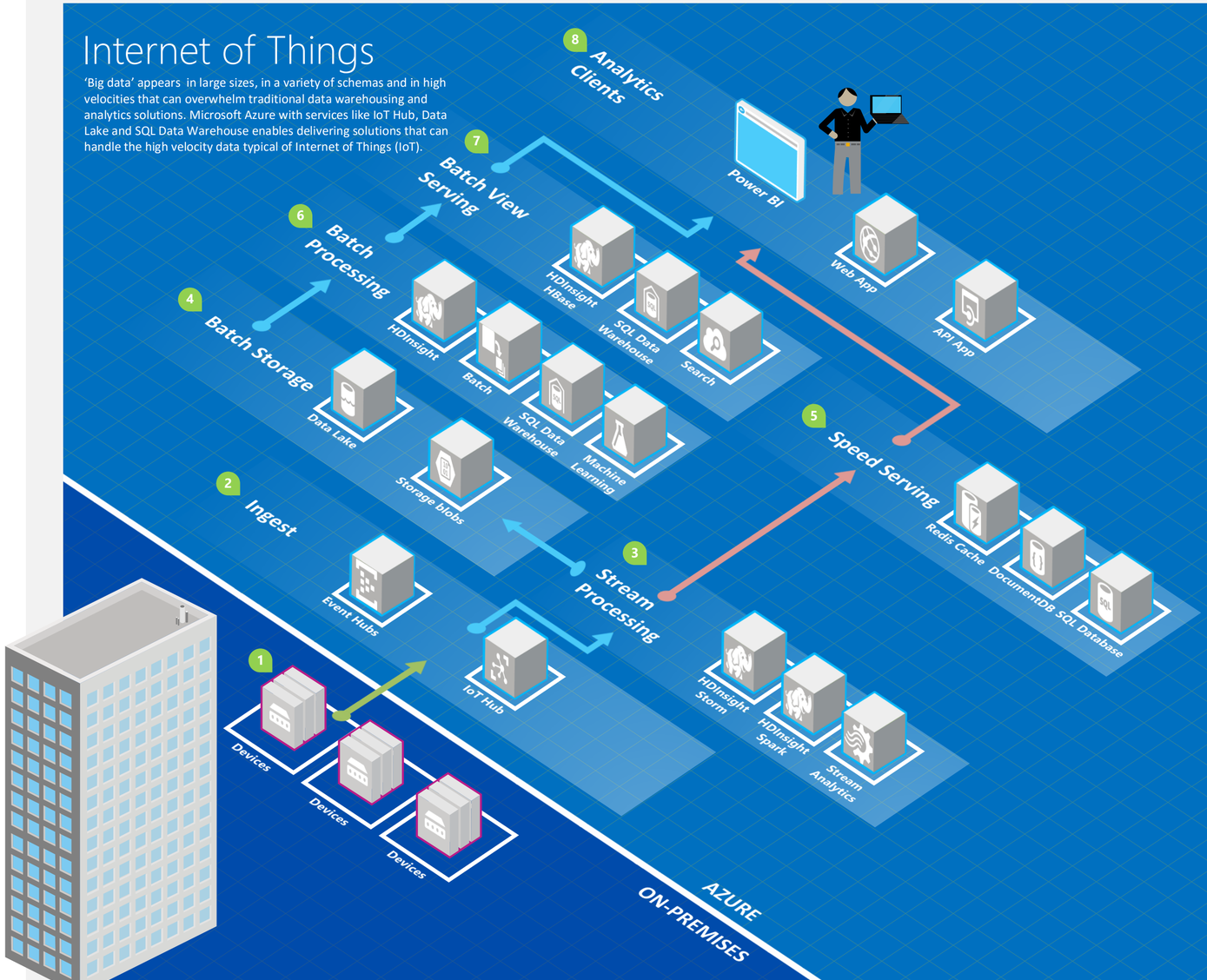
Internet of Things

'Big data' appears in large sizes, in a variety of schemas and in high velocities that can overwhelm traditional data warehousing and analytics solutions. Microsoft Azure with services like IoT Hub, Data Lake and SQL Data Warehouse enables delivering solutions that can handle the high velocity data typical of Internet of Things (IoT).



1. Telemetry data from devices or aggregated by device gateways is transmitted to high-scale, multi-consumer queues provided by Event Hubs or IoT Hub.
2. The telemetry data sits within a queue waiting to be processed by a stream processing component. Messages not processed within a certain window of time (typical maximum is 7 days) are deleted automatically.
3. Telemetry data can be processed in micro-batch form (e.g., a batch consisting of data for the last 10 seconds) or in tuple-at-a-time fashion (e.g., each datum is processed as it is received).
4. A stream processing component is used that collects all the raw data from the multi-consumer queue and writes into scalable storage for batch processing. The stream processing component applies minimal to no processing on the device data.
5. Another stream processing component is used to compute and select out the important data that must be available to analytic clients with minimal latency. This data is stored in a fashion most appropriate for the analytics clients to query for and retrieve the low latency data.
6. Batch processing components are able to periodically re-compute the desired data sets by running batch style computation over the raw data.
7. The output of the batch processing components are the data sets in a form useful for querying by the analytics clients. This is typically a database view, but it may also be represented in other forms such as an external index.
8. Analytics clients can draw from the batch views more accurate and complete data that is available to them with higher latency. Analytics clients can draw from the Speed Serving components the data that is generally smaller in volume, possibly less accurate, but delivered with minimal latency.

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