



NOW Deployment Applications

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Motivation



- Why deployment applications?
- C2C-Communication is subject to direct network effects
 - Availability only given with a certain market penetration
 - Applications with immediate added value are necessary
 - Support in overcoming market entry barriers
- Multiple possible scenarios
 - Car2Home
 - Car2Infrastructure
- Use of existing standards and infrastructures
 - Reuse of existing applications
 - Integration in existing environments

Selection Process



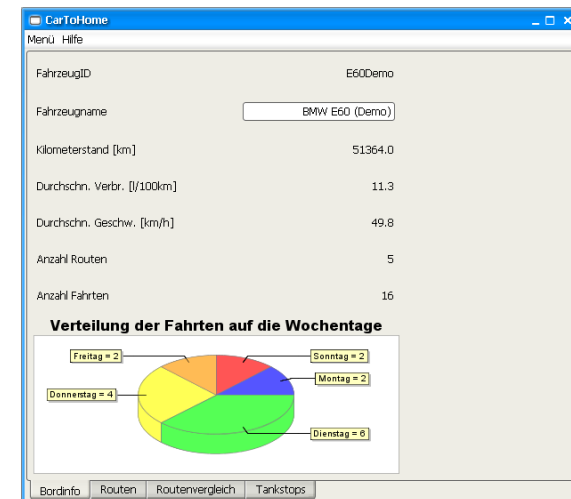
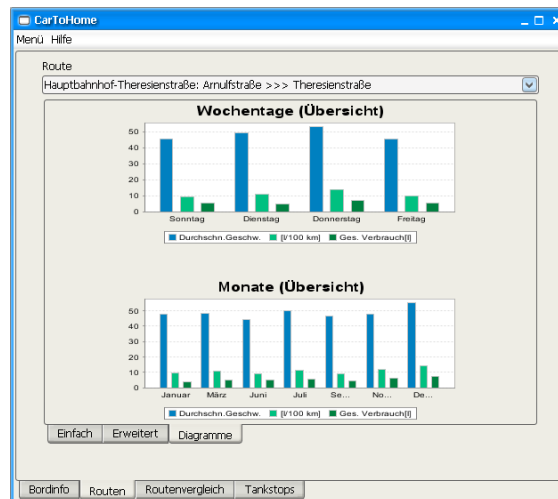
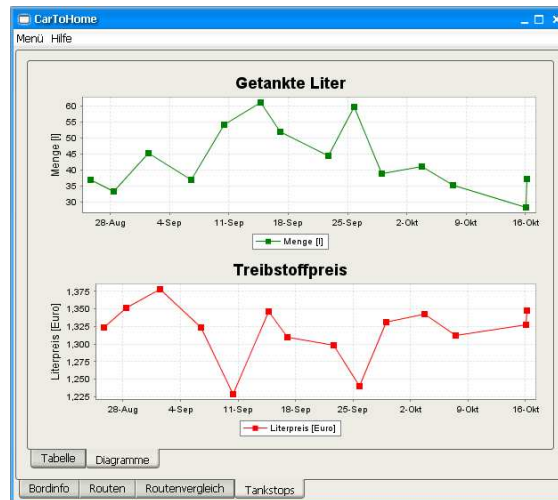
- Collect application ideas
- Establish evaluation criteria
- Result:
 - C2Home: Video/Music Download
 - C2Home: Driving data / route comparison
 - Point of Interest Notification
 - Drive-through payment
 - C2Home: Accessing vehicle data (fuel level, ...)
- Further steps:
 - Use cases
 - Specifications
 - Implementation
 - Integration

Route Data Comparison



- Collect and record driving data in the vehicle
- Provision of log files via FTP
- Statistical analysis at the home PC
 - Average velocity
 - Travelling times
 - Distances covered
 - Fuel consumption
 - Compare different trips for one route
- Implemented in Java
- Vehicle side as OSGi Bundle

Route Data Comparison



Video/Music Download



- Single music files and playlists can be managed separately
- Avoid doubles
- Basic technologies
 - XML for managing the libraries
 - FTP for transfer
- Implemented in Java
- Vehicle side as OSGi Bundle

Video/Music Download



C2Hmp3Client

Datei Bearbeiten Ansicht Übertragung Hilfe

Bibliothek

- Home
- Fehlende Mp3
- Entfernen
- Hochladen

Playlist Bibliothek

- Home
- Fehlende Playlisten
- Entfernen
- Hochladen

Musik Filter

| Genre | Artist | Album |
|----------------|------------------------|------------------------------------|
| All (5) | All (10) | All (4) |
| (52)Electronic | Momo | Unknown |
| Soul | Animal & The Muppets | Trapez Ltd. 44 |
| Soundtrack | Raabe, Max | Das Nächste Mekingof Aller Zeiten |
| Undefined | Und | The Life Aquatic With Steve Zissou |
| (12)Other | Nkkfurie De La Caution | |
| | LaVette, Bettye | |
| | Nomi, Klaus | |

| Home | Fahrzeug | Titel | Artist | Album | Genre |
|------|----------|---------------------------------------|------------------------|------------------------------------|----------------|
| ✓ | | Mahna, Mahna | Animal & The Muppets | Unknown | (12)Other |
| ✓ | | Das London Symphony Orchestra | Knorkator | Das Nächste Mekingof Aller Zeiten | (12)Other |
| ✓ | | Die Blume Des Yochipilli | Knorkator | Das Nächste Mekingof Aller Zeiten | (12)Other |
| ✓ | | Das Singende Klingende Universum | Knorkator | Das Nächste Mekingof Aller Zeiten | (12)Other |
| ✓ | | What Condition My Condition Is In | LaVette, Bettye | Unknown | Soul |
| ✓ | | Garnix | Momo | Unknown | Undefined |
| ✓ | | Ping Island/Lighting Strike Rescue Op | Mark Mothersbaugh | The Life Aquatic With Steve Zissou | Soundtrack |
| ✓ | | Thé À La Menthe | Nkkfurie De La Caution | Unknown | (12)Other |
| ✓ | | Ding Dong! The Witch Is Dead | Nomi, Klaus | Unknown | (12)Other |
| ✓ | | Tellerip Girl | Raabe, Max | Unknown | (12)Other |
| ✓ | | Rodeo | Und | Trapez Ltd. 44 | (52)Electronic |
| ✓ | | Indian Love Call | Whitman, Slim | Unknown | Soundtrack |

Wireless Payment



- Comparison of several payment techniques
- Comparison of multiple payment techniques:
 - Debit
 - Credit card
 - Other mobile payment methods
 - Electronic purse (Geldkarte)
 - PayPal
- Pairing
 - Public-key-infrastructure
 - Manual authentication (by comparing short strings)
- Takes into account vehicle context
- Sample scenario: parking lot

Wireless Payment



BMW Firmenparkplatz, Hanauer Str. 46
Parkgebühren: 10,- € pro Stunde

Wireless Payment nutzen

Abbrechen

Bitte vergleichen und bestätigen
Sie den Sicherheitscode: 6126

Ja

Nein

Bitte bestätigen Sie die Zahlung von
0.21 EUR mit Auswahl einer Zahlungsart.

Abbrechen

GeldKarte

Auf Rechnung

Zahlung erfolgreich, vielen Dank für
die Benutzung des BMW Parkhauses!

OK

...under the hood



- Ontologies as foundation for further services
- “An ontology is a [formal], explicit specification of a [shared] conceptualization” (Gruber 1993)
 - Abstract model (multiple ontologies are possible)
 - Widely accepted models
 - Formal description language (based on XML, RDF(S), OWL), integrated into the W3C stack
 - Machine readable, -processable (-interpretable ?)
- Use cases:
 - Description of the driving situation
 - Recommender systems
 - Abstract model for vehicle sensor data
 - Is active safety possible with ontologies?

...under the hood



- Message based communication
- Event based channels
 - Topics (receiving)
 - Queues (sending)
- Separation of applications from message handling
- More flexible distribution of messages within one vehicle
- Reorganization of queues is possible at any time (prioritization of messages)
- In combination with ontologies semantic annotation of messages becomes possible