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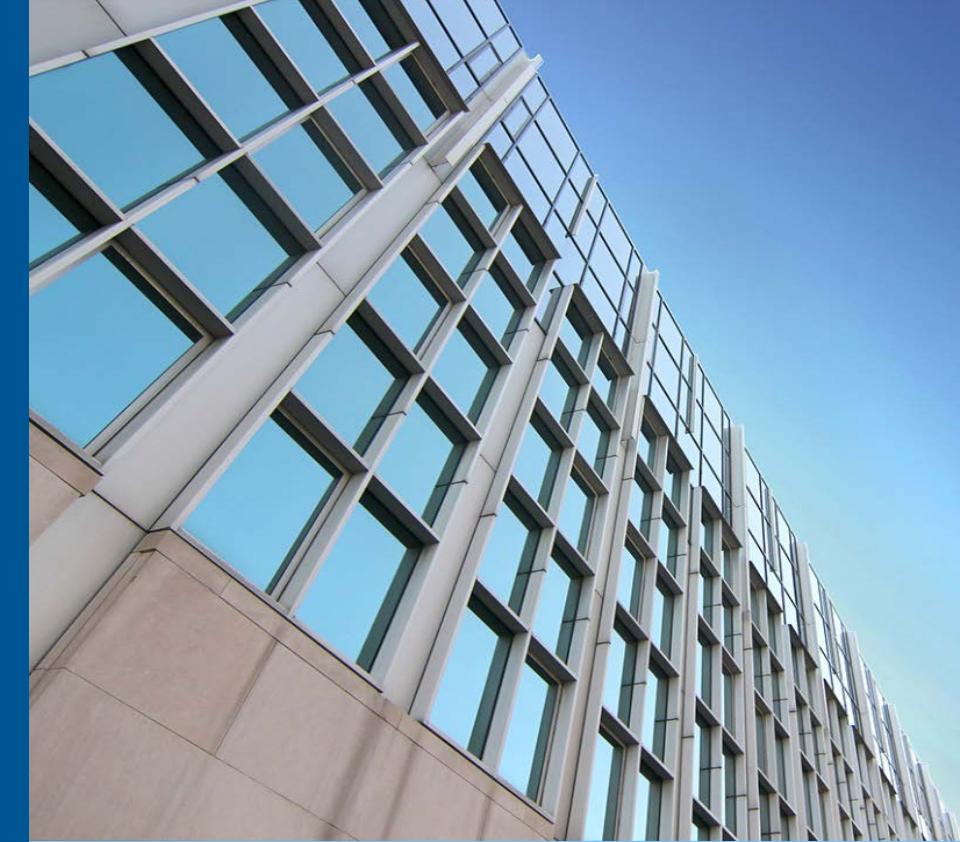
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Using Network Flow to Gain Cyber Situational Awareness

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Software Engineering Institute

| Carnegie Mellon University

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Polling Question 1

How familiar are you with the concept of “Cyber Situational Awareness”?

Sounds interesting, but I haven’t put much thought into it

I’m familiar with situational awareness, but have never applied it to cyber

It’s an important part of my work but I would like to better understand it

I’ve studied and applied the concept extensively



Polling Question 2

What is your background?

Executive management

Technical management

Operational leader (e.g., shift supervisor)

Technical or operational staff

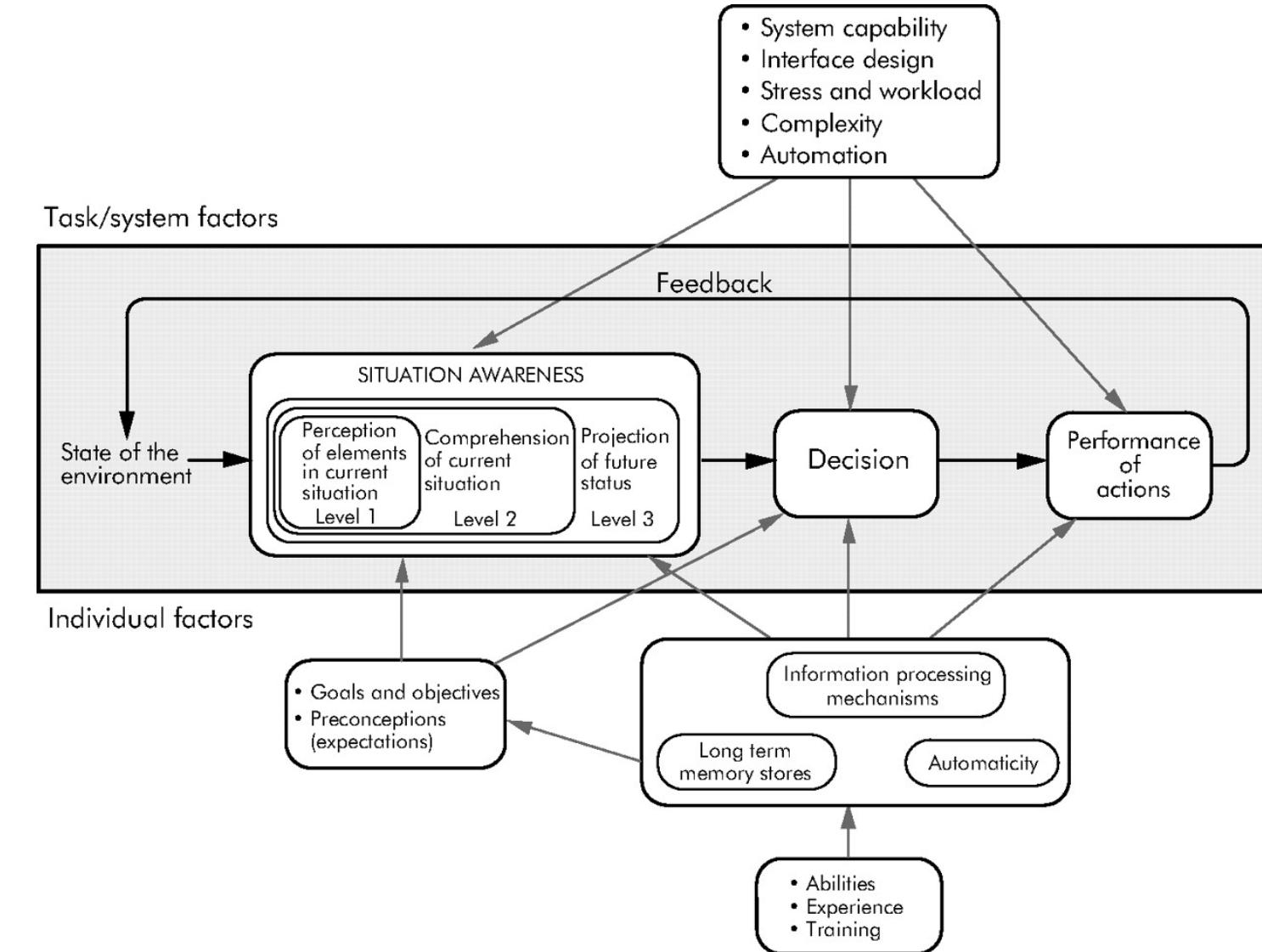




Situation Awareness Is a State of Knowledge

Situation awareness is the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future.

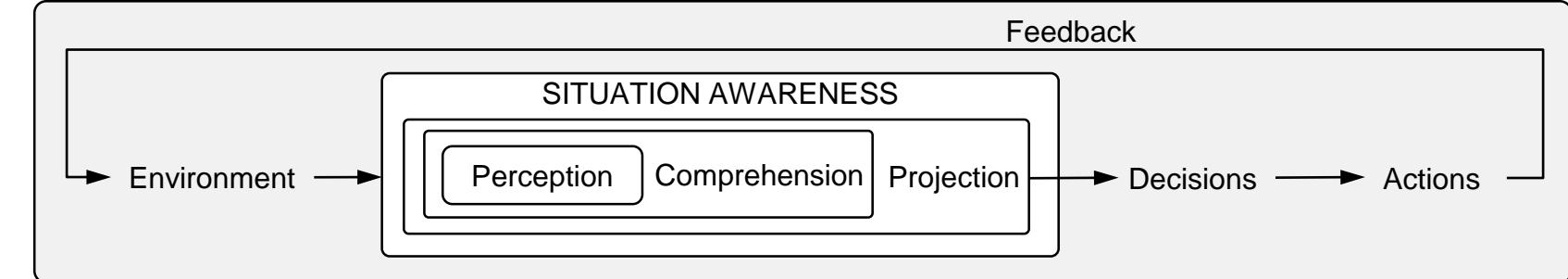
Endsley, M. R. SAGAT: A methodology for the measurement of situation awareness (NOR DOC 87-83).
Hawthorne, CA: Northrop Corp.



Endsley, M. R. *Toward a Theory of Situation Awareness in Dynamic Systems*.
Human Factors, 1995, 37(1), 32-64



System Factors

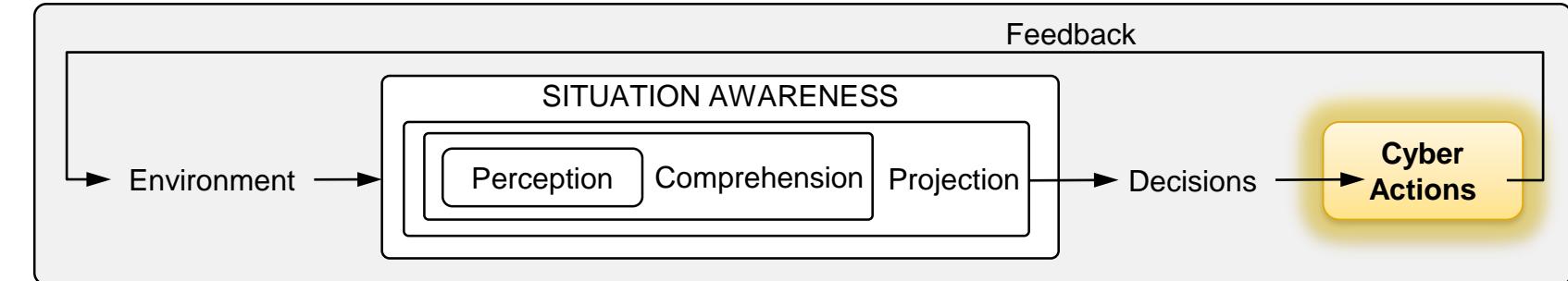


Individual Factors

Situation awareness is the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future.



System Factors



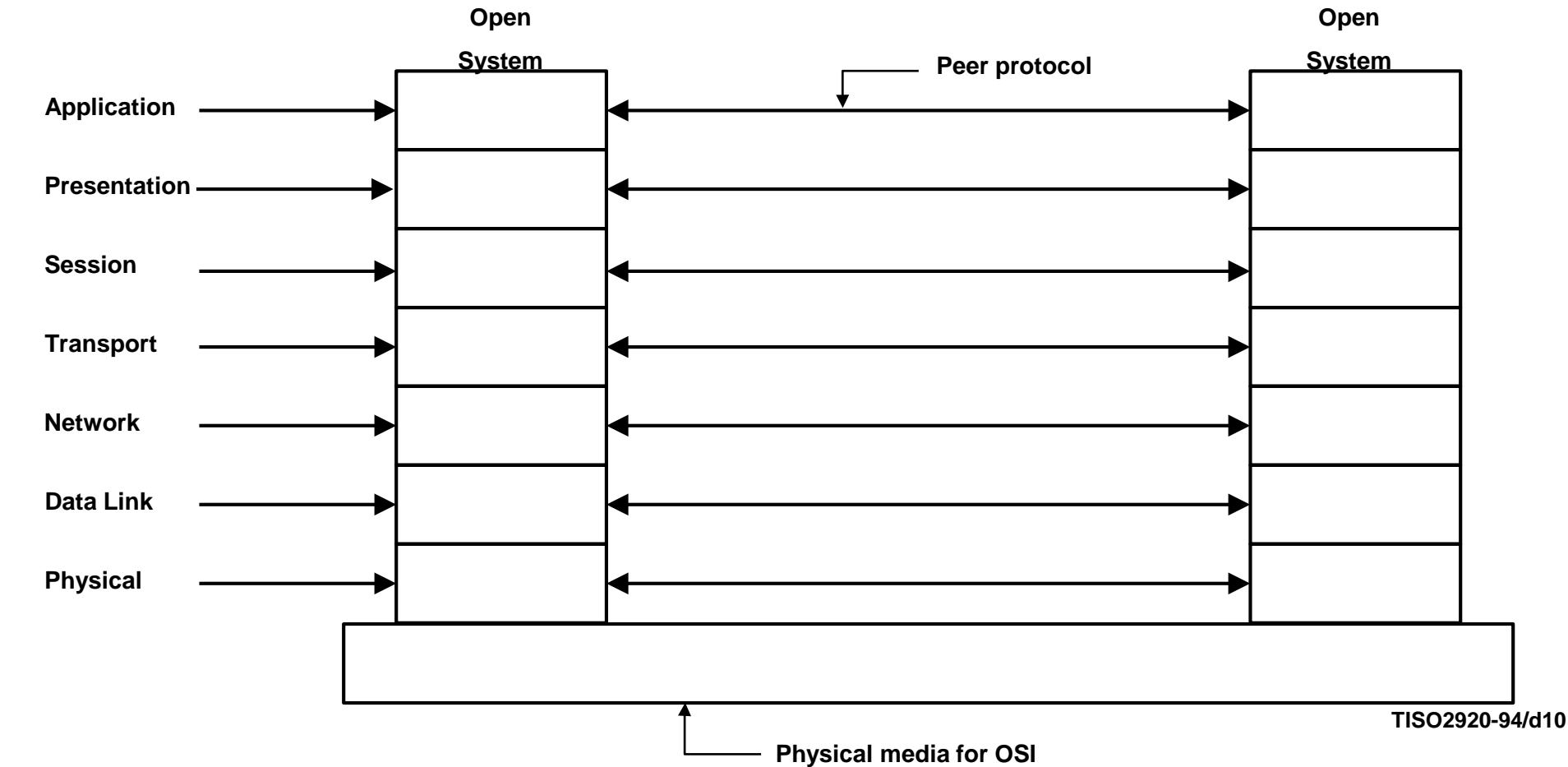
Individual Factors

Cyber situational awareness is the subset of all situation awareness necessary to support taking actions in cyber.





The Open System Model

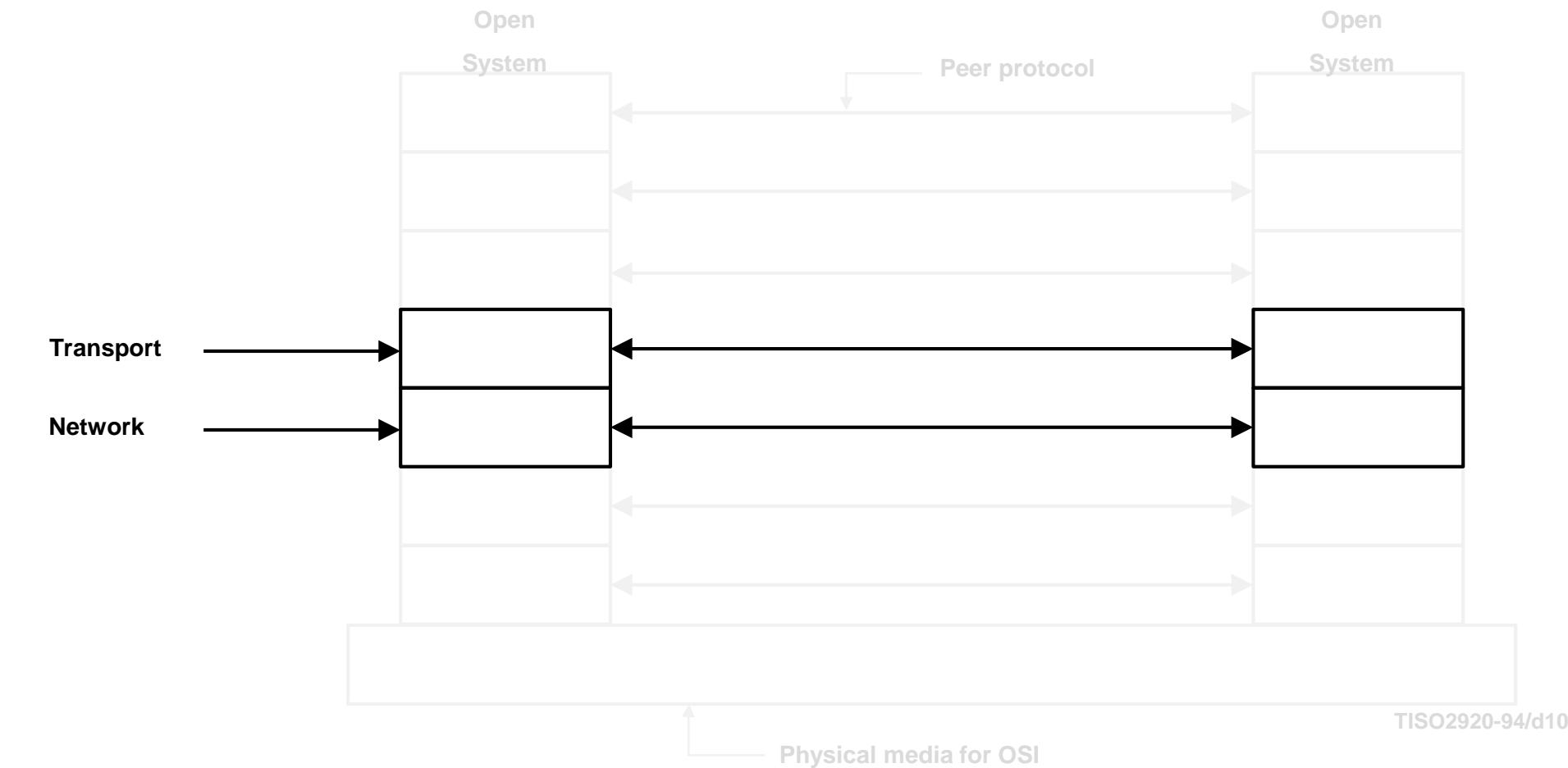


ISO 7498 para 6.1.3 page 28

Figure 11 – Seven layer reference model and peer protocols



The Open System Model



ISO 7498 para 6.1.3 page 28

Figure 11 – Seven layer reference model and peer protocols



Environment

System Factors

Feedback

Environment
Network Flow

SITUATION AWARENESS

Perception Comprehension Projection

Decisions

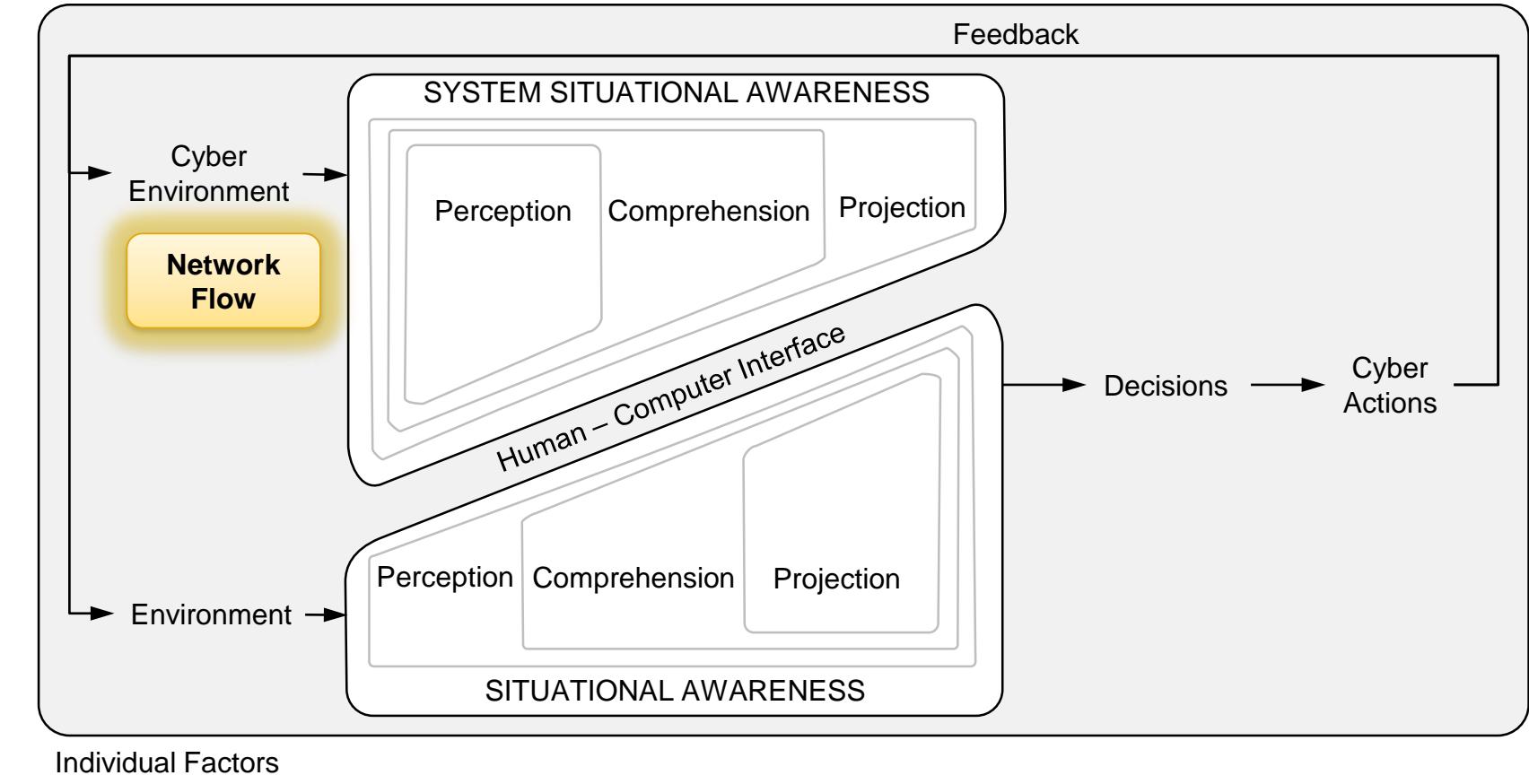
Cyber Actions

Individual Factors

Cyber situational awareness is the subset of all situation awareness necessary to support taking actions in cyber.



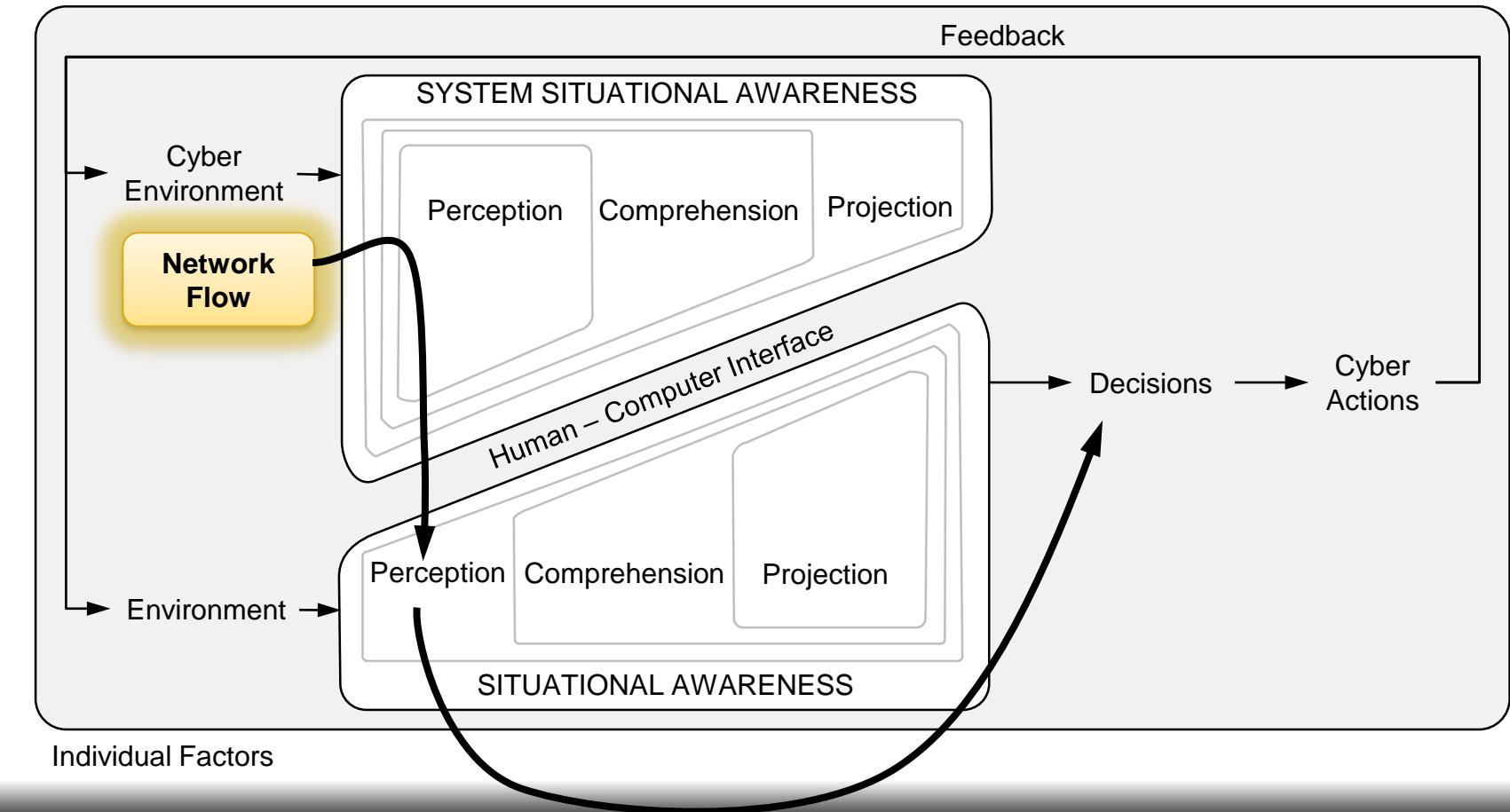
System Factors



Individual Factors



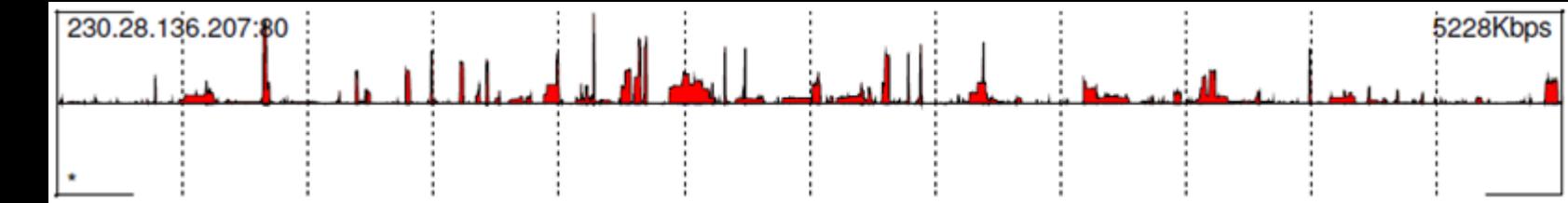
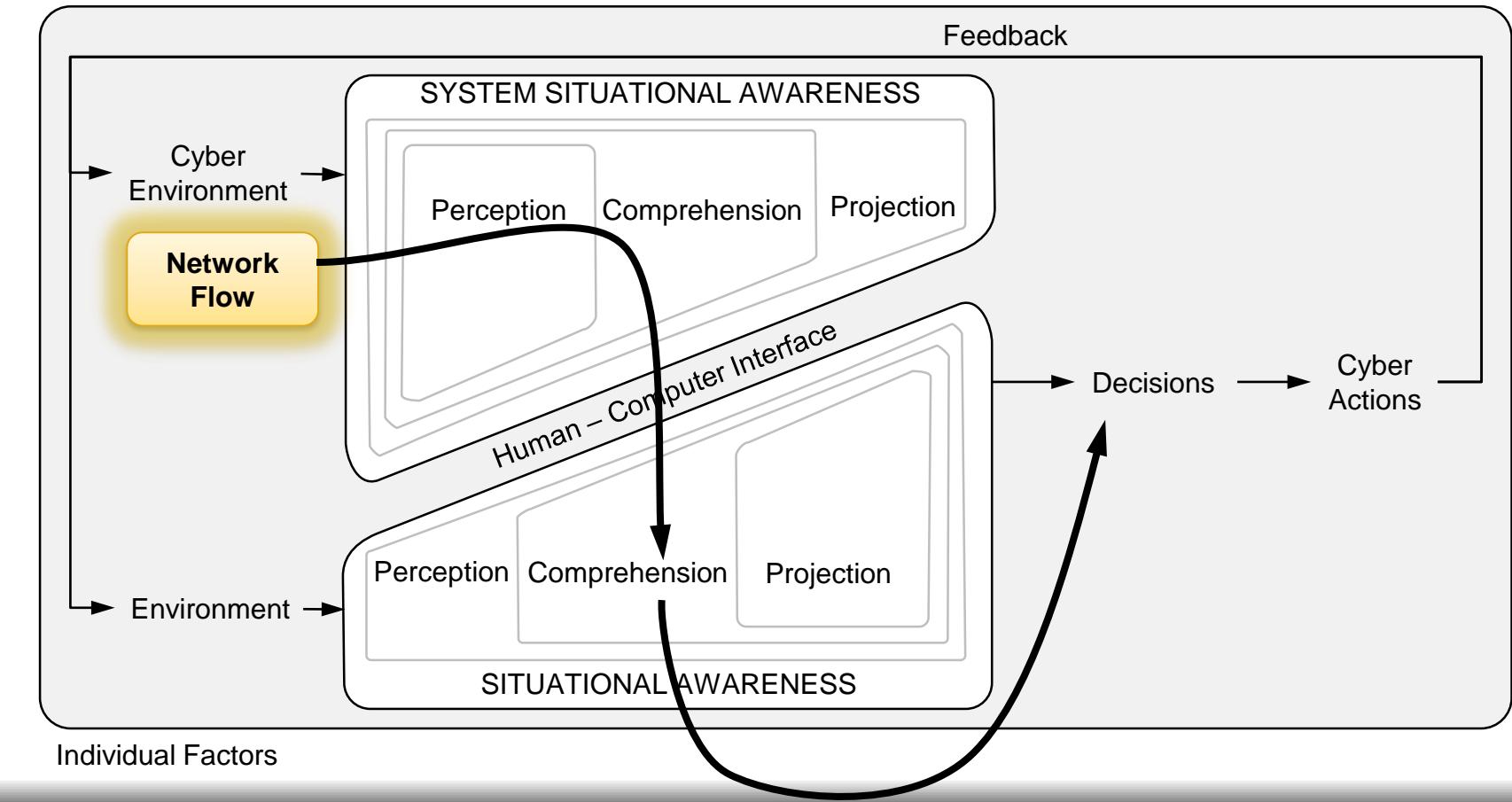
System Factors



sIP	dIP	sPort	dPort	proto	packets	flags	initF	type
192.168.1.105	198.51.100.6	49152	80	6	4	SRPA	S	outweb
198.51.100.6	192.168.1.105	80	49152	6	3	S PA	S A	inweb

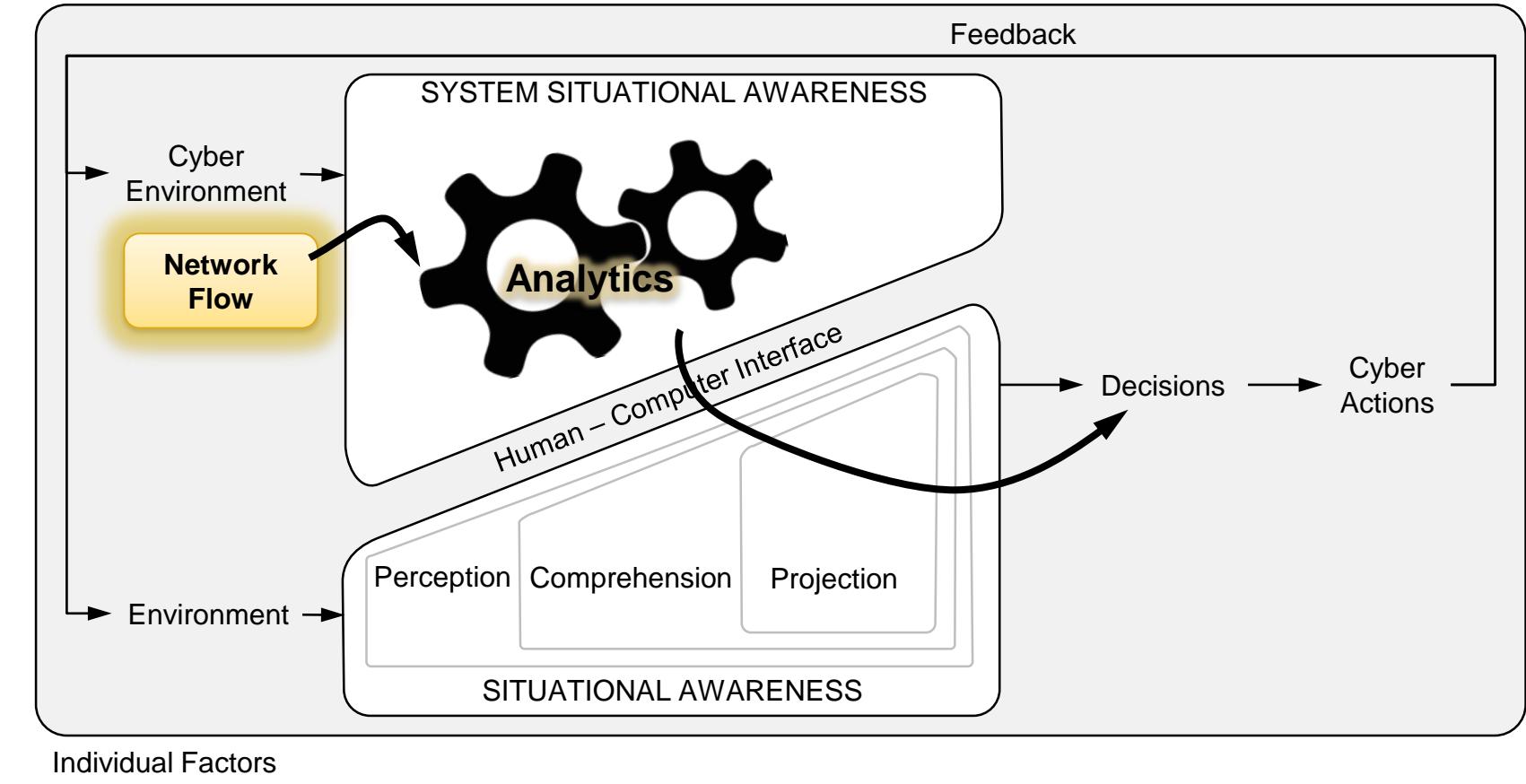


System Factors





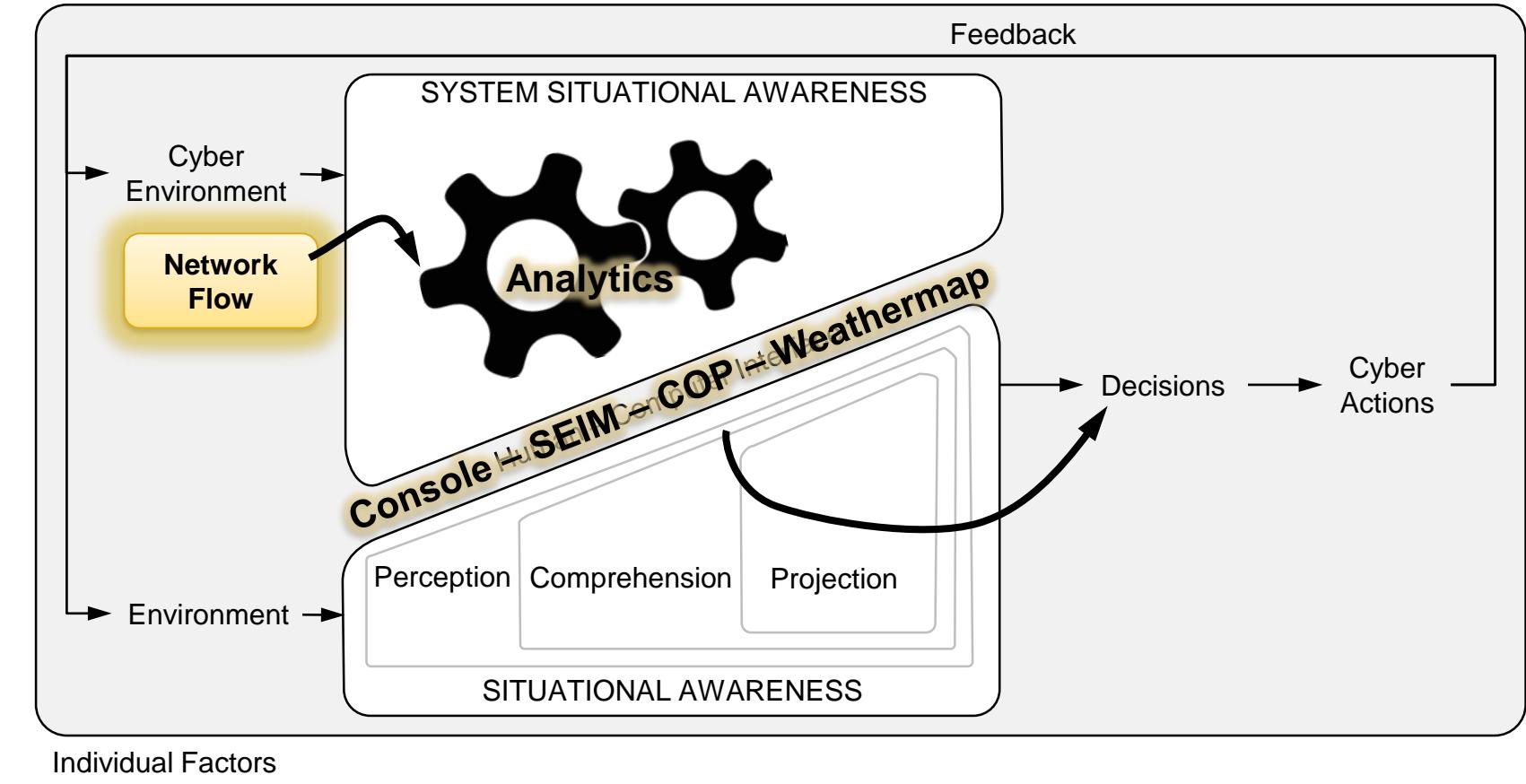
System Factors



Individual Factors



System Factors



Individual Factors



Sensing

Analytics

**Decision
Support**

Human - Computer Interface

Situation Awareness



Polling Question 3

What should we discuss in more detail?

Sensin

Analytics

Human – Computer Interface

Situation Awareness

Decision Support





System Factors

Sensing

Analytics

Human – Computer Interface

Situation Awareness

Decision Support

Individual Factors



System Factors

Analytics

Sensing

Decision Support

Human – Computer Interface

Situation Awareness

Individual Factors



System Factors

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Analytics

Decision Support

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Situation Awareness

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Decision Support

Human – Computer Interface

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System Factors

Sensin

Analytics

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Situation Awareness

Decision Support

Individual Factors



Q&A



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for Large-Scale Network Analytics



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SEI Webinar
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