

# DIMPLE for Incident Response Enhancement

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DIMPLE (Device Independent Media Platform for Location Enhancement) is a Location Based Service that provides an easy to use Content Management System (CMS) and a media delivery platform that can seamlessly and transparently multiserve location based digital content to any internet enabled device.

This document describes the DIMPLE system, and suggests how it might be used as a media platform to offer real-time information in support of personnel responding to any kind of emergency incident. DIMPLE can provide an integrated 'big picture' view of any location-specific digital media information sources, and can use AR technology to provide a view of these information sources from the perspective of any suitably equipped operative on the ground.

Figure 1 shows a schematic of the DIMPLE system architecture. The system consists of a CMS, a Media Server, and a Content Repository. Based around an interactive map, the DIMPLE CMS allows users to quickly and easily construct location based digital media projects. Content providers can assemble, geotag, and preview digital content in a variety of formats, from plain text and html to still images, audio, and downloadable or streaming video. Digital assets can be added, deleted, edited and shared amongst projects. The DIMPLE Content Repository stores digital assets for each project in a variety of formats. For example, video content can be stored simultaneously in Quicktime (.mov), Flash (.swf) or MPEG (.mp4) formats for serving to Apple, Nokia, or Android devices, respectively. The same asset can also be stored in audio only format, for devices that don't support video; or even as an image or text file – to be served to legacy devices which have no audio or video support.

The CMS can check each project for completeness and consistency. For example, if the user decides that they wish to serve video content to Apple devices (Mac, iPhone, iPad etc.) DIMPLE can check that versions of all video assets have been provided in Quicktime format.

The DIMPLE media Server offers a web service that will, from a single defined endpoint, serve appropriate content to a wide range of devices. Content in a format suitable for the requesting device's capabilities will be assembled 'on the fly', without requiring separate request paths to be defined for each device class. For example, if an Apple device (Mac, iPhone, iPad etc.) requests content containing video assets, that content will be served in the form of a Quicktime movie. If instead, the device supports Flash video, then Flash content will be served. If the device only supports MPEG video formats, then mp4 will be served. If the device does not support any video formats, an audio

only version of the content can be served. If the device has neither video nor audio support, a still image or text can be substituted instead.

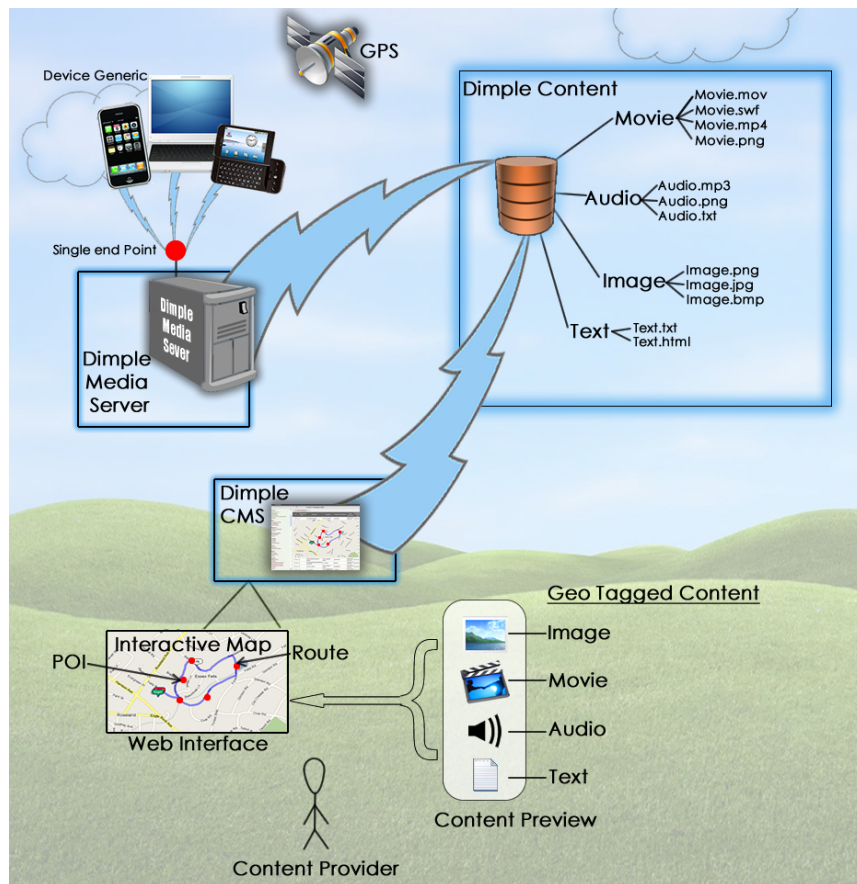
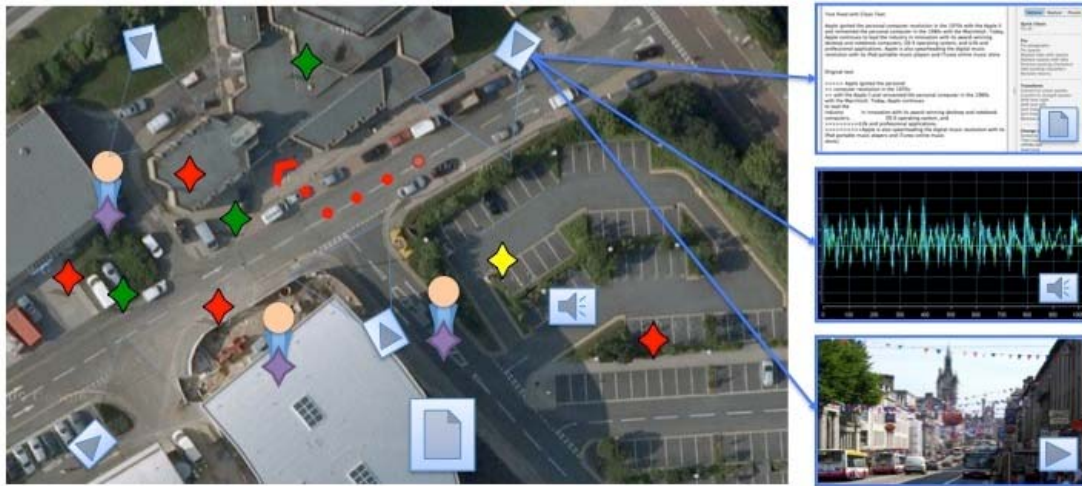


Figure 1. Schematic of the DIMPLE Architecture

A number of Application Programmer Interfaces are provided which give client devices flexible access to the content stored within the DIMPLE platform. These can be used with Javascript libraries which work alongside a number of static and dynamic mapping platforms (e.g. Google Maps, Ovi Maps, Open StreetMaps) to map content on a range of devices. Additionally, DIMPLE content can be served in a variety of formats, including HTML (tailored to each device- including customised cascading style sheets) and JSON (containing just content URLs, and therefore allowing complete control over rendering assets in native apps, for example). DIMPLE content can also be automatically served through Augmented Reality browsers such as Layar and Wikitude.

Currently in beta testing, DIMPLE is being used in a number of projects involving environmental and health and safety issues, accessibility for the disabled, public arts, and regeneration projects, for example.



*Figure 2 Map Interface to the DIMPLE IRE System*

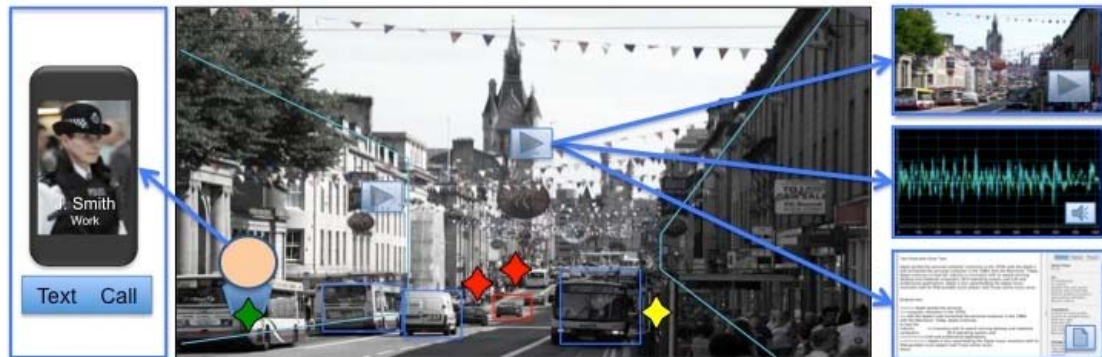
As well as static digital content which is geo-tagged to a particular location, DIMPLE can also be used to monitor and track mobile content sources. This combination of static and mobile digital media makes DIMPLE an ideal platform on which to base an Incident Response Enhancement (IRE) system, which can be used with a variety of mapping and Augmented Reality platforms to provide emergency and security services with enhanced real-time information to inform their response to ongoing security or emergency situations.

Figure 2 illustrates a map interface to the IRE system, which could be accessed by a variety of different internet enabled device types, such as laptops, tablet computers, or smartphones. Geotagged DIMPLE content sources are shown as icons on the map. The map shows icons representing a number of static content sources, such as building entrances/exits, fire hydrant locations, webcams etc. The DIMPLE platform, can serve this content in a variety of different media formats. Selecting one of the building entrances/exits for example might provide a video view of the approach to the entrance/exit from each direction. These videos can be provided in the appropriate format for the device that is requesting the resource (Quicktime, Flash, mp4, etc.). Alternatively, this same information can be provided in audio format instead (if hands free use is required), or as a series of still images, or as text, depending on the capabilities of the device showing the map, and the requirements of the user.

As well as static content sources, figure 2 also shows the location of mobile content sources, such as emergency vehicles, paramedics and security service personnel. Each of these would be equipped with a GPS enabled device in order to track their location. These same devices enable the user to access an Augmented Reality view of the incident location from their own perspective, as shown in Figure 3.

Figure 3 represents the Augmented Reality view through the camera of a suitably equipped mobile device. The view is augmented with icons representing DIMPLE content sources. The user can see icons representing fellow security and emergency service personnel, and the location of building

entrances/exits. Selecting one of the personnel icons will allow the user to call or message the person represented by the icon. Selecting one of the entrance/exit icons will present content about that location, in a format suitable for the device's capabilities, and according to the user's preferences.



*Figure 3. AR view of the Dimple IRE System*

The DIMPLE platform's open APIs mean that content can be served through several different existing AR platforms, such as Layar and Wikitude. Alternatively, DIMPLE data can be delivered through custom built AR applications, targeted as specific devices.