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Passive Asset Dependency Discovery (CADDY)

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Asymmetric Resilient Cybersecurity Initiative Roadshow

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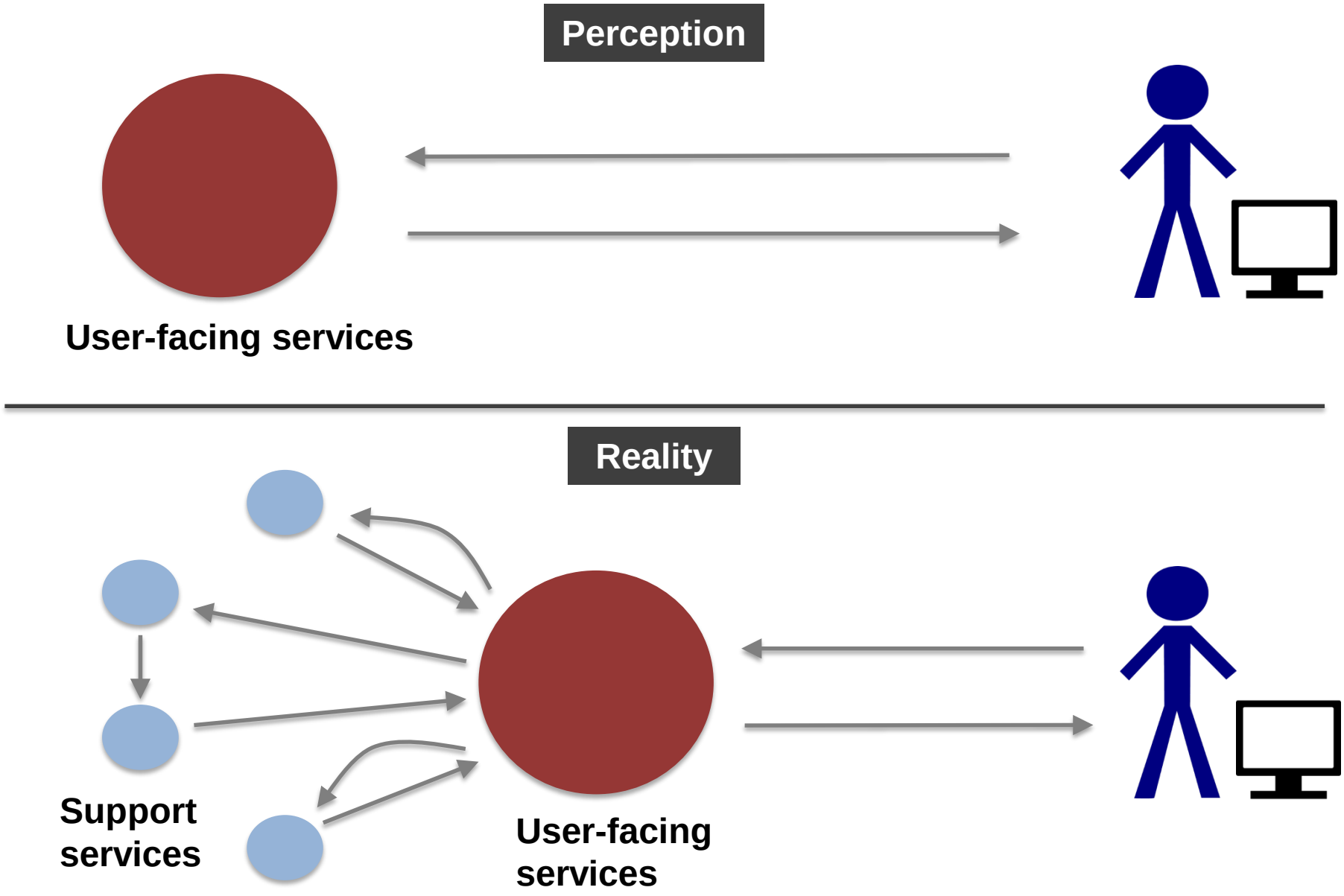
Need



Competition

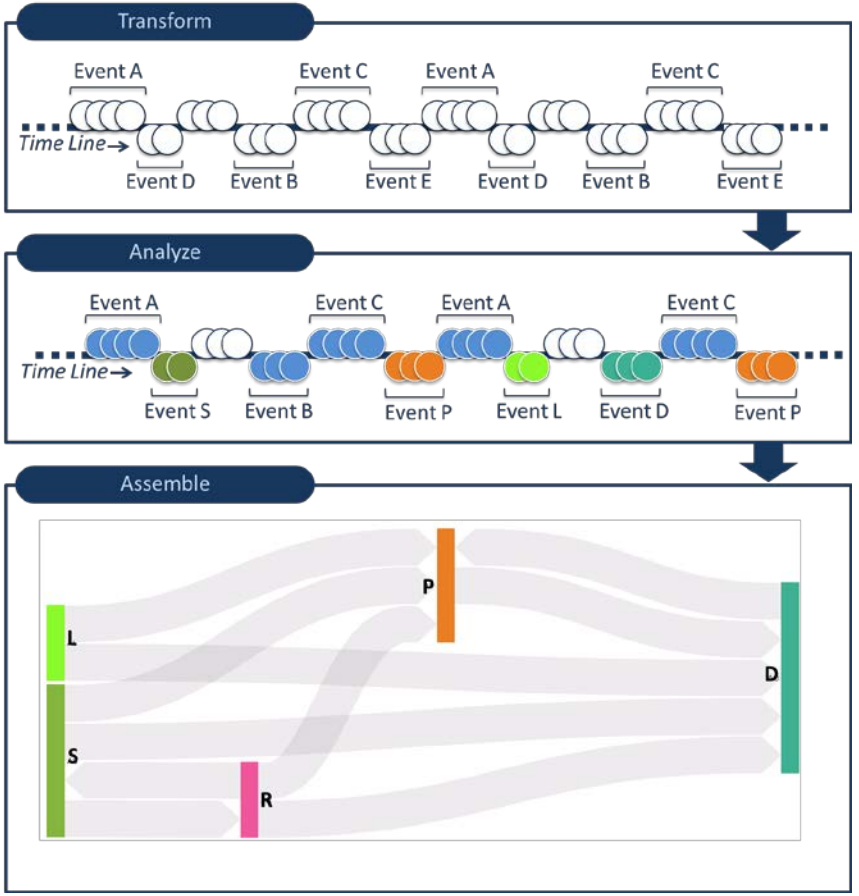
- Commercial products are available, including:
  - IBM Tivoli Application Dependency Discovery Manager (TADDM)
  - ServiceNow Discovery
- Academic literature details many approaches, such as:
  - Sherlock
  - Constellation
  - NSDMiner
  - Rippler
- Unlike CADDY, these approaches:
  - Identify ***host*** dependencies, but don't provide a general approach to identify network ***application*** and ***service*** dependencies
  - Require endpoint access, either via OS commands, agents, or other forms of instrumentation; or employ interventions that limit scalability and usefulness
  - Are sensitive to uncontrolled network factors

CADDY

- Passive approach
- Takes standard network flow (works on other timestamped data)
- Requires no other impediments to discover and track dependencies
- Scalable
- Can be deployed centrally or distributed across an enterprise

Approach

- **TRANSFORM:** Flow information and other timestamped sources are mapped into event space
  - Clustering flows into event classes based on rules (networking principles) and minimal ML
- **ANALYZE:** Discover co-occurrences in event stream
  - Examine event class time series for relationships
  - Analysis based on ensemble model of statistical, signal processing, and machine learning approaches
- **ASSEMBLE:** Organize co-occurrences into recurrent temporal sequences



Benefit

- Tunable to your network attributes
- Field-tested in operational environments
- Operates over any timestamped event data
- Doesn’t require clock synchronization between data reports

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