Real Time BI in Cloud

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Data Streams

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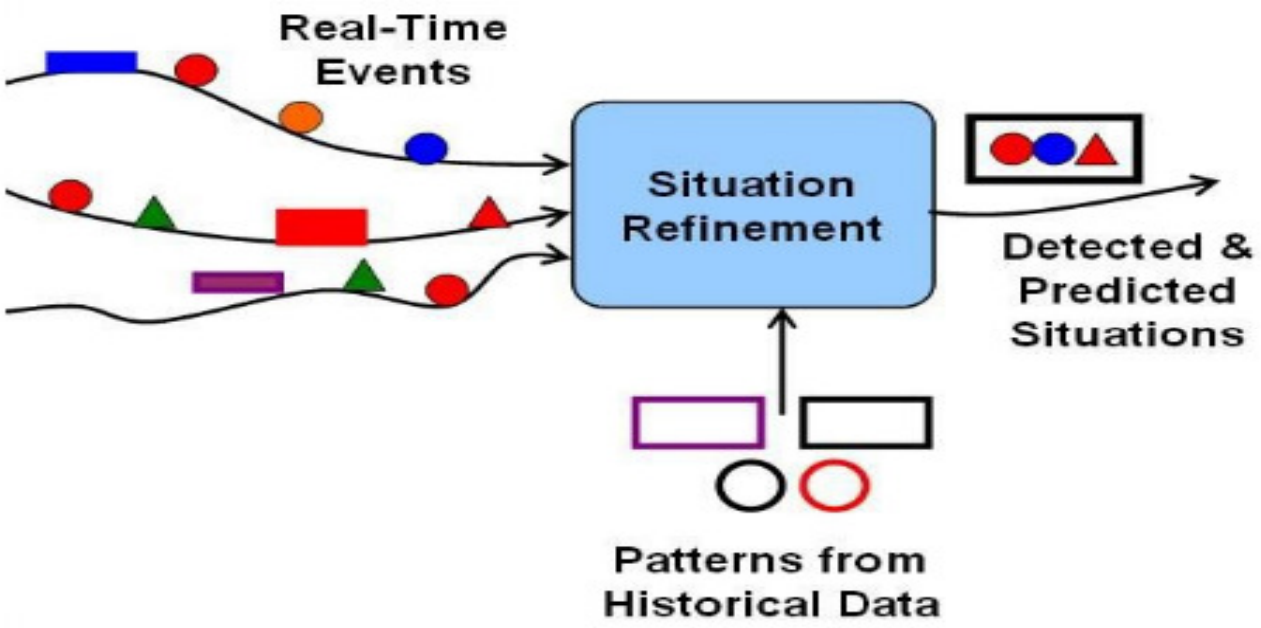
BI Trends

- It has become from good to have to nice to have
- Real time fraud detection
  - Fraud at the time credit card is used
- Advertising.. Manage marketing campaigns on a hourly basis
- Call center optimization; Increase the SLA
- Social media and Social networking
    - Structure to unstructured data
- Intelligent traffic management
    - Rerouting to meet SLA's
      - Accidents, weather etc.. Road, Rail roads
    - Impact of storms
- Smart Power Grids
    - Intelligent meters; how consumptions; every 15 to 30 minutes
      - Eliminate wastes and better distribute
- Sustainability
- Healthcare

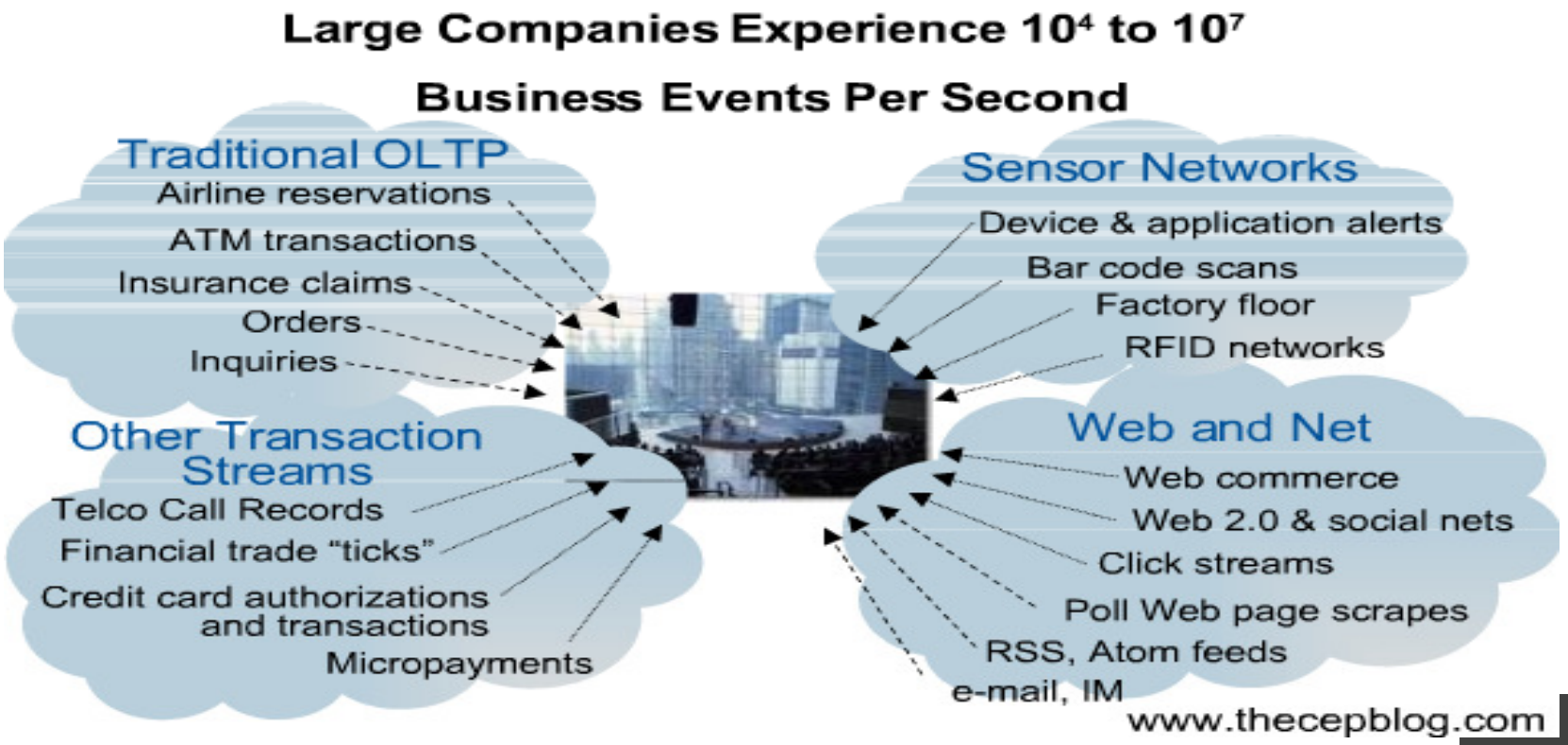
Challenges

- Data Volume
  - More and more data need to be processed
- Smarter Analytics
  - More intense in terms of processing
  - Predictive in nature
- Faster decisions: Day to day decision making
  - Operational; decisions on sec to sec
- Budgets
  - Self service BI

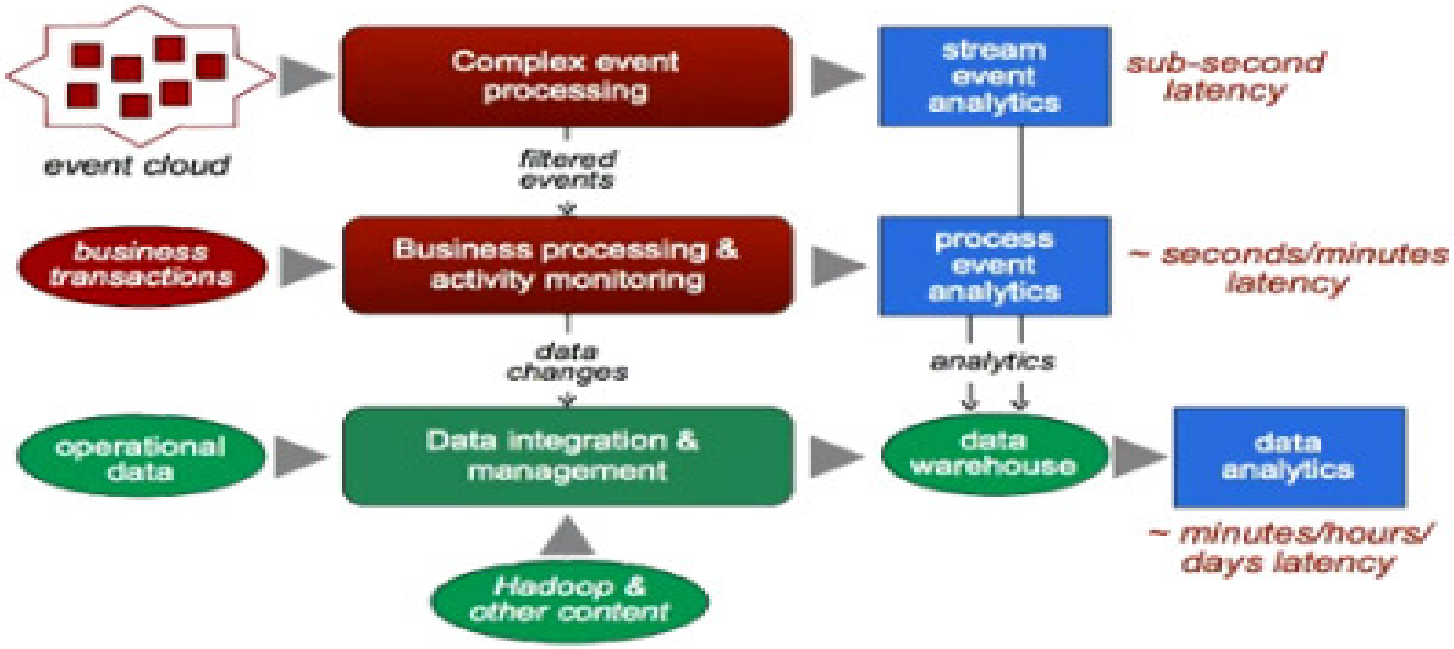
Real Time.. What is it?



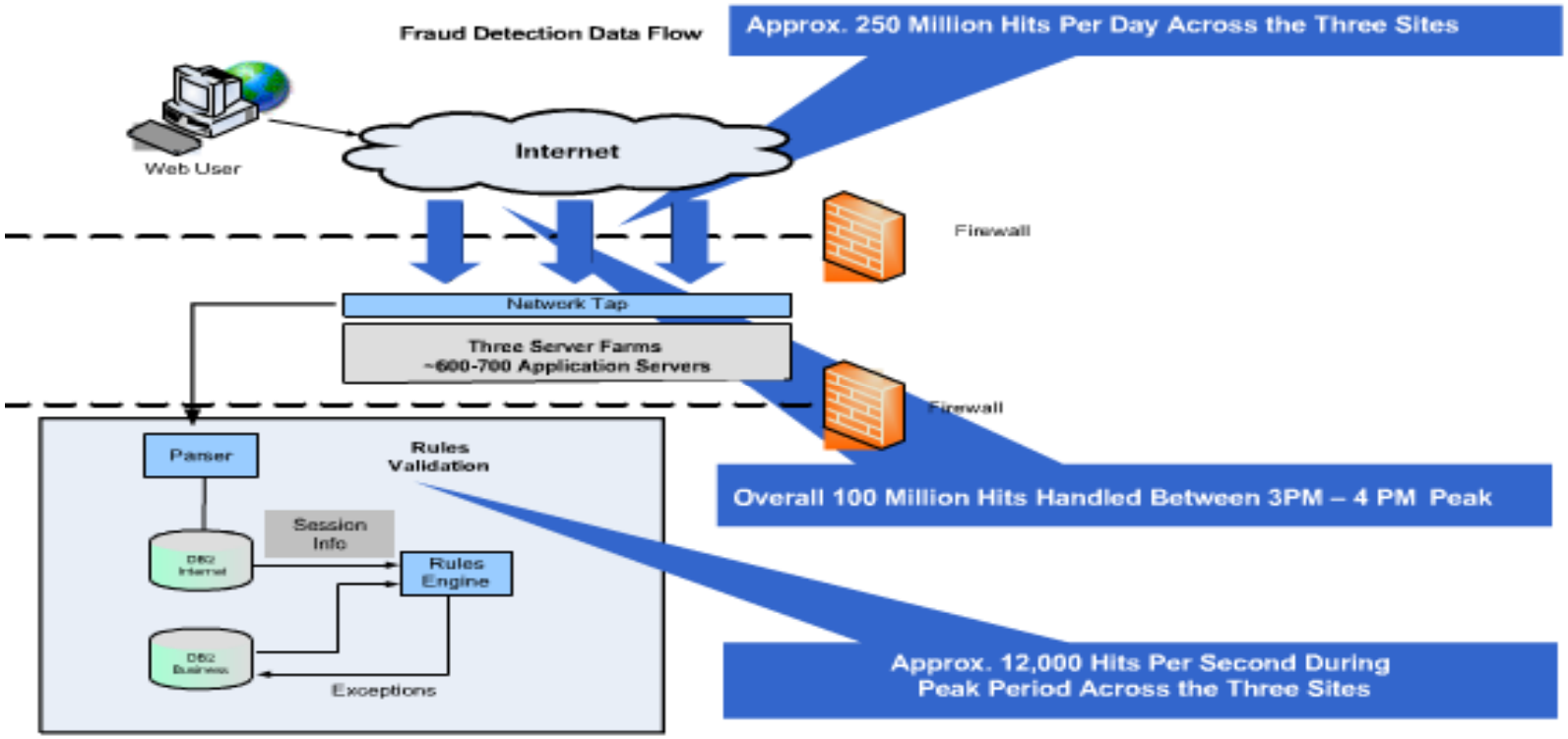
Events.. How many?



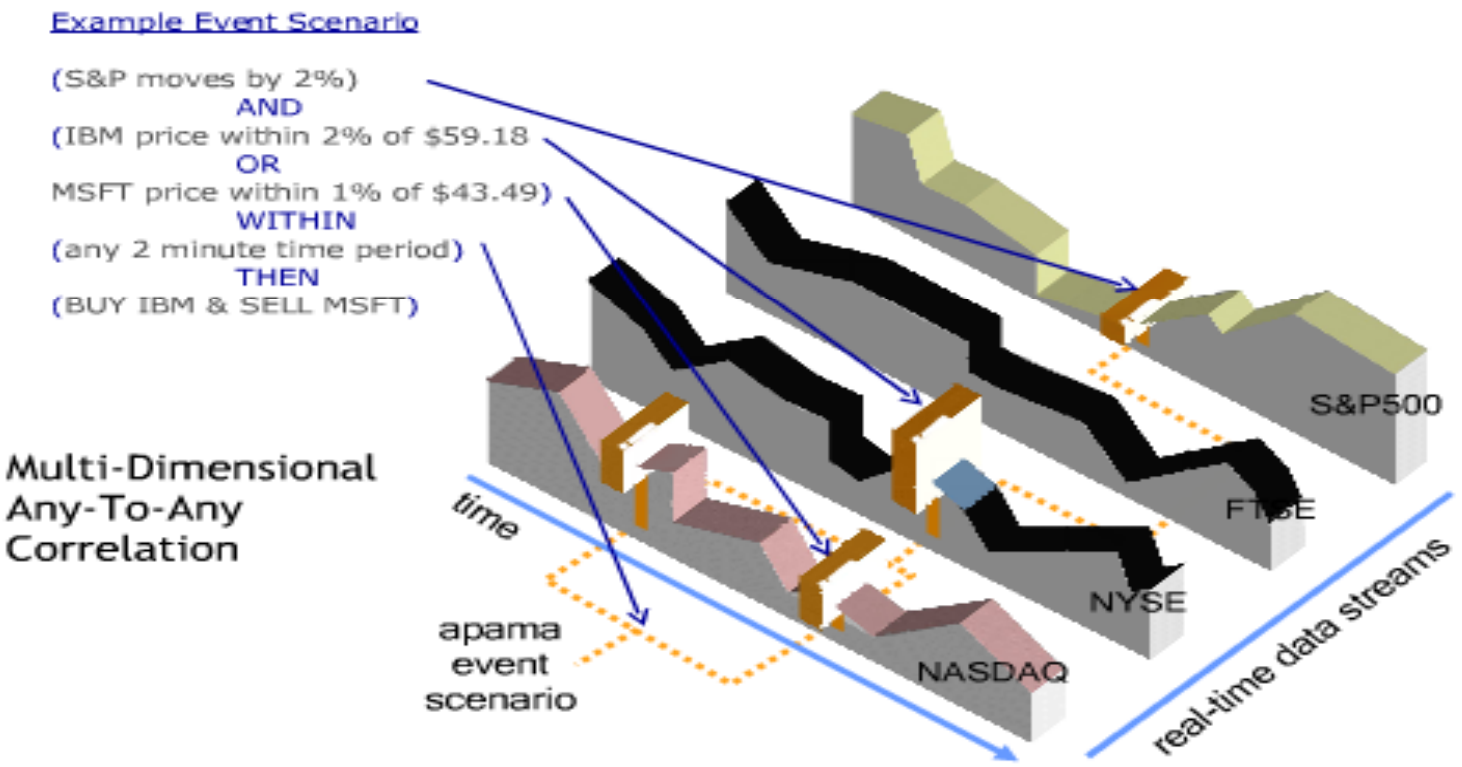
Faster Decisions – Real time Analytics



Fraud Detection Use case



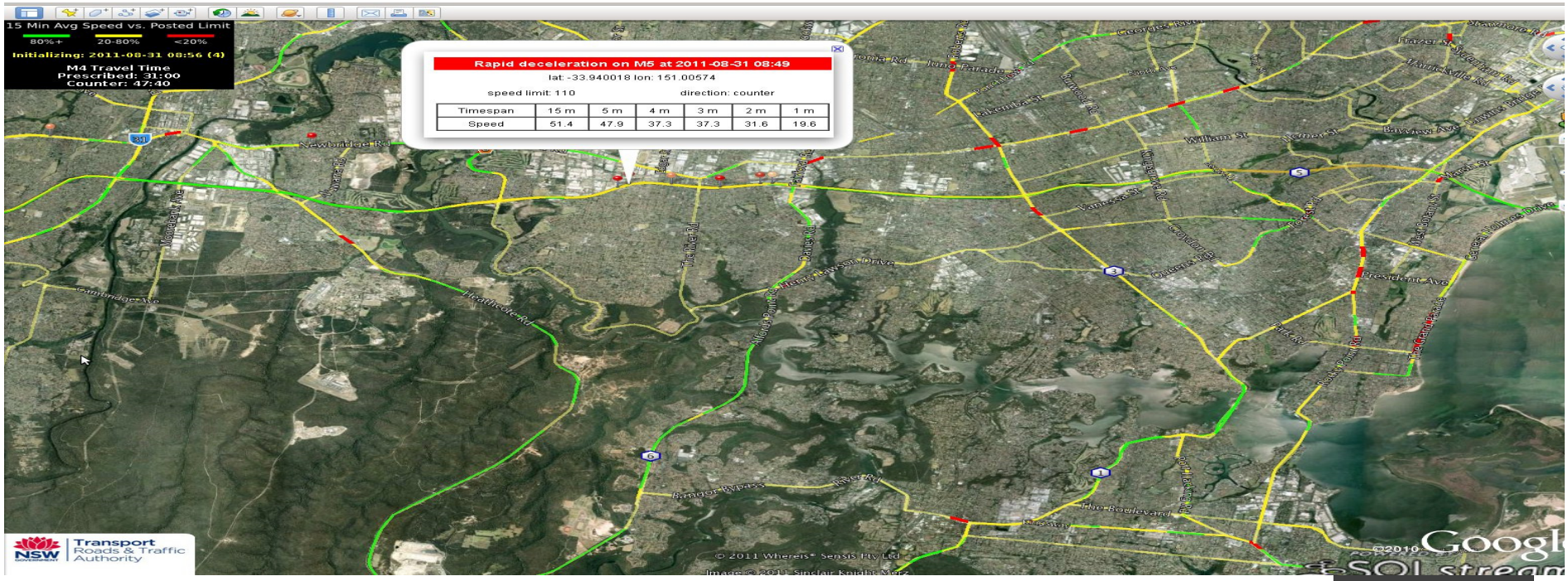
Algorithmic Trading Usecase



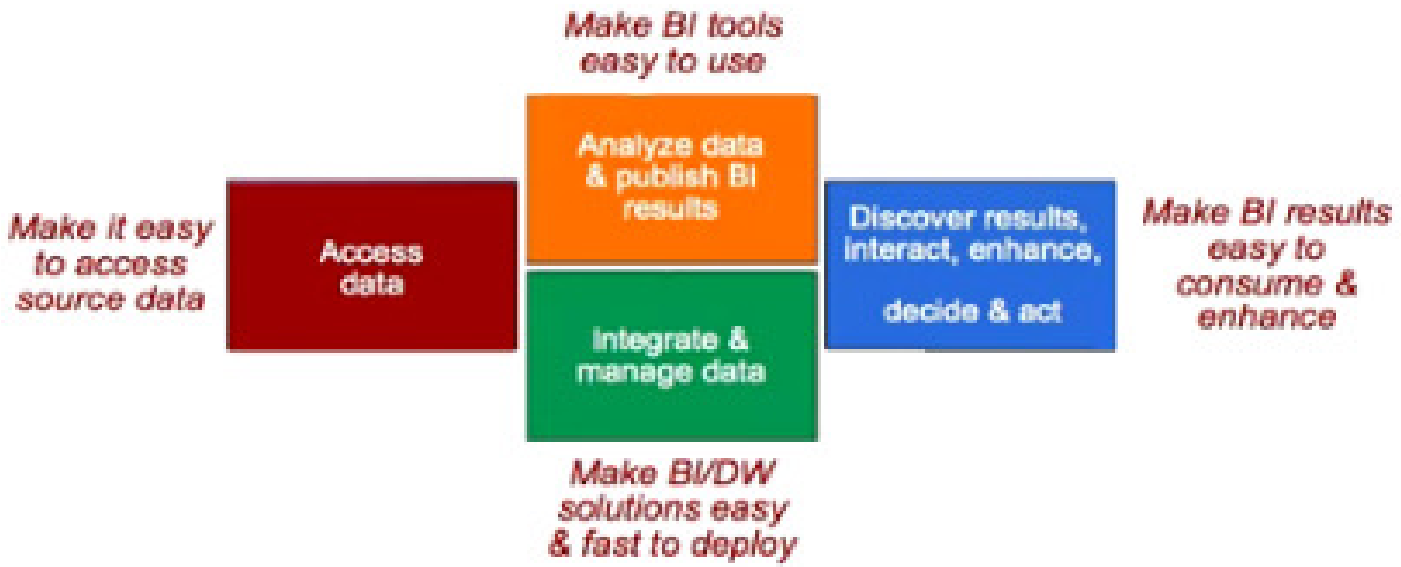
Predicting Traffic Congestion

Detecting the rapid onset of congestion

Congestion is detected by comparing moving averages for the larger time window with that for the smaller time window. For example, comparing a 2-minute average with a 1-minute average:



Self Service BI



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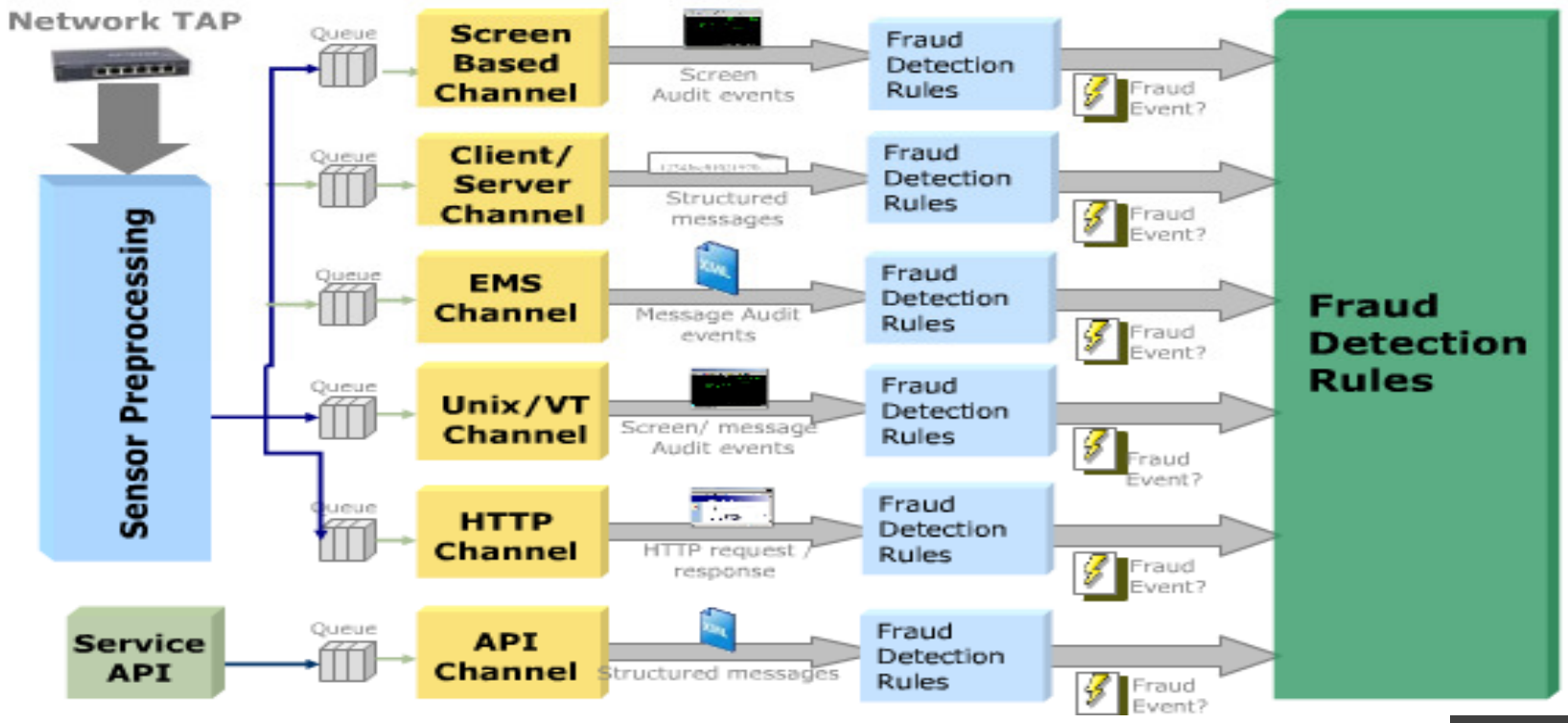
Real time Analytics - Technologies

- Complex Event Processing
- Distributed Data Sources
  - Internal Systems
    - CRM, ERP etc
  - External systems
    - Social Media, Transportation etc..
- Key Technology Enabler is Complex Event Processing

Traditional Event Driven Architecture



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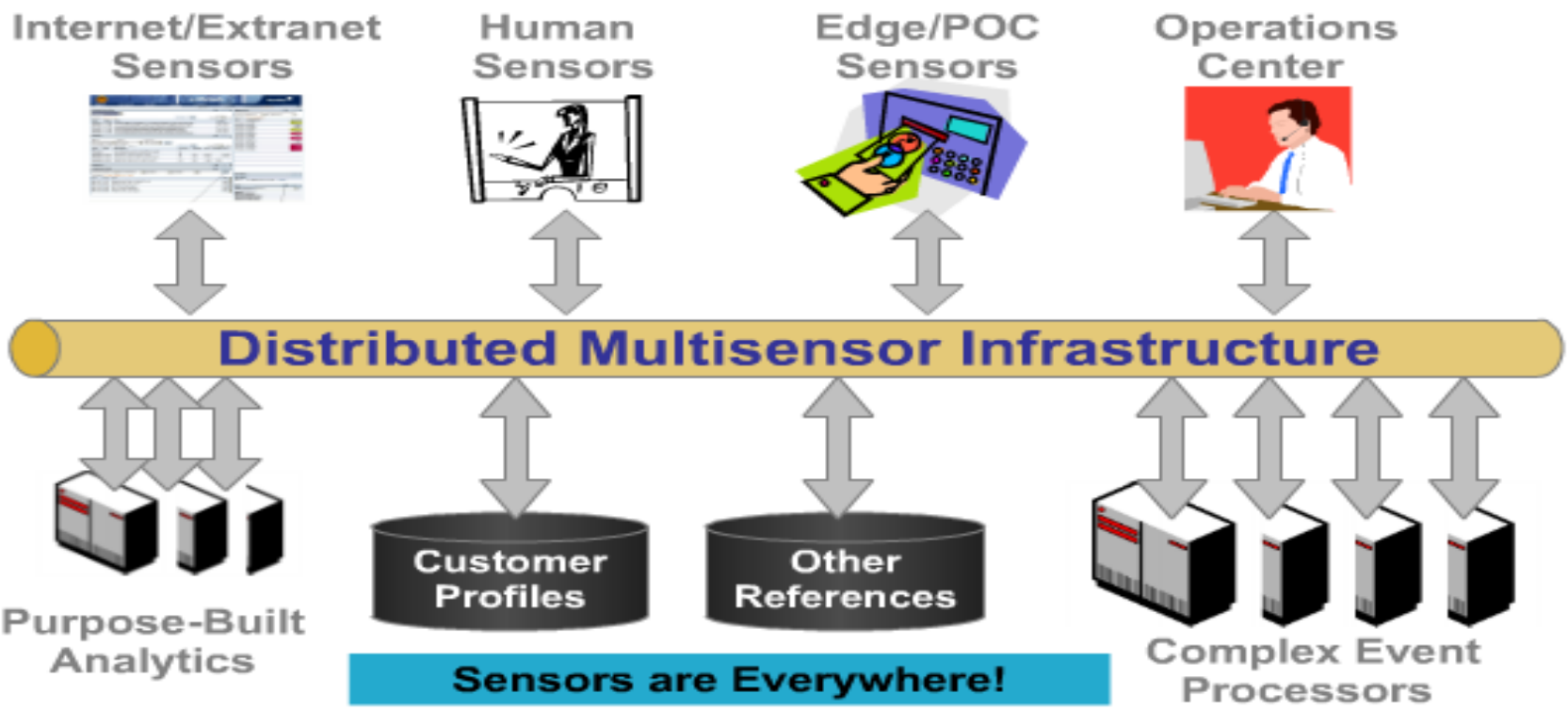
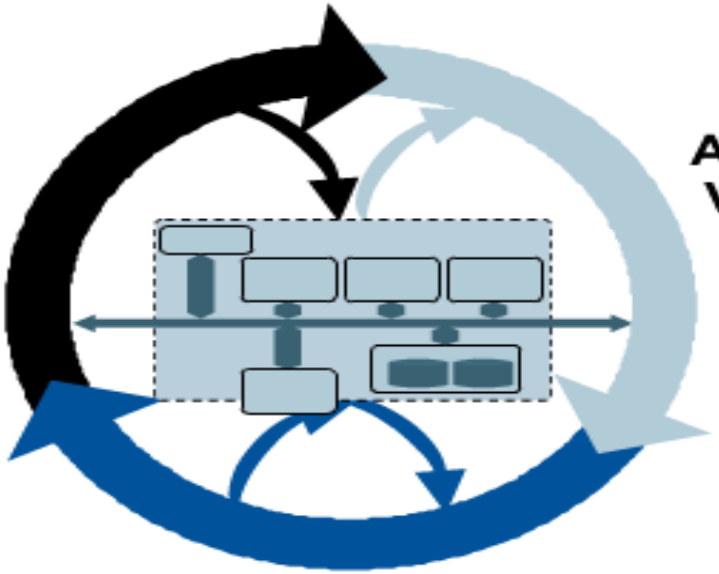
Emerging Event Driven Architecture



Key EDA Concepts



Sense

Detect events across the enterprise in real-time. Normalize and contextualize.

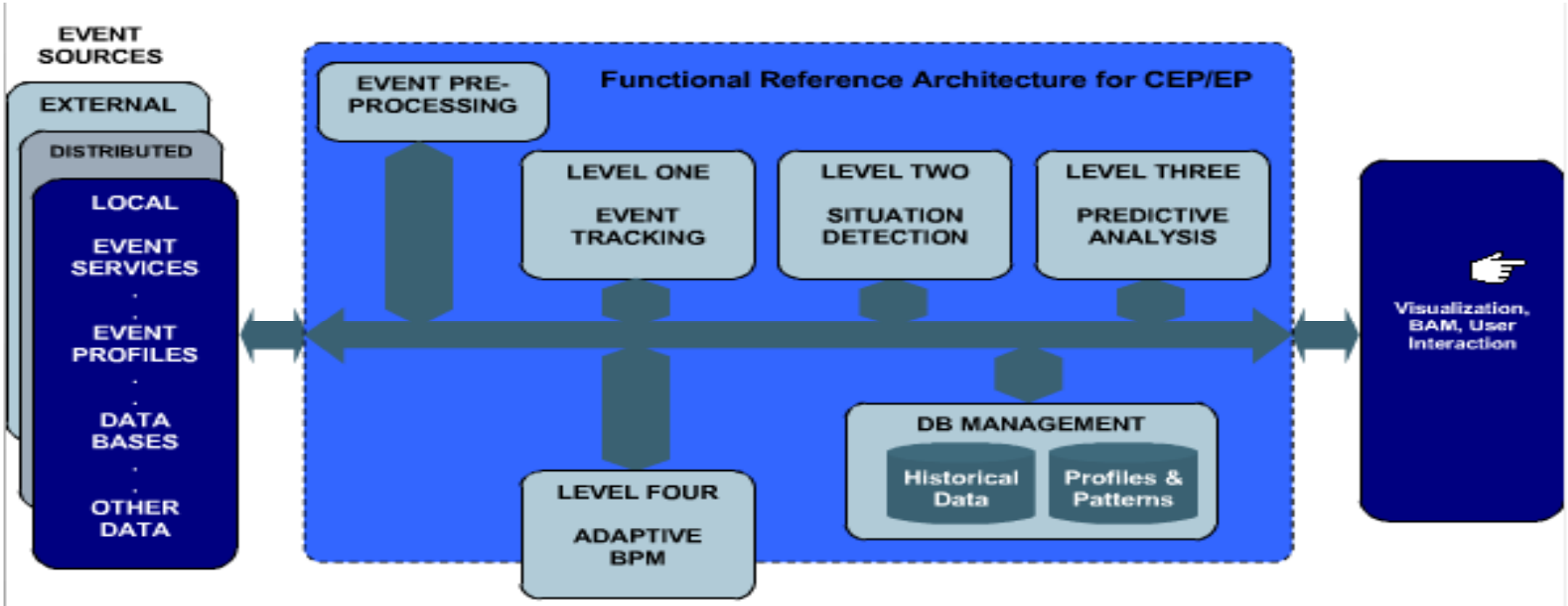
Analyze & Visualize

Aggregate events across multiple sources; correlate with historical data, refine

Respond

Manage resources, processes; Invoke actions in real-time

Functional Reference Architecture



Adapted by Tim Bass from the JDL:
Steinberg, A., & Bowman, C., Handbook of Multisensor Data Fusion, CRC Press, 2001

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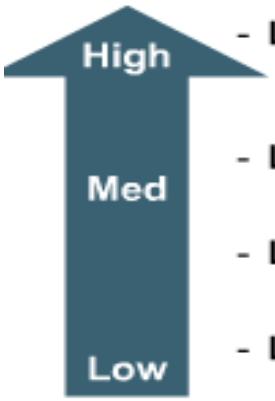
Are you in the right direction?



- **Multi-level inference in a distributed event-decision architectures**
  - **User Interface (Dashboards, BAM, Visualization, Portals)**
    - Human visualization, monitoring, interaction and situation management
  - **Level 4 – Process Refinement (Adaptive BPM)**
    - Decide on control feedback, for example resource allocation, sensor and state management, parametric and algorithm adjustment
  - **Level 3 – Impact Assessment (Predictive Analytics)**
    - Impact assessment, i.e. assess intent on the basis of situation development, recognition and prediction
  - **Level 2 – Situation Refinement (Situational Detection)**
    - Identify situations based on sets of complex events, state estimation, etc.
  - **Level 1 – Event Refinement (Event Track and Trace)**
    - Identify events & make initial decisions based on association and correlation
  - **Level 0 – Event Preprocessing**
    - Cleansing, transformation of raw event data to produce semantically understandable data

Now

Then	Now
Sun microsystems	amazon web services™
SIEBEL	salesforce.com
Microsoft Exchange	Google Apps
Microsoft Office SharePoint	box
COGNOS	GoodData

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Real time Use cases

- Cyber and algorithmic trading — Finance, energy
- Compliance reporting and monitoring — MiFID, RegNMS, SOX
- Adaptive CRM — Call centers and web clicks
- Financial controls — "Track and trace," , surveillance
- Fraud detection — Web commerce, AML, credit cards, telco
- Track and Trace – Patients, packages, pharmaceuticals
- Military — Situational awareness, intelligence
- Security and Networks — Intrusion detection (IDS) and NMS
- Sensor networks — RFID, GPS and others
- Transportation operations — Trucks, airlines, ships or trains
- Service Level Agreements (SLAs) – Telco, B2B, networks

Challenges

- Building experts
- Data is fragmented
- Analysis is done independently and inconsistently
  - Where the data come from
  - Rely on gut feel and analysis
- Discipline required to improve operational failures over time
- Doing analysis all over again

Lean Analytics Solutions

- Data Integration
- Certified Lean Analytics
- Custom analytics in 24 to 48 hours
- Lean experts much more effective
  - Comments and post specific points
  - Triggers and events that notify them out of balance
- Set of best practice ideas.

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Key Takeaways

- ☞Event Processing can be Computationally Intensive
- CEP Requires a Number of Technologies:
  - Distributed Computing, Publish/Subscribe and SOA
  - Hierarchical, Cooperative Inference Processing
  - High Speed, Real Time Rules Processing with State Management
  - Event-Decision Architecture for Complex Events / Situations
- PredictiveBusiness™ is a Reality Today