# RFID & Part Lifecycle Management
## Data Synchronisation Prototype

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# Background

- Boeing Phantom Works worked with BT as members of the Cambridge Univ. Aero-ID program consortium
- We developed a Data Synchronization prototype that includes representations of RFID Tag, RFID Reader and backend system in the context of RFID based aerospace maintenance operations.
- Boeing Phantomworks worked with BCA GoldCare to define the Data Synchronization needs statement and shared with the Aero-ID program consortium. BT and Boeing Phantomworks formulated the Data Synchronization prototype
- BT provided the development resources to realize the prototype.



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# Data Synchronisation Prototype Context

- Aim
  - Demonstrate data synchronisation, lifecycle ID and notification
  - Establish and test simple aerospace scenarios
  - Stimulate awareness of the benefits of data sharing
  - Platform for rapid progress to live industry trial

- BT Auto-ID Prototype
  - Able to operate in standalone mode
  - Simulation of handheld client application and tag data



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# Prototype Architecture Summary
## Data Sync & Lifecycle ID & Data Mgmt

Tag


*Tag read / write*

Reader

**IP network**

BT AutoID Platform Service

Central Database

Rules Engine

Data Parser

Notification Service

**Web delivery**

Reports

**XML notification**

3P Systems

***PDA client application***

***Windows based OS***

***Windows, Linux or Unix***

***Apache web servers***

***Oracle database***

***J2EE compliant***

# Prototype Scenario Scope

- Part Birth (by Manufacturer)
- Replacement of Part by Service Company
- Shipment of Part to OEM



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# Part Birth

BT Aerospace Auto-ID Prototype

File Scenario Help

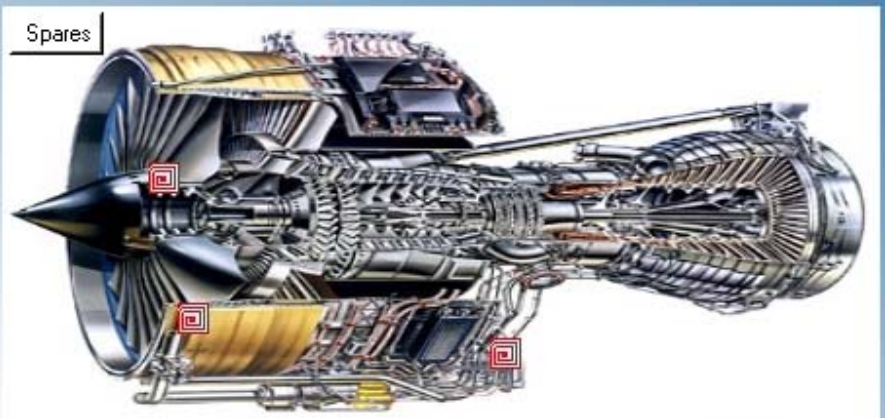
## BT Auto-ID Services

### Part Birthed

- New Tag attached to part
- Tag Read (check new tag)
- Enter data on PDA required for Creation of Tag
- Data Written to Tag
- Data Synchronised with centralised Auto-ID system
- Part ready for Airline use

Tag Representation

Spares



RFID Reader / PDA

New Part Application

| | |
|---|---|
| MFR. | 61G49 |
| Part Ser No. | 45287AS2534/345 |
| Org Part No. | 51055AS124/1345 |
| Part Desc. | Uppr Lft Eng Inlet Man |
| MFR Date | 14 May 2007 |
| Fab. | 95G45 |

Read Write Synch

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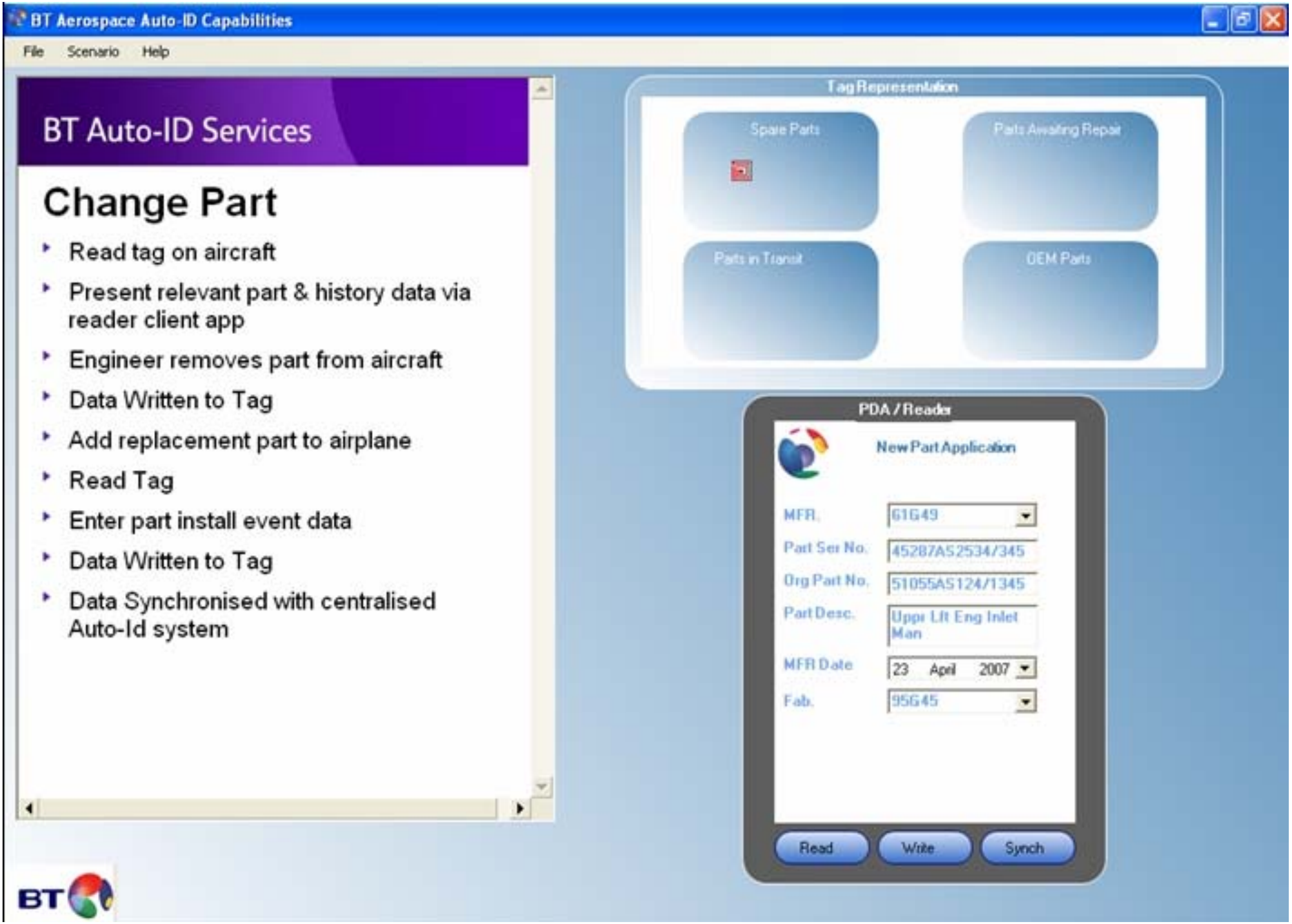
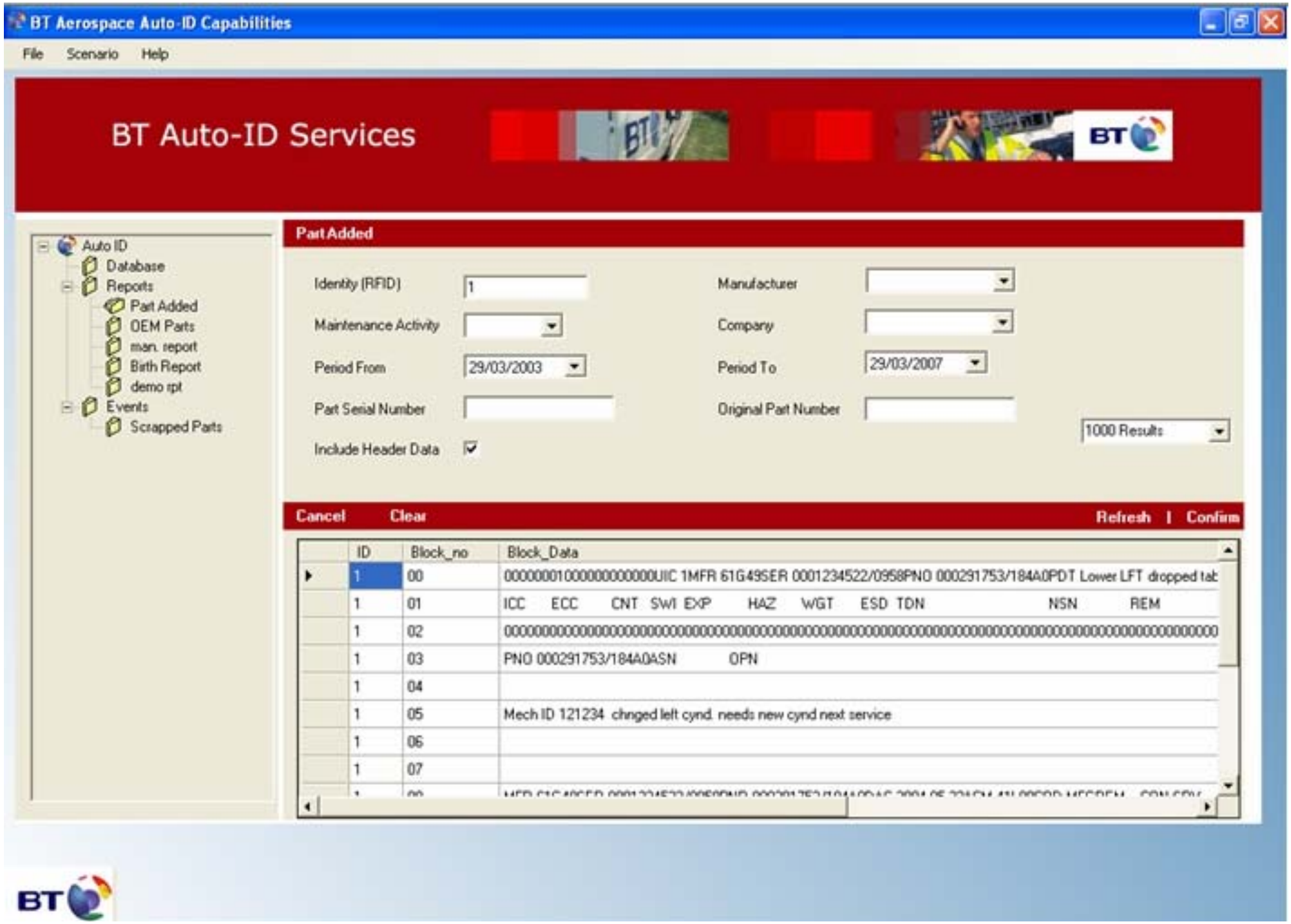
# Part Replacement



# Reporting


BT Aerospace Auto-ID Capabilities
File
Scenario
Help
BT Auto-ID Services
Auto ID
Database
Reports
Part Added
OEM Parts
man. report
Birth Report
demo rpt
Events
Scrapped Parts
Part Added
Identity (RFID)
1
Manufacturer
Maintenance Activity
Company
Period From
29/03/2003
Period To
29/03/2007
Part Serial Number
Original Part Number
1000 Results
Include Header Data
Cancel
Clear
Refresh
Confirm
ID
Block_no
Block_Data
1 00 0000000100000000000UIC 1MFR 61G49SER 0001234522/0958PNO 000291753/184A0PDT Lower LFT dropped tab
1 01 ICC ECC CNT SWI EXP HAZ WGT ESD TDN NSN REM
1 02
1 03 PNO 000291753/184A0ASN OPN
1 04
1 05 Mech ID 121234 chnged left cynd. needs new cynd next service
1 06
1 07

# Some Lessons from the Prototype

- **Master Data - what is master data?**
  - Tag holds data but can could get damaged, the Centre may not have latest updates. Protocols and rules need establishing
- **Data Synchronisation**
  - needs design for tag central database co-ordination solution and
- **What happens when tag is full?**
  - re-use oldest blocks? Add new tag? Remove old tag?
  - Process issues need to be considered as well as development issues
- **"Redundant" characters in tag schema**
  - filling tags up quicker than necessary e.g. 4 character codes only 3 are used. "/" delimiter characters, not really needed as tag data is not human readable. This is helped by encryption and use of capital letters only
- **Repeat data in tag**
  - some constant data gets repeated unnecessarily for this application
- **Central database has very high operation benefit potential**
  - Needs to support publishing and searching for the MRO community
  - Boeing identified requirement for ‘trusted third party’ to provide a service



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# BT’s Cross-Industry Publish and Subscribe Vision