

RFID: Addressing, Event Management and Network Services

RFID Reader Management

Overview

- Role of reader management
- Reading
- Smoothing and events
- Messaging
- Standardization

Reader management

- Configuration commands
- Observation commands
- Event commands
- Notifications and messaging
 - Synchronous
 - Asynchronous
- Management framework architecture
 - Reader-host
 - Controller based

Configuration

- Complementary to SNMP
- Deals with specific RFID features
 - antenna configurations
 - antenna status
 - tag protocols
 - reader anti-collision
 - especially for dense deployments
 - mobile readers can complicate matters
- Monitoring of RFID functions

Observations

- Read, write or modify tag information
- Deals with “raw” RFID readings

```
<Alien-RFID-Reader-Auto-Notification>
  <ReaderName>RDCK01</ReaderName>
  <ReaderType>Alien RFID Tag Reader (Class 1 / 915Mhz) </ReaderType>
  <IPAddress>192.168.0.245</IPAddress>
  <CommandPort>23</CommandPort>
  <Time>2006/08/09 14:12:00</Time>
  <Reason>Auto monitoring</Reason>
  <Alien-RFID-Tag-List>
    <Alien-RFID-Tag>
      <TagID>0102 0304 0506 0709</TagID>
      <CRC>87B4</CRC>
      <DiscoveryTime>2006/08/09 14:11:55</DiscoveryTime>
      <Antenna>0</Antenna>
      <ReadCount>837</ReadCount>
    </Alien-RFID-Tag>
    <Alien-RFID-Tag>
      <TagID>2283 1668 ADC3 E804</TagID>
      <CRC>9FD0</CRC>
      <DiscoveryTime>2006/08/09 14:11:03</DiscoveryTime>
      <Antenna>0</Antenna>
      <ReadCount>1</ReadCount>
    </Alien-RFID-Tag>
  </Alien-RFID-Tag-List>
</Alien-RFID-Reader-Auto-Notification>
```

Events

- Smoothing
 - averaging observations e.g. how many times a tag has been read over a one minute period (due to lower than 100% read success rate)
 - remove duplicates e.g. tags captured by two antennas attached to the same reader
 - remove spurious observation e.g. nearby tagged items that are only transient
- Complex events
 - raw observations to higher level events e.g. pallet has entered storage area

Messaging

- Sync, async notifications in response to filters
- Mostly XML message exchanges
 - vendor protocols, EPC Reader Operations
- Messages must be routed to host or controller
- State must be maintained persistently
- Reporting

Architecture

- Host-reader
 - each reader managed separately via peer-to-peer communication with a dedicated host
 - controlling host must manage each reader individually
- Controller-based
 - local controller mediates between reader group and applications and other middleware