



## RFID Software Basics

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RFID software development can be separated into specific tasks independent of the methodology chosen. These are:

Device	Data	Process	Network
<ul style="list-style-type: none"> <li>• Configuration</li> <li>• Tuning</li> <li>• Diagnostics</li> </ul>	<ul style="list-style-type: none"> <li>• Smoothing and filtering</li> <li>• Log events</li> <li>• Apply logic</li> <li>• Interface with database</li> </ul>	<ul style="list-style-type: none"> <li>• Business rules</li> <li>• Workflow</li> <li>• Exceptions management</li> <li>• Visibility and notification</li> </ul>	<ul style="list-style-type: none"> <li>• Health and monitoring</li> <li>• Alarms</li> <li>• Management</li> </ul>

### SDK's and API's

Software Developer Kits (SDK's) generally provide software tools and documentation to aid software development for a piece of hardware such as an RFID interrogator.

The software tools are usually provided as a library of software routines in the form of Dynamic Link Libraries (DLL's).

The collection of routines contained within the DLL's are called an Application Program Interface (API).

A good API will hide the majority of the underlying low-level device-specific software details from developers, thus allowing them to focus on the application instead of the hardware.

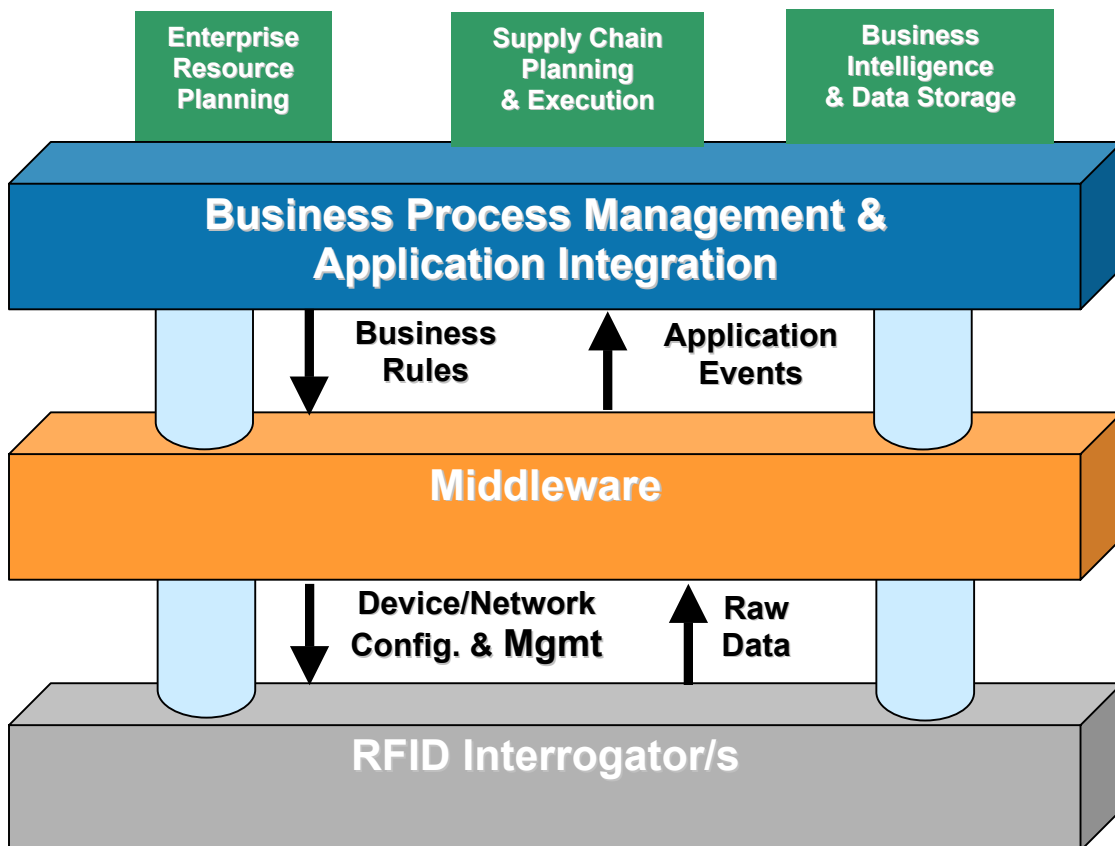
SDK's and API's can be separated into two basic categories:

1. SDK's and API's for basic serial communication between the PC and the interrogator.
2. SDK's and API's to handle the specific interrogator packet data protocols.

## Middleware

This term, like many others in the field, is applied so broadly that it has lost its meaning. For our discussion we will use the following:

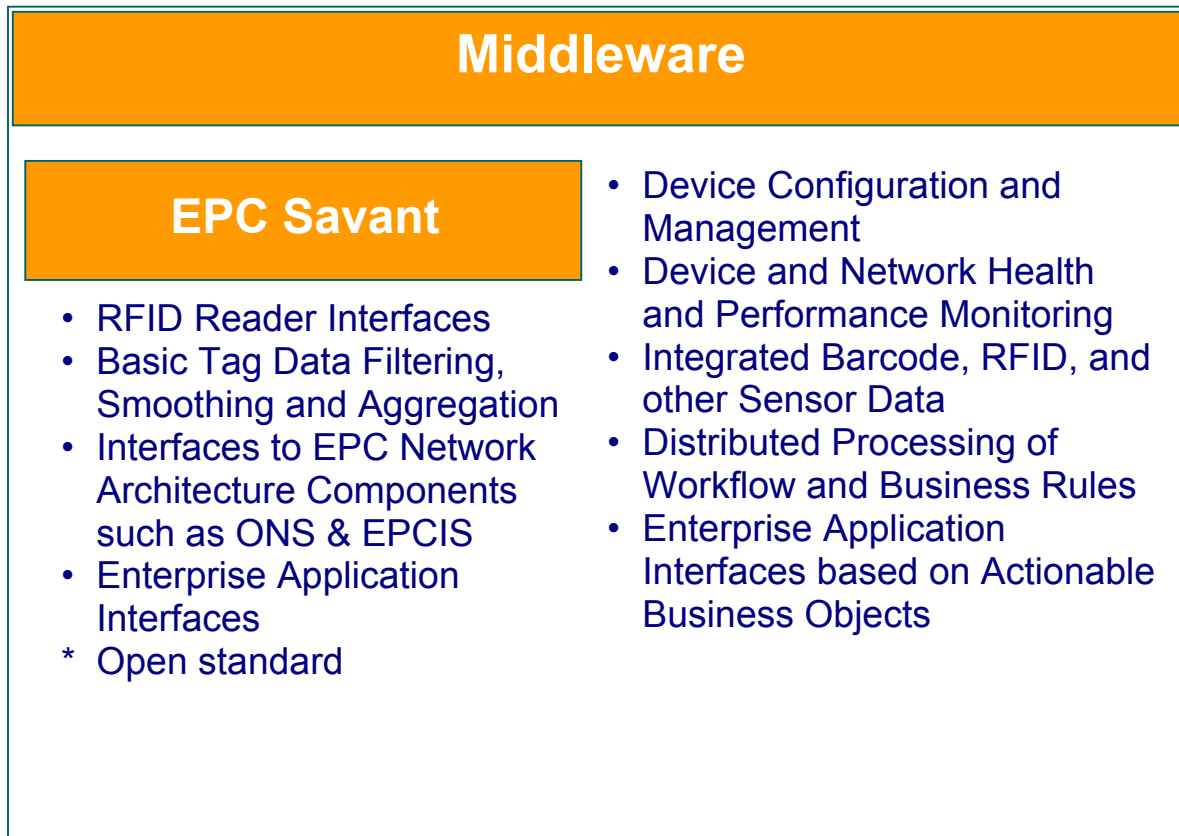
**Middleware** - Any software component that bridges the physical device layer and the business process management and application integration layer.



RFID Middleware should strive towards these goals:

- **Reader interfaces:** provide drivers to retrieve data from the readers of various hardware manufacturers.
- **Data filtering:** aggregate, purge and filter tag data thereby reducing the data flow to the application software.
- **Reader coordination:** detect the movement of RFID tags as they pass from the read range of one reader to another. This directional movement detection can be captured and passed on to the application software as an inventory movement notification.
- **System monitoring:** monitor tag/reader network performance to generate a real-time view of tags being read. It may also capture history and analysis of tag-read events for application tuning and optimization.

## The EPC Savant relationship to Middleware:



### Software Issues of Concern:

RF Tag sources, are inherently unreliable, meaning that a tag that is within an antenna's read field may not be sensed during each and every read cycle.

This leads to the desire for a more elaborate method for generating tag presence events.

For example, the host may require that a tag be present for a certain number of read cycles within a certain time interval before a valid presence event is generated.

## Other issues:

- Memory capacity is limited and can vary - bounds checking is required.
- Typically organized in addressable page/block format - may need to manage data that spans multiple pages/blocks.
- The number of write cycles is large but finite
- Locked memory cannot be unlocked - may want to require locking authorization.
- Interrogator response packet length is limited - a complete response may span multiple packets. Monitor response status information.
- Bit order may vary for different interrogators - pay close attention to manufacturers specifications.
- Packet data is binary - difficult to work with some environments such as VB. May need to convert to strings for easier manipulation of data.
- Protocols vary for different interrogators - protocol management will be required if allowing use of different interrogators.

Dynasys engineers are experienced developing RFID control firmware, RFID Middleware and system programs for RFID applications. Please give our Dynasys Sales Engineers a call and they can assist you with your RFID software needs.

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