MCCI

Product Brief

# MCCI® Media Transfer Protocol

MTP for Cell Phones

Microsoft has positioned MTP in a strategically central role. Highly integrated MTP support is now standard in Windows Vista, Xbox, Media Player-11 and car stereos from leading auto makers. However, cell phone OEMs who want to leverage this opportunity with MTP media-phones face a complex task. User expectations, based on popular media players, have set a very high bar for ease of use, reliability, and compatibility.

MTP was designed for stand-alone, hard-drive based media players. Cell phones are far more complex devices than media players, with different requirements and constraints. Stand-alone players don't typically have removable media, require concurrent functionality, or have vulnerability to malicious code. Dedicated players also don't have to integrate seamlessly with other tasks the user needs to perform.

MCCI has addressed these issues with its MTP solution, which simplifies both the OEM and end-user experience.

MCCI Solution

- All MTP capabilities now supported on MCCI wired and wireless USB

- Fully concurrent call handling, synchronization and playback via reentrant code and a robust architecture

- Simple OEM reconfiguration for multiple products and the addition of new media formats without recompiling

- Combined MTP and PictBridge architecture minimizes memory requirements.

- Dynamic database architecture allows management of all media content through a single database and application

Now Playing

★★★☆☆

0:35   3:25

Song Title
Artist
Album Title

Add to playlist | Prev | Next | Stop
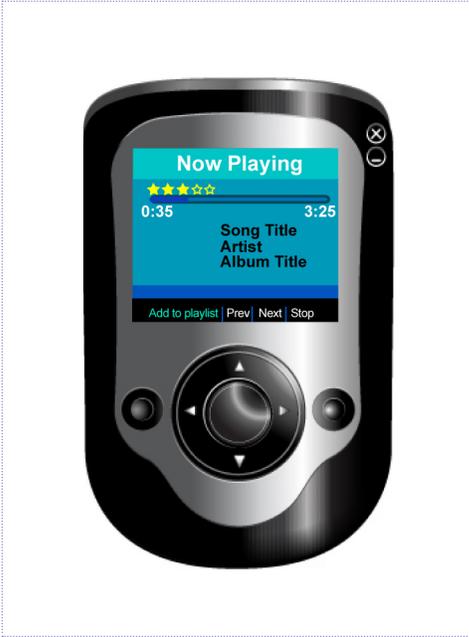
- Database optimized for fixed and removable memory, with deterministic reliability; automatic recovery of corrupted data

- Automatically combines fixed memory and memory card data to present single database to UI

- Passes Windows Media Certification test; eligible for Windows Vista Premium logo

- APIs support integration with third party DRMs and UIs

Dynamic Database Module

Central to the flexibility and high performance of MCCI MTP is our implementation of the Modular Media Storage Services (MMSS), which manages the storage of media content. MMSS employs a patented B-Tree architecture with a log-based file system, providing redundancy and highly efficient access for searching and sorting. MMSS is pre-configured for the most common types of queries for media player applications.

Contents

The MCCI MSS database provides OEMs with the ability to incorporate the descriptive information from any type of media content into a central media database. A generic query capability allows the OEM total flexibility to configure database indexing, searching, and sorting. For example, cell phone photos and videos, or content received from proprietary services can be indexed for later retrieval. The end result is a simplified user interface, delivering fast and efficient access to all the content stored in the phone.

The MSS database automatically combines internal flash memory and flash card-based content to present a single database to the user interface. The database has other advanced capabilities that allow configuration of content types and database queries, and the capability to acquire database information from non-MTP transports, for example, content downloaded over-the-air via proprietary IP. The database is built using an extremely reliable and fault-tolerant internal architecture, providing a deterministic degree of reliability.

MCCI MTP Block Diagram
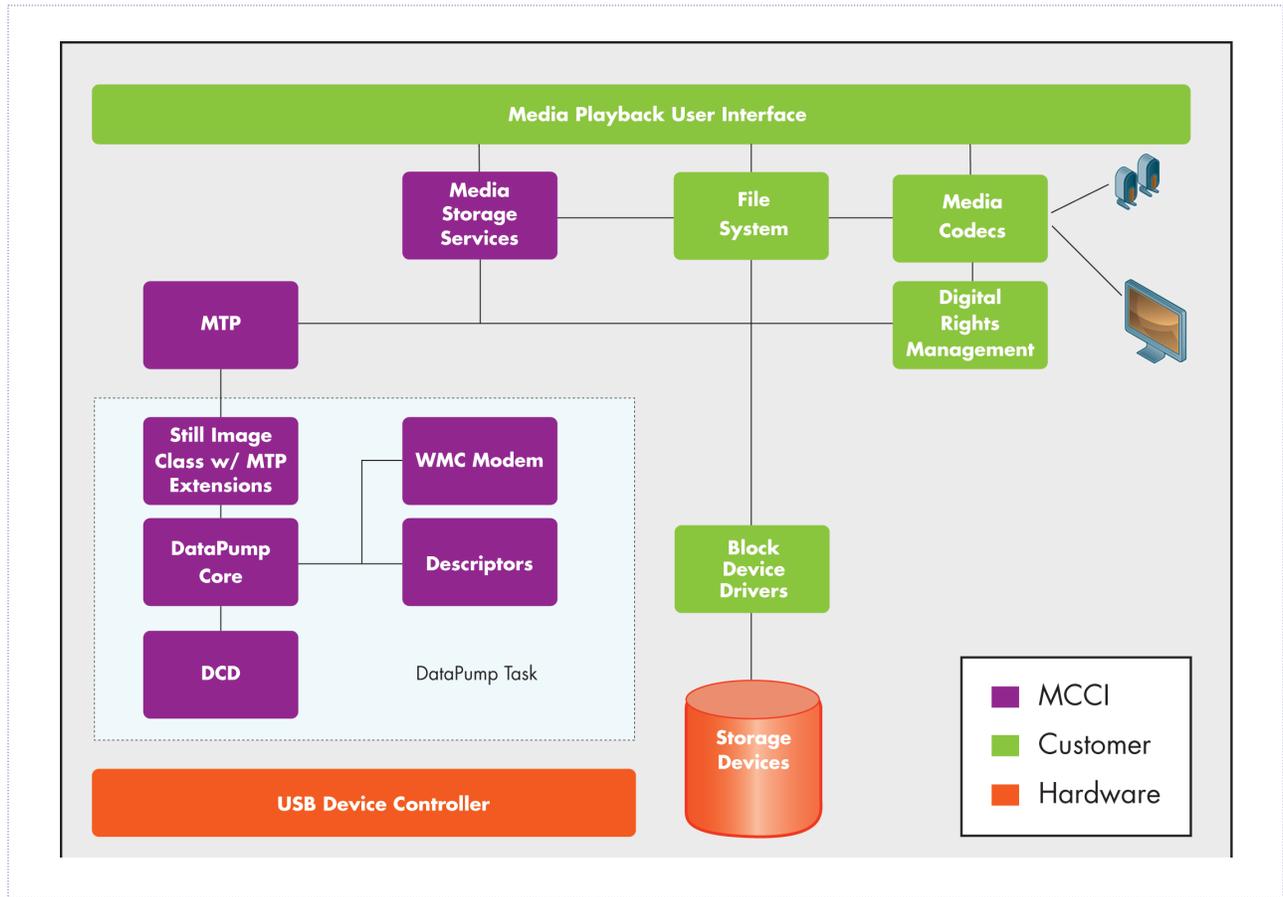
Cell Phone Firmware Implementation Blocks

- MCCI USB DataPump® – USB protocol and device class support stack
  - Still Image Class (SIC) with MTP Extensions
  - Device Chip Driver
  - MTP Descriptors
  - Wireless Mobile Communication modem
- MCCI MSS – Stores and organizes media content
- MTP protocol – Manages and controls connected devices
- DRM – Controls and logs usage, from third party vendor
- Codec – Decoder plays back content; Encoder records content, from third party
- Flash file system – High performance firmware, from third party vendor

PMPSim GUI and Debug Messages

Validation Tools

MCCI provides test and simulation software to speed product development:

• PMPSim is a Windows-based application that provides user interface and codec functionality to allow demonstration and testing of the MCCI MTP stack. The MTP stack used with the Windows application is the same MTP stack used for the embedded systems with a Win-32 wrapper. It can be used to replicate and debug problems in the MTP device stack. PMPSim demonstrates the portability of the MCCI MTP stack to multiple platforms.

• MTPHVT is an MTP host (initiator) emulator, capable of generating MTP commands with valid or invalid data and parameters. MTPHVT is used as an aid for functional development, testing, and debugging. It can also be used to validate the reliability, validity, and fault tolerance of MTP device implementations, and it has the capability to capture and display MTP command and response traces.

NOTE: Both of the above programs use an MCCI Catena® PCMCIA card to provide a USB device interface that can be connected to a host port on the PC-based test system.

Wireless (WUSB) MCCI Catena cards are available as part of the MCCI WUSB composite device support.

Third Party USB Product Integration

MCCI MTP is optimized for use with the MCCI USB DataPump, but its standards-based architecture is easily ported to third-party USB stacks. It is also supported by the MCCI Wireless USB (WUSB) firmware and toolset. Music phones and media players built with the MCCI MTP solution can integrate with multiple Digital Rights Management (DRM) clients and OEM or third party players and user interfaces.

For a "media player quality" download experience, a high-speed USB or WUSB interface is recommended. Wired USB implementations of MCCI MTP work with the following components integrated above the customer's hardware:

- Device Controller Driver (DCD)
- MCCI USB DataPump
- Still Image Class (SIC) Driver
- Wireless Mobile Communications (WMC) Modem and Mass Storage Classes

Test for Success

Media playback compatibility is a critical part of the user experience. To ensure compatibility, MCCI tests its MTP solution with Microsoft Windows Media Player 10 and 11 (WMP-10 and WMP-11). In addition, MCCI runs the Microsoft PlaysForSure test against the MCCI PMPSim media player reference platform. When the customer product passes this test suite in an approved test lab, the product is eligible for Vista Premium logo certification. Products passing this test are also assured of successful operation with the retail media server framework that supports online purchase, rental, and subscription models for audio and video content.

Microsoft Windows Logo Certification

- Microsoft has moved the former "Plays For Sure" program into the Windows logo program.

- The Windows Media Player logo and verification system ensures Windows Media (WM) format compatibility.

- It also ensures many aspects of a good user experience, such as songs starting to play back quickly after selection.

- Windows Media Player Certification is applicable to mobile media players, PCs, and networked devices such as cell phones.

- It also applies to consumer electronics — XBox, set-top boxes (STBs), car stereos, and home theater equipment.

- Windows Media Player Certification specifies DRM (Digital Rights Management), WM Codec, and reliability requirements.

- Certification tests include automated, manual, service compatibility, and functional testing.