

InnoPath OMA-DM RTOS Device Suite

Performance

- Highly compact diff files
- Minimal client footprint
- Content aware diff generator
- Flexible compression framework

Post-Load Capability

- Push client onto handsets in the field
- Reduce time to deploy MDM

Upgradability

- Client field upgradable
- Add new features
- Support evolving standards

Footprint

- Smallest footprint in the industry
- Reduce handset BOM

Scalability

- Handles the largest image sizes required by OEMs

Usability

- Intuitive GUI for diff generation
- Detailed status reporting
- Simple, well documented APIs
- Integration, test and debug tools

Flexibility

- Ports to any processor or OS
- NOR/NAND memory
- Network agnostic
- User pull upgrades
- Server push upgrades
- Supports OTA, Cable & Memory cards

Interoperability

- Standards based
- Compatible with HP/Bitfone, Funambol, IBM, Innoace, Smith Micro / Insignia, mFormation, Nokia, Synchronica, Websync, and Wisegram

Failure Recovery

- Fail safe
- Fallback to earlier firmware

InnoPath's end-to-end iMDM device management system includes both the iMDM Server Suite as well as the iMDM Device Suite. The Device Suite includes an OMA-DM based device management client on the handset, which communicates with the server, allowing the handset to be managed over the air.

InnoPath's client is, of course, interoperable with InnoPath Servers. It is also interoperable with standards-based 3rd party servers. There are two basic clients available, one for RTOS platforms such as REX and Nucleus and another for Open OS platforms such as Windows Mobile and Symbian. Both incorporate sophisticated firmware management (FOTA), configuration management, diagnostics, and security capabilities. Both include software that allows the operator to generate FOTA update packages by creating a "diff" file.

The InnoPath client consists of the Device Management Engine (DME), a Device Update Agent (DUA) and the Delta Manager (DM). An OEM or OS platform provider may elect to use either the DME, the DUA/DM, or both.

Device Management Engine (DME)

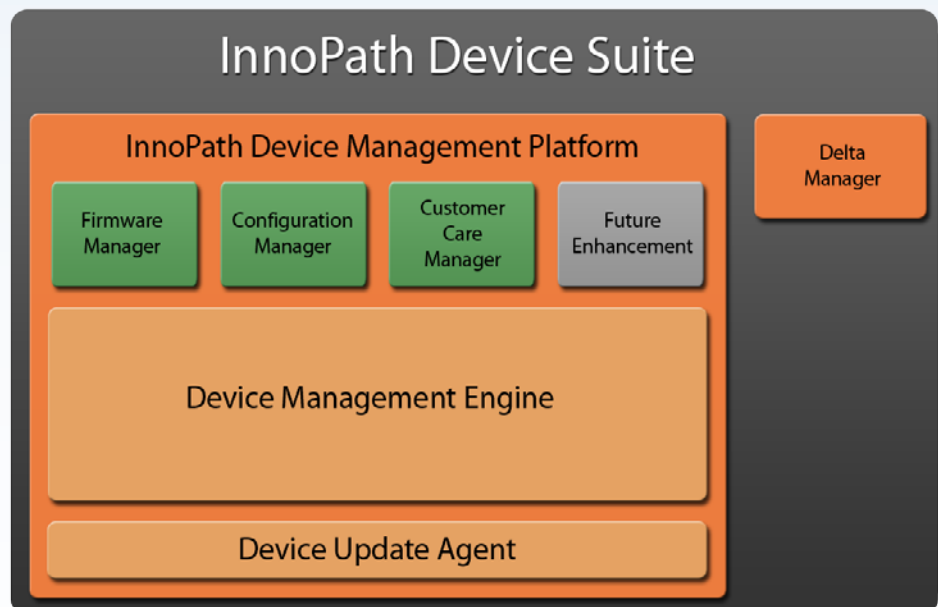
The DM Engine is the core of the solution, maintaining the OMA-DM session with the server, orchestrating downloads, communicating with the DUA, and supporting the various DM applications such as FOTA, Configuration Management, Lock & Wipe, and Device Pulse.

Device Update Agent (DUA)

The DUA is responsible for firmware updates and executed during Initial Program Load (IPL) mode on the device. IPL mode is when the device is first booting up, before the applications begin running. It is much like a PC when it has finished self-test and before it begins booting Windows.

Delta Manager (DM)

InnoPath also supplies a host-based tool used to generate the 'delta' between two images and/or file system components. This tool also creates a package that can be ingested by the iMDM or any OMA-DM server. Currently supported package formats are UPC & PIC.



InnoPath RTOS Client Features and Specifications

Client Platform

Features

- Firmware Management (FOTA): Update device firmware over-the-air to address bugs and increase usability
- Configuration Management: Set (CP) or set and verify (DM) device configurations
- Security Management: Lock and Wipe lost or stolen phones, enables 3rd party applications such as antivirus, firewall and encryption
- Diagnostics: Diagnose device operational issues

Client Characteristics

- Provisioning: Enable services remotely
- Bootstrap: Factory & OTA: Enable first-time automatic configuration
- Network, Client & User initiated DM sessions: Multiple modes for updating firmware
- Small Footprint: Reduces Bill-of-Material costs
- Software Image Update: Support Ultra-low cost, basic and feature phones
- Fast Updates: Enhances user experience
- Digital Signatures: Enhanced security
- Custom Carrier Support: Enables operator specific management requirements
- Roaming Support: Saves operator bandwidth if subscriber is roaming
- Multiple DM server support
- Compression: Supports Multiple Algorithms
- Configurable session timeout
- Client management tree – DM tree provisioning, SIM card management

Supported OSs

- REX
- REX+BREW
- Nucleus
- Open OS support available with InnoPath Open OS Client

Client Security

- SSL, SSL Proxy
- DES, 3DES
- AES-128
- MD-5
- SHA-1

Standards Compliance

- OMA-DM 1.2 & 1.1.2 (coexist), OMA-CP 1.1
- FUMO 1.0, OMA-DL 1.0
- OTAFF
- XML 1.0
- WBXML 1.3
- WAP 183 & 184

Client Applications

Firmware (FOTA) Management

- 100% fault tolerant, supports error recovery
- Installation confirmation including integrity checks
- Fail-safe including bringing devices to operable state after upgrade/update and handling of typical causes of network or device failures
- Flexible format support
- Flash Agnostic
- Suspend/Resume
- Package Encryption & Compression
- Diff Size/Blocks Optimized
- Multi-step Diff handling
- Stable API Set
- Multiple notification methods

Configuration Management

- Automatically provision initial application settings on the device, increase uptake of revenue-generating services; enhance usability
- Verify application settings on handset against operator baseline and correct if required - improve subscriber satisfaction and usability

Security Management

- Lock and Wipe lost or stolen phone

Diagnostics Management

Retrieval of critical handset data including:

- Device model
- Device manufacturer
- Handset serial number
- Software/firmware build #
- Signal strength
- Battery strength
- Embedded device applications (not downloadable applications)
- Device phone #
- Time on phone clock
- Available memory (RAM and ROM)
- Default language
- Roaming
- Voice enabled
- Data enabled