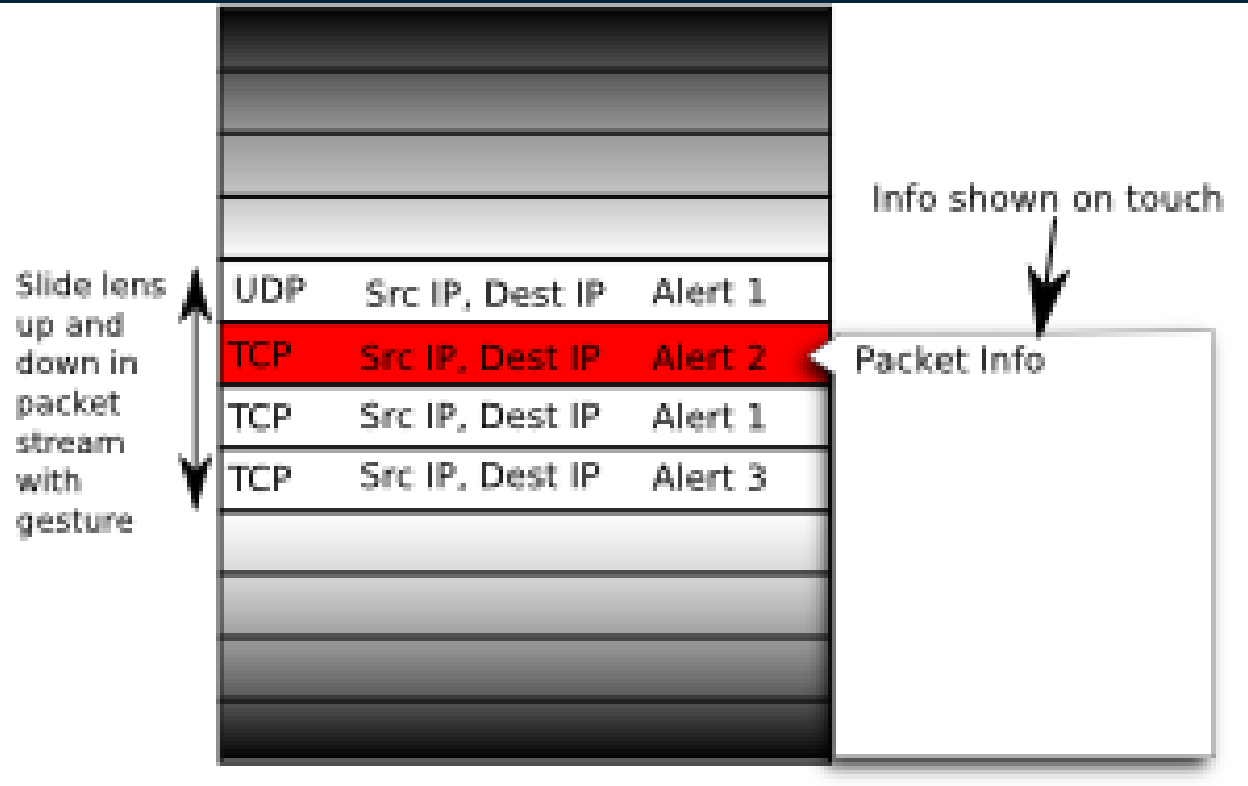
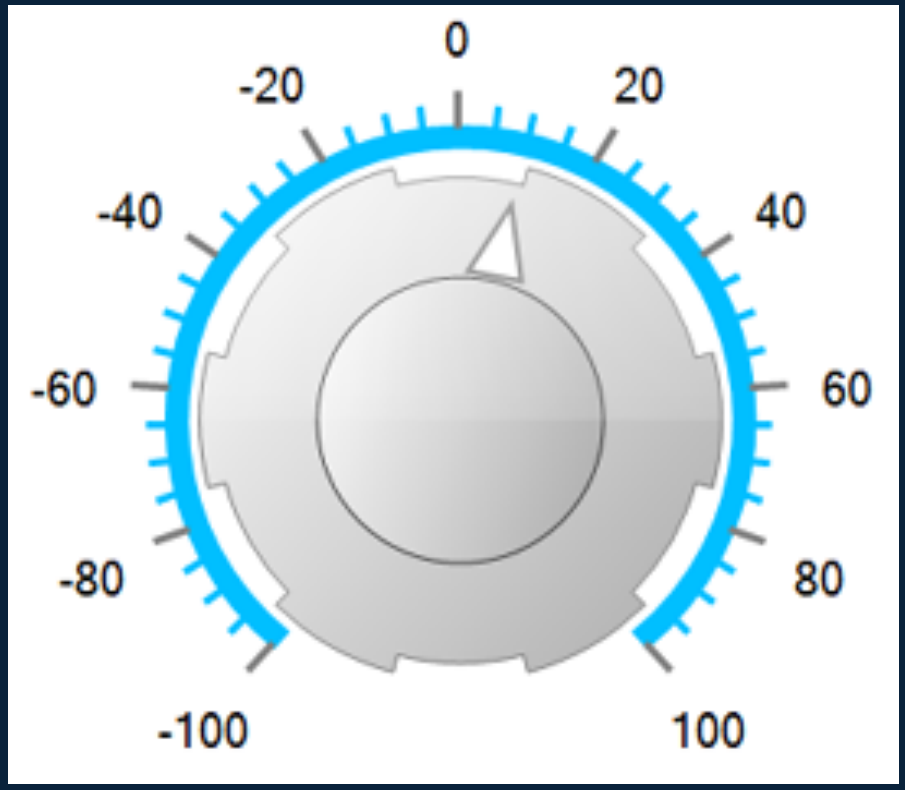
Packet Level



Time



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Using Metadata

- To learn context
- To describe interactions -> create knowledge base

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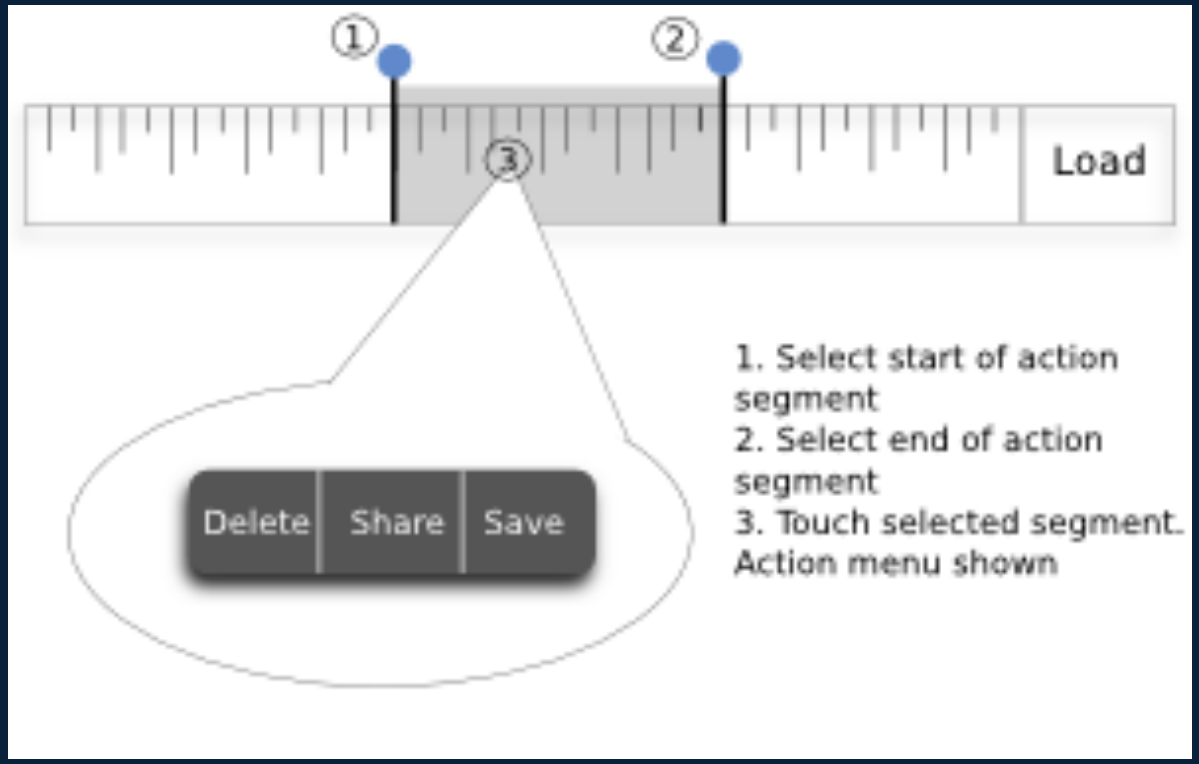
ActionLine



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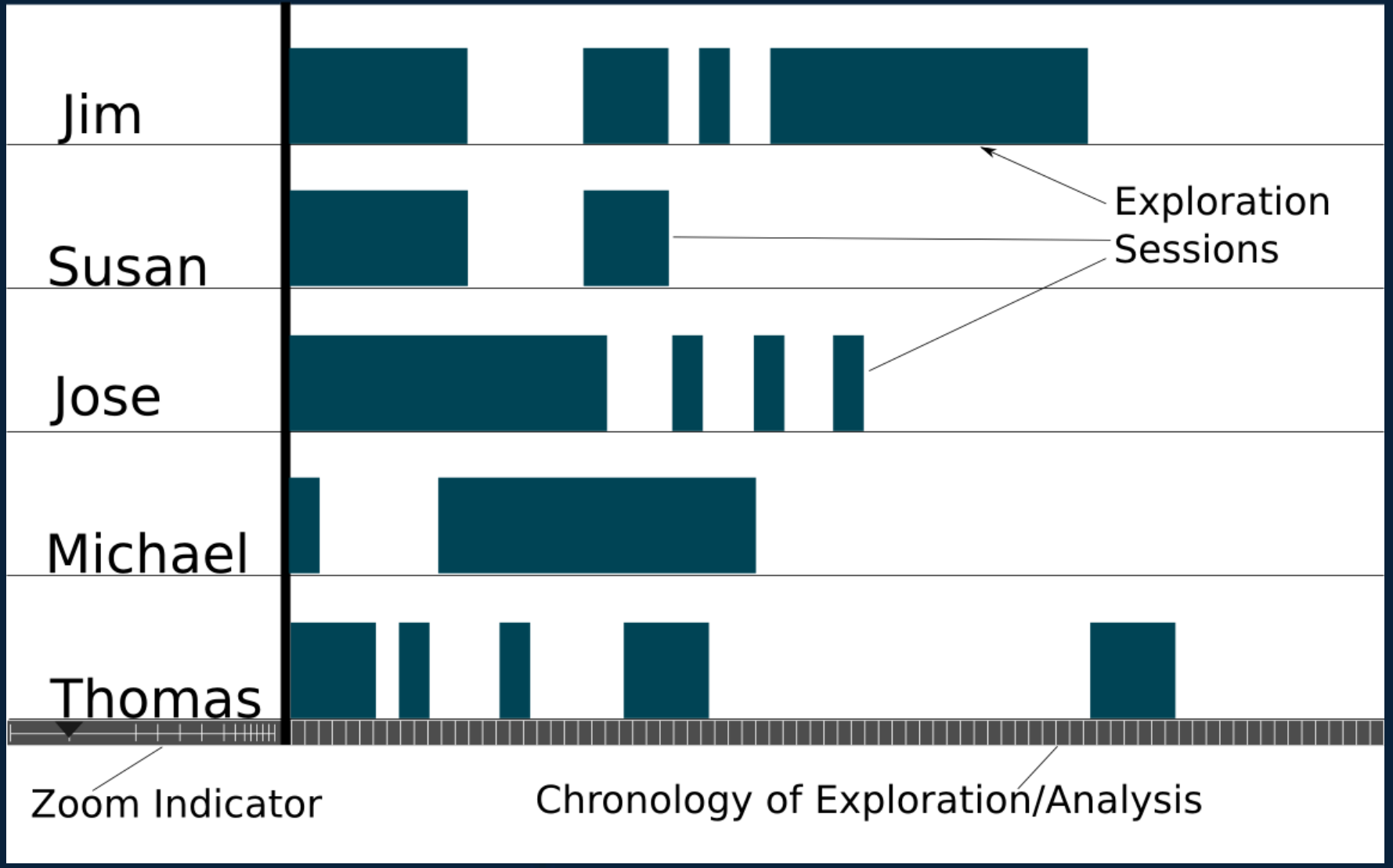
Knowledge Tracks



User-refined Alert Correlation

- Make alert correlation interactive
  - Guided exploration of data

- Allow addition/removal of events from attack
- Correlation computation updated

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Wrapping Up

- Exposed the need for a multi-method research
- List of Requirements:
  - Monitoring
  - Analysis
  - Response
  - Knowledge Management
- Argued for a new mode of interaction

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Questions?

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