



University of
South Australia

Analytics for Big Data in real time

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What is real-time analytics?







- The use of data for analysis as soon as it enters the system.
- Assumes a level of computer responsiveness that a user senses as **immediate** or **nearly immediate**.
- Associated with **streaming data architectures**.



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The six Vs of big data

Big data is a collection of data from various sources, often characterized by what's become known as the 3Vs: *volume*, *variety* and *velocity*. Over time, other Vs have been added to descriptions of big data:

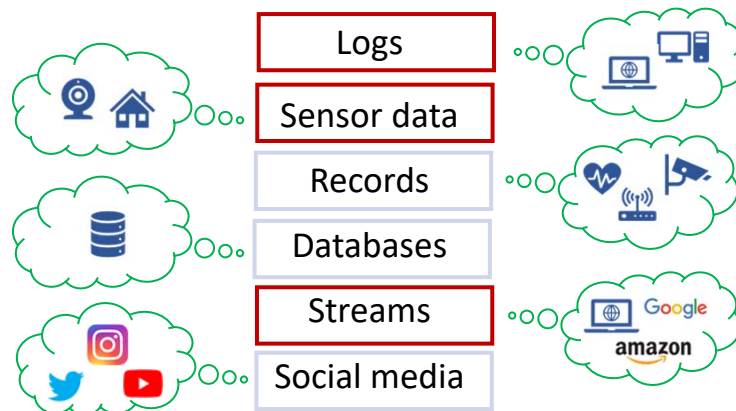
VOLUME	VARIETY	VELOCITY	VERACITY	VALUE	VARIABILITY
The amount of data from myriad sources.	The types of data: structured, semi-structured, unstructured.	The speed at which big data is generated.	The degree to which big data can be trusted.	The business value of the data collected.	The ways in which the big data can be used and formatted.
					

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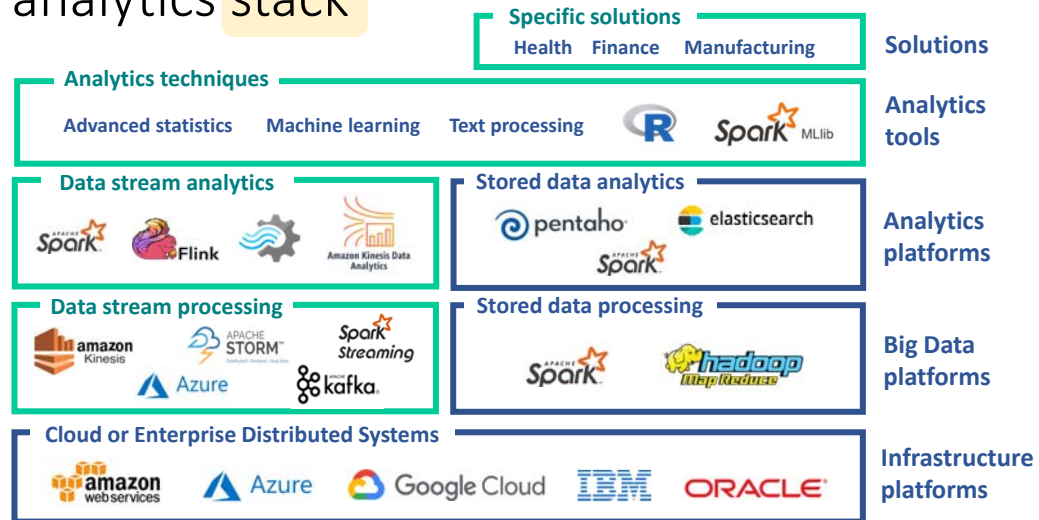
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Which Big Data sources?



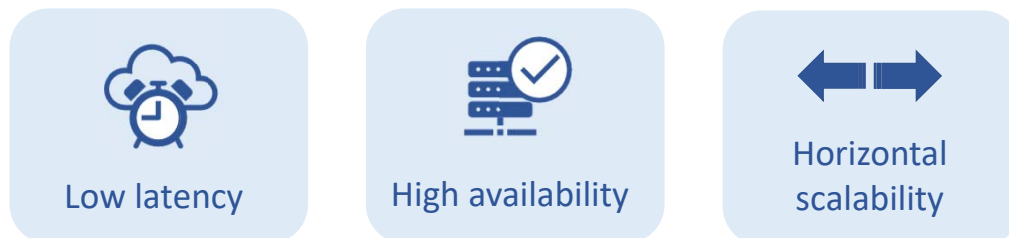
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Real-time analytics stack




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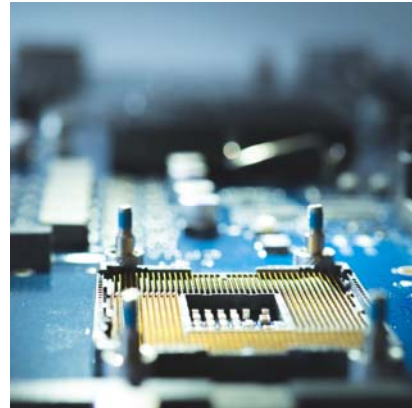
Characteristics of real-time analytics systems



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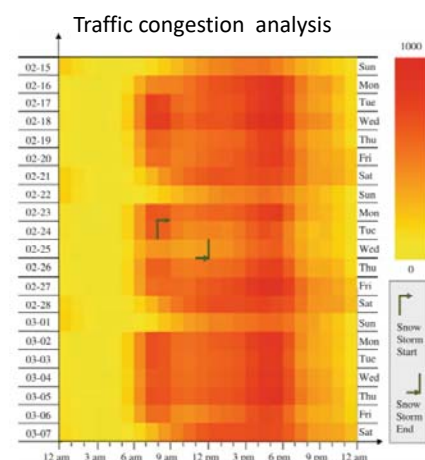
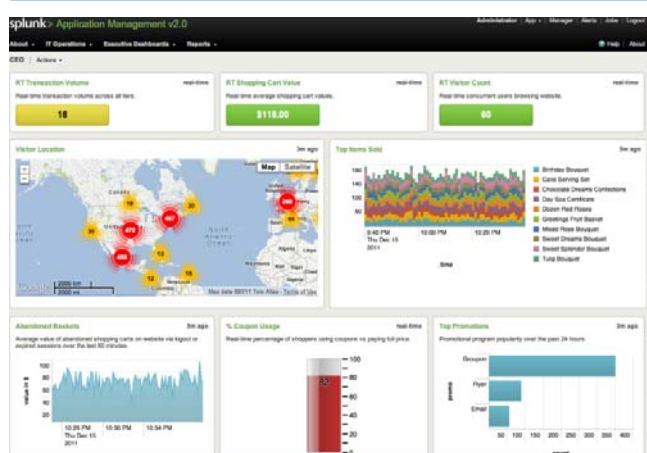
How real-time analytics works

- Edge computing
- Processing in memory
- In-database analytics
- Data warehouse appliances
- In-memory analytics 
- Massively parallel programming



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Real-time data visualisation



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Benefits of real-time analytics

- Quickly detect and respond to patterns in user behaviour
- Improved competitiveness
- Instant analyses to help create focused outcomes
- Profitability in the long term
- Faster and more efficient decision making



Challenges with real-time analytics

- **Vague** definition of 'real time'.
- **Inconsistent** requirements due to interpretations of 'real-time'.
- Creating an architecture **capable** of meeting requirements.
- **Computations** over a sliding time window
- Processing **out of order** events.



Use cases for real-time analytics



Fine-tuning
customer facing apps



Targeted
promotions



Targeted
advertising



Financial
trading



Real-time credit
scoring



Detecting fraud
and anomalies



Health
monitoring



Emergency and
humanitarian services

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